

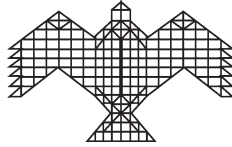


NATIONAL INSTITUTE OF ADVANCED STUDIES

Bengaluru, India

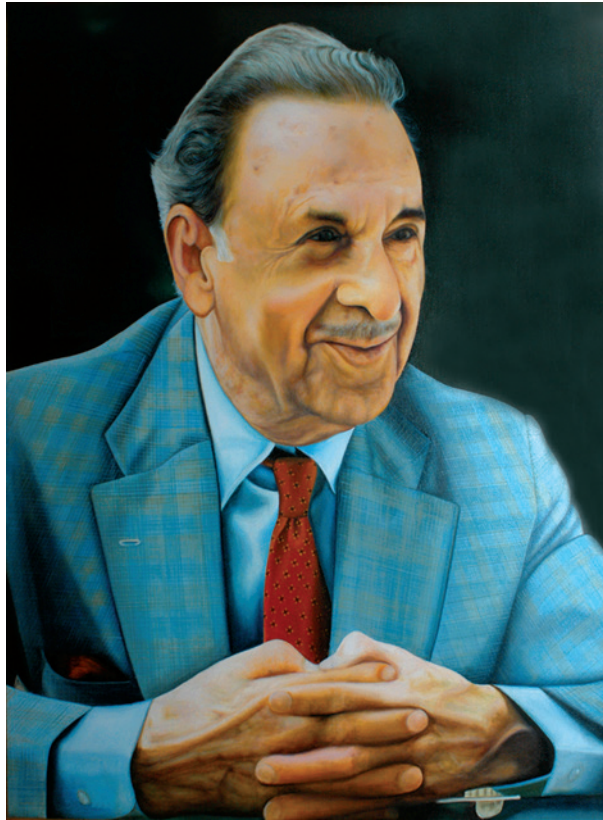
ANNUAL REPORT 2019 – 2020





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JRD Tata
Founding Chairman

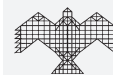
The Vision and Mission of NIAS

To integrate the findings of scholarship in the natural and social sciences with technology and the arts through multi-disciplinary research on the complex issues that face Indian and global society.

To assist in the creation of new leadership with broad horizons in all sectors of society by disseminating the conclusions of such research through appropriate publications and courses as well as dialogues with leaders and the public.

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FROM DIRECTOR'S DESK



The National Institute of Advanced Studies (NIAS) has made steady progress during 2019-20 and had addressed many societal issues and made policy interventions. Prof BV Sreekantan, who had conceptualised and established the Consciousness Studies Programme and Prof S Settar, a renowned historian, both legends in their own fields, passed away. We, at NIAS, will always cherish their memories.

The projects on Inequality and Human Development; Education; Heritage, Science and Society; supported by the Tata Consultancy Services (TCS), have been successfully completed. The study on Inequality and the Demand for Non-Farm Occupations pointed out that in the process of industrialisation, labour workers, mainly dependent on agriculture, from north and east of India have migrated to industrial south and west of India. They earned in cities but continued to maintain their households in villages. Such a situation leads to uncertainty of availability of labour during crisis as being witnessed at present. It was also pointed out that the main factor of farmers' suicides is not poverty. The pressure for farmers to move out of an unviable agriculture and at the same time unavailability of non-farm jobs forced them to take loans for various social demands. As the pressures of unpaid debts mounted on them, it led to suicides in some cases. Dr Ashok Lahiri, Member, 15th Finance Commission, had released reports on these projects related to Inequality and Human Development.

In the field of Education, the review of Ashram schools in Maharashtra resulted in the efforts to revisit the state's norms to govern Ashram schools. Life histories of 130 women scientists were traced and diversity among them was understood. Another study resulted in a comprehensive assessment of the vocational and technical education in India. It was found that vocational education in schools can be a key conduit through which skilling and employment opportunity of youth could be plugged in.

The study on Metal Crafts has documented selected metal crafts which has distinctive cultural and technological significance. These included the copper image casting and icon making tradition of Swamimalai in Thanjavur district, the rare bell and lamp making traditions of Nacharkoil, the Swami-plate making tradition which dates back to Thanjavur Maratha period, the bronze mirror making tradition of Aranmula in Kerala, rare and skilled blacksmithing practices of Karuman, and fading memories of the Kammara blacksmiths of the making of the legendary wootz steel.

The Urban and Mobility Studies Programme examined the linkages between migration, skilling, livelihoods and social mobility among construction and low-end service sector workers in Bengaluru, Karnataka. The socio-economic transformations set in motion by the building of a new capital city, Amaravati in Andhra Pradesh were studied.



An interdisciplinary project to study human-environment interactions is nearing completion. The effects of open cast coal mining and thermal power stations in Ramagundam area in Telangana are being studied and modelled.

The Energy and Environment Programme has clearly come out with policy insight related to Flue Gas Desulphurisation (FGD) technology. Based on analysis of 100 thermal power plants, it was recommended that FGD technology should be used in exceptional cases only. As there is surplus power generation capacity, the old plants less than 500 MW in South India should be closed down instead of fitting with FGD technology. The recommendation made after detailed discussions with all stakeholders under chairmanship of Dr Saraswat, Member NITI Aayog.

The Animal Behaviour and Cognition Programme has conducted on the demography, behavioural ecology and management of primates, elephants and fish in peninsular India and drivers of human primate conflict. The study on Asian elephants traced life history of elephants and helped in managing human-elephant interactions. Low-cost mitigation strategies have been identified to protect crops from crop-raiding monkeys. The procedure for raising population of Deccan mahseer in lab conditions has been developed. The Complex Systems Programme has focussed on modelling effects of coal mining and climate change impact on ecosystems (terrestrial and marine). Models have been developed to explain post-1985 regime shift in sardine and mackerel populations along the Indian coast and prediction of increase in jellyfish numbers due to climate change.

Under Science Communication Programme, a survey of public perceptions of Artificial Intelligence (AI) and its impact was carried out. A new tool 'Toon Logs' combining cartoons and Blogs has been developed to communicate scientific and technological issues.

Under Consciousness Studies Programme, the concepts of consciousness and self-reflection in the context of related epistemological and ontological structures in Kashmir Saivism have been developed. A new algorithm – Compression-Complexity-Causality (CCC) to identify causal relationships between time series was invented, measuring consciousness and sustainability research.

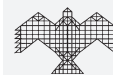
The study on Space Weapon Systems looked at Indian systems and technology requirements and prepared a detailed report for the Defence Research and Development Organisation (DRDO). A study on need for Space Security for India for safety and security of our strategic space assets and India's Space Situational Awareness Requirements has been conceptualised.

The new programme on Science Diplomacy have started addressing issues related to Science and Diplomacy in the Arctic, the Himalayan Science Council, the Ocean Commons and Blue Economy, and India's Science and Diplomacy in the Outer Space. Focus is also on leveraging Science Diplomacy in South Asia and multilateral organisations such as BRICS, BIMSTEC, etc.

The Conflict Resolution and Peace Research Programme is a new programme focusing on understanding internal conflicts in India (the Maoist conflict, religious radicalisation, conflicts in north-eastern Indian states, and Indian political processes) and causes, courses and consequences of radicalisation across the world. A major research study on Balochistan, focusing on contemporary trends and fault lines has been completed.

Two interschool projects on 'Early Fusion Music' and 'The Non-human in Indian Sculpture' have been undertaken. In Early Fusion Music project, the realm of music, cultural exchanges within India during colonel period is being examined. The history of depicting elephants and primates in sculpture during (n) 2000 years is being studied.

The Doctoral Programme made phenomenal progress, eleven students got their degree this year. Fifty-nine students are pursuing their studies employing multi-disciplinary approaches. Currently Mysore University, Manipal Academy of Higher Education (MAHE) and University of Trans-disciplinary Health Sciences and Technology (TDU) are offering degrees. The Defense Institute of Advanced Technology (DIAT) and NIAS has agreed to jointly supervise doctoral students leading to a degree.



Total seven Training Courses were organised including Senior Executives Course, Space and Foreign Policy and five courses supported by Department of Science and Technology (DST), Government of India on themes related to Social Responsibility of Scientists; Global Developments in Science and Technology; Policy for Science and Science for Policies; Science and Sustainability; Science, Technology and Innovation Policy.

Major outreach activities include One-Day Conference on Gandhi@150: Ideas and Relevance to Contemporary Societal Challenges; the Annual NIAS-CISAC (Committee on International Security and Arms Control in US) Dialogue on Strategic Threats of the 21st Century between India and USA to discuss about a) Deterrence and Strategic Stability, b) Nuclear Material Transportation Security and c) Cyber Security; and Panel Discussion on Towards Creating a Plan-A for India in Arctic.

An approach to develop a strategy to enhance contribution of NIAS in the field of sustainability theory, evaluation and theory has been conceptualised. The process of integrating research in various fields leading to sustainability will be undertaken. A new initiative between Sahapedia and on “Digital Humanities” has been launched, to focus diversity of Indian, and South Asian knowledge and culture-scapes. I am sure these new initiatives will help to advance multidisciplinary approaches to address societal issues.

Shailesh Nayak
Director, NIAS



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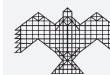
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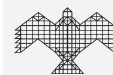
ACKNOWLEDGEMENT

The National Institute of Advanced Studies (NIAS) acknowledges its gratitude to its funding agencies, organisations, institutes and the people for their support in various forms to conduct the research activities, organising training programmes, doctoral programme, meetings, workshops, seminars and symposia successfully.

Our gratitude to:

Sir Dorabji Tata Trust, Mumbai
Tata Education and Development Trust, Mumbai
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TCS Foundation, Mumbai
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Department of Space, Government of India
Department of Atomic Energy, Government of India
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Humane Society International, Hyderabad
Regional Centre for Strategic Studies, Colombo, Sri Lanka
Texas A&M University, Texas
Rufford Foundation, UK

NIAS looks forward to receiving continued support from our well-wishers, funding agencies and all others towards actualising our research and academic mandate.



OBITUARIES

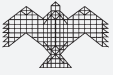


Prof BV Sreekantan, Honorary Visiting Professor, NIAS, passed away on October 27, 2019.

Prof BV Sreekantan, one of the guiding spirits of NIAS right from its early days, left his mortal body on Deepavali Day, October 27, 2019. He had lived a full life of 95 years, marked by a deep commitment to scientific and philosophical thinking, a wonderful compassion for all around him and warm friendship for each and every individual in the Institute. He joined NIAS in 1992, at the invitation of Dr Raja Ramanna, the then Director and a close colleague and friend. And ever since his joining the Institute, Prof Sreekantan had completely immersed himself in multiple endeavours, all committed to building up an institution, which would be unique, not only in the country but one of its kind anywhere in the world. Apart from his significant contributions to the country in the field of cosmic rays, Prof Sreekantan's remarkable contributions to NIAS were primarily in the areas of consciousness studies, more specifically in the setting up of the Consciousness Studies Programme, philosophy of science, the doctoral programme in the Institute and the NIAS Library.

What Prof Sreekantan personally meant to the members of NIAS can perhaps be best judged by the emotions expressed by them at a condolence meeting held for him at the Institute on October 30, 2019. Prof VS Ramamurthy (former Director, NIAS) said that Prof Sreekantan was a role model for all of us to emulate. His ability to work hard and better the benchmarks marked a value that we could all follow. Dr Shailesh Nayak, the present Director, believed that the demise of Prof Sreekantan had left a vacuum that could never be filled. Prof Sisir Roy mentioned that he was able to share the good news of the publication of a volume, co-authored by them, with Prof Sreekantan just before he passed away and that Prof Sreekantan had had further plans to work on another book on dimensionality in the coming days. Prof Roy also spoke about his keen interest in understanding reality and the Indian concept of *maya*. Prof Sangeetha Menon enumerated many instances of her interactions with Prof Sreekantan and said that he was the epitome of unconditional love and childlike enthusiasm to always learn more. She mentioned that it was he who wholeheartedly encouraged her to organise the first national conference on consciousness in India in NIAS, way back in 1998. Mr A Deva Raju bemoaned the irreparable loss that the Institute had suffered and said that, with the passing away of Prof Sreekantan, the three foundational pillars of NIAS – BVS, CVS and MNS – had been taken away. He mentioned the gentlemanly nature of Prof Sreekantan, his sense of discipline and, above all else, his humility in spite of his great scholarship and academic achievements.

Prof LM Patnaik remarked that he had always been impressed by Prof Sreekantan's astonishing memory and how Prof Sreekantan had even remembered having met him several years ago, at a meeting in which he had received the Homi Bhabha Fellowship from Prof Sreekantan. He also mentioned that Prof Sreekantan was very interested in AI studies and that they had had several interesting conversations. Prof Anindya



Sinha said, in a written message, that Prof Sreekantan's passing away was "a truly dark day for us all and for our Institute. It has lost a part of its soul. Prof Sreekantan was possibly the most important reason I came to NIAS and he has, to a great extent, been responsible for what I am today. Even how I am thinking of cognitive science right now is being guided by a thoughtful article that Prof Sreekantan emailed me just about a month ago. He will always shine on within me...". As he will, over all of us who he loved so much, as long as the institution continues to march forward, inspired by the dreams and passion of Prof Sreekantan.

by Prof Sangeetha Menon

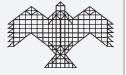


Prof S Settar, Honorary Visiting Professor, NIAS, passed away on February 28, 2020.

One of Karnataka's most renowned historians and iconic figures in the field of Kannada and Culture, Prof Shadakshari Settar was Member of the Heritage, Science and Society Programme in the School of Humanities. He leaves behind a towering legacy in the fields of art history, anthropology, history of religion and classical and regional literature.

Born in Bellary district in 1935 he obtained PhD degrees from Karnatak University, Dharwad as well as Cambridge University. He has contributed to building numerous national institutions in his illustrious career as Professor in Karnatak University, Dharwad for three decades, as past Director, National Museum Institute, past President of the Indian Council of Historical Research, New Delhi, past Director of Institute of Indian Art History at Dharwad and past Honorary Director Indira Gandhi National Centre for the Arts, Southern Regional Centre and he also served on the Advisory Board of the Indira Gandhi Rashtriya Manav Sangralaya Bhopal. A multi-faceted personality, Prof Settar was also a writer of repute who wrote several short stories under the pen name 'Priyadarshini' through the 1970s and 1980s and went on to revive his popular writing in Kannada more recently. He joined NIAS in 2002 as Dr S Radhakrishnan Visiting Professor and was engaged in prolific scholarly research and writing till the end.

His prodigious scholarship spanned many areas of Karnataka's rich artistic, linguistic and artisanal history and contributed in no small measure to the declaration in 2008 of Kannada as a classical language. While his early work had elegantly explored the vibrant milieu of Hoysala sculptors and records of artisans, he extended these approaches at NIAS to explore the early trajectory of writing and social history of scribes. Apart from his engagement with Kavirajamarga, a medieval foundational Kannada classic in Kannada, Prof Settar's insightful research into the history of Kannada and its script, the 'Halagannada Lipi', delved into earlier evidence such as the tripadi poetry in the 6th century Badami inscriptions, and also explored Dravidian antecedents going back to Sangam Tamil poetry. His most recent publication completed just days before his sad demise delved into the vocabulary of Buddhist artisans of the remarkable site of Sannati and the little-known world of the scribes associated with Mauryan edicts in north Karnataka such as Chapada who hailed from Afghanistan. His research going back to the 70's into the religious history of Jainism



and the ritual practice of voluntary termination or 'Sallekhana Vrata' practised by Jain monks in the region of Shravanabelagola, had far reaching implications and was invoked in a ruling in the Rajasthan High Court in 2015 that Sallekhana or Santhara could not be treated as suicide. He also expanded his work on the Hoysala idiom with a monograph on Somanathapura. As a bilingual writer, Prof Settar was equally versatile and at ease in both English and Kannada and many of his English writings were translated into Kannada and vice versa.

In his time in NIAS, he co-organised some landmark international conferences, including one on Jainism, and most recently a major international one on the diverse manifestations of Ramayana in India, South India and Southeast Asia in 2017 which saw participation from various Southeast Asian countries. As an expert on the Vijayanagara Heritage of Hampi, he gave impetus to the Digital Heritage and Digital Hampi project supported by Department of Science and Technology.

His receptiveness to new ideas was in evidence in the drone documentation of the spectacular site of Shravanabelagola. Prof Settar was a great connoisseur of the arts and showcased several outstanding performers at NIAS such as from the great musical hub of Dharwad. He organised a couple of innovative major art camps and workshops at NIAS, resulting in the beautification of NIAS, one of which was on traditional mural painting from Kerala where he guided the artists towards a creating a lovely mural at NIAS which evocatively depicted various aspects of Kalidas' Shakuntalam.

Prof Settar was a lively and urbane conversationist, who would hold court, whether it was at the high table in Oxford when the NIAS-UKIERI team visited in 2011, where he revelled in his Oxbridge connections, or at the NIAS dining table sharing intriguing nuggets of information with staff and students alike, or whether it was in the company of the stalwarts of Kannada intellectual and artistic discourse such as Prof UR Ananthamurthy and Mr Girish Karnad. As pointed out by Prof Roddam Narasimha at a memorial at Bangalore International Centre he was one of the greatest of Karnataka's public figures.

Amongst the many awards he was decorated with his tenure at NIAS were Bhasha Samman from Kendra Sahitya Academy, Kalburgi award from Kannada Book Authority in 2018, Pampa Prashasti and Karnataka Rajyotsava Award and Presidents' Award in 2019. NIAS is deeply indebted to Prof S Settar for his generous bequeathment of rich and rare scholarly collection to the NIAS library which will continue to engage and stimulate scholars, students and the public for decades to come.

by Prof Sharada Srinivasan



EXECUTIVE SUMMARY

The activities of NIAS have been organised under four schools: Conflict and Security Studies, Humanities, Natural Sciences and Engineering and Social Sciences. The following is a summary of the major outcomes and achievements through various programmes and initiatives of the various schools at NIAS.

1. **CONFLICT RESOLUTION AND PEACE RESEARCH PROGRAMME** – The Conflict Resolution Programme (up to early 2020) undertook a series of evidence-based research on select conflicts related to natural resources and people's movement in Odisha on vulnerabilities and volunteerism.

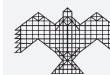
The newly created programme – Conflict Resolution and Peace Research Programme attempts to pursue evidence-based research on individual conflicts and identifying elements that can be used to resolve them in achieving peace and their resolution. The Programme has a special focus on the following: India's Northeast, Left-wing affected areas, J&K, Sri Lanka, Myanmar, Pakistan and Afghanistan. A series of research backgrounders ranging from conflicts in Northeast to the Maoist conflicts in India have been published offering substantial and critical knowledge on each of these conflicts.

2. **SCIENCE DIPLOMACY PROGRAMME** created in February 2020. During the last few years, the Science Diplomacy project was part of the International Strategic and Security Studies Programme.

The Programme works closely with the International Strategic and Security Studies Programme and the Energy and Environment Programme. The primary focus is the Arctic, Himalayan Science Council, Blue Economy, Outer Space and Affordable Healthcare. The Secretariat for the BRICS-Young Scientists Forum is supported by the Programme.

3. **INTERNATIONAL STRATEGIC AND SECURITY STUDIES PROGRAMME** specialises in examining contemporary issues having bearing on national security from a Science and Technology perspective, coupled with Geo-Political, Military and Organisational elements. The Programme has initiated research studies on some key technologies, like Unmanned Aerial Systems (UAS) or 'Drones', and their deployment in the National Air Space, in advocating policy and regulatory mechanisms required to minimise such lags. The widespread use of UAS and unregulated crowding of the skies can have serious societal impact. The development and application of software and analysis tools for independent assessment of parametric and performance issues are major activity. Application of Geographic Information System in Space applications, Maritime domain and Defence is another area of interest in the Programme. Considering the emerging situations in the Space Environment, where the congested and contested space can lead to potential conflicts, the programme proposes to study the Space Situational Awareness needs of the Country.

4. **CONSCIOUSNESS STUDIES PROGRAMME** – The Study of Consciousness Measures and Synchrony between Brain and Cardiovascular Dynamics in Yoga Experience, contributed to the initial proposing of causality-based measure of consciousness, and also conceptualising the idea of 'Yoga Experience' as an integrated approach to understand both the physical and mental implications. The proposed network causal activity measure can distinguish between levels of consciousness in monkeys (awake/anaesthesia) by analysing electrocorticographic signals from the lateral cortex. A novel brain inspired AI architecture for automated learning and classification is being developed. The team is exploring relations between principles of causality, learning and information theory. The study on indigenous healing traditions of Kerala could complete the initial field work and documentations of indigenous healers, their methods and practises of curating illness and healing. Philosophical and textual study of the philosophical school of Kashmir Saivism contributed to understanding the aesthetic and cognitive aspects of mind, consciousness and ritual arts.



5. **HERITAGE, SCIENCE AND SOCIETY PROGRAMME** made good progress in areas of sustainable metal crafts heritage, geospatial applications in heritage management, dissemination of archaeology, and architecture and sculpture of Karnataka. A unique exhibition on Indian Heritage in Digital Space, and Digital Hampi was held at National Museum New Delhi from January 16 to February 23, 2020 with the release of the book Digital Hampi, co-edited by Prof Sharada Srinivasan. Prof Settar completed an authoritative work on early Buddhist artisans of north Karnataka, which could only be released posthumously.
6. The principal projects conducted by **ANIMAL BEHAVIOUR AND COGNITION PROGRAMME** over the last year were broadly in the areas of mammalian behavioural ecology, animal cognition, human-wildlife interactions, urban ecologies, performance studies, science communication and public risk perception. Findings from studies carried out by the programme members highlighted the negative impacts of anthropogenic activities on primate survival, the efficacy of conditioned taste aversion as a field technique to reduce human-primate conflict, behavioural adaptations by fish species in response to high-density environmental conditions, the emergence of novel behavioural strategies in elephants in anthropogenic habitats, the necessity of integrating other-than-human lives into urban planning, the value of human and nonhuman performance as voices against urbanisation, the effectiveness of using Traditional Folk Theatres as a medium for science communication and factors that influence farmers' choice of mitigation strategies against crop-raiding wildlife. Apart from contributions to fundamental research in the fields of animal social behavior and animal and human cognition, programme members' work in the area of environmental decision making also produced concrete insights for animal management and wildlife conservation policies.
7. **COMPLEX SYSTEMS PROGRAMME** focuses on interdisciplinary, path-breaking research based on principles of nonlinear dynamics. Work has focussed on topics such as climate change impact on ecosystems (terrestrial and marine), predicting climatic tipping points, modelling animal movement and interaction between species, pollution growth prediction, modelling effects of anthropogenic activities like coal-mining, etc. Other topics include dynamics of nonlinear mechanical systems, neuronal firing, nonlinear effects in sensory systems, multi-phase flows and cavitation, to name a few. Outreach activities range from off-campus seminars to offering a carefully tailored course at IISc open to students from NIAS, IISc and several institutions to encourage research in complex systems.
8. **ENERGY AND ENVIRONMENT PROGRAMME (EEP)** focuses on the Sustainable Development Goals (SDGs), specifically; affordable and clean energy (SDG 7) and its relation to climate change (SDG 13), responsible production and consumption (SDG 12).

EEP faculty are engaged in working groups constituted by Government of India on key aspects of National mineral and coal policies. The team members are working closely with other like-minded organisations in areas like optimal electricity source mix, energy sustainability, inter-disciplinary research on air and water environment as well as public health and sustainable cities. EEP organised policy-focused workshops to bring together key stakeholders to discuss key subjects like, human-environment interactions, energy sustainability, and power sector reforms and presented actionable policy recommendations to the Government on vital issues.
9. **SCIENCE COMMUNICATION PROGRAMME** – The focus of the programme is to obtain effective and informative insights of managing public perceptions and acceptance of the risks associated with new and emerging technologies, through science and technology communications such as nuclear technologies. Efforts were concentrated on exploring the utilisation of newer platforms and visual media for science communication. A NIAS report on 'Survey on Public Perception: AI and Its Impact' was brought out. Two videos 'Blue Economy' by Dr Shailesh Nayak and 'Human Primate Interaction' by Prof Sindhu Radhakrishna have been added to the library of 'Let's Talk' series. Combining the capabilities of Cartoons and Blogs to reach out to society, a new series 'ToonLogs' has been initiated, which would address diversified topics relating to Science. The first in the series has been created and dealt with 'COVID'.



10. EDUCATION PROGRAMME continued to work on its focus areas by engaging in research, teaching, advocacy and interventions. The programme completed projects on i) Nurturing the Gifted and Talented Children ii) Emerging Concerns in Vocational and Higher Education iii) Residential Schools in Maharashtra and iv) Women in Science and Engineering this year and came out with research reports. Dr Shivali Tukdeo published her book, *India Goes to School: Education Policy and Cultural Politics* with Springer that looks at policy production and circulation in India.

11. INEQUALITY AND HUMAN DEVELOPMENT PROGRAMME completed two major projects that helped understand the role of inequality in important aspects of India's transformation from an agrarian economy to one based on industry and services. The projects studied the role of inequalities in this transition in the demand for non-farm jobs as well as in farmers' suicides. The reports that were released in Delhi by the Member of the 15th Finance Commission, Prof Ashok Lahiri, to a group of senior academics, explored the mechanisms that generated both short-term migrant labour on a scale that has not been seen anywhere in the world, as well as farmers' suicides. The studies pointed to the need to better relate to the challenges faced by former agriculturists seeking non-agrarian opportunities; a need that has become very evident in the migrant labour crisis within the response to the Coronavirus pandemic.

12. URBAN AND MOBILITY STUDIES PROGRAMME explored diverse processes and manifestations of urbanisation and social and spatial mobility in contemporary India, based primarily on grounded ethnographic fieldwork. Two major funded research projects on India's Changing Cityscapes and Speculative Urbanism: Land, Livelihoods, and Finance Capital were completed during the year.

TRAINING PROGRAMMES conducted include:

34th NIAS Programme for Senior Executives

Programme on Space in India's Foreign Policy Technology – Policy – Security Considerations

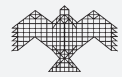
NIAS-DST Training Programmes on

- (i) Social Responsibility of Scientists: Pathways and Outcomes for Women Scientists
- (ii) Science and Technology: Global Developments and Perspectives
- (iii) Policy for Science and Science for Policies
- (iv) Science and Sustainability in India for Women Scientists
- (v) Science, Technology and Innovation Policy

DOCTORAL PROGRAMME – NIAS is recognised as a centre for research by Manipal Academy of Higher Education (MAHE), Mysore University and the University of Trans-disciplinary Health Sciences and Technology (TDU) from which students get their PhD degrees. At present there are fifty-nine students pursuing interdisciplinary research in natural and engineering sciences, social sciences, humanities and arts.

MAJOR RECOGNITION received by the faculty members include:

- Prof Rajaram Nagappa received HEMSI-MR Kurup Endowment Award for the year 2015. The Award is instituted by the High Energy Material Society of India, Thiruvananthapuram Chapter and the award function was held on November 8, 2019. He was felicitated by the Aeronautical Society of India, Thiruvananthapuram Chapter on December 28, 2019 for Outstanding Contribution on the occasion of PSLV Golden Mission.
- Prof Sangeetha Menon was invited by Université Des Mascareignes, Mauritius, as Visiting Professor in October 2019.
- Prof Anindya Sinha was nominated International Advisor to the Twenty-Ninth International Biology Olympiad, held at Szeged, Hungary in July 2019. He was also invited by the Department of Geography, Cambridge University to be a Visiting Scholar from October to December 2019.



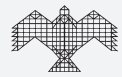
- Dr MB Rajani was elected as Young Affiliate of The World Academy of Sciences 2019-2023 in the area of Earth Sciences. She was conferred the PR Pisharoty Memorial Award 2019 by the Indian Society of Remote Sensing for significant and pioneering contributions in the area of Remote Sensing and GIS Application for Archaeology.
- Prof V Bhujanga Rao received Professional Achievement Memento from Hon'ble Vice President of India on August 28, 2019 at NSTL, Visakhapatnam as part of the Golden Jubilee Function of NSTL. GITAM University, Visakhapatnam conferred upon the Doctor of Science (h.c.) degree on November 9, 2019.
- Prof Sudha Mahalingam received Doctorate from Centre for Energy Policy, Faculty of Engineering and Information Technology, University of Technology, Sydney in March 2020.

NIAS has initiated various measures of outreach and extending the news and updates of academic achievements through several modes such as monthly reports, quarterly newsletters, social media and website.

SCHOOL OF CONFLICT AND SECURITY STUDIES

Programmes

- Conflict Resolution and Peace Research
- Science Diplomacy
- International Strategic and Security Studies



SCHOOL OF CONFLICT AND SECURITY STUDIES

School of Conflict and Security Studies was created in May 2016 to build synergy within and across disciplines. The School of Conflict and Security Studies, in early 2020, added two new programmes – Science Diplomacy and Conflict Resolution, now renamed as the Conflict Resolution and Peace Research Programme. This programme includes the International Peace Research Initiative (IPRI), which was a part of the International Strategic and Security Studies Programme (ISSSP), another central pillar of the School. As a result, in 2020, the School has now three programmes viz, the Conflict Resolution and Peace Research Programme, the Science Diplomacy Programme and the International Strategic and Security Studies Programme.

One of the most important activities of the School is to build a network of institutions. It started as “Bangalore Quad” in 2018 and now named as “Bangalore International” having St Joseph’s College, Christ (Deemed to be University) and Bangalore University as partners. The network organised many events having emphasis on young scholars. The focus is to set up a “Bangalore School” in future. Departments of international studies in Mysore University, Stella Maris College in Chennai and Pondicherry University have shown interest in becoming the part of the School activities under the network.

Within the Institute, the School is active in terms of working with each other at the Programme and individual levels. Faculty and scholars across the Programmes in the School, work together on events and publications. Perhaps, the School is also fortunate to have its focus coterminous with each other in terms of the Programmes.

The School plans to make the Bangalore International beyond being an academic network. The long-term objective is to make the Bangalore School as an independent School of thought, like the Chicago School in the US, providing an alternative perspective to the national capital.

The Bangalore School would need better coordination, and more importantly, funds to take the process forward. The School of Conflict and Security Studies will strive towards the same.

Programmes

- **Conflict Resolution and Peace Research**
- **Science Diplomacy**
- **International Strategic and Security Studies**



CONFLICT RESOLUTION AND PEACE RESEARCH PROGRAMME

Introduction

The Conflict Resolution and Peace Research Programme (CRPR) is a new programme created in March 2020 within the School of Conflict and Security Studies. Until February 2020, there was an exclusive Conflict Resolution Programme within the School, and an International Peace Research Initiative (IPRI) as a part of the International Strategic and Security Studies Programme (ISSSP), also within the School. Both were merged to form the new programme – CRPR.

Research Activities

Vulnerabilities and Political Aspects of Civil Society – Vulnerabilities and Volunteerism: Funded by the Department of Science and Technology, this was a collaborative project between the CRPR of NIAS, Friedrich – Schiller University, Jena and Disaster Research Unit, University of Berlin, Germany. This study investigated an important aspect of conflict that has not been adequately understood in the Indian context: volunteerism. Volunteers can work both to reduce the pains of conflict as well as to enhance conflict. It is thus necessary to understand what prompts individuals to volunteer. Based on the extensive field survey in rural Karnataka and Uttarakhand, the study has detailed the aspects of volunteerism and vulnerability in Indian context. The final report of the project has been submitted.

Natural Resource Distribution, Conflict and Consciousness – Dissecting People's Movement in Odisha: Funded by the Indian Council of Social Science Research (ICSSR), this project investigates the peoples' movements in Odisha on the issue of natural resource distribution in three districts of Odisha. A research paper on 'Local Movements under a Revolutionary Brand' has been accepted for publication. The final report has been submitted.

Maoist Conflict in India: The Left-Wing Extremism, widely known as the Maoist conflict, is one of the major security threats to India. This violent conflict has been dominantly understood through a security perspective not adequately engaging with other critical aspects like grievances of people, governance deficit, faulty development models and the possibility of dialogue between the State and the Maoists, and offered policy recommendations to reduce the risk of conflict. A research essay on 'Politics of Good Governance and Development in Maoist Affected Scheduled Areas in India: A Critical Engagement' has already been published in a journal and a research paper titled 'People's Movements in a Revolutionary brand: Understanding the Maoist movement in Odisha' has been accepted for publication.

International Peace Research Initiative (IPRI)

Radicalisation across the World – Causes, Courses and Consequences: The primary aim of the project is to identify types, causes, actors and consequences of radicalisation on groups, individuals and the State. The research study on Radicalisation focuses on five themes: causes of radicalisation, manifestations of radicalisation, government and civil society initiatives to address radicalisation, international linkages through ideology, groups and networks and forecast in regions of Africa, Europe, Central Asia, Middle East, China, South Asia and Southeast Asia.

Peace Innovation and Peace Start-Ups, Young IPRI Workshop, December 13, 2019 – The Young International Peace Research Initiative (YIPRI), a platform for the young scholars on peace and conflict studies, was inaugurated at the IPRI Annual Study Author's Workshop. It looks at Peace





Innovation and Peace Start-Ups as novel concepts in charting a peace plan of action by interacting with young scholars across South Asia. Young scholars from different parts of South Asia participated in sharing their ideas on Peace Innovation.

A study on 'Conflict Peripheries' in South Asia – exploring the reasons for the conflicts crowded in geographic peripheries in Pakistan, India, Sri Lanka and China. A major study Balochistan during 2019-20 focusing on contemporary trends and fault lines has been finalised. As a part of the IPRI, a series of short commentaries (Peace Comments), and essays (IPRI Briefs). 'Peace Lecture' series in collaboration with the Konrad Adenauer Stiftung (KAS) were published.

Study on Global Protest Movements: Confounded with a new trend across the world, the research at the programme included understanding the political protests and mass movements from Chile to Hong Kong. A one-day workshop titled 'Discontent in/ for Democracy: The Rise of Global Protest Movements' was organised in February 2020. The primary focus of the study is to map the trajectory, trends and predictions in the rise and return of protest movements in three regions – the Middle East, Africa, and Latin America, along with Hong Kong and Spain. Class, gender, environment, political separatism and technology were the key issues studied by the scholars in predicting the consequences of the protest movements.

Study on Contemporary Conflicts and Peace-building: Taking a unique and complementary approach to study global conflicts along with a critical analysis of the peace-building process, the primary focus of the project is on conflicts and peace processes in South Asia, Southeast Asia, and the Middle East. The research study analyses few conflicts on a weekly basis to be able to observe, track and predict the conflict curve better. This becomes the basis for forecasting and estimating an early warning response for a peace process. In this regard, the outcome of the project is an academic endeavour – the Conflict Weekly. It aims to track, interpret and analyse conflicts and peace processes across the world with a special emphasis on South Asia. This endeavour is a joint initiative by the IPRI at NIAS and the Global Partnership for the Prevention of Armed Conflict (GPPAC) South Asia at RCSS, Colombo.

Study on Climate Change and Conflicts: The aim of the research study is to search the conceptual ground for understanding resource conflicts not only from the politics of identity and institutions but also to link the impact of climate change with the escalation of these conflicts. In this, the study focuses on different institutions of disaster management and their role in identifying and reducing the vulnerabilities of different groups impacted by climate change keeping in mind whether these sub institutions, in turn, affect the traditional relationships among the different groups giving rise to latent conflicts.

Academic Events

Drivers of Migration: A Global Analysis, IPRI Peace Lecture by Dr Francoise Heran, April 13, 2019.

After the Count: What Do the Election Results Portend, Panel Discussion, May 24, 2019.

Converting Social to Security: The State and the Maoists in Tribal-Dalit Conflict in Koraput, NIAS Wednesday Discussion Meeting, May 29, 2019.

Gandhi @150: Ideas and Relevance to Contemporary Societal Challenges, One-day Conference, September 16, 2019.

Radicalisation: Cause, Course, Consequence, Annual Authors' Workshop, November 28 to 30, 2019 with the support of Konrad Adenauer Stiftung (KAS) and in collaboration with UNESCO Madanjeet Singh Institute of South Asia Regional Cooperation (UMISARC), Pondicherry University.





Hong Kong and Spain: Drivers of Conflict, IPRI Peace Lecture by Prof Heribert Dieter, November 30, 2019.

Discontent in/for Democracy: The Rise of Global Protest Movements, Young IPRI Workshop, February 7, 2020 – In collaboration with the Konrad Adenauer Stiftung (KAS).

Dr Anshuman Behera presenting a paper in a conference organised by ORF, New Delhi.



Doctoral Students

Mr Shyam Hari P is working on 'Understanding Political Conflicts and Alliance Formation: A Case Study of Two Villages in Kerala'.

Mr Surya Shankar Sen is working on 'Implications of Local Conflicts on Bilateral Relations: Cases of Land Boundary and Enclave Conflicts on India –Bangladesh Relations'.

Ms Zarnain Manzoor is working on 'Discourses around the Kashmiri Pandits: Engaging in fractured Identity and Politics of Dialogue'.

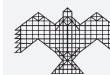
Ms Hrudaya Chandana is working on 'Discursive Formulations of Violence in Ethnic Conflict: Generation and Transmission of Values'.

Ms Aparupa Bhattacharjee is working on 'The Role of Religion in Contemporary Nation-building: A Case Study of Sri Lanka, Myanmar, and Thailand'.

D Suba Chandran, *Head*

Anshuman Behera

Doctoral Students: Shyam Hari P, Surya Shankar Sen, Zarnain Manzoor, Hrudaya Chandana, Aparupa Bhattacharjee



SCIENCE DIPLOMACY PROGRAMME

Introduction

The Science Diplomacy Programme (SDP) is the newest one created in February 2020. During the last few years, the Institute was looking at Science Diplomacy as a project within the International Strategic and Security Studies Programme. In February 2020, the project has been raised into an independent programme within the School of Conflict and Security Studies.

Research Activities

Indo-Arctic: A Study on India's Science and Diplomacy in the Arctic – The Science Diplomacy Programme's study on the Arctic has two pillars – to look at the Arctic from a holistic and multidisciplinary perspective that includes environment, energy, economy, security and diplomacy; and to propose a strategy to New Delhi on what could be an Indian strategy towards the Arctic. The first pillar of the Arctic project involves the following five components- first, a comprehensive database looking at the existing research stations, networks, treaties and legal mechanisms and Arctic stations; second, a political and strategic database looking at policies and strategies pursued by individual countries and regional groups; third, a science and technology database on the Arctic; fourth, developments relating to energy in the Arctic; and fifth, environment and bio-diversity in the Arctic.

The second pillar of the Arctic project at the SDP looks to evolving an “Indo-Arctic strategy” whereby India can achieve its interests in the Arctic. This pillar has a strong policy component to it. It involves proposing Indo-centric Arctic dialogues with specific countries, organising track-I and track-II Arctic dialogues in India, hosting an Arctic Chair and liaison with multiple Arctic networks elsewhere. A case for developing an Indo-Arctic strategy to address India's Arctic interests is being developed. The strategy would look at India building an Arctic coalition in Asia, building infrastructural and energy linkages with Russia to reach the Arctic, constructing bilateral partnerships with the smaller Arctic powers – Norway, Denmark and Iceland, and bringing Arctic networks to India.

The Himalayan Science Council: A Study on India's Science Diplomacy in the Third Pole

With a keen interest in the Arctic, the SDP has expanded its focus on polar research. The Himalayas are considered as the third pole with the largest ice coverage after the Antarctic and the Arctic. This is being given significant focus at the BIMSTEC meetings where there was a separate meeting in December 2019, to discuss the Himalayan Science Council (HSC). What happens in the Himalayas would directly impact the livelihoods of all the countries in the region-the first being the agriculture sector. The global shift in the climate patterns would have an irreversible impact on the Himalayas. Coordinated efforts are essential to explore the challenges that the region is expected to face. It is planned to work with similar institutions within the BIMSTEC and beyond to take the idea of HSC forward through dialogues and networks outside the government, and also through it.

The Ocean Commons: A Study on India's Blue Economy through Science and Diplomacy – Blue Economy looks at the economic and strategic potential of the vast potential of the ocean resources. It looks at the ocean-dependant economic development for improving quality of life of people ensuring inclusive social development along with environmental and ecological security. India had committed to advance its blue economy at the Sustainable Blue Economy Conference in Nairobi in 2018. India's focus could be on sustainable fisheries, coastal ecosystems, coastal and deep mineral and energy resources, coastal marine spatial planning, CRZ, pollution, shipping and infrastructure, manufacturing, security and strategic dimensions, international engagement, accounting framework for blue economy and establishing policy frameworks. The main focus areas are to look at innovative ideas to pursue India's Blue Economy, through its S&T strength. The study would also look at areas within the S&T that needs to be strengthened further to achieve India's Blue Economy potential. Second, the Programme would lead/create multi-disciplinary dialogues to achieve India's maritime potential.



Space and Beyond: India's Science and Diplomacy in the Outer Space – With the expanding scope of Outer Space, states would rely increasingly on multiple initiatives in the Space. No State would be able to tap the resources on its own and will have to work with the others. Science and diplomacy will have to play a larger role in exploiting the potential of the Outer Space. It is proposed to study the existing situation in the Outer Space through first creating a database. The SDP would also look at what India could do, as a regional space power, how it could extend its strengths in Space, and what technology would it need further.

Leveraging Science Diplomacy in Multilateral Organisation: The Role of BRICS and BIMSTEC in India's Soft Power Politics. The National Institute of Advanced Studies has been functioning as the Secretariat to the BRICS Young Scientists Forum, supported by the Department of Science and Technology. The main goal of the forum is to provide a common platform to young budding scientists across BRICS countries, to help them to connect and network in order to resolve common societal challenges with their innovative research. On the other hand, the BIMSTEC is a regional organisation that is at its nascent stages of integrating Research Institutions and enhancing cooperation in Science and Technology. It is proposed to identify potential areas of cooperation between BIMSTEC countries to enhance the collective scientific capability of the region.

A primary research on disaster-management in the Bay of Bengal region assessing the political, social and technological factors that could partake in deepening diplomatic cooperation in the multilateral group has been undertaken. Other areas of research include China 5G diplomacy with third world countries, Strategic potential of Blue Economy in BIMSTEC, Soft Power in Asia-Pacific and Chinese investments in Pakistan.

Doctoral Students

Ms Rashmi Ramesh is working on 'Governance in the Arctic: The Role of Institutions with Special Reference to the Arctic Council, Saami Council and Arctic Circle'.

Ms Harini Madhusudan is working on 'Militarisation in Outer Space: A Case Study of India, Japan and France'.

Events: Discussions, Conferences and Workshops

Arctic Scientific Frontiers: Global and Regional Significances, Chairperson Remarks by Dr Shailesh Nayak, ICWA, March 4, 2020.

Arctic: India is Not Far, Lecture by Prof D Suba Chandran, ICWA, March 4, 2020.

Geopolitics in the Arctic, Ambassador PS Raghavan, in Panel Discussion "Towards Creating a Plan-A for India in the Arctic", NIAS, February 4, 2020.

India in the Arctic: An S&T Perspective, Dr Shailesh Nayak, in Panel Discussion "Towards Creating a Plan-A for India in the Arctic", NIAS, February 4, 2020.

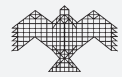
Shaping India's Arctic Policy: An Introduction, Prof D Suba Chandran, in Panel Discussion "Towards Creating a Plan-A for India in the Arctic", NIAS, February 4, 2020.

Arctic Research in India: What Has Been Done in India and What Could Be Done Further?, Dr Sulagna Chattopadhyay, in Panel Discussion "Towards Creating a Plan-A for India in the Arctic", NIAS, February 4, 2020.

Iceland, Denmark and Norway: Small States, Big Access, Ms Rashmi Ramesh, in Panel Discussion "Towards Creating a Plan-A for India in the Arctic", NIAS, February 4, 2020.

The Polar Silk Route: What does China want in the Arctic?, Ms Harini Madhusudan, in Panel Discussion "Towards Creating a Plan-A for India in the Arctic", NIAS, February 4, 2020.

Militarization in the Arctic: Russia and Beyond, Mr Parikshith Pradeep, in Panel Discussion "Towards Creating a Plan-A for India in the Arctic", NIAS, February 4, 2020.



Arctic Governance: Possibility of an Arctic Treaty, Presentation by Mr Yashaskar Shubham, NIAS, January 28, 2020.

Arctic and India, Discussion with Dr Arvind Gupta, January 28, 2020.

Himalayan Science Council and Beyond: S&T Initiatives in BIMSTEC, Panel Discussion at NIAS, January 10, 2020.

Initial Remarks by Dr Shailesh Nayak. Panel inputs by Dr Nischalnath Pandey, Director, Centre for South Asian Studies, Prof VS Ramamurthy, Prof SD Muni, Prof PM Soundar Rajan, Prof Srikumar Pullat and Prof M Sai Baba.

Blue Economy, Lecture by Dr Shailesh Nayak, at Centre for Maritime Studies, Pondicherry University, November 28, 2019.

D Suba Chandran, *Head*

Research Associates: Sourina Bej, Sukanya Bali

Doctoral Students: Rashmi Ramesh, Harini Madhusudan



INTERNATIONAL STRATEGIC AND SECURITY STUDIES PROGRAMME

Introduction

The primary objective of International Strategic and Security Studies Programme (ISSSP) is to study the Science and Technology perspective influencing the Political, Military, Economic and Security developments in India's immediate and extended neighbourhood, and the world in general. This in turn involves analysing the impact of technology on security, and providing policy inputs on relevant issues through research, discussion meetings, workshops and conferences. Research proposals on these lines are generated based on inputs obtained through presentations/discussions held with likely sponsors in the security establishment. In addition, members of the Programme have also taken up research in their own areas of interest and domain expertise.

Research Activities

Weapon systems help in formulating both development and defence strategies. Keeping this in mind, studies were taken up on five advanced weapon systems, namely, Aerial Weapons, Space Weapons, Submarine based Weapons, Directed Energy Weapons (DEW) and Fifth Generation Fighter Aircraft (FGFA). In the initial phase, studies on Aerial Weapons, Space Weapons and DEW Systems were prioritised. The report and main recommendations pertaining to Space Weapons has been completed and submitted. The reports on Aerial Weapons, Hypersonic Weapons, and DEW are being finalised. Based on the study of space weaponisation, a paper titled India and Weaponization of Space has been submitted as a book chapter for Abolition-2000. Study on submarine-based weapons has made adequate progress.

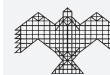
There has been continued demand for the in-house developed missile trajectory analysis software Quo Vadis. Documentation and training were provided to the staff of the user agencies. The in-house software called Veni, Vidi, Vici, being developed for Space Situational Awareness, is progressively being operationalised with the active collaboration of representatives from the user agency.

China's Space Programme: It covers the political, economic, military and the organisational aspects, and providing a holistic as well as a detailed micro level picture of the current status of the Chinese space effort. Chinese strategies of using space for military purposes, basic research in the sciences as well as for promoting international relations are also addressed in detail. Chinese space capabilities are benchmarked with the capabilities of other countries.

An approach to assess the internal and external vulnerabilities of a nation state uses the interconnections between geography, history and peoples, to come up with a measure for the strength of a national identity of a state has been developed. This is complemented by a novel social network-based approach to look at the external vulnerabilities of a country. This enables one to look at a higher order and multilateral approach to the relationships between countries. This new method has been applied to the People's Republic of China as the first case study and the assessments have been used as input to a larger study on China US military rivalry and its implications for the countries of the Indo-Pacific.

The report on China's War and Deterrence Strategies and Its Implications for the Countries of the Indo-Pacific Region has been updated. It is under print for distribution to a wider audience in the country and abroad. The report specifically addresses the viability of China's Anti-Access/Area Denial (A2AD) strategy in a conflict over Taiwan under several scenarios.

Tool to Assess Satellite Capability: The tool can assess the capability of a set of Satellites to carry out space-based espionage activities. The tool can compute the target (point, moving or area target-types) coverage patterns from a Satellite (ELINT, Optical or SAR sensor-types). The Satellite positions are computed based on the most applicable information at that instant from sources such as NORAD. It can also function from a local information base when Internet access is restricted. The integration follows the well-established SGP4 Model. A simple to use user interface lets the full functionality of the tool be exploited. The results are presented in



2D/3D world view. A detailed off-line report gives an overall assessment for the period of study. An outside agency that has taken this tool, is putting through rigorous testing before deployment. Observations made/enhancements projected are being addressed presently.

Growing Chinese Influence in the Indian Ocean: The research primarily focuses on two crucial aspect of Chinese emerging maritime role in the region: First, China – Pakistan Economic Cooperation Project and analysing port development in Makran coast using open source satellite images. The study looks into the port development in Makran Coast and possible security implication to India's maritime security concern in the Arabian Sea. Second, the study on Underwater Domain Awareness (UDA): aim to build India's naval capability to detect, track and identifying Chinese submarine in the Indian Ocean. The team discussed the practicability, limitations and feasibility of UDA with specialists from the Indian Navy, NPOL, INCOIS, etc.

NIAS Quarterly on Contemporary World Affairs was during 2019. The second issue focussed on Global Strategic Trends in 2020, and the third issue focusses on Global Protest Movements – and is likely to be published during the second quarter of 2020.

Emerging Dynamics in Indo-Pacific Region: The study looks at the geopolitical, technological, and foreign policy orientation of littorals in the region. In particular, the geopolitical developments in India's neighbourhood, South China Sea and the Indian Ocean are being examined.

As part of a research study on Tawang Region in India-China Border, the local border community, Monpa and their perception on the development has been profiled. The study also made an attempt to understand the linkages of the local border communities with Bhutan and Tibet. A book titled "Tawang, Monpas and Tibetan Buddhism in Transition: Life and Society along the India-China Borderland" written by Dr M Mayilvaganan is being published in June 2020 by Springer.

Safety and Security Aspects of Strategic Military and Space Assets: The study focuses on the reliability and ethical issues arising out of application of Artificial Intelligence (AI) in Electronic Warfare systems and lethal autonomous weapon systems.

Underwater Domain Awareness Requirements: It is reported that Chinese submarines have been sighted in Sri Lanka and Pakistan ports, while their transit from South China Sea to Indian Ocean went unnoticed. It is felt important for Indian Navy to have the capability to track such movements by employing appropriate UDA sensors.

Mapping Mangrove Changes in India and Neighbouring Countries: This study is useful for the 'Mangroves for Future' movement created in South Asia to facilitate international cooperation for preservation of Mangroves that are essential for coastal security and biodiversity.

Strategic Importance of China-Pakistan Economic Cooperation (CPEC) Project: The study proposes to investigate the changes that have taken place in Makran coast after 2013, especially after the Chinese involvement in the development work through the CPEC framework. Satellite imagery combined with GIS software tools will be used in the analysis to track the construction activities and progress in development of the facility.

Outreach

The following Seminars/Workshops/Conferences/Courses were organised:

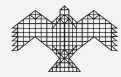
1. Interaction with Naval Higher command Course Participants, on April 16, 2019.
2. A presentation by Tibetan Policy Institute, Dharmashala and discussions on Education System in Tibetan Communities was organised at NIAS on April 19, 2019.
3. A meeting with IDSA and ICWA relating to Science Diplomacy was held on April 23, 2019.



4. A talk by Rear Admiral Monty Khanna (Retd.) on PLA Navy was organised at NIAS on May 17, 2019.
5. An interaction with members of Royal Defence College was organised at NIAS on May 20, 2019.
6. The FICCI-ISRO-NIAS interaction for Commercial use of NavIC was held at NIAS on May 27, 2019.
7. The Second Course on Space and Foreign Policy was organised at NIAS during June 10 to 13, 2019.
8. One day seminar on AI and its applications for Defence/Strategic Issues was organised along with Integrated Defence Staff and DRDO, at NIAS on August 5, 2019.
9. A Book Discussion on Plutonium and Beyond: The Future of Nuclear Energy, with Dr Alan J Kuperman on August 6, 2019.
10. A Lecture titled Modi 2.0: Foreign Policy Challenges, by Pramit Pal Chaudhuri, Foreign Affairs Editor of the Hindustan Times, and a Distinguished Fellow, Ananta Aspen Centre, New Delhi was organised at NIAS on September 11, 2019.
11. A briefing on Indian Democracy and Federalism, with visiting delegation from Myanmar on September 26, 2019.
12. A capacity Building Workshop for Young Scholars, titled NIAS Strategic Forecast 2020: Contemporary World Affairs was organised at NIAS on November 16, 2019.
13. An interaction on *Afghanistan and Nepal*, with Amb Rakesh Sood, Special Envoy of the Prime Minister of India on Disarmament and Non-Proliferation Issues and former Ambassador to Afghanistan, Nepal and France on January 7, 2020.
14. A lecture titled India's Foreign Policy Trajectories by Prof SD Muni, member of the IDSA's Executive Council, on January 10, 2020.
15. A lecture titled India as a Rising Power, by Prof TV Paul, James McGill Professor of International Relations in the Department of Political Science at McGill University, Canada and a Fellow of the Royal Society of Canada, on January 14, 2020.
16. The NIAS-CISAC Dialogue on Strategic Threats of the 21st Century, during January 27 to 29, 2020.
17. A workshop titled 100 Years of Svalbard Treaty/ARCTIC – Towards preparing a Plan-A for India. Climate Change, S&T, and Strategic Engagements, with inaugural address by Amb PS Raghavan, and presentations by Dr Shailesh Nayak, Prof D Suba Chandran, Dr Sulagna Chattopadhyaya, Rashmi Ramesh, Harini Madhusudan, Parikshith Pradeep on February 4, 2020.
18. A book discussion titled Trumped: Emerging Powers in a Post-American World with Dr Sreeram Chaulia, on February 18, 2020.
19. An interaction titled US Foreign Policy and East Asia, with Dr Devin T Stewart on October 3, 2019.

Panel Discussions

1. A panel discussion on Science Diplomacy, was organised between experts from NIAS and RIS, with Prof Rajaram Nagappa, Prof D Suba Chandran and Prof PM Soundar Rajan from ISSSP as panellists, at RIS, New Delhi on April 22, 2019.
2. Prof Rajaram Nagappa participated in the Brainstorming session on India-Russia bilateral cooperation held at ICWA, New Delhi on May 9, 2019.



3. A panel discussion on India-China Strategic Stability, with Prof Rajaram Nagappa, Lt Gen Dr Prakash Menon, AVSM, PVSM, VSM, Prof VS Ramamurthy, Mr Manoj Kewalramani and Dr George Perkovich as panelists, was held at NIAS on December 5, 2019.
4. A panel discussion on S&T Initiatives in BIMSTEC, with initial remarks by Dr Shailesh Nayak and Dr Nishchalnath, Director, Center for South Asian Studies, Prof VS Ramamurthy, Prof SD Muni, Prof PM Soundar Rajan, Prof Srikumar Pullat and Prof M Sai Baba as panelists, was held at NIAS on January 10, 2020.



Srikumar Pullat, *Head*
D Suba Chandran
S Chandrashekar
PM Soundar Rajan
N Ramani
Lalitha Sundaresan
Rajaram Nagappa
M Mayilvaganan
Amit Mukherjee
Prakash Panneerselvam
Doctoral Students: BR Guruprasad, Murali Murti, Sherin Ajin

SCHOOL OF HUMANITIES

Programmes

- Consciousness Studies
- Heritage, Science and Society



SCHOOL OF HUMANITIES

School of Humanities is engaged in research in the broad areas of philosophy, psychology, literature, archaeology, history, mathematical modelling, fine arts, and culture. The Programmes of the School focus on consciousness studies; cognitive sciences; Indian philosophy, philosophy of psychology; indigenous healing traditions; philosophy of mind, language and mind, integrated information theory; causality; brain inspired artificial intelligence; archaeometallurgy and analysis of ancient metals; geo-heritage and mining heritage, artisanal crafts and sustainability, art history and bronzes of Karnataka, monumental and stone architectural heritage and digital heritage; field archaeology, Iron Age-Early Historic south India, landscape archaeology and geospatial analysis for cultural heritage; study of origins and evolutionary trajectories of monument-building traditions in India, and ancient knowledge systems; experimental archaeology, dissemination of archaeology and translations of literary classics in Kannada into English; and cross cultural musical exchanges in colonial period.

School of Humanities has two Programmes, namely the Consciousness Studies Programme, and the Heritage Science and Society Programme. Both Programmes have been grounded on theoretical and field-based work, with scholars from different disciplines working together.

Consciousness Studies Programme (CSP) is the only academic programme in India that focuses on the humanistic and health aspects of consciousness along with a critical approach to the empirical theorisation of the self in humans and animals. The Programme during this academic year focused on seven projects and engaged in a number of outreach activities. The philosophy the Programme has been adopting is to inspire collective efforts and outcomes through the sustenance of multipronged research work that are based on coordinated time bound efforts which connects and brings together both the Research Team members and the Project Mentors and Vision Lead to a common space.

Heritage Science and Society Programme aims to explore links between culture and society and science and civilisation, for the documentation and preservation of heritage and material, culture through research in archaeological sciences, archaeomaterials and landscape archaeology. Specifically during this academic year the Programme focused on the NIAS-Exeter AHRC funded Networking Research Project on Performing the Periphery: Politics of Performance in the Urban Periphery of southern India, apart from India Digital Heritage Project and few workshops and conferences on hands-on bronze casting, Geospatial Technologies for Heritage Conservation and Management, and geo-heritage.

Programmes

- **Consciousness Studies**
- **Heritage, Science and Society**



CONSCIOUSNESS STUDIES PROGRAMME

Introduction

The NIAS Consciousness Studies Programme (CSP) has groups working on human communication examining behavioural decision-making, communication and social cognition, information theory, conceptual mathematics, and quantum approaches to consciousness. A novel outreach and in-house discussion forum on pertinent interdisciplinary issues connecting literature, psychology, data science, complexity studies and philosophy was undertaken. The goal is to bring awareness to the public and interested students and scholars the importance of health, aesthetic pleasure, and knowledge as a triune reality deeply interconnected with consciousness.

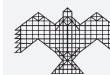
Research Activities

Causal Structures, Vimarsa and the Pratyabhijña – A Comparative Research Study on Kashmir Saivism and Information Theory: The project is funded by the Tata Education Trust. The major intent and goal of the project are to focus on the fundamental discussions pertaining to philosophical and psychological questions raised by the thinkers of Kashmir Saivism and attempt the contextualising of Information theory, consciousness studies and artificial intelligence, from the view point of analysing causal structures of thought, experiences and entities. The study is the first comparative attempt to juxtapose emotions, aesthetic process, memory, cognitive structures and the self in the context of understanding consciousness in Indian philosophy in the light of contemporary interdisciplinary discussions on consciousness, cognition and the self. The focus for this academic year has been: The Interface of Pratyabhijña Philosophy, Rasa Aesthetics, and Kashmir Kavya literature; Transcendence and Embodiment in Kashmiri Shaivism; A Theoretical Study of Two Ethnic Performances – Tirayattam and Sarpamthullal with Interpretations using Dhvani Theory of Indian Aesthetics; Investigations into Learning Algorithms in Intelligent Machines.

Kashmir Saivism, Self-Reflection and Aesthetics: The project is funded by Indian Council of Philosophical Research (ICPR). The major goal of the project is to understand the concepts of consciousness and self-reflection in the context of related epistemological and ontological structures that imply insights for understanding causal mechanism in Kashmir Saivism. The outcome of relates study emotions, aesthetic experience and the aesthetic process, in the context of understanding consciousness within the classical traditions of Indian philosophy. The cognitive and the aesthetic characteristics that underlie the philosophical discussions on emotions have been brought out in the light of understanding perceptual and experiential reality vis- a- vis the metaphysical structures of the concept of pratyabhijña. The project was completed and report submitted to ICPR.

Documentation and Study of Alternate and Indigenous Psychiatric and Psychological Practises of Healing and Wellness (With a Pilot Project of Model Building Focusing on Kerala State): The project is funded by the Tata Education Trust. The major objectives of the project are to document the indigenous healing and wellness traditions of Kerala, and understand the psychological and psychiatric implications with the help of examining antiquity, tribal medicine and native landscapes, ritual healing, and indigenous living. During this academic year, Twelve Interviews were completed with documentation of the life of the tribal healers in Kasargod and Kannur Districts of Kerala. Fieldwork among five tribal colonies under Nilambur Forest Range has been completed. Another part of the project is to understand the association of language with consciousness, specifically how ambiguity as a function of language might be influential in psychological healing through Mantravada. For an analysis of the same, the researcher aims to look into the narratives that emerge from the interactions and interviews with Mantravada practitioners and patients who seek solace in the faith-healing traditions.

A Study of Consciousness Measures and Synchrony between Brain and Cardiovascular Dynamics in Yoga Experience: The project is funded by DST-SATYAM (Department of Science and Technology – Science and Technology of Yoga and Meditation) is an interinstitutional in collaboration with the Indian Institute of Science, and National Institute of Mental Health and Neurosciences. The objective of the project is to understand depth and quality of yoga and meditation on well-being. A protocol for taking EEG measurements of yoga/meditation practitioners as well as control volunteers has been finalised after several iterations and a pilot study. The



acquisition of ECG measurements of yoga/meditation practitioners as well as control volunteers has started. We have evaluated a host of complexity measures of consciousness and have converged on a novel measure that we have proposed – Network Causal Activity. We have initiated an exhaustive survey of existing qualitative/psychological measures that have been used in studies pertaining to Yoga and Meditation.

Causality Testing in Cognitive Neuroscience with Applications to Measures of Consciousness: The project is funded by the Cognitive Science Research Initiative (CSRI) of Department of Science and Technology (DST). A new algorithm – Compression-Complexity-Causality (CCC) to identify causal relationships between time series was invented. CCC performs reliably on short, noisy, sampled and filtered time series that occur in practical scenarios. CCC outperforms Granger Causality consistently and can be applied to wide range of applications in econometrics, cognitive science, climatology, measuring consciousness and sustainability research. Network Causal Activity (NCA) was tested on ECoG datasets from monkeys to characterise the level of consciousness in awake and anesthesia states based on causal activity in brain networks. NCA could potentially be applied to help neurosurgeons determine the level of consciousness in patients who are unable to report their experience. We have proved a causal stability synchronisation theorem which is a necessary and sufficient condition for coupled dynamical systems to achieve complete synchronisation. Potential applications include determining when a group of coupled neurons will synchronise indicating the onset of a seizure.

Automatic Identification of SARS-CoV-2 vs SARS-CoV-1 Viruses: A compression-complexity distance measure was proposed to identify the novel SARS-CoV-2 virus that is causing the ongoing global pandemic of virus disease (COVID-19) and distinguishing it from SARS-CoV-1 virus using only short contiguous fragments of nucleotide sequences. The proposed algorithm could potentially be used in vaccine research by enabling rapid matching of genomic sequences and could avoid the need for sequence assembly. The research is conducted along with the Amrita University.

Neuro-chaos Inspired AI: ChaosNet, a chaos based artificial neural network architecture for classification has been proposed mimicking the chaotic firing of neurons in the brain (which conventional algorithms do not). ChaosNet produces state-of-the art performance on classification tasks on publicly available datasets. With as low as 0.05% of the total data used for training, the proposed method reports accuracies ranging 73.89% to 98.33% while also claiming to be robust to external noise.

Outreach

Prof Sangeetha Menon offered two-day workshop on October 16 and 17, 2019 at Université Des Mascareignes, Mauritius on Qualitative Research and Methods, focusing on exploring quality, its philosophy, beyond the subject-object divide paradigm, and the complexity of the networked existence. The workshop focused on themes such as: i. Freedom of the Researcher and Her/His Approach; ii. Contextualizing the Work within an Interdisciplinary Framework; iii. Extending the Reach; iv. Publications, Book Reviews and Writing of Grant Proposals; v. Reaching Out and Connect with different Communities; vi. Policy Impact and Fundamental Work; vii. Research Ethics, Self-transformation and Global Well-being.

A lecture series by Prof Tilak Agerwala (IMB Emeritus and Adjunct Faculty, NIAS CSP) was organised on Emerging Information Technologies: Impact and Opportunities.

Lecture 1: Artificial Intelligence and Related Technologies

Abstract: <https://niascsp.com/2019/11/03/emerging-information-technologies-impact-and-opportunities-part-1/>

Video: https://www.youtube.com/watch?v=4_nfUE2yJpI

Lecture 2: The Internet of Things

Abstract: <https://niascsp.com/2019/11/03/emerging-information-technologies-impact-and-opportunities-part-2/>

Video: https://www.youtube.com/watch?v=1_VG0cmhxaM

Lecture 3: Collective Intelligence

Abstract: <https://niascsp.com/2019/11/03/emerging-information-technologies-impact-and-opportunities-part-3/>

Video: <https://www.youtube.com/watch?v=UxdfPXIytPY>



The *Svasthya-rasa-bodhini* Public Lecture by Prof Tilak Agerwala on Ethical Design: An Artificial Intelligence Perspective.

Abstract: <https://niascsp.com/2019/11/19/ethical-design-an-artificial-intelligence-imperative-tilak-agerwala/>

Video: <https://www.youtube.com/watch?v=Wm-CHGVmw8o>



Interactive Session and Lecture by Dr Sudarshan Iyengar (Associate Professor, IIT Ropar, and Adjunct Faculty, NIAS CSP) on The Joy of Computing, on the occasion of World Philosophy Day (Coordinator: Ms Niharika Sharma).
Video: <https://www.youtube.com/watch?v=ajFujq0SaRE>

Panel Discussion organised under the banner of NIAS CSP Evening Philosophy Chat: The “Fragile” Human Experience and the “Strong” Artificial Intelligence: Limits, Possibilities, and Challenges.

Panelists: Prof Tilak Agerwala, Dr Sudarshan Iyengar, Dr Saurabh Todariya, Dr NC Narayanan and Prof Sangeetha Menon.

Video: <https://www.youtube.com/watch?v=DIgVZsW9gy4>

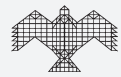
Abstract: <https://mailchi.mp/6972ee9cf936/20nov2019-epc-panel>



A Brainstorming Session was organised on October 22, 2019 on Phenomenological Approach to Qualitative Research with Prof Sangeetha Menon, Prof Koshy Tharakan and Prof Prasenjit Biswas.
NIAS CSP YouTube Channel Link: <https://youtu.be/aM9yAgZu5Hw>



A Presentation and Thematic Discussion was held on behalf of the NIAS CSP, The Reading Glass Forum by Prof Sangeetha Menon, Ms Meera Menon, Ms Sukanya G on Self, Identity and Healing Practices.



NIAS CSP YouTube Channel Link: <https://youtu.be/Im29KCrFKTo>

Abstract: <https://niascsp.com/2019/09/21/self-identity-and-healing-practices-sangeetha-menon-meera-kumar-menon-and-sukanya-g/>

The Reading Glass Presentation on Consciousness and Causality: Perspectives from Integrated Information Theory, Phenomenology and Kashmir Shaivism.

Presenters: Nithin Nagaraj, Shankar Rajaraman and Saurabh Todariya

Abstract: <https://niascsp.com/2019/10/24/consciousness-and-causality-perspectives-from-integrated-information-theory-phenomenology-and-kashmir-shaivism/>

Video: <https://www.youtube.com/watch?v=arJJT2N9PuI>

The Reading Glass Presentation on Reflection: A Sneak Peak into the Past by Ms Niharika Sharma on July 5, 2019.

Video: https://youtu.be/A_UXOLEU05I

The *Svasthya-rasa-bodhini* Public lecture on The Idea of a 'Witch' in Central India by Dr Shashank S Sinha on July 23, 2019.

Video: <https://youtu.be/1BSMXQrKwJE>

Brainstorming Session: Critical Enquiry and Methods in Philosophy, with Prof Sachchidananda Mishra, Prof Sreekumar Nellickappily and Prof Sangeetha Menon on July 25, 2019.

Video: <https://youtu.be/c3DDPLSCzks>

The Reading Glass Presentation on Turing Test: An Imitation Game to Determine Machine Intelligence by Mr Harikrishnan NB on August 16, 2019.

Video: <https://youtu.be/jeGz5gCmYvw>

Brainstorming Session on The Question of Philosophy, Art and Mathematics in Relation to Models of Formal Thinking, With Prof Soumyabrata Choudhury on September 18, 2019.

Video: <https://youtu.be/GnVzQDuhLzc>

The *Svasthya-rasa-bodhini* Public lecture on Between Dionysus and Plato: Is there Aesthetic Thinking in Ancient Greece? by Dr Soumyabrata Choudhury on September 18, 2019.

Video: <https://youtu.be/gGEp8F7-v5c>

The Reading Glass Thematic Discussion on Self, Identity and Healing Practices by Prof Sangeetha Menon, Ms Meera Menon and Ms Sukanya G on September 27, 2019.

Video: <https://youtu.be/Im29KCrFKTo>

The Reading Glass Presentation on Why Do We Have to be Conscious about Our Own Earth by Dr Deepa VK on April 4, 2019.

Video: <https://youtu.be/W-0t-ptzDKg>

The Reading Glass Presentation on Myth, Mystery and Myself: Where does Meaning Lie? by Ms Meera Kumar Menon May 10, 2019.

Video: <https://youtu.be/366nqUaESYc>

The Reading Glass Presentation on Introduction to Graphic Design and Color Psychology by Dr Abhishek Shrivastava on May 24, 2019.

Video: <https://youtu.be/06Xq7PSvkd4>

The *Svasthya-rasa-bodhini* Public Lecture on The Relevance of Mirror Neurons to Mental Health by Dr Urvakhsh Mehta on May 28, 2019.

Video: <https://youtu.be/pKkaaXzQ8MA>



The *Svasthya-rasa-bodhini* Public Lecture on From Sensuous to Super-Sensuous by Dr C Rajendran on June 27, 2019.

Video: <https://youtu.be/yGtH8fE8KE8>



The Course on Knowing, Experiencing and Being: Methods, Applications and Philosophies inspired by Phenomenology, Collective Frameworks, and Reflective Capabilities, is being attended by students from various disciplines and institutions.



Panel Discussion on The Fragile, Human Experience and The Strong Artificial Intelligence organised on November 20, 2019.

Sangeetha Menon, *Head*

Sisir Roy

Anindya Sinha

BV Sreekantan (*till October 27, 2019*)

Nithin Nagaraj

VV Binoy

Post-Doctoral Associates: VK Deepa (*till March 5, 2020*), Shankar Rajaraman

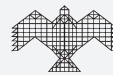
Doctoral Students: Siddharth S, Aditi Kathpalia, Niharika Sharma, Meera Kumar Menon

Research Associates: Saurabh Todariya, Amrutha MK, Sukanya G, Rakesh Kumar, Harikrishnan NB

Junior Research Fellows: Priyanka S, Shweta Siddannavar, Nikita Agarwal

Research Assistant: Abhishek Shrivastava

Project Assistant: Ashwini G



HERITAGE, SCIENCE AND SOCIETY PROGRAMME

Introduction

The Heritage, Science and Society Programme aims to explore links between culture and society and science and civilisation, for the documentation and preservation of heritage and material culture through research in archaeological sciences, archaeomaterials and landscape archaeology. A landmark NIAS-TCS project report was completed on Metal Crafts, including bronze casting, swami plate making and lost wax bell making around Thanjavur, Swamimalai Nachiarkoil, and a project on metal antiquities of Karnataka including insights on metal-cased Tipu era rockets. The untimely and tragic demise of Prof S Settar on February 28, 2020, doyen of Kannada and Culture leaves a huge void, with the NIAS library being indebted to him for his recent generous donations of scholarly books in epigraphy, archaeology, art and architecture.

Research Activities

NIAS-TCS Heritage Project was completed and the report provides an overview of the techno-cultural milieu and survival status of declining and increasingly marginalised metal-working artisans making icons, bells, mirrors, embossed Swami plate, iron and wootz steel works particularly in the Cauvery basin. The study focussed on their once glorious historical trajectories and attempted to enhance their visibility in the pedagogical milieu through hands-on experimental and practical workshops, exhibitions and audio-visual outreach, through interactions about 100 members of craft communities. These included the copper image casting and icon making tradition of Swamimalai in Thanjavur district which harks back to famous Chola bronzes and which recently got the Geographical Indicator Patent, the rare bell and lamp making traditions of Nacharkoil, in the Thanjavur district of Tamil Nadu, the Swami-plate making tradition which dates back to Thanjavur Maratha period, the bronze mirror making tradition of Aranmula in Kerala, rare and skilled blacksmithing practices of Karuman, and fading memories of the Kammara blacksmiths of the making of the legendary wootz steel for which southern India was famous in antiquity. Audio-visual footage and interviews of master craftsmen, late bell maker Govindarajan and late icon maker Mohanraj Sthapati could be captured before their sad demise last year.

Bronzes of Karnataka: Stylistic and Technical Studies supported by Karnataka State Department of Kannada and Culture: The aim of the project is to explore the traditions of bronze casting antiquity of Karnataka in both technical and stylistic perspectives. Little documented crafts practices were explored at Shivarapatna and Nagamangala. Using digital iconometry and ontology studies comparative aspects of iconography were explored of stone sculptures and bronzes of Jaina and Hindu affiliations from Karnataka of the early to late medieval periods. Lesser known collections were also studied such as in Udipi and Sringeri.

Networking Research Project on Performing the Periphery: Politics of Performance in the Urban Periphery of Southern India: This NIAS-Exeter AHRC funded project explored in innovative ways the aspects, heritage and socio-cultural milieu of performance at the margins of the urban peripheries, including both human and non-human. The studies include some of the performance arts traditions that fall out of the more elite or 'classical' milieu such as Silambattam and Villu Pattu from Tamil Nadu and the use of temple elephants in ritual in Kerala. The exchange visits from the University of Exeter Drama Department and visits by the NIAS team to Exeter University in November 2019 to present papers in a colloquia were undertaken.

India Digital Heritage Project: Exhibition on Indian Heritage in Digital Space emerging out of the DST supported India Digital Heritage and Hampi project was featured at National Museum, New Delhi in month of January and February 2020. A room-size 3-D prints of some of the temples of Hampi, such as Vitthala temple and chariot etc along with other sites including Taj Mahal and Rani-ki-Vav, along with augmented reality tours were exhibited.

IGNCA Vishwakarma Project: A major 250 pages monograph was submitted entitled 'Vishwakarma, Kammalar, the Last Artisans: Copper Base and Ferrous Metal Crafts Heritage of Southern India'.



Megaliths: An important breakthrough in the study of ancient stone-working techniques, by developing a geometrical method, and other supporting means, to differentiate between wedge-marks on split stones in the early medieval and late medieval periods was made. The classification of megalith types, by comparing specimens of similar type at different sites has been refined. The study on evolution of temple-form in Karnataka has been undertaken. As part of this work, he has also examined the artisan in myth and history, by tracking the careers of actual early as well as late medieval artisans from quarry inscriptions etc and comparing with myths about artisans from various regions of India were examined. Another aspect of the study of temple-form is summed up in a recent paper on the temple shikhara as an abstraction of a mountain-peak, illustrated with ample examples of various stages of development. The study of Indian megaliths has been expanded into northeastern India, by initiating a study of the megaliths of the Jaintia and Khasi Hills of Meghalaya in collaboration with the Martin Luther Christian University, Shillong.

An excavation in Siruthavoor, Kanchipuram District, Tamil Nadu the objective of this was to identify the habitation and correlate the megaliths to the Iron Age-Early Historic landscape was conducted. A grid-based survey of the megalithic burials at Amoor (which is adjacent to Siruthavoor) documenting over a 100 burials was undertaken. Two experimental studies, one on use of stone tools for butchering, second on production of black colour pottery were conducted. Various outreach programmes such as workshops and conferences for school students, general public and archaeologists in order to disseminate Archaeological methods as a part of a project titled 'Understanding the Past: Disseminating Archaeology' funded by Sundaram Finance were organised.

The projects in the area of geospatial analysis for cultural heritage studies include: 1) Exploring sea charts and coastal maps made in colonial period to study cultural heritage and geomorphology along the Indian coast (funded by Ministry of Earth Sciences, Government of India); 2) Identifying Archaeological Mounds in Large Buddhist Sites in Ganga Valley like Nalanda, Bodhgaya and Vikramasila using Stereoscopic Satellite Images and Photogrammetric Techniques (funded by Science and Engineering Research Board), and Carbon Dating (using AMS techniques) Bricks Collected from Unprotected Mounds; 3) Studying Historical Water Storage, Transportation and Usage in the Malaprabha River Valley (funded by the Department of Science and Technology, Government of India); 4) Towards Developing a Scalable National Database of Cultural Heritage Landscape, have undertaken a pilot of 25 sites (funded by Indian Space Research Organization).

Prof Sharada Srinivasan interview for DD Science Channel where an exhibit was put up by Heritage group at the Indian Science Congress Stall. <https://www.indiascience.in/videos/vigyan-se-samadhan-h-telecast-on-05-slash-02-slash-2020>

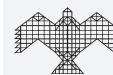


Workshops

A hands-on bronze casting workshop was held on September 5, 2019 at NIAS, 'Karu, the mould: Art and Science of South Indian Bronze Casting' involving about a 100 students, with practical demonstrations and lectures in the modelling and casting of South Indian icons, with demonstrations by the family of the renowned master craftsman Sthapati from Swamimalai, Late Dr Mohanraj Sthapati.

A photo-exhibition on display and the Doordarshan film 'Darshan of the Divine' on Chola bronzes made by Benoy Behl with interviews of Prof Sharada Srinivasan was also aired.

An international conference on "Interweavings of Tangible and Intangible Heritage: A Case Study of the Historic Town of Srirangapatna" jointly with University of Liverpool and Mysore School of Architecture on July 8, 2019.



A conference on “Geospatial Technologies for Heritage Conservation and Management” was jointly organised by FICCI and NIAS at NIAS on July 19, 2019.

A workshop on “Geo-Heritage” was held at NIAS with INTACH-Bengaluru in July 2019.

A two-day workshop on The Metal Casting Tradition of India and Korea, 2020 with National Science Museum of Korea and Government College of Architecture and Sculpture, Mamallapuram on January 21 and 22, 2020.

Research Methods Workshops in Archaeology, funded by Sundaram Finance was organised at Madras Institute of Development Studies (MIDS) in collaboration with Prof Venkatachalapathy, MIDS, Chennai from January 2 to 6, 2020, at NIAS on July 26 2019. International Conference on Relevance of Indian Archaeology, funded by Sundaram Finance and ICHR, at NIAS during July 24 and 25 2019.

Art Exhibition on Art and Archaeology, funded by Sundaram Finance and ICHR, at NIAS during July 24 and 25, 2019.

Sharada Srinivasan, *Head*

S Ranganathan

S Settar (*till February 28, 2020*)

Srikumar M Menon

MB Rajani

Smriti Haricharan

Post-Doctoral Associates: Asmita Mohanty, S Udayakumar

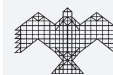
Doctoral Students: Ekta Gupta, Krupa Rajangam, Kuili Suganya, K Venkatesh, Sonia Das

Project Staff: Madan Sundarraj, Suresh Ratha, Uma Krithika, Sheela Karunakaran

SCHOOL OF NATURAL SCIENCES AND ENGINEERING

Programmes

- Interdisciplinary Forays into Human-Environment Interactions: An Integrative Research Initiative in Energy, Ecology and Nonlinear Modelling
- Animal Behaviour and Cognition
- Complex Systems
- Energy and Environment
- Science Communication



SCHOOL OF NATURAL SCIENCES AND ENGINEERING

School of Natural Sciences and Engineering covers research in the fields of engineering and mathematics, ecology, animal behaviour and cognition, energy, environment and conservation biology, minerals, and water. Current research interests of the faculty members include various aspects of signal and image processing; cryptography; number theory; mathematical modelling of complex chaotic systems; wildlife conservation; primate and elephant behaviour; urban ecologies, coal and minerals; energy security, environmental impact assessment; public health; performance studies, sustainable transportation, water, and science communication.

The School consists of researchers with the most diverse set of research interests who have been able to establish national and international collaborations with the unique interdisciplinary perspectives that they bring to their own research. The faculty in this School pursue multiple research projects and collaborations in India and abroad, and also guide the largest number of doctoral students in any School at NIAS.

The research contributions of the faculty extend across multiple SDGs including, SDG 2 (zero hunger), SDG 3 (good health and well-being), SDG 6 (clean water and sanitation), SDG 7 (affordable and clean energy), SDG 8 (decent work and economic growth), SDG 12 (responsible consumption and production), SDG 11 (sustainable cities and communities), SDG 12 (responsible consumption and production), SDG 13 (climate change), SDG 14 (Life below water), SDG 14.b (access for small-scale artisanal fishers to marine resources), and SDG 15 (Life on land).

Most of the faculty in this School have established successful research collaborations with faculty in other Schools within NIAS and outside NIAS in the spheres of teaching, research, or training.

Programmes

- **Interdisciplinary Forays into Human-Environment Interactions: An Integrative Research Initiative in Energy, Ecology and Nonlinear Modelling**
- **Animal Behaviour and Cognition**
- **Complex Systems**
- **Energy and Environment**
- **Science Communication**



INTERDISCIPLINARY FORAYS INTO HUMAN-ENVIRONMENT INTERACTIONS:

AN INTEGRATIVE RESEARCH INITIATIVE IN ENERGY, ECOLOGY AND NONLINEAR MODELLING

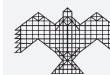
While the School of Natural Sciences and Engineering is largely Programme driven as per the NIAS ethos, faculty from the Animal Behaviour Programme, the Complex Systems Programme, and the Energy and Environment Programme are collaborating on a prestigious research project sponsored by the Science and Engineering Research Board (SERB) for the “Intensification of Research in High Priority Areas”. This three-year research project supports proposals in high priority areas where multidisciplinary/multi-institutional expertise is required which will put our nation on the international science map in that particular discipline.

The research project has the following objectives:

- Explore sustainable pathways towards energy security at affordable prices, while minimising the adverse impact on ecology.
- Investigate human-primate conflicts to identify behavioural and anthropogenic factors that may drive the same.
- To model nonlinear complex phenomena, such as climate change, wildlife movement, ecological dynamics, and environmental effects to understand the aspects that govern human-environment coupling.

One of the objectives of this project is to develop sustainable pathways towards energy security at affordable prices for India while mitigating any adverse impacts on ecology and public health. The study area of this project was the Ramagundam-Bellampalli coalfields in Telangana and has obtained cooperation of the key stakeholder, Singareni Collieries Company Limited (SCCL).

- Opencast coal mines must implement more effective dust controls and also maintain a thick green belt to separate the core and buffer zones (inhabited areas) to limit public exposure to particulate matter (PM) concentrations within the relevant annual standards (60 and 40 $\mu\text{g}/\text{m}^3$ for PM_{10} and $\text{PM}_{2.5}$ respectively). In addition to dust control during mining operations, re-entrainment of dust during coal handling and transportation and dispersion of fine dust from overburden dumps must be controlled. However, the ambient air concentrations of gaseous pollutants (SO_2 and NO_2) around the coal mines and coal power plants in the Ramagundam area are significantly lower than the annual standard (50 $\mu\text{g}/\text{m}^3$). This is due to the use of low-sulfur (0.5-0.7%) domestic coal in these TPPs which also incorporate tall chimneys (225–275 m) to disperse the pollutants so that ambient air concentrations are significantly lower than the norms.
- Pit lake systems evolved from open-cast coal mine voids have the potential to be a more cost-effective, environment-friendly and beneficial option for coal mine closure as opposed to the current mandate of backfilling the final void by re-handling the previously excavated and vegetated overburden dumps. It is possible to transform the final void into a water reservoir to supply water for irrigation by implementing a scientific approach to the design and management of pit lakes. Therefore, as mandated by Section 20A of the MMDR Act (1957), there is a good potential for exploring the utility of pit lakes for the local communities by conducting inter-disciplinary, field-based research (combining science, technology, and social science) on the current and upcoming pit lakes in all opencast coal mines in the country.
- According to the designated best-use classes specified by the Central Pollution Control Board (CPCB), the present data on the water quality in the areas around the four opencast coal mines in the Dorli-Bellampalli coalfield indicates that the pH, electrical conductivity, and total dissolved solids values in the water samples drawn from this area are within the prescribed BIS/CPCB limits though they exceed



the pre-mining values. While the dissolved oxygen values indicate higher levels of aeration in the surface water than in the groundwater, the water quality here fits the criteria for Class D use for the propagation of wildlife and fisheries or Class E use for irrigation. With adequate tertiary treatment, the water quality in the pit lakes can also meet the requirements for Class C use (drinking water) by the local communities after suitable steps are taken to prevent anthropogenic pollution and the formation of an anoxic layer in the pit lake.

- Coal is a central subject (under the Entry 54 Union List 1), and the Central Government (Government of India) itself controls more than 94 percent of the coal produced in India through public sector undertakings like CIL, SCCL, NLC, and NTPC. It has recommended that Government of India set up an independent, multi-disciplinary “Coal Mines Authority” with in-house professional expertise in the ecology, environment, geology, hydrology, hydrogeology, biodiversity, mine planning and social aspects of coal mining to consider all these facets in an integrated manner before granting the key statutory approvals for coal mines.

The second objective of the project is to understand factors that drive human-primate conflict across India and, amongst several achievable goals, identify low-cost mitigation strategies that can be used by farmers to protect their crops from crop-raiding rhesus and bonnet macaques as well as common langurs. Another aim of this project component is to understand the behavioural ecology of a unique subpopulation of the endangered lion-tailed macaque, as it explores human habitations and exploits human-food resources, such forays marking the beginning of human-macaque conflict in the biodiversity hotspot of the Western Ghats.

The third objective of the project is to understand the complex couplings between living systems and the physical environment, in particular, the effects of climate change and environmental effects on ecological systems, inter-species interactions, wildlife movement and aspects governing human-environment coupling.

A predictive dynamical growth model was developed to understand the growth of PM 2.5, PM10, SO_x, NO_x from the Singareni open cast coal mines and thermal power plant. Studies are in progress to investigate the impact on the surrounding vegetation cover, using NDVI data from MODIS, and from the Forest Survey of India.

The project has completed three years and has been extended for another six months by SERB in view of the progress made in integrating their research efforts to deliver on the original as well as the additional objectives set by the SERB expert committee midway through the Project.

Dr Shailesh Nayak, Project Coordinator
Prof R Srikanth, Principal Investigator
Prof Sindhu Radhakrishna, Principal Investigator
Prof Janaki Balakrishnan, Principal Investigator
Prof Anindya Sinha
Prof Sheela K Ramasesha
Dr Tejal Kanitkar
Dr VV Binoy
Dr Harini Santhanam.



ANIMAL BEHAVIOUR AND COGNITION PROGRAMME

Introduction

The Animal Behaviour and Cognition Programme conducts research on the ecology, behaviour, cognition, genetics and conservation status of several wildlife species across the country, chiefly primates, elephants and fishes. The primary goals of the Animal Behaviour and Cognition Programme are to understand the evolution of social behaviour and communication, the cognitive foundations of behaviour and to study intraspecific variation in ecology and behaviour of animals. These core areas of research are complemented by other research interests of faculty members in the areas of environmental decision-making, animal personality, human-wildlife conflict, human-animal studies, urban studies, environmental education and natural resource conservation.

The Programme include projects on the demography, behavioural ecology and management of primates and elephants in peninsular India, the nature of human-urban animal interactions, drivers of human primate conflict, frugivore seed dispersal, affordance learning and object use in wild macaques, behavioural flexibility and environmental coping strategies in fish species, traditional performances in theatre, music or the fine arts as representative of the increasing marginalisation of human and nonhuman societies, cross-cultural musical exchanges in colonial India, the costs of food choices in India.

Research Activities

Studying Elephants in Human-Dominated Landscapes. The study on male elephants was funded by the Wildlife Conservation Trust, Mumbai, hypothesised that the high risks to survival posed by increasingly urbanising, and often unpredictable, production landscapes may necessitate the emergence of behavioural strategies that would allow male elephants to particularly persist in such landscapes. The findings showed that male Asian elephants did indeed display striking emergent behaviour, particularly through the formation of stable, large, long-term all-male associations, which may constitute a unique life history strategy for individual male elephants in the high-risk, but resource-rich, production landscapes of southern India. These observations not only support the hypothesis that such emergent behaviours are likely to constitute an adaptive strategy for individual male elephants that may be forced to increasingly confront anthropogenically intrusive environments but also contribute to the management of human-elephant interactions and the conservation of elephant populations in such landscapes.

The Politics of Performance on the Urban Periphery in Southern India: The project is funded by the Arts and Humanities Research Council, Swindon, UK is executed in collaboration with Exeter University, UK. The study particularly examined the role of performance in generating debate and interest in the challenges of urbanisation, with a specific focus on the complicity of performance in urban growth and the effect of such growth on traditional performance practices. Some of the case studies included the Urur-Olcott Kuppam Vizha in Chennai, which has worked with marginalised communities such as fisherfolk, and its significance for local communities; the Vrishchikotsavam in Tripunithura in Kerala, which highlighted the effects of urbanisation on the future of nonhuman performance—elephants, in this case—and its associated sociocultural traditions; and the Kochi-Muziris Biennale, which considered the relationship of live performance therein to Fort Kochi itself as a historic port town.



Crop-foraging Rhesus Macaques



The results of the study emphasise the significance of these different performative art forms for the cities they inhabit and their connections with the concerns of particular areas, people or environmental challenges in the often marginalised, urban peripheries of southern India.

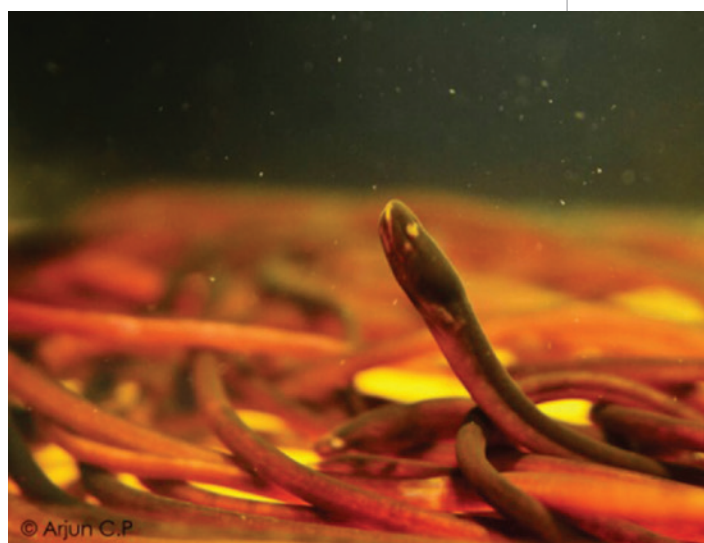
Urban Ecologies: Governing Nonhuman Life in Global Cities: The project conducted along with Cambridge University and funded by a Horizon 2020 grant from the European Research Council, Brussels. It focuses on a range of wild, feral and cultivated species in the Indian cities of Delhi and Guwahati and provides insights into what urbanisation might entail for these other-than-humans. More specifically, the study assays ways in which nonhuman knowledges enable our rethinking about the nature of expertise that counts in urban governance and attempts to animate urban political thought by reflecting upon how such etho-geographical insights can potentially contribute to our understanding of the political ecologies of urbanisation.

Understanding Behavioural Flexibility and Environmental Coping Strategies in Indigenous Megafishes and Subterranean Piscine Species: The project is supported by the Department of Biotechnology, Government of India, aims to trace out factors influencing behavioural flexibility, a determinant of the capacity of a species to adapt to the changes occurring in the physicochemical and biological components of the environment, in two fish species of conservation importance: Deccan mahseer, *Tor khudree* and blind eel, *Monopterus* sp. The former is a megafish species growing up to the size of 20-30 kg and the latter, a data-deficient fish inhabiting subterranean ecosystems of the periphery of the Western Ghats. In many states in central and southern India, thousands of hatchery-reared mahseer fingerlings have been released into natural waterbodies in an attempt to increase the population size of the species. However, such restocking efforts have not been very successful. The results of these studies highlight cognitive factors that influence behavioural consistency and the use of cerebral hemispheres by Deccan mahseer juveniles has been traced out. A population of Deccan mahseer adaptable to laboratory conditions was developed for the first time.

Biologically significant and endemic hypogean fishes, inhabitants of subterranean ecosystems in the western periphery of Western Ghats, are feared by people, as they resemble snakes in their physical appearance. As these species inhabit dugout wells, people often come in contact with them, which lead to conflict situations. Hence a secondary aim of this study was to develop a



All-male Group of Elephants



Subterranean Fish



Student-Scientist Interaction Workshop



public- involved conservation strategy for subterranean fish. The result of this study will contribute towards designing programmes for the promotion of coexistence between humans and this quickly vanishing species.

An Indo-Japan collaborative project on Mammalian Seed Dispersal was supported by the IBCD bilateral cooperative scheme of the Department of Science and Technology, Government of India, and conducted in collaboration with Ishikawa Prefectural University, Japan, Kyoto University, Japan, National Science Initiative, Dehradun, AV Rama Rao Foundation, Hyderabad, and Ashoka Trust for Research in Ecology and Environment, Bengaluru. Results from the project analysed the seed dispersal reliability of macaques. The two studies on human-primate conflict are being funded by ISRO and DST and aim to understand factors that drive human-primate conflict in India and identify low cost mitigation strategies that can be used by farmers to protect their crops from crop raiding monkeys.

Humane Society International-India provided a grant to conduct study on the costs of food choices in India. This study, in collaboration with Azim Premji University, Bengaluru, builds on ongoing work on human-environment interactions and aims to evaluate the ecological costs of the food choices humans make with particular focus on human-animal coexistence and environmental sustainability.

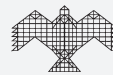
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Doctoral Students: Sreedhar Vijayakrishnan, Ashni Kumar Dhawale, Nitesh S Anchan, Vignesh S, Anmol Chowdhury, Shruti Ragavan, Shubhangi Srivastava, Sneha Gutgutia, Sayan Banerjee, Athira Balakrishnan



COMPLEX SYSTEMS PROGRAMME

Introduction

The enormous variety of phenomena we see around us in nature and in daily life arises because of different kinds of nonlinearities occurring in the interactions between elements constituting various systems, producing complex behaviour. The Complex Systems Programme makes use of appropriate physical concepts and mathematical techniques to make useful predictions in diverse systems and to determine how one could achieve some control over their behaviour.

Complex system studies cover a wide range of subjects and are by nature, interdisciplinary, multidisciplinary, cross-disciplinary and trans-disciplinary. Examples range from geodynamics, ecological systems, social systems, econodynamics, study of structural stability of buildings, to other areas such as fluid dynamics, neuroscience, sensory systems, cellular processes, morphogenesis, electronic systems, climate dynamics, etc.

Since its inception in July, 2012, the Programme has made leading and pioneering contributions to subjects as varied as climate impact on ecological systems and prediction of insect pest outbreak cycles, modelling animal movement in human modified landscapes, predictive modelling of atmospheric pollutant growth, dynamics and acoustic cavitation of charged microbubbles, novel nonlinear oscillations in coupled Josephson junction models, coupled neuron dynamics, novel bursting mechanisms in neurons, secure encryption and transmission of messages using q -deformations, aspects of hearing research, studies on the role of fluctuations in ecological dynamics, dynamics and acoustic cavitation of charged microbubbles, etc.

Research Activities

The following projects have been undertaken funded by SERB, DST, Government of India.

1. Nonlinear Oscillatory Phenomena in Sensory Systems (under the EMR scheme – ended in June, 2019): The broad objective of this project was to get better insights of the physical mechanisms and dynamics governing the different types of activity and behaviour including bursting of sensory systems at the cellular scale through investigations with generic and simplified mathematical models. An important contribution of the Programme was the investigation into the firing patterns of neurons with different excitability mechanisms coupled via electrical gap junctions. The bursting mechanisms underlying the diverse dynamical behaviour exhibited under different coupling schemes, ranging from quiescence to spiking to bursting and burst synchronisation were identified. A unique burst mechanism based on a novel bifurcation occurring for bidirectional coupling was reported.
2. Complex Dynamics of Simple Nonlinear Mechanical Systems and Their Applications (research grant under the MATRICS scheme): The broad objective of this project is to elucidate the dynamics and the different bifurcation mechanisms underlying the diverse kinds of nonlinear oscillations observed in different variants of a certain class of nonlinear oscillators under different types of forcing. These studies are expected to help in giving better insights into the dynamics underlying certain physical and biological systems such as models of Josephson junctions and neurons.

One of the directions of the Programme's research activity has been in developing mathematical models for predicting climate-change impact on marine ecosystems and biodiversity. These include a model explaining the post-1985 regime shift in sardine and mackerel populations along the Indian coasts as arising as a consequence of climate change, and another that predicts increased jellyfish numbers (observed in India and globally) due to climatic changes and anthropogenic factors. Validation of these models using data from CMFRI and IMD is underway.



In the area of movement ecology, a stochastic model for capturing animal movement in the presence of man-made landscape features was proposed and validated with telemetry data of hornbills. This was a collaboration with Nature Conservation Foundation, Mysuru.

A dynamical model for modeling and predicting the growth rate of atmospheric pollutants validated with global atmospheric CO₂ fossil fuel emission data, was developed by the Programme in collaboration with Prof Juergen Kurths, PIK, Potsdam. Further, a systematic method was proposed for predicting climatic tipping points.

Outreach

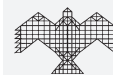
Prof Janaki Balakrishnan as a Guest Faculty of Indian Institute of Science offered a course on Introduction to Dynamical Systems Theory (MA 278), in the Mathematics Department, Indian Institute of Science, Bengaluru.

Students from IISc, IISER Kolkata, IISER Pune and BITS Goa did their summer research internship.

Janaki Balakrishnan, *Head*

Post-Doctoral Associate: Sudharsana V Iyengar

Junior Research Fellows: Bhavna Kandra, Ankit Vikrant (*till July 25, 2019*), Vaddi Meher, (*till June 7, 2019*).



ENERGY AND ENVIRONMENT PROGRAMME

Introduction

India's Power Sector is undergoing a multi-faceted transition in terms of more stringent environmental standards while faced with a growing demand due to the aspirations of Indians for a better standard of living and accelerating industrial growth in the country. India's current position is unique in this respect since the power sector must meet all these challenges while lowering the tariffs to enhance affordability without unduly increasing the subsidy burden of the utilities. During this year, the Energy and Environment Programme (EEP) has also started carrying out research on actionable policies and practices related to air and water environment, and energy security and sustainability.

Research Activities

The overall focus is on the affordable and clean energy and its relation to responsible consumption and production (SDG 12) and climate change (SDG 13).

Understand the Interaction between Components of Earth and Human Systems at Various Spatial and Temporal Scales: The project is funded by the Ministry of Earth Sciences (MoES), Government of India. The key research findings of their research are as follows:

- There are very few location-specific, real-world studies that trace the dispersion patterns of particulate matter and gaseous pollutants from a power plant because of the dependence on meteorological conditions like ambient temperature, wind velocity, and wind direction. Therefore, the dispersion of PM and SO₂ (two of the major pollutants after CO₂) emitted from the stack of an actual thermal plant was simulated using computational fluid dynamics calculations. Actual emissions from a 275 m tall stack and the meteorological parameters of the location were used in the simulation. Simulations were carried out for stable, neutral and unstable boundary layer conditions that represent the night, morning and afternoon situations, respectively. It was found that the PM plume rises to heights of 530, 390 and 290 meters during the mornings, afternoons and nights, respectively. The PM plume continues to remain suspended in the atmosphere over large distances (~30 km) from the TPP.
- On the other hand, the SO₂ emitted from the stack disperses quite quickly. During the morning and afternoon, the SO₂ concentration is below the measurable limit within 12 km from the stack, while the plume travels up a distance of 30 km during the night. However, simulation studies indicate that the 24-hour weighted average concentration of SO₂ at a height of 10 meters and a distance of 25 km from the TPP studied is about 14.2 µg/m³ compared to the measured value of 9.2 µg/m³ at this distance. In either case, the SO₂ concentration is less than the NAAQ 24-hour standard of 80 µg/m³.
- The foregoing findings acquire salience given the findings of the DST Clean Coal project that the mandate to retrofit FGDs in all thermal plants must be reviewed after assessing the ambient air concentrations of SO₂ around the older thermal plants that are not located in sensitive, urban, or critically polluted areas. Our studies point to the need to implement a more scientific and phased approach to environmental compliance which may lead to a sustainable, environment friendly as well as a viable power sector which is critical to India's economic growth.
- The grid balancing in South India due to the large proportion of intermittent and variable renewable energy in this region need to be facilitated by modernising existing pumped storage plants (PSPs) and creating new capacity for PSPs in existing hydro projects. The Government need to invest in enhancing pumped storage capacity in the Southern and Western regions of the country.
- Currently, states which started deploying renewable energy earlier have higher Renewable Purchase Obligations (RPOs) and these have resulted in higher costs of energy for the consumers in these states. The asymmetry in the level of RPOs prescribed by the Central Government for different states in India has



resulted in the DISCOMs in South India bearing disproportionate costs of greening the power sector. It is recommended that RPOs be determined using multiple considerations, such as the total renewable energy potential in the state, the mix of consumers from different categories (i.e., the number of agricultural consumers, industrial consumers, urban load centres, etc.), the pattern of electricity consumption in the state, among other considerations.

- The four large states in South India (Andhra Pradesh, Karnataka, Tamil Nadu, and Telangana) are shouldering a heavy financial burden (Rs.330 to 1500 crores per year) for absorbing a high amount of renewable energy as a result of the “must-run” status granted to solar and wind energy plants in India. This is largely due to the Power Purchase Agreements (PPAs) that were signed between the distribution utilities in the state and RE developers before the year 2016. Even though newer solar plants are cheaper, the average cost of solar energy in all southern states is significantly high. At this juncture, with 49% of the national RE capacity located in South India, serious consideration needs to be given about the financial burden placed on the cash-strapped DISCOMs in South India due to the implementation of the “must-run” policy. In this context, it is recommended that the “must-run” policy be reviewed, and distribution utilities not be mandated to purchase renewable energy beyond meeting the RPOs decided by the state regulators on an objective basis. The extra energy generated in South India by solar and wind energy plants can be absorbed by distribution utilities outside the region that do not currently meet their RPOs. In the meantime, the Central Government may also consider special incentives for the DISCOMs in South India that are procuring higher amounts of RE beyond their respective RPOs and bearing a disproportionate burden of climate change mitigation.

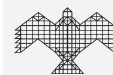
Clean Coal Project: An Integrated Approach to Development and Environment in the Power Sector is supported by the Department of Science and Technology, Government of India. The overarching objective of this project is to recommend the optimal technology and policy interventions to be implemented at the State and Central levels to meet South India’s growing needs for reliable, low-cost energy while mitigating the environmental impacts of coal utilisation.

During the year 2019-20, the project team collected data on flue gas emissions (SPM, SO₂, NO_x) and water consumption from more than 100 coal-fired Thermal Power Plants (TPPs) in South India. Data on power generation costs and costs associated with retrofitting Pollution Control Technologies (PCT) like Flue Gas Desulphurization (FGD) units and high-efficiency Electrostatic Precipitators (ESP) were also collected. Detailed analyses were then performed to estimate the impact on TPP performance parameters and power generation cost due to the retrofit of PCTs like FGDs and ESPs. The team also interacted with four major power producers – KPCL, TANGEDCO, TSGENCO, and NTPC) to get their views, concerns, and challenges faced by them. A workshop was organised with key stakeholders in the power sector on September 17, 2019. The primary goal of this workshop was to discuss the Implementation of Clean Coal Technologies to Comply with the New Emission Norms: Way Forward for TPPs in the Southern Region. The workshop was chaired by Dr VK Saraswat, Member, NITI Aayog. The salient research findings of this project to date are as follows:

- Retrofit of FGDs to reduce SO₂ emissions in the TPPs of South India (73 units) would lead to high capital-intensive investment impacting the power generation tariff by around 20-25% and is likely to increase the operating costs in terms of procurement and handling limestone needed for FGD as well as the handling and disposal of the by-product ‘Gypsum’. Further, FGDs will also increase Auxiliary Power consumption (APC) by 1.5-2% and also hike water consumption. The costs associated with these changes will have to be transferred to the major paying consumers (mainly, industries) thereby affecting their competitiveness and job creation. The increase in APC would also directly impact CO₂ emissions since more coal is required to generate the same amount of power.
- The sulphur content in Indian coals is much less (0.5 to 0.8%) as compared to imported coal. Therefore, the use of washed coal would not only help in bringing down SO₂ emissions by removing



Overview of a modern opencast coal mining complex.



pyritic bands in the coal during the washing process but will also reduce the specific coal requirement of the power plant. Coal washing will also reduce particulate matter emissions to a very large extent by improving the efficiency of the Electrostatic Precipitator (ESP). Based on the current levels of SO₂ emissions, the use of washed coal and Sorbent injection of lime into the boiler can help several TPPs to meet the new emission norms cost-effectively. The studies conducted at NIAS have also concluded that this would be an economical alternative for sub-500 MW power plants which will not complete 25 years by 2022. Finally, it is recommended that FGD retrofit should be an exception rather than a rule for sub-500 MW TPPs if they are not located in urban/sensitive/critically polluted areas.

- TPPs in India are already equipped with tall chimneys (225m – 275m) to tackle air pollution by ensuring wide dispersion so that the ground level concentrations of SO₂ and NO₂ are significantly below the National Air Quality standards even at a distance of about 25-30 km from the TPP. Therefore, the TPPs must focus on upgrading their ESPs to remove 99.98% of the particulate matter pollution which can achieve with low-cost indigenous technology rather than postponing the installation of high-efficiency ESPs along with the costly, imported FGDs.
- The current level of stressed assets in India's Power Sector due to the worsening supply-demand mismatch also offers an opportunity to DISCOMs in South India for reducing overall tariffs for their customers. This can be done by procuring more power from stressed pithead TPPs in the Eastern and Western regions of the country rather than from TPPs within each State which may be far off from coal sources. Ministry of Coal (MoC) has already announced a scheme ("Shakti") to enable power utilities to transfer their coal linkages to TPPs who can produce power at a lower cost, mainly due to the logistical advantage. Therefore, it is feasible to reduce the overall cost of compliance with EPAR for TPPs in South India by progressive closure of the +25-year old, inefficient TPPs while procuring more power from already commissioned Central Generating Stations (CGS) in South India or pithead TPPs located in the Western Region (WR) and the Eastern Region (ER) through the National Grid which is being strengthened.



India's first ultra-supercritical power plant set up by NTPC Limited in Madhya Pradesh.



Largest solar power plant in India in Pavagada, Karnataka.



Final coal mine void converted to a water reservoir for the benefit of local communities.



Participants in the NITI Aayog-NIAS-DST Clean Coal Workshop chaired by Dr VK Saraswat.



- Clean coal technologies like coal washing and sorbent injection can reduce the cost of compliance with EPAR in India since these are indigenous technologies, and do not depend on imported technology like FGDs. These technologies used in combination or on a stand-alone basis can optimise the cost of compliance in contrast to depending on imported FGDs which will increase CO₂ emissions and water consumption in TPPs besides increasing capital investments and hiking power tariffs on a perennial basis.
- The EEP findings foretell a technically feasible and cost-effective transition plan developed for the power sector in South India which will progressively result in a more environment-friendly power sector despite the anticipated growth in electricity demand by 2022. In this transition model, we have proposed an 'End of Life' policy to retire old TPPs with capacities below 500 MW which will complete 25 years of service in December 2022 and replace their power supplies by enhancing power procurement from modern, under-utilised TPPs in South India or other parts of the country.
- To determine the load-generation balance and determine the loading scenarios of the 400kV transmission lines and 400/230kV transformer infrastructure under the aforesaid proposal, detailed power flow studies were also conducted. These power flow studies were conducted for the 2022-23 power scenario with the help of the Power System Simulation Engineering (PSSE) simulation software available with India's Grid-Operator - Power System Operation Corporation (POSOCO). It was found that the retirement of the 25-year old TPPs has a negligible impact on the availability of power to meet the power demand, mainly due to the gross supply-demand mismatch that exists in India's power sector today. Further, the retirement of old TPPs and more effective utilisation of already commissioned modern TPPs will reduce specific coal consumption and therefore decrease CO₂ emissions as well as water consumption. All this will ensure cleaner thermal power generation at much lower costs than the FGD implementation plan mandated by the Central Pollution Control Board (CPCB) since the fixed cost per unit of the modern TPPs will come down significantly once their utilisation is optimised in an overall quest to reduce tariffs for all consumers in the country. This is key to the fulfilment of SDG 7 which is to provide both clean and affordable energy.

Dr Tejal Kanitkar authored a book on "An Integrated Framework for Energy-Economy-Emissions Modelling: A Case Study of India" published by as part of the Springer Briefs in Environmental Science.

Outreach

A Workshop on "Optimal Electricity Mix for the Southern Region" at NIAS, January 17, 2020.

A session on "Women, Science, and Scientific Temper" at the 16th National Conference of the Indian Association of Women's Studies in January 2020.

10th Annual Conference on Climate Change at the Tata Institute of Social Sciences in August 2019.

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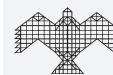
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SCIENCE COMMUNICATION PROGRAMME

Introduction

The research activities of the programme are centred around “Science and Risk Communication”. The focus of the work is to obtain effective and informative insights of managing public perceptions and public acceptance of public risks associated with new and emerging technologies, through science and technology communications. Activities relating to Risk Communication have been to focus on nuclear technologies. Exploring different dimensions of understanding, beliefs and attitudes towards nuclear technologies and risk associated with in diverse strata of the Indian population. Tracing out the influence of various social, psychological and cultural factors on the acceptance of nuclear energy in India. The focus of the work is on outlining strategies based on science and technology communication for eradicating fear of hazards and enhancing the acceptance and appreciation of nuclear power by the general public of India. Developing strategies for refuting vested communication attempts to propagate doubts and fear on nuclear energy.

Explore and make use of the newer platforms becoming available for interacting with public and as part of plan to reach people more effectively. Some of the efforts that the programme concentrates on:

- a) Creation of website to develop into a platform relating to science communication
- b) Use social media platforms like Facebook for dissemination of information
- c) Utilising visual media for communicating research

Research Activities

Survey on Public Perception: AI and Its Impact: AI is identified as one of the emerging technologies which would have bearing on the lives of the people and society in the coming years. Making use of the newer platforms becoming available for interacting with public, an online survey was commissioned to ascertain the public perception about the AI and its impact. The survey covered topics ranging from the source of information about AI to its expected impact on education, agriculture, defence, finance etc. Factors influencing trust and adoption of AI, role of government in terms of the regulation of AI machines, mitigation of mishaps etc. were formed the themes of the questions. Response of 1299 participants (hailing from 27 states of India) which included both urban and rural was obtained during a period of two weeks in the mid of 2018. The results of the study have been brought in the form of a NIAS report titled “Artificial Intelligence (AI) and India: Promise, Perception and Preparedness”.

Let’s Talk Series: Efforts to leverage Visual Communication Techniques and Technologies for effective science communication have continued. “Let’s Talk” video series is a part of this effort, where prominent researchers talk about their core research and the need for communicating the importance of their work to the public at large. Two videos “Blue Economy” by Dr Shailesh Nayak and “Human Primate Interaction” by Prof Sindhu Radhakrishna have been added to the library.

Use of Social Media: Social media presents tremendous opportunity to gauge the interests and reactions of the public at large and allows for quantitative assessment of our reach and enables the classification of audience based on their responses to the content. As part of our plan to reach people more effectively, two Facebook pages titled ‘NIAS–SciComm AI’ and “NIAS–SciComm” were created.

Facebook Pages and NIAS–SciComm–AI: The Facebook page was created with the aim of providing current, relevant and applicable news relating to Artificial Intelligence to the viewers. Topics included that reflect novel and diverse applications of AI, ethical and societal issues. The sources of the articles that are shared on this page are Google Alerts and Google News and the articles that appear are surveyed and identified articles are uploaded on the Facebook page. On an average of 2 to 3 articles are published daily. It is interesting to note that the articles that dealt with the societal applications of AI and those that address privacy issues have gained more reach and clicks. 540 people follow this page and typically around 50-70 reach for each of the post.



Facebook Pages NIAS-SciComm: In a similar effort, another Facebook page ‘NIAS-Comm’ was created to bring together the latest trends in science and articles focusing on the careers in science, research, communicating research. The sources of the articles that are shared on this page are Google Alerts, Google science and technology news, and popular science magazines. 511 people follow this page and typically around 50-70 reach for each of the post.

ToonLogs: A New Initiative to Communicate Science: With newer platforms of communication and reaching out to people emerging and being used to varied extents, how one chooses to reach out becomes important. Cartoons are one of the effective ways of reaching out and making an impact. In the recent times, Dr Pradeep Srivastava used cartoons to communicate science and started a new branch of science communication “Scientoons”. Blogs have been effective mode to communicate with details. Combining the capabilities of Cartoons and Blogs to reach out to society, the concept of “ToonLogs” has emerged. “ToonLogs” would address diversified topics relating to Science. The first in the series has been created and dealt with “COVID” and the second one on “Super Pink Moon”. A Facebook page on “ToonLogs” has also been created. Initial response and reach are very encouraging. The efforts would be continued in the coming year.

Risk Communication: Activities relating to Risk Communication have been focussed on Nuclear technologies. Work carried out in various countries relating to risk communication relating to nuclear energy have been surveyed. Use of social media in risk communication about nuclear power plants was studied.

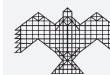
Human Reliability Programme in Industries of National Importance: The safe and reliable operation of high hazard installations depends not only on technical excellence but also on individuals and the organisation. It is recognised that safety is not only a technical matter, but it also depends heavily on the behaviour of the people working in the lifecycle of high hazard installations. Human Reliability (to describe human performance) is widely used in fields requiring high standard of safety, such as aviation, petroleum and chemical process and nuclear industries. Research activity relating to Human Reliability Programme in the Industries of National Importance is being pursued. This is NIAS-Texas A&M University collaborative programme. Two discussion meetings and one panel discussion were organised as part of the activity conducted in the last one year. One postdoctoral associate and one project associate are working for the project.

Effective Communication of the Risks involved in Natural Disasters: The project is supported by Vigyan Prasara, Government of India and Samvidhan, and NGO based out of Guwahati. The study has examined various aspects of science communication, such as (i) factors influencing public and media attention during the rapid onset period of cyclones, (ii) communicating information about climate change in the rural and marginalised regions of the North-eastern India (iii) the efficacy of Traditional Folk Theatres (TFT) as a medium for communicating climate change concepts to farmers and school children.

Outreach



Discussion Meeting on Human Reliability Programme in Industries of National Importance, jointly conducted by NIAS and Texas A&M University with technical support from ORNL, USA, during April 24 and 26, 2019.



Public Discussion Meeting on Ancient Indian Knowledge System: Holistic Development of Children Public Event at NIAS on May 8, 2019.



Release of the book Homi Bhabha: A Visionary and Science Administrator Extraordinaire, book authored by Mr Narendra Dutt Sharma and Prof Baldev Raj, at NIAS on June 21, 2019.

NIAS and Texas A&M University jointly conducted a Core Group Discussion Meeting at NIAS on Human Reliability Programme in Industries of National Importance, during October 15 to 17, 2019.

Panel Discussion on Gender, Science and Engineering in India: Complexities and Anomalies at NIAS on February 28, 2020.

M Sai Baba, *Head*

VV Binoy

Post-Doctoral Associate: Ipshita Chowdhury

Doctoral Student: Sreshtha Mondal

Junior Research Fellow: Siddharth Sinha

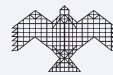
Technical Assistant: Nandha Gopan

Project Associate: Lakshmi Handsa (*till March 14, 2020*)

SCHOOL OF SOCIAL SCIENCES

Programmes

- Education
- Inequality and Human Development
- Urban and Mobility Studies



SCHOOL OF SOCIAL SCIENCES

School of Social Sciences consolidates efforts to research problems facing India's economy, polity and society, and disseminates the results to the bureaucracy, industry and civil society. The School works towards this goal through three largely autonomous programmes: Education, Urban and Mobility Studies, and Inequality and Human Development.

School of Social Sciences has, across its three programmes, evolved a broad-based concern over the challenge of exclusion in India. While the origins of this concern and the paths followed by each of the three programmes are not identical, they share a common focus on the processes of exclusion and their manifestation in everyday life. In understanding the multiple dimensions, and interconnections, of different processes of exclusion the School has developed a more comprehensive and heterogeneous view of the Indian economy and society as a whole.

The oldest programme in this School – the Education Programme – has placed a great deal of emphasis on the social processes that exclude children from their right to education. At the same time the programme has also looked at those children whose giftedness sets them apart. The programme has also, over the years, explored the exclusion of women in the STEM disciplines.

The Urban and Mobility Studies Programme explores diverse social transformations in post-liberalisation India, in the context of rapid economic growth and urbanisation, through multi-scalar and comparative analyses of changing urban and peri-urban livelihoods, economies and ecologies. In accordance with the SDG goal of making 'cities and human settlements inclusive, safe, resilient and sustainable', the programme examines urban development policies and practices from the perspectives of equity, social justice and environmental sustainability.

The Inequality and Human Development Programme has been exploring the instrumentality of ethically unacceptable differences. It focuses on the processes that generate inequality – including the nature of exclusion – as well as the instrumental role played by these inequalities on large social and economic processes.

Programmes

- **Education**
- **Inequality and Human Development**
- **Urban and Mobility Studies**



EDUCATION PROGRAMME

Introduction

The Education Programme addresses many theoretical and empirical issues through policy engagements, advocacy related interventions and independent research in critical domains of education.

Research Activities

National Programme for Education of Gifted and Talented: A analysis of the project data (Education of the Gifted and Talented; Exclusion in Education and Women in the STEM disciplines) was carried out and research papers are being prepared. A review workshop at NIAS to share the research work in the area of the education of the gifted and talented was organised. A five-day residential Second Summer Workshop for Rural and Tribal Children; a two-day residential workshop for the NIAS MAIYA Prodigy fellows; and a three-day winter workshop for the students of NIAS supported Advanced Learning Centres of Bengaluru and Hyderabad were organised. The second Alchemy 2020 was organised to exhibit the projects and deep learning of the NIAS-ALC students. This year Alchemy 2020 was organised in collaboration with the Jawaharlal Nehru Planetarium, Bengaluru.

The research also points to the significance of academic networks beyond the narrow understanding of academic networks. In other words, there are several forms of invisible biases that operate as women advance in their careers.



Prof Anitha Kurup interacting with the ALC children before the ALCHEMY event



Second Summer Workshop for Rural and Tribal Children

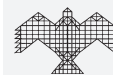
Social Exclusion and Education: A review of Ashram schools for marginalised in Maharashtra was completed. The historical, social and institutional contexts was understood. The curricula, teaching, pedagogy and civic initiatives were studied and it recommended to revisit the state's norms for Ashram school's governance.



Field Work – School in Palghar



Field Work – School in Jawhar



Women in STEM Project: The project traced the life journey of women scientists across different research institutes and universities of India to understand and celebrate the diversity among women scientists in India. For this purpose, in-depth interviews based on semi-structured questionnaire were conducted with over 130 women faculty located primarily at six research-focused institutes, one Indian Institute of Science Education and Research (IISER), and seven teaching-focused Universities/ Institutions, in the disciplines of Engineering, Biology, Physics, Chemistry, and Maths. Situated within twin critical feminist perspectives, first, that there is no singular representative 'woman' and, second, that scholarship tends to normalise euro-centric experiences as universal, this project furthers the nascent scholarship on women researching science and engineering in India by theorising the diversity of institutional locations.

The research focused on the changing work-life balance as India experiences the transition of the joint families to nuclear families. This changing pattern points to the critical role that scientific institutions can play as enablers to enhance the participation of women in science and engineering. The research analyses factors that influence women to study science which is distinctly different from factor that helps them build a scientific career. The interplay of family background, schooling experience and influence of role models interact in different ways and impact women when they make a choice to study science and build careers. **Impact of Academic Networking on Women in STEM Disciplines:** The research also points to the significance of academic networks beyond the narrow understanding of academic networks. In other words, there are several forms of invisible biases that operate as women advance in their careers.

Prof Anitha Kurup was hosted by the School of Computing and Engineering Sciences, Florida International University, Miami as a Visiting Professor during September 23 and October 3, 2019. During her visit, she made several presentations and interacted with several departments to explore the possibility of collaborations.

Historical Developments, Policy Turns and Emerging Concerns in Vocational and Higher Education in India: The study has the objectives 1) A comprehensive review of the evolution of vocational and technical education in India; 2) An analysis of the relationship between vocational education aspirations, motivations and employment choice. The research study is based on literature reviews and survey interviews of employees in four manufacturing industries in Bengaluru – BHEL, BEL, Toyota Kirloskar and Hindustan Aeronautics Limited. The study resulted in 1) A comprehensive assessment of vocational and technical education; and its policy trajectories in India; 2) A critical evaluation of the relationship between vocational education and employment choice of employees in manufacturing industries, Bengaluru. The study also identified research gaps and challenges in several areas of vocational education sector and its subfields for critical policy interventions.

The following reports were published by the Education Programme in 2019:

Voices from Margins: Education and Aspirations among Youth from two Tribal Districts in Maharashtra and Karnataka.

TCS Gifted Report: Challengers in Identifying and Mentoring Gifted and Talented Children in Developing Countries: Experiences from Rural and Urban India.

Spaces of Learning and Growth: A Review of Ashram Schools in Maharashtra.

Historical Developments, Policy Turns and Emerging Concerns in Vocational and Higher Education in India.

Capturing Diversity: A Comprehensive Report on Women in Science and Engineering in India.





Outreach

NIAS- ALC Weekend classes every Saturday at NIAS, April 2019 to March 2020.

Summer Residential Workshop for Rural and Tribal Children in Mysore, June 24 to 28, 2019.

Summer Residential Workshop for Rural and Tribal Children in Chamrajanagar, July 1 to 5, 2019.

Third Talent Search Mentoring Workshop for NIAS MAIYA PRODIGY Fellows, May 19 and 20, 2019.

Review Workshops on Education of the Gifted and Talented, NIAS, September 5, 2019.

Fourth NIAS MAIYA PRODIGY AWARD Function at NIAS, January 3, 2020.

ALC Facilitators Workshop at NIAS to review the curriculum for the NIAS supported ALCs, February 1 to 3, 2020.

Winter Workshop for students of NIAS supported Advanced Learning Centres in Bengaluru and Hyderabad, February 26 to 28, 2020.

AlChemY 2020 Exhibition of Students Projects and Display of Deep Learning of NIAS-ALC Students, February 29, 2020.

Review workshops on Education of the Gifted and Talented.

Anitha Kurup, *Head*

Shivali Tukdeo

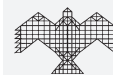
Shalini Dixit

Jeebanlata Salam

Malavika Kapur

Doctoral Students: Anupama Mahajan, Savitha S Babu, Subroto Das, Shaima Amatullah

Megha Poonia, Sabna ES, Chestha Arora



INEQUALITY AND HUMAN DEVELOPMENT PROGRAMME

INSTRUMENTALITY OF DIFFERENCE

Introduction

The Inequality and Human Development Programme aims to develop policy options based on multidisciplinary and empirically consistent conceptualisation of inequality and to contribute towards discourse to enable more informed policy choices. This perspective ensures the programme goes beyond the measurement of poverty and inequality to the causes and consequences of these phenomena. The empirical and theoretical work carried out in the programme has explored the ways in which inequality can be instrumental in determining the nature and extent of transformation in rural India. While approaches preoccupied with measurement have been content with establishing the extent of informality in rural India, IHDP has focused on the relationship between the economically dominant formal sector and much poorer informal activities. An interesting example is the case of Self Help Groups in rural Karnataka who borrow from the formal banking systems and sometimes set up their own informal lending networks.

The programme took a major step forward by studying a much more widespread example of the link between formality and informality through two projects sponsored by Tata Consultancy Services. A major concern of one project was the role of informality in bridging the spatial difference between the industrialising regions and the places where workers are being released from agriculture. The networks that identify and train the workers are largely informal even as the work is primarily in the formal sector in cities. The second project on farmers' suicides also explored, among other things, the suicide-inducing informal pressures on individual farmers even as they reacted to the process of agriculture being replaced by formal industry.

The programme expects over the next three years to build on this understanding of the instrumentality of inequality in the Indian economy and society through two projects which have once again been supported by Tata Consultancy Services. These projects will explore the effects of regional differences in the development of skills and at the larger relationship between inequality and growth in India.

Research Activities

The year saw the completion of two major projects supported by TCS, one on "Inequality and the Demand for Non-farm Occupations and the other on Inequality and Farmers' Suicides in India". The reports on the two projects were released in Delhi on November 13, 2019 by Prof Ashok Lahiri, Member 15th Finance Commission.

A striking result of the study of the demand for non-farm jobs was the challenge of distance in India's rural transformation. This study was carried out before the challenge of distance was made evident to the country at large by migrant workers seeking to return home during the Covid 19 crisis. The largescale movement out of agriculture to industry is a part of all major processes of industrialisation. This movement is difficult at the best of times but has been further complicated in India by two inequalities, one of distance and the other between the urban and the rural. The crisis of distance emerges from the fact that the areas where labour was being released from agriculture were often a considerable distance away from the centres where there was a demand for labour in industry and services. This distance also had a regional pattern to it, with the release of labour from agriculture occurring largely in districts towards the north and east of India, while non-farm jobs were concentrated to the south and west of the country. The spatial difference could have been overcome if only required a one-time migration. But the stark inequality between the costs of living in the village and the city ensured a large number of workers could not afford to permanently migrate to urban centres. Their efforts to earn in the city while maintaining their household in the village, has led to a number of pressures. The temporariness of this arrangement has led to uncertainty about the availability of labour in cities, even as the workers' need to return home to be with their families in times of crisis can, and does, lead to huge humanitarian disasters.



The second study was on one of the major consequences of inequalities that emerged from the movement of the economy away from agriculture: farmers' suicides. The study demonstrated that the main factor causing farmers' suicides was not so much extreme poverty, as the pressures to leave agriculture. The poorer states typically had relatively lower Suicide Mortality Rate Ratios of farmers to non-farmers, while these ratios were higher in states where there was a substantial movement out of agriculture. In Kerala, a relatively better-off state, the pressure to move out of an unviable agriculture was greatest on agricultural labour. While the young among them could find non-agricultural work, older agricultural labour found it much more difficult to do so. The pressures generated by the inability to find work were accentuated by social demands. In order to get their daughters married to men working outside agriculture, huge dowries had to be paid. These demands led to them taking loans they had little chance of repaying, using whatever influence they could. And as the pressures of unpaid debts mounted it sometimes led to suicide.

In Maharashtra the pressure was on the middle farmer. The failure of their non-agrarian options in several districts had contributed to small farmers increasing the ranks of agricultural labour. The middle farmers were squeezed out of this process, as they typically had a social status that did not allow them to become agricultural labour. Several of them tried to climb up the farm-size ladder, by taking large loans for investment. When these investments failed, ensuring they had no way of repaying the loans, a number of these middle farmers committed suicide.

Doctoral Students

Ms Anamika Ajay worked on 'The Impact of Development on Social Conflicts: Case Studies of Intra-family and Inter-group Strife in Two Villages of Kerala'. She was awarded a PhD on January 10, 2020.

Ms Ankita Rathi worked on 'Transition from Village to Town: A Study of Two Settlements in Punjab'. She has submitted her thesis.

Ms Meera Sudhakar is working on 'Development Policy as a Social Process: Case of Niranthara Jyothy in Karnataka' and is currently writing her thesis.

Mr Ajit Kumar Babu is working on 'Inequalities in the Process of Agriculturalists Learning Non-agricultural Skills' and is currently doing his fieldwork.

Ms Chandana Rajsekharan Bindu is working on 'Response to Inequalities under Divergent Development Strategies: A Study of Two Villages in Gujarat and Kerala' and is currently doing her fieldwork.

Mr Shilajit Sengupta is working on 'Political Consequences of Intra-Village Inequalities in Rural Transformation – A Study of Two Villages in West Bengal', and is currently doing his fieldwork.

Outreach

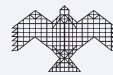
A workshop was conducted to review the two research projects of the Inequality and Human Development Programme on May 20 and 21, 2019, at the institute. The external experts who attended the workshops were Dr AK Shiva Kumar,



Prof Ashok Lahiri releasing the reports on non-farm jobs and on farmers' suicides in Delhi. Others in the picture are Prof Ramesh Chand, Dr Shailesh Nayak and Prof Narendar Pani.



Dr Rajeev Khandelwal and Prof Arun Kumar at the workshop on the projects on non-farm jobs and on farmers' suicides at NIAS.



Dr Anup K Pujari, Prof Arun Kumar, Prof Charan Singh, Ms Indrani Mazumdar, Mr K Jairaj, Prof Manish Jha, Prof Meera Velayudhan, Prof Mridul Eapen, Prof N Jayaram, Prof Rajasekhar, Dr Rajiv Khandelwal, Prof Shiv Vishwanathan, Dr Siraj Hussain, Prof SS Meenakshisundaran, Dr Vijoo Krishnan, Joint Secretary of All-India Kisan Sabha and Ms Anumeha Yadav.

A panel discussion on the reports on 'Inequality and the demand for non-farm jobs' and 'Inequality and farmers' suicides' was organised on November 13, 2019 at India International Centre, New Delhi. The eminent academics and social activists on the panel included Dr Ashok Lahiri, Dr Ramesh Chand, Prof Surinder Jodhka, Prof Arun Kumar, Prof Zoya Hasan, Prof CP Chandrasekhar, Prof Charan Singh, Prof Jayati Ghosh, and Mr Harsh Mander.

Narendar Pani, *Head*

Kshitija Joshi (*till October 4, 2019*)

Sumedha Bajar (*till January 29, 2020*)

Doctoral Students: Anamika Ajay, Ankita Rathi, Meera Sudhakar, Ajit Kumar Babu, Chandana Rajsekharan Bindu, Shilajit Sengupta



Prof CP Chandrasekhar, Prof Surinder Jodhka and Mr Harsh Mander at the panel discussion on the reports on non-farm jobs and on farmers' suicides in Delhi.



URBAN AND MOBILITY STUDIES PROGRAMME

Introduction

The Urban and Mobility Studies Programme focuses on the social and economic reverberations of urbanisation and migration in India's cities, towns and villages. Researchers and students in the Programme collaborate across disciplines and interdisciplinary areas of research, including sociology and social anthropology, gender studies, geography, urban studies, heritage studies and art history, conservation, and migration and transnational studies, to understand processes of urbanisation and different forms of mobility. Building on our core methodological strengths in ethnography and qualitative methods, research projects have examined the linkages between rural-urban mobility and Bengaluru's new service economy; and the impacts of the 'worlding' of India's cities through real estate-led development and top-down urban planning for local communities and political ecologies.

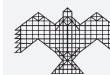
Research Activities

This year, the Programme completed two major funded research projects – a study of migration, skilling, and labour in Bangalore's organised service economy, and a study of the development of the new 'greenfield' capital city of Andhra Pradesh. The third major project – a comparative study of land, livelihoods, ecology and finance in the context of rapid urbanisation in Bangalore and Jakarta – will be completed in late 2020.

India's Changing Cityscapes: Work, Migration and Livelihoods: This project was funded by the Indian Council for Social Science Research (ICSSR), was carried out in collaboration with the Institute for Social and Economic Change (ISEC), Bengaluru. The study examined the linkages between migration, skilling, livelihoods and socio-economic mobility among low-end service sector workers in Bengaluru. The study documented the practices of skill development centres in Bengaluru which bring rural youth (with minimum 10th standard education) to the city for training and facilitate their entry into lower rungs of the new service economy. Within organised services, the study focused particularly on the retail, beauty and wellness and transportation sectors. Although employment in the 'new service economy' is often viewed as a route to economic mobility for unemployed, semi-educated youth, the study found that such jobs are usually precarious, marked by informality and low wages, and do not provide migrant workers with a viable foothold in the city. These conditions lead many service workers to change jobs quickly or often to return to their villages, creating a mobile, fluid and peripatetic service workforce. The study has raised troubling questions about the current skill development policy paradigm as well as the current trajectory of services-led economic development and urbanisation in India. The final report was submitted to ICSSR in September 2019 and was revised based on the expert reviews, and has been disseminated to the public.

'World-City' Planning in Andhra Pradesh: A New Model for Urbanisation?: This project was supported by the Azim Premji Foundation, and was completed in December 2019. The study tracked the socio-economic transformations set in motion by the building of a greenfield city for the new capital of Andhra Pradesh, Amaravati. It has documented in detail the financial, political, bureaucratic, and social processes and relations through which an urban mega-project has been planned and implemented, and examined the social consequences – especially for caste and class inequalities – of forced urbanisation combined with a participatory model land assembly and urban development. The project has resulted in three publications till date, including a journal article in the prestigious international journal *Economy and Society* this year, and the final report and a monograph are under preparation.

Speculative Urbanism: Land, Livelihoods, and Finance Capital: This project was funded by the National Science Foundation (USA), is being carried out in collaboration with the Departments of Sociology and Geography at the University of Minnesota and the Geography Department at UCLA (USA). The project is a comparative study of changes in land use, property relations, livelihoods and urban ecologies in response to the circulation of finance capital into the real estate sectors of Bengaluru and Jakarta. Fieldwork was completed this year and data analysis and writing are ongoing. The project focused on two sites in Bengaluru, one peri-urban and



the second in the city centre, where we examined the processes and impacts of real estate-led urbanisation. In the peri-urban site we traced the multi-scalar social and financial networks through which agrarian land is transformed into urban real estate, highlighting the social and ecological consequences of the expansion of the city into its hinterland. In the core city site, the project has documented the socio-economic impacts of large-scale real estate development and slum redevelopment projects for the residents of former working-class neighbourhoods and informal settlements.

A major research proposal on Inequalities in Global Bio-oil Value Chains was developed in collaboration Eindhoven University of Technology, Utrecht University and universities in Indonesia and Sweden, through a workshop organised at NIAS in April 2019. The proposal, submitted to the Volkswagen Foundation, was short-listed and presented at Copenhagen in October 2019.

Doctoral Students

Ms Rashmi M successfully defended her thesis entitled 'Mobile Phones and Changing Media Consumption Practices in Bangalore' and was awarded the PhD degree by MAHE on October 3, 2019.

Ms Priya Gupta submitted her thesis entitled 'Adivasi Rights and Wildlife Conservation: Contesting Citizenship in Nagarhole Tiger Reserve' to MAHE in February 2020.

Outreach

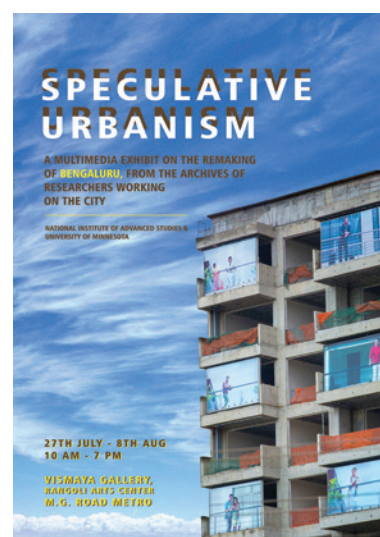
Speculative Urbanism Exhibition: A multi-media exhibition entitled *Speculative Urbanism*, was put up at a public gallery in Bengaluru, from July 27 to August 8, 2019, and again at the Indian Institute of Human settlements from September 26 to October 5, 2019. The exhibit featured photography, material artefacts, video, and text from our project. It received strong media coverage and made the key themes of our research – the operation of land markets, the entanglement of real estate and finance capital, the ecological impacts of real estate on the city, and livelihood impacts – available to a wider public.

A public presentation titled 'Jakarta Sinking, Bengaluru Parched: Conversations on the Intersections between Land, Water, Finance, and Planning', at Ashirvaad, Bengaluru, organised by the Environment Support Group, July 29, 2019.

A Workshop on Housing Rights was held at NIAS, July 20, 2019.

Public lecture: Working Futures: The ILO, Automation and Digital Work in India by Dr Kaveri Ishwar Haritas, Associate Professor, OP Jindal Global University, January 13, 2020.

Changing India Event Series (supported by Pratiksha Trust):
Public lecture: Narrative as Justice: Imagining Feminist Justice from #MeToo to Feminist Judgments Projects by Dr Jhuma Sen, Assistant Professor, Jindal Global Law School, July 12, 2019.





Public Book Talk: *Narrow Fairways: Getting by and Falling Behind in the New India* by Dr Patrick Inglis, Assistant Professor of Sociology, Grinnell College, USA, October 21, 2019.

Public Lecture: *Walled In: An Anthropological Look at the Politics of Exclusion in Contemporary America* by Dr Anand Pandian, Professor, Johns Hopkins University, USA, January 8, 2020.

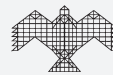
Carol Upadhyia, *Head*

Post-Doctoral Associate: Hemangini Gupta
(till July 31, 2019)

Research Associates: Juwairia Mehkri, Harpreet Kaur, Sachinkumar Rathod

Doctoral Students: Rashmi M, Keya Bardalai, Snehashish Mitra, Vijayashree Kashyap, Priya Gupta





INTER-SCHOOL PROJECTS

Early Fusion Music: Cross-cultural Musical Exchanges in Colonial India from the late 18th to the Early 20th Century

It is a project that spans across programmes and schools of NIAS. The project has three distinct components: 1) Examining instances of cross-cultural musicological exchanges during the said period in South India 2) In Bengal and 3) To examine the phylogeny of tunes through computational analysis of acoustic signals. A literature review and archival study has been undertaken.

In the study, the realm of music, and cross-cultural exchanges that happened in various parts of India, largely exemplified by the colonial adoption of Indian classical and popular music, especially in Bengal are being examined. The development of a new genre of compositions in south Indian classical music—Nottusvara, wherein devotional words in Indian languages (mainly Sanskrit or Telugu) were set to popular tunes played by European bands during the period are being studied. The phylogeny of tunes through computational analysis of acoustic signals to characterize their complexity and identify patterns in the notation that may reveal specific signatures of the composer have been taken up.

Prof Andindya Sinha, Principal Investigator
Dr MB Rajani
Dr Nithin Nagaraj

The Nonhuman in Indian Sculpture: Tracing the Depiction of Elephants and Primates in Monumental Sculpture through Indian History

This project has been investigating the evolutionary history of the depiction of nonhuman species, especially elephants and primates, in Indian monumental sculpture from about 2,000 years before present. It primarily focusses on the materials used, stylisation in form and accuracy of anatomical details – as influenced by the nature of the medium – and the sculpting techniques of various schools and guilds of craftsmen in different historical periods. The project also aims to examine the faithfulness with which certain aspects of the behavioural profiles and cognitive abilities of these species have been sculpted, in contrast to the anthropomorphisation of their forms and behaviour. The project has commenced with reconnaissance visits to different monuments shortlisted from the literature and will be followed by the documentation and detailed analyses of nonhuman sculpture that are representative of different time periods in Indian history.

Dr Srikumar M Menon, Principal Investigator
Prof Anindya Sinha



POLICY BRIEF

Sustainability of Coal Mining in India – Challenges and Way Forward

Thermal power plants based on coal generate about three-fourths of the country's electricity. India's proven coal reserves are sufficient to meet the country's needs for several decades. Coal is also a vital input for core industries like steel and cement. India imported 235 million tons of coal at the cost of more than Rs.1.7 trillion during FY 19 despite being the World's second-largest producer of coal. While coal mining operations have positive economic impacts on the local area in terms of infrastructure development, employment and business opportunities, adverse effects of coal mining on the ecology of the local area also need to be considered.

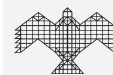
In view of to minimise impact on environment and maxima socio-economic development, India needs effective and efficient regulatory governance for mining, environment protection, and reclamation.

Unified Authority have such regulatory body should have professional expertise in the ecology, environment, geology, hydrology, hydrogeology, biodiversity as well as mine planning to mine closure related issues. In order to consider all these facets in an integrated manner before granting the key statutory approvals for coal mines, a "Unified Authority" with appropriate capacity and resources under the aegis of the MOEF&CC has been proposed. Authority may grant all forest/environment clearances, mining plans for coal mines and also monitor their compliance throughout their operating lives right up to final closure. The Mine Opening/Closing Permissions, in managing the Escrow Agreements, and in monitoring the implementation of the approved Progressive/Final Mine Closure Plans to be transferred to this Authority.

It is envisaged that such Authority will also facilitate job creation and contribute to a reduction in coal imports by ensuring "ease of doing business" without compromising on forest and environment compliances.

To achieve the above goals, it may be considered to enact a "Sustainable Coal Mining Code" by the parliament to consolidate all statutory provisions governing environment/forest matters related to coal mines, while preserving the Mines Act which regulates health and safety in all mines. This Code shall empower the "Unified Authority" to ensure efficient and effective environmental governance of coal mines in the manner explained above. Ultimately, this will contribute to the realization of India's Sustainable Development Goals and facilitate both energy security and sustainability for India during the ongoing energy transition.

A detailed policy brief (NIAS/NSE/EEP/U/PB/08/2019) was prepared and sent to all stakeholders and policy makers.



TRAINING PROGRAMMES

NIAS has been conducting training programmes in order to develop leadership to address various societal issues through multidisciplinary approaches. The Flagship Training Programme for Senior Executives and Space in India's Foreign Policy were self-supporting programmes. The Department of Science and Technology supported five training programmes including two for only women scientists.



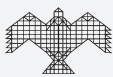
34th NIAS Programme for Senior Executives

Theme: The flagship programme of NIAS, 34th NIAS Annual Programme for Senior Executives with the theme 'The Promise of India – Achieving the Potential to be a Global Leader' was held during January 6 to 11, 2020. The nineteen participants included senior executives from various government organisations as well as from private industries. The programme included lectures and discussions on a range of subjects.

Inaugural Address: Mr KM Chandrasekhar, Chairman, Centre for Development Studies and former Cabinet Secretary to the Government of India set the tone of the programme with his inaugural address.

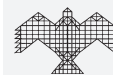
Speakers: The sessions were addressed by well-known personalities including Dr K Radhakrishnan, Dr Usha Kim, Ambassador Rakesh Sood, Prof T Jayaraman, Prof SS Meenakshisundaram, Prof Narendar Pani, Prof VS Ramamurthy, Dr Ravi Chellam, Mr Anil Swarup, Ms Usha Thorat, Ms Revathy Ashok, Mr Partha Sarathy Bhattacharya, Prof SD Muni, Dr Ashok Bhan, Mr K Venkataramanan and Dr Nishchal Nath Pandey, all of whom brought in their valuable experience and learnings into the discussions. A public lecture was also organised on 'The Promise of Artificial Intelligence' by Prof Tilak Agerwala followed by a panel discussion on the way forward for India with Prof Agerwala, Dr SR Sudarshan Iyengar, and Prof Anjula Gurtoo which was chaired by Prof Sangeetha Menon. In addition, the fifteenth Raja Ramanna Memorial Lecture by Prof Roddam Narasimha on 'Indic Mathematics' was also organised as a part of the Senior Executives programme. Both these public lectures were highly appreciated by the participants of the programme as well as members of the public who participated in these public programmes. The valedictory address was given by Ambassador PS Raghavan, the current Chairman of the National Security Advisory Board.

A highlight of the programme this year was the Odissi Dance Performance by Nrityagram Dance Ensemble. Another highlight of this year's programme was a conducted tour of the ISTRAC-Mission Operations Complex which was widely appreciated by all the participants.



Coordinators: The programme was coordinated by Prof D Suba Chandran and Prof R Srikanth. Ms V Girija assisted in the coordination of the programme.

Feedback: The participants appreciated the programme structure, content and organisation. While the interaction with the renowned speakers gave them a unique exposure into India, the interaction amongst the participants allowed them to develop new relationships which will help the participants to enhance their potential contributions to their respective organisations.



NIAS-DST Training Programme for Women Scientists on Social Responsibility of Scientists: Pathways and Outcomes

Theme: NIAS-DST Training Programme for Women Scientists on Social Responsibility of Scientists: Pathways and Outcomes was held from February 10 to 14, 2020. This programme offered a platform for constructive dialogues among scientists, technologists, science administrators, social scientists and policy makers to reiterate the responsibilities of scientists and technologist and making scientific enquiry socially relevant.

Inaugural Address: Inaugural lecture titled Science and the Sociological Imaginations was delivered by Prof Surinder S Jodhka, Jawaharlal Nehru University.

Speakers: The other major topic deliberated were “Is there anything science should not do? What are the demands of science from society? What are the societal demands on science? Are there any social inclinations in the practice of science in India? Should we always trust science? Internationally acclaimed resource persons Prof Narendar Pani (NIAS), Prof Shiv Visvanthan (OP Jindal Global University), Prof T Jayaraman (MS Swaminathan Research Foundation), Prof Prajval Shastri (Indian Institute of Astrophysics), Prof Jahn timer Phalkey (Science Gallery, Bengaluru), Prof Rohini Godbole (Indian Institute of Science), Prof Roddam Narasimha (Jawaharlal Nehru Centre for Advanced Scientific Research), Dr Tarun Menon (NIAS) and Dr Nishant M Srinivasaiah (Asian Nature Conservation Foundation) shared their perceptions, experiences and lead the discussions. Dedicated sessions based on the incidents ignited global discussions on the science-society interactions and social responsibility of science, The Manhattan Project, usage of algorithms to predict susceptibility of a person to commit crime by the US judiciary (Machine Bias), the Battle to set up a telescope at Hawaii and the Stanford Prison Experiment were also the component of the training programme. Prof Narendar Pani, Dr VV Binoy, Dr Harini Santhanam and Dr Shivali Tukdeo presented these cases, followed by each participant giving a brief presentation on a selected aspect of these incidents, leading to the open discussion.

A Public Lecture on “Science and Justice” by Prof G Mohan Gopal, Member, National Judicial Academic Council of the Supreme Court and a Saxophone Recital by Vidwan Bengaluru R Manjunath and Associates were also organised as part of this programme. The training programme concluded with valedictory address by Prof AK Singhvi, Physical Research Laboratory, on the topic “Science and Technology of the Future and Role of the Academia”.

Coordinators: The programme was coordinated by Prof Narendar Pani, Dr VV Binoy and Dr Harini Santhanam. Ms VB Mariyammal assisted in the coordination of the programme.

Feedback: The participants provided positive comments describing their satisfaction with the programme and its organisation. Overall it was suggested that the programme provided a unique platform to interact with experts from different disciplines and discuss multiple perspectives of scientific research as women scientists and academics.



NIAS-DST Training Programme on Science and Technology: Global Developments and Perspectives

Theme: NIAS-DST Training Programme on Science and Technology: Global Developments and Perspectives was organised from December 9 to 20, 2019. It had 20 participants and the emphasis on the development of leadership qualities through the integration of multidisciplinary knowledge and the current developments and their scientific, social and policy dimensions. The participants in the programme included from, ISRO, DAE, ICFRE, CSIR, DoT, DoE, ICAR, DBT, ARCI and academic institutes.

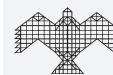
Inaugural Address: Prof Kota Harinarayana, former Vice Chancellor, University of Hyderabad, outlined how India has gained by global growth of science and technology and the resultant lower costs across the sectors.

Speakers: Very senior and eminent people delivered the talks (29 including two public lectures) and there was active participation from the participants. The public lecture by Dr Pradeep K Srivastava made a lucid presentation on using cartoons as a medium to reach out to common people and bringing out change. Mr Madhuchandran, in his public lecture highlighted the importance of organic farming and how the efforts have brought out change in the lives of farmers in the region of Mandya. The valedictory address was given by Mr Vivekananda, Vice President, Tata Consultancy Services.

Visit to Shravanabelagola and Master Control Facility at Hasan formed part of the programme. The participants had enhancing experience in the visit to JNCAR and interaction with Prof CNR Rao. A flute recital by Mr Pathanjali and Master Viswanathan was organised as part of the programme.

Coordinators: The programme was coordinated by Prof M Sai Baba and Dr Anshuman Behera. Mr KS Rama Krishna assisted in the coordination of the programme.

Feedback: The overall feedback of the participants on the training programme has been highly satisfactory.



NIAS-DST Training Programme on Policy for Science and Science for Policies

Theme: This programme, seventh in the series, for scientist-administrators and technologists at the Director/ Divisional Head position from various scientific organisations in the country, focused on the theme 'Policy for Science and Science for Policies' was organised from October 21 to 25, 2019. The theme offered opportunity for multidisciplinary engagements with an excellent list of speakers.

Inaugural Address: The inaugural address was delivered by Prof G Padmanabhan, President, National Academy of Sciences, India (NASI) on Science Policy.

Speakers: Energy, Environment and National Challenges by Prof R Srikanth; The Need for a National Culture Policy for India by Dr Vikram Sampath; India, Traditional Medicine and Healthcare Policy by Dr Meenakshi Negi; Public Policy and Local Governance: Implications for Sustainability by Dr NC Narayanan; Flood Hazard in India by Dr Vishwas Kale; Villages and the Reach of Science by Dr Sabyasachi Chatterjee; Science Education and Reaching Across by Dr Leena Wadia; Swami Vivekananda and the Science-Religion Dialogue by Dr Makarand R Paranjape; Development, Environment and Human Rights: Towards Sustainability and Equity by Dr Ashish Kothari; Science Diplomacy by Dr Bhaskar Balakrishnan; Psychiatry and Mental Health Policy and Society by Prof Naren Rao; an evening panel discussion on Science Society and Development: Prospects and Challenges for 2020 by Prof LM Patnaik, Dr H Paramesh and Prof Jahnvi Phalkey. The programme ended with a long feedback session and valedictory address by Prof T Ramasami.

A Bharatnatyam Recital by the students of Nataraja Nritya Shala was organised during the programme.

Coordinators: The programme was coordinated by Prof Sangeetha Menon and Dr MB Rajani. Ms JN Sandhya assisted in the coordination of the programme.

Feedback: The participants in general were very appreciative of the diversity of topics and quality of discussions, and particularly the ambience at NIAS.



NIAS-DST Training Programme for Women Scientists on Science and Sustainability in India

Theme: NIAS-DST Training Programme for Women Scientists on Science and Sustainability in India, supported by the Department of Science and Technology, institutions including R&D Laboratories on the theme Science and Sustainability in India was held from September 23 to 27, 2019. This programme was organised for women scientists and technologists in India. Such an acquaintance was created to help bring in debates and constructive dialogues among scientists, science administrators and technologists towards social progress.

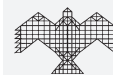
Inaugural Address: The programme was inaugurated by Dr Shailesh Nayak, Director, NIAS.

Speakers: A wide range of topics covered were on Science and Sustainability, Human Development and Sustainability, Sustainability and Food Security, Sustainable Materials Management, Sustainability and School Education, Sustainability and Skill Development, Innovations in Infrastructure Development: The Business of PPP's with a Focus on Sustainability, Managing water and wastewater for sustainability in a metropolis – Science, Technology and a city, Sustainable Living Choices, Local Action on Climate Change: Opportunities and Constraints, A Sustainable Model for Universal Health Coverage: How does India Measure Up?, Breaking Patterns Creating Change, Economics of Sustainability, New Approaches towards Resilience: Design Thinking, Research and Policy-Making. The Speakers included Dr Manu Mathai, Ms Radha Gopalan, Dr Medha Tadpatrikar, Mr G Anand, Prof SS Mantha, Dr M Pushpavathi, Prof G Raghuram, Mr Vishwanath Srikantaiah, Mr D Suresh, Dr Neha Sami, Dr Sreelata Rao Seshadri, Ms Radha Ramaswamy, Prof Narendar Pani, Ms Deepta Sateesh. The valedictory address was delivered by Ms Uma Reddy, Managing Director, M/s Hitech Magnetics and Electronics Private Limited, Bengaluru.

Public Lectures on Energy Security through Sustainable and Climate Friendly Nuclear Route by Dr Sekhar Basu; Speech and Hearing Sciences: Genesis, Growth and Sustainability in India by Dr M Pushpavathi and Puppet Show titled Bhaskaracharya's Leelavathi by Dhaatu Puppet Theater were part of the programme.

Coordinators: The programme was coordinated by Prof Sindhu Radhakrishna and Dr Shalini Dixit. Ms S Lalitha assisted in the coordination of the programme.

Feedback: The participants mentioned that attending the programme was a 'Home-away-from-Home' experience and that they felt very comfortable during the duration of the course. They felt that the programme was participatory and effective which enhanced their skills and provided them with a broader perspective of the current practices in sustainability science and technology. The programme enlightened everyone with respect to the idea of science for progress and sustainability in India.



NIAS-DST Training Programme on Science, Technology and Innovation Policy

Theme: NIAS-DST Training Programme on Science, Technology and Innovation Policy was held from August 19 to 30, 2019.

Inaugural Address: The inaugural address was delivered by Prof VS Ramamurthy, former Secretary to Government of India, Department of Science and Technology and former Director, NIAS.

Speakers: Other eminent speakers included, Dr VS Hegde, Prof V Bhujanga Rao, Prof Virendra M Tiwari, Dr Shailesh Nayak, Dr N Ramamoorthy, Dr PS Goel, Dr SS Meenakshisundaram, Dr S Ayyappan, Prof LM Patnaik, Dr Amitabh Sinha, Dr Shankar Venugopal, Mr Mohit Virmani and many others. Brainstorming/workout discussions were arranged during which the participants, divided into five groups, were asked to deliberate on the various lectures given on each day and to make recommendations, point out challenges and ideas for implementation of policies. The valedictory address was given by Mr Ajit Kumar Seth, former Cabinet Secretary, Government of India, New Delhi. A public lecture by Prof CNR Rao on “Intuition, Inspiration and Innovation in Science” was arranged as part of the training programme.

As part of the programme, an industrial visit to Master Control Facility (ISRO), Hassan and a visit to Centre for Nano Science and Engineering (CeNSE), Indian Institute of Science, Bengaluru was arranged. A Carnatic Classical Concert by Vocalist Vidwan HG Amruthavarshini and her team was also organised.

Coordinators: The programme was coordinated by Dr Nithin Nagaraj and Dr Amit Mukherjee. Mr KS Rama Krishna assisted in the coordination of the programme.

Feedback: Overall grading of the programme with reference to relevance of the course module/ course, content, benefits/usefulness of the training in the present job and satisfaction with structure and organisation of programme has scored 9.083 out of 10. The facilities provided by the host organisation towards accommodation, catering, classrooms, transport/infrastructure has scored 9.500 out of 10.



Programme on Space in India's Foreign Policy Technology – Policy – Security Considerations

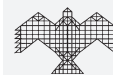
Theme: The second course on Space and Foreign Policy as a paid course at NIAS was organised during June 10 to 14, 2019. The course was well attended with 23 participants from the defence forces, DRDO, ISRO and security establishments.

Inaugural Address: The course was inaugurated by Air Marshal TD Joseph, Senior Air Staff Officer, HQ Training Command, Bengaluru

Speakers: Well-known domain specialists addressed the participants.

Coordinator: Prof Rajaram Nagappa

Feedback: The feedback received was very positive with participants voting for conduct of the course on an annual basis.



DOCTORAL PROGRAMME



The National Institute of Advanced Studies (NIAS) motivates exceptional students who are interested in pursuing interdisciplinary research in natural and engineering sciences, social sciences, humanities and the arts. NIAS PhD students have a unique opportunity to broaden their intellectual horizons beyond their narrow training during their thesis research. NIAS not only values such cross-pollination of ideas but encourages and provides the necessary support to its students to develop interdisciplinary orientation to problem-solving.

Mysore University, Manipal Academy of Higher Education (MAHE) and University of Trans-Disciplinary Health Sciences and Technology (TDU), Bengaluru have recognised NIAS as a research institute and award degrees to doctoral students. This year NIAS has entered into agreement with the Defense Institute of Advanced Technology (DIAT), Pune for joint supervision of doctoral students.

NIAS has received 370 applications across the schools, 14 candidates were selected for the year 2019 after multistage selection process.

The academic year started from August 1, 2019. NIAS faculty offered courses in a wide range of areas to the students and other Institutions. The mandatory courses are Foundation Course, Research Methodology, Research Writing Course and a Proposal Course has been designed to acquaint students for writing their proposals.

The thematic courses taught in the first semester (August-December 2019) were: Global Politics: Contemporary World Affairs; Bridging Science with Society; An Introduction to Conflict and Security Studies; Introduction to Social Conflict; Social Psychology; Introduction to Maritime security; Paradigms of Research and Research Process; Sociology of Education; Energy Modelling; Effective Research Writing Course; Power Generation Technologies; Human Environment Interactions; Contemporary Archaeology; Introduction to Strategic Studies; Carnatic Music Theory; Perspective in Social Sciences.

The courses offered in the second semester (January to April 2020) were: Global Politics: Contemporary World Affairs; Governance in Maritime and Space; Topics in Information Theory Chaos and Casual Learning; GIS for Spatial Data Visualization and Analysis; Knowing Experiencing and Being: Methods, Applications and Philosophies inspired by Phenomenology, Collective Intelligence, and Reflective Capabilities; Integrated Water Resources Management; Introduction to Philosophy of Social Science and Perspectives and Processes in Education.

NIAS Annual Students' colloquium was organised during December 2 and 3, 2019 in which students presented their work to the NIAS community. The annual colloquium is considered to be a part of the review process of the doctoral scholar.



The following students were awarded PhD degrees:

Sl No.	Date	Name	Supervisor	Title	University
1.	May 21, 2019	Sanket S Kulkarni	M Mayilvaganan	India's Energy Security Concerns and Decision Making: Case Studies of Cross-Border Natural Gas Pipelines	MAHE
2.	June 18, 2019	R Shankar	Sangeetha Menon	A Qualitative Approach to the Psychology of Three Self-conscious Emotions from Sanskrit Poetics	Mysore
3.	July 22, 2019	Shatarupa Bhattacharyya	Narendar Pani	Interaction between Development and Festival Durga, Kali and Bonbibi-Dakhinray in the Sundarbans	Mysore
4.	August 6, 2019	Naresh Keerthi	Rajesh Kasturirangan	The Cognitive Polysemy of Sensory Terms in Sanskrit	MAHE
5.	August 9, 2019	Nimisha Agarwal	Anindya Sinha	Rethinking Climate Change: Perception, Adaptation and Vulnerability among Rice and Wheat Farmers in Northern India	MAHE
6.	August 17, 2019	Samiksha Bajpai	Rajesh Kasturirangan	A Cognitive Analysis of the Compound Verb in Hindi	Mysore
7.	October 3, 2019	M Rashmi	Carol Upadhya	Mobile Phones and Changing Media Consumption Practices in Bangalore	MAHE
8.	October 4, 2019	Priyam Laxmi Borgohain	Dilip R Ahuja	Downstream Environmental and Socio-Economic Impacts of the Ranganadi Hydel Project in Northeast India	MAHE
9.	January 6, 2020	Nishant M Srinivasaiah	Anindya Sinha	Grabbing the Bull by the Tusks: Behavioural Ecology of the Male Asian Elephant in a Human-Dominated Landscape	MAHE
10.	January 10, 2020	Anamika Ajay	Narendar Pani	The Impact of Development Impact of Development on Social Conflicts-Case Studies of Intra-Family and Inter-Group Strife in Two Villages in Kerala	MAHE
11.	March 20, 2020	BR Guruprasad	M Mayilvaganan	Contribution of External and Indigenous Elements to India's Space Capabilities: An Appraisal	Mysore

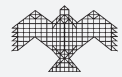


The following students are currently pursuing their doctoral studies:

Sl No.	Name	Guide	Date of Joining	Thesis Title	University Registered
1	Subroto Dey	Shivali Tukdeo	1 Aug'16	Dreams and Discontents: Understanding career and Life-path of High School Students in Mandla, Madhya Pradesh	MAHE
2	Neesha Dutt	Dilip R Ahuja	2 Aug'10	Urban Greens – Ecological Impacts and Socio-economic Drivers of Turfgrass Ecosystems	MAHE
3	Priya Gupta	Carol Upadhya	1 Aug'11	Interface of Exclusionary Conservation Policies and Rights of Communities: Case Study of a Protected Area	MAHE
4	Murali Murti	Arun Vishwanathan	1 Aug'11	Knowledge Process and Their Role in Innovation – A Comparison of Selected Chinese and Indian Practices	MAHE
5	Sumithra S	Sharada Srinivasan	1 Aug'12	Creative Collectives: A Case Study of Collaborative Practices in Karnataka	MAHE
6	Venkatesh KN	Sharada Srinivasan	1 Aug'13	Evaluation of Mysore Painting: Exploring the Role of Royal Patrons in the Emergence of Styles in the 18 th and 19 th Centuries	MAHE
7	Ankita Rathi	Narendar Pani	1 Aug'13	Transition from Village to Town: A Study of Two Settlements in Punjab	MAHE
8	Krupa Rajangam	Sharada Srinivasan	11 Aug'14	Study on Resident Communities and Conservation Practice: Case of Hampi World Heritage Site	MAHE
9	Savitha Suresh Babu	Shivali Tukdeo	11 Aug'14	Welfare Hostels in Higher Education: Understanding the Experiences of Dalit and Adivasi Women Students	MAHE
10	Keya Bardalai	Carol Upadhya	11 Aug'14	Northeast Women Migrants in Delhi: Aesthetic Labour in the New Consumer Economy	MAHE
11	Anupama Mahajan	Anitha Kurup	11 Aug'14	Contours of Lived Experiences of Children Identified as Gifted in India	MAHE
12	Sashi Kiran C	Kshitija A Joshi	3 Aug'15	Understanding and Modeling Residential Electricity Demand in India	MAHE
13	Meera Sudhakar	Narendar Pani	3 Aug'15	Development Policy as a Social Process- A Case Study of Niranthara Jyothi Programme in Karnataka	MAHE
14	Sreedhar Vijayakrishnan	Anindya Sinha	3 Aug'15	Seeing the Elephant: Socioecology and Physiology of the Female Asian Elephant Maximus in an Anthropogenic Landscape in Southern India	MAHE
15	Vijay CS	Kshitija A Joshi	3 Aug'15	Electricity System Modeling for Large Scale Renewable Integration in India	MAHE
16	Aditi Kathpalia	Nithin Nagaraj	1 Aug'16	Theoretical and Experimental Investigations into Causality, Its Measures and Applications	MAHE
17	Ekta Gupta	MB Rajani	1 Aug'16	Advancing Archaeological and Geomorphological Understanding of the Indian Coast Using Old Cartographic and Visual Records	MAHE



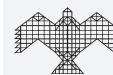
Sl No.	Name	Guide	Date of Joining	Thesis Title	University Registered
18	Kuili Suganya	MB Rajani	1 Aug'16	Geospatial Analysis of Ancient Water Features in the Archaeological Landscape of Malaprabha River Valley	MAHE
19	Vijayashree CS	Carol Upadhya	1 Aug'16	Production, Circulation and Consumption of Bhuta Masks and Sculptures: An Ethnographic Study	MAHE
20	Sherin Jose	M Mayilvaganan	1 Aug'16	Spatialising Nation-State through the Discourses of Development and Security at the Borderland: A Case Study of Tawang	MAHE
21	Varun S Bhatta	Sundar Sarukkai	14 Sept' 16	Philosophical Analysis of Matter in Contemporary Physics	MAHE
22	Sarvajeet K Sinha	R Srikanth	1 Aug'17	Consolidation of Laws Related to Environment Protection in Surface Coal Mining in India – Prospects and Challenges	MAHE
23	S Vignesh	Sindhu Radhakrishna	1 Aug'17	Interactions of Consent: Human – Bovine Relations in Tamil Nadu	MAHE
24	Cheshta Arora	Anitha Kurup	1 Aug'17	Scientific, Technological, and Gendered relations: An Ethnographic Study of Women Scientists, Engineers and Factory Workers	MAHE
25	Lavanyaa VP	Srikanth R	1 Aug'18	Ambient Air Quality and Public Health – A Study in Bengaluru	MAHE
26	Soumyadeep Das	Srikanth R	1 Aug'18	Universal Access to Affordable, Reliable and Modern Energy Services – A Case Study	MAHE
27	S Siddharth	Sangeetha Menon	3 Aug'15	A Study on the Metaphysics of Conscious Experience	Mysore
28	Shyam Hari P	Anshuman Behera	3 Aug'15	Understanding Political Conflict and Alliance Formation: A Case Study of Two Assembly Elections in Kerala (2006 and 2011)	TDU
29	Surya Sankar Sen	Anshuman Behera	1 Aug'16	Implications of Local Conflicts on Bilateral Relations: Cases of Land Boundary and Enclave Conflicts on India-Bangladesh Relations	TDU
30	Snehashish Mitra	Carol Upadhya	1 Aug'17	Contestations over Urban Land and Environment: Negotiating Citizenship in the Hills of Guwahati	TDU
31	Nitesh S Anchan	Anindya Sinha	1 Aug'17	Other Minds: Philosophical and Empirical Approaches in the Conceptualisation of the Nonhuman Mind	TDU
32	Ashni K Dhawale	Anindya Sinha	1 Aug'17	Monkey on a Hot Tin Roof Ecological and Behavioural Adaptations of Lion-Tailed Macaques to a Rainforest–Anthropogenic Habitat Matrix in the Western Ghats Mountains of Southern India	TDU



Sl No.	Name	Guide	Date of Joining	Thesis Title	University Registered
33	Chandana R Bindu	Narendar Pani	1 Aug'17	Patterns of Response to Inequality in Relation to the Development Process: A Study of Two Villages in Gujarat and Kerala	TDU
34	Shilajit Sengupta	Narendar Pani	1 Aug'17	Political Consequences of Intra-village Inequalities in Rural Transformation: A Study of Two Villages in West Bengal	TDU
35	Ajit Kumar Babu	Narendar Pani	1 Aug'17	Inequalities in the Process of Former Agriculturists Learning Non-agricultural Skills	TDU
36	Aparupa Bhattacharjee	D Suba Chandran	1 Aug'18	Role of Religion in Contemporary Nation-building: A Case Study of Sri Lanka, Myanmar, and Thailand	TDU
37	Sreshtha Mondal	VV Binoy	1 Aug'18	Determinants of the Protective Action Decision Making During Floods: A Study of the Kerala Deluge 2018	MAHE
38	Zarnain Manzoor	Anshuman Behera	1 Aug'18	Discourses around the Kashmiri Pandits: Engaging with 'Fractured Identity' and the 'Politics of Deadlock'	TDU
39	Shaima Amatullah	Shalini Dixit	1 Aug'18	Perceptions of Social Discourses and Identity Negotiations: A Psychological Study of Muslim Community in India	TDU
40	Hrudaya Chandana K	Anshuman Behera	1 Aug'18	Discursive Formulations of Violence in Ethnic Conflict: Generation and Transmission of Values	MAHE
41	Meera Kumar	Sangeetha Menon	1 Aug'18	The Secret of the Word and the Theatrics of Faith Healing: Tracing the Language-Consciousness Nexus Through Mantravada Traditions in Kerala	MAHE
42	Niharika Sharma	Sangeetha Menon	1 Aug'18	Par samvit and Pratyabhijñā : An Onto-Epistemic Enquiry in Kashmir Shaivism	TDU
43	Shruti Ragavan	Anindya Sinha	1 Aug'18	Of Cash Cows and Piggy Banks? Natures, Cultures and Politics of the Cultivated Animal in Urban India	TDU
44	Anmol Chowdhury	Anindya Sinha	1 Aug'18	Rethinking the Urban 'Wild' Animal: Ethnologies and Ethnographies of Nonhuman Primates in Indian Cities	TDU
45	Sneha Gutgutia	Anindya Sinha	1 Aug'18	Life at the Urban Margins: Human-animal Relations and Precarity in Indian Cities	TDU
46	Shubhangi Srivastava	Anindya Sinha	1 Aug'18	A Tail of Two Cities: Ecological, Socioeconomic and Political Dynamics of Human-Dog Relations in Urban India	MAHE
47	Sayan Banerjee	Anindya Sinha	1 Aug'19	Encountering More-Than-Human Lifeworlds: Behavioural and Political Ecologies of Human-Elephant Relations in Northeast India	Yet to register



Sl No.	Name	Guide	Date of Joining	Thesis Title	University Registered
48	Preeth Khona	MB Rajani	1 Aug'19	Early Fusion Music: Cross-Cultural Musical Exchanges in Colonial India from the Late 18 th to the Early 20 th Century	Yet to Register
49	Anna George	Smriti Hariharan	1 Aug'19	Reverberations of Cilapatikaram and the Worship of Kannaki in Caste, Gender and Regional Identities of Kerala and Tamil Nadu	Yet to Register
50	Megha Poonia	Shalini Dixit	1 Aug'19	Collective Memory and Social Identity: A Study of Denotified Tribes in Rajasthan	Yet to Register
51	Sabna ES	Anitha Kurup	1 Aug'19	Understanding Practices Related to Menstrual Health among Women in Rajasthan	Yet to Register
52	Athira Balakrishnan	Sindhu Radhakrishna	1 Aug'19	From Wild to Vermin: A Study on the Human-Wild Pig Conflict in India	Yet to Register
53	Rakesh G Nannewar	Tejal Kanitkar	1 Aug'19	Assessment of Socio-Economic Impact of Agromet Services in Hyderabad-Karnataka Region	Yet to Register
54	Tanmay Ghosh	R Srikanth	1 Aug'19	Assessing Public Transit Integration with Special Focus on First and Last Mile Connectivity	Yet to Register
55	Sudip Kumar Kundu	Harini Santhanam	1 Aug'19	Assessment of the Socio-economic Impacts of Potential Fishing Zone (PFZ) and Ocean State Forecast (OSF) advisories for Odisha State, India	Yet to Register
56	Aariz Ahmad	R Srikanth	1 Aug'19	Interlinking of Rivers: Case Study of the Almatti-Pennar Link	Yet to Register
57	Rashmi BR	D Suba Chandran	1 Aug'19	Arctic Governance: The Role of Institutions with Special Reference to the Arctic Council, Saami Council and Arctic Circle	Yet to Register
58	Harini Madhusudan	D Suba Chandran	1 Aug'19	Militarisation in Outer Space: A Case Study of India, Japan, and France	Yet to Register
59	Shruti Shankar	Shivali Tukdeo	1 Aug' 19	NA	Yet to Register



ANNUAL MEMORIAL LECTURES

Six annual memorial lectures were organised as follows:

Nineteenth MN Srinivas Memorial Lecture



Prof Sanjay Srivastava

Professor of Sociology, Institute of Economic
Growth, Delhi

*Urban Theo-topias: Religious Claims to Space and
the Language of Administrative Rationality in New
Gurgaon*

January 17, 2020

Fifth CV Sundaram Memorial Lecture



Dr Frederick Asher

Professor Emeritus of Art History, University of
Minnesota

*India Abroad: Material Evidence for Premodern
Indian Ocean Trade in Malaysia and Thailand*

November 15, 2019

Fifteenth Raja Ramanna Memorial Lecture



Prof Roddam Narasimha

Honorary Professor, Jawaharlal Nehru Centre for
Advanced Scientific Research, Bengaluru and
Former Director, IAS

Algorithms or Axioms? A View of Indic Mathematics

January 8, 2020



Fourth Lakshmi Nizamuddin Memorial Lecture



Prof M Pushpavathi

Director, All India Institute of Speech and Hearing,
Mysuru

*Speech and Hearing Sciences: Genesis, Growth and
Sustainability in India*

September 24, 2019

K Subrahmanyam Memorial Lecture



Prof C Raja Mohan

Director, Institute of South Asian Studies, National
University of Singapore

*Farewell to South Asia – Rethinking India's
Neighbourhood*

August 13, 2019

The Seventh RL Kapur Oration



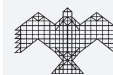
Mr Chiranjiv Singh

Former Ambassador of India to UNESCO in Paris

The Quest of Dr Kapur

June 24, 2019

Dr MB Rajani is the Coordinator of Annual Memorial Lectures.



PUBLIC PROGRAMMES

Prof Anitha Kurup, Dr MB Rajani and Dr Harini Santhanam, NIAS

Panel Discussion on Gender, Science and Engineering in India: Complexities and Anomalies

February 28, 2020

Dr Kanti Kumar Anant Pawar

Department of Archaeology, Deccan College Postgraduate and Research Institute, Pune

Iron Technology in Central Indian Megalithic Tradition: Problems and Perspectives

February 25, 2020

Prof G Mohan Gopal

Member, National Judicial Academic Council of the Supreme Court, Chaired by the

Hon'ble Chief Justice of India

Science and Justice

February 11, 2020

Dr Kaveri Ishwar Haritas

Associate Professor, OP Jindal Global University

Working Futures: The ILO, Automation and Digital Work in India

January 13, 2020

Prof Tilak Agerwala, IBM Emeritus, Former Vice President, IBM, New York

Dr SR Sudarshan Iyengar, IIT Ropar

Prof Anjula Gurtoo, Indian Institute of Science, Bengaluru

Panel Discussion on AI and the Promise for India

January 9, 2020

Dr Anand Pandian

Professor, Johns Hopkins University, USA

Walled In: An Anthropological Look at the Politics of Exclusion in Contemporary America

January 8, 2020

Dr Neha Dhavale

Post-Doctoral Associate, Department of Archaeology, Deccan College Postgraduate and Research Institute, Pune

Looking at the Young Ones: Bioarchaeological Investigation of Children and Childhood in the Past

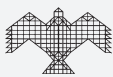
December 20, 2019

Vidwan Sri Chittoor K Patanjali and Master Chittoor P Viswanathan

Carnatic Classical Flute Concert

December 19, 2019





Dr Madhu Chandran

Managing Director, Mandya Organic Foods Private Limited
S&T and Going Organic
December 13, 2019

Dr Pradeep Kumar Srivastava

Former Deputy Director and Senior Principal Scientist, Medicinal and Process Chemistry Division, Central Drug Research Institute, Lucknow
Sciencetools and Sciencetoonics
December 10, 2019

Dr Tilak Agerwala

Dr S Radhakrishnan Chair Visiting Professor, NIAS and IBM Emeritus
Ethical Design: An Artificial Intelligence Imperative
(Svasthya-rasa-bodhini CSP Public Lecture Series)
November 29, 2019

Prof Tilak Agerwala, Dr Sudarshan Iyengar, Dr Saurabh Todariya, Dr NC Narayanan and Prof Sangeetha Menon

Panel Discussion on The "Fragile" Human Experience and the "Strong" Artificial Intelligence: Limits, Possibilities, and Challenges
November 20, 2019

Dr Raghu Pillai

Wastewater Treatment Expert, REWS India Limited, Bengaluru
A Novel Industrial Wastewater Treatment Technology-Fine Particle Shortwave Thrombotic Agglomeration Reactor (FPSTAR) Boomtube Resonator
November 14, 2019

Ms Smrithi Harits, Ms Raksha MG, Ms Abhilasha Rajasekaran, Mr Pragalb RS, Ms Namratha Hosurkar, Ms Sirisha MS, Ms Smrithi Vinod Saladi, Ms Nidhi Rao Govardhan and Ms Srinidhi Vinod Saladi

Bharatanatyam Group Recital
October 24, 2019

Prof LM Patnaik, Dr Jahnavi Phalkey and Prof H Paramesh

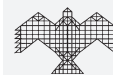
Panel Discussion on Science Society and Development: Prospects and Challenges for 2020
October 23, 2019

Dr Patrick Inglis

Assistant Professor of Sociology, Grinnell College
Book Talk on Narrow Fairways: Getting by and Falling Behind in the New India
(Changing India Series Supported by the Pratiksha Trust)
October 21, 2019

Dr V Siddhartha, Adjunct Faculty, NIAS

Prof Roddam Narasimha, Emeritus Professor and Former Director, NIAS
Mr Balan Nambiar, Practising Artist
The NIAS Logo and the Sulva-Sutra
October 11, 2019



Dr Sekhar Basu

Former Chairman, Atomic Energy Commission and Secretary to the Government of India, Department of Atomic Energy
Energy Security through Sustainable and Climate Friendly Nuclear Route
September 23, 2019

Dr Soumyabrata Choudhury

School of Arts and Aesthetics, JNU
Between Dionysus and Plato: Is there aesthetic thinking in ancient Greece?
(Svasthya-rasa-bodhini CSP Public Lecture Series)
September 18, 2019

Dr La Toya Waha

Senior Programme Manager, Political Dialogue Asia Regional Programme, Konrad-Adenauer-Stiftung, Singapore.
Book Discussion: Religion and State Formation in Sri Lanka
August 30, 2019

Prof CNR Rao

Linus Pauling Research Professor and Honorary President, Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru
Intuition, Inspiration and Innovation in Science
August 26, 2019

Prof SS Meenakshisundaram, Former Principal Secretary to the Chief Minister of Karnataka

Prof PS Jayaramu, Former Head, Department of Political Science, Bangalore University

Mr Gopal Hosur, Former Inspector General of Police, Intelligence, Karnataka
Book Discussion on Corridors of Intelligence: Revealing Politics authored by Dr DV Guruprasad, Former Director General of Police, Karnataka.
August 22, 2019

Dr MB Rajani, Dr Sumedha Bajar, Dr Kshitija Joshi, Dr Shalini Dixit and Prof Anindya Sinha, NIAS

Interactive Panel Discussion on Understanding Skewed Sex Ratio in India
August 19, 2019

Prof Narendar Pani

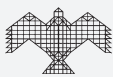
Dean, School of Social Sciences, NIAS
One Nation, Many Worlds – The Divisive Politics of Globalization
August 16, 2019

Dr Manickam and Dr Arul

Mirakle Wellness Foundation
Healing is Best When Done in Tune with Nature
(Inner Peace Lecture Series in Association with Foundation for Good Governance)
August 9, 2019

Prof Sachchidanand Mishra

Professor, Banaras Hindu University
God in Twenty-first Century
(Svasthya-rasa-bodhini CSP Public Lecture Series)
July 25, 2019



Dr Shashank S Sinha

Publishing Director, Routledge

The Idea of a 'Witch' in Central India

(Svasthya-rasa-bodhini CSP Public Lecture Series)

July 23, 2019

Dr K Kasturirangan

Chairman, Inter-University Centre for Astronomy and Astrophysics, Pune
and

Formerly Chairman, ISRO

Draft National Education Policy: Some Perspectives

July 19, 2019

Dr Jhuma Sen

Assistant Professor, Jindal Global Law School

*Narrative as Justice: Imagining Feminist Justice from #MeToo to Feminist
Judgments Projects*

(Changing India Series Supported by the Pratiksha Trust)

July 12, 2019

Dr Sanjeev Jain

Professor of Psychiatry, National Institute of Mental Health and
Neurosciences, Bengaluru

Psychological Impact of the Partition of India

July 11, 2019

Dr C Rajendran

Former Professor and Head, Department of Sanskrit, Dean, Faculty of
Languages,

University of Calicut

*From the Sensuous to the Super-Sensuous: An Outline of Abhinavagupta's
Aesthetics*

(Svasthya-rasa-bodhini CSP Public Lecture Series)

June 27, 2019

Dr Urvakhsh Meherwan Mehta

Associate Professor of Psychiatry, NIMHANS, Bengaluru

*Knowing Others through Knowing Oneself – The Relevance of Mirror Neurons
to Mental Health*

(Svasthya-rasa-bodhini CSP Public Lecture Series)

May 28, 2019

Mr C Narayanaswamy, Former Member of Parliament

Mr K Jairaj, Former Additional Chief Secretary, Government of Karnataka

Dr Anshuman Behera, Assistant Professor, NIAS

Prof Narendar Pani, Dean, School of Social Sciences, NIAS

Panel Discussion on After the Count: What Do the Election Results Portend?

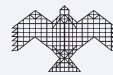
May 24, 2019

Prof V Bhujanga Rao

ISRO Chair Professor, NIAS

*Talk to Your Babies a Lot: From Science to Policy (Brain Development in
Infants and Toddlers through Sound and Music)*

May 13, 2019



Prof Malavika Kapur, Visiting Professor, NIAS

Dr NC Induchoodan, Shiksha Sanskriti Utthan Nyas, Kochi

Discussion on Ancient Indian Knowledge System: Holistic Development of Children

May 8, 2019

Mr TM Krishna, Acclaimed Carnatic Musician

The Jogappas, From the Borders of Karnataka, Maharashtra and Telangana

Transcending Genres – Musical Conversation

April 11, 2019

Mr JK Dobi, Mr JK Jagadeesh and Mr JC Annaiah

Dubare Elephant Camp, Kodagu District, Karnataka

The Song of the Mahout: Performances, Interactions, Lives

April 10, 2019

Prof P Rama Rao

ARCI, Hyderabad and Former President, IIM

First Dr Baldev Raj Memorial Lecture

(Organised by the Indian Institute of Metals, Kolkata; IIM-Human Resources Development Centre, Kalpakkam-Chennai and IIM Bangalore Chapter in Association with NIAS)

April 9, 2019

Prof Narendar Pani, NIAS

Dr Anshuman Behera, NIAS

Dr Anurag Tripathi, Christ University, Bengaluru

Public Discussion on The Great Indian Elections 2019

April 4, 2019





WEDNESDAY DISCUSSION MEETINGS

NIAS Wednesday Discussion Meetings is one of the outreach events that have continued since the inception of the Institute. The faculty of the Institute meets every Wednesday for academic discussions after a lecture delivered by a member of the faculty. These Wednesday meetings also serve as a forum for invited guest speakers to deliver lectures on subjects of their choice.

Dr Shivali Tukdeo

Associate Professor, Education Programme, NIAS

Caring for Other People's Children: Teaching in Ashram Schools of Maharashtra

February 26, 2020

Dr Tuleshwori Sapam

Post-Doctoral Associate, School of Natural Sciences and Engineering, NIAS

Chikungunya Fever and a Possible Intervention for Its Treatment

February 19, 2020

Prof Sudha Mahalingam

Dr Raja Ramanna Chair Professor, NIAS

All That Glitters in The Travel Spiel

February 5, 2020

Dr Smriti Haricharan

Assistant Professor, Heritage Science and Society Program, NIAS

Reflecting on Keeladi and Archaeology in India

January 29, 2020

Prof Dinesh Kumar Srivastava

Homi Bhabha Chair Professor, Energy and Environment Programme, NIAS

Has Technology Destroyed Our Sanskars

January 22, 2020

Prof Sisir Roy

Senior Homi Bhabha Fellow and Honorary Visiting Professor, NIAS

Ontology of Time: D gen to Einstein

December 4, 2019

Dr Harini Santhanam

Assistant Professor, Energy and Environment Programme, NIAS

Thirst to Thrust-Leveraging Science, Technology, Engineering and Management (STEM) to Solve New-Age Water-Centric Issues

November 27, 2019

Prof Malavika Kapur

Visiting Professor, NIAS

Perilous Development of Indian Preschool Children: Let Children Play!

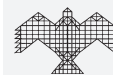
November 13, 2019

Ms Tanusree Chaudhuri

Senior Research Fellow, School of Natural Sciences and Engineering, NIAS

Understanding Epilepsy through Genomics and Molecular Modelling

November 6, 2019



Dr Sudharsana V Iyengar

Post-doctoral Research Associate, NIAS

'Q-Deformation' and Its Applications to Real World Situations

October 30, 2019

Mr Narayanan Raghunathan

Author and Founder and Director, Wonder Haiku Worlds

Seamless Infinite Infinitudes of Infinite Cosmoses

October 16, 2019

Prof M Sai Baba

TV Raman Pai Chair Professor, NIAS

Science, Technology, Society and Communication: The Challenge

October 9, 2019

Dr S Udayakumar

Post-Doctoral Associate, Heritage, Science and Society Programme, NIAS

To Trace, Observe and Understand the Ancient Metal Technology in India

September 11, 2019

Dr Tejal Kanitkar

Associate Professor, Energy Environment Program, NIAS

The Paris Agreement and Beyond: Strategic and Operational Advantages of Declaring Long Term Climate Goals

September 4, 2019

Prof Sheela K Ramasesha

Principal Scientist, Energy and Environment Programme, NIAS

India Needs 24x7 Renewable Energy

August 14, 2019

Dr Shalini Dixit

Assistant Professor, School of Social Sciences, NIAS

Education for Sustainability: Ideas, Status and Challenges in India

August 7, 2019

Dr Eric Sheppard, Humboldt Chair and Professor of Geography, UCLA, USA

Dr Helga Leitner, Professor, Department of Geography, UCLA, USA

Dr Michael Goldman, Associate Professor of Sociology and Global Studies, University of Minnesota, USA

Dr Vinay Gidwani, Professor of Geography and Global Studies, University of Minnesota, USA

Dr Suryono Herlambang, UNTAR, Fakultas Teknik, Jakarta, Indonesia

Dr Liong Ju Tjung, UNTAR, Fakultas Teknik, Jakarta, Indonesia

Prof Carol Upadhy, Head, Urban and Mobility Studies Programme, NIAS

Speculative Urbanism in Bangalore and Jakarta

July 31, 2019

Ms Aparupa Bhattacherjee

PhD Scholar, NIAS

The Easter Attacks: Understanding Sri Lanka's Return to Violence

July 17, 2019

Prof Jahnavi Phalkey

Founding Director, Science Gallery, Bengaluru

Exploring Twentieth Century History of Science and Technology in India

July 3, 2019

**Dr Amit Mukherjee**

Assistant Professor, International Strategic and Security Studies Programme, NIAS

Assessment of Chinese Hypersonic Capabilities – An Interpretive Analysis

June 26, 2019

Mr Wasif Al-Hwari

Lecturer, Department of Conservation at Yarmouk University, Jordan

Threats and Challenges Facing Cultural Mosaic in JORDAN

June 19, 2019

Ms Kuili Suganya

PhD Scholar, NIAS

Ravines and Riverfront Gardens: The Mughal Settlement of Agra and Subsequent Spatial Transformations

June 12, 2019

Dr Anshuman Behera

Assistant Professor, Conflict Resolution Programme, NIAS

Converting Social to Security: The State and the Maoists in Tribal-Dalit Conflict in Koraput

May 29, 2019

Dr VV Binoy

Assistant Professor, School of Natural Sciences and Engineering, NIAS

Too Many Bacteria to Remember! – Can We Make Ecology Education Exciting?

May 22, 2019

Dr Deepa VK

Postdoctoral Associate, Consciousness Studies Programme, NIAS

Tribal Medicinal Knowledge in Kerala- Practices and Challenges

May 15, 2019

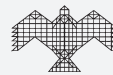
Dr Shailesh Nayak

Director, NIAS

Transformation Towards Sustainability

April 3, 2019

Prof Anindya Sinha is the Coordinator of the Wednesday Discussion Meetings.



ASSOCIATES' PROGRAMME

NIAS shares its experiences, both intellectual and cultural, with a select group of distinguished persons. As Associates, they enjoy certain privileges, including access to the NIAS library, invitations to all major events and opportunities to dine with the NIAS faculty and distinguished visitors. As of now we have 125 distinguished personalities as our associates. NIAS organises regular associates' meetings, which include lectures, plays, and performing arts events.



Vidwan Bengaluru R Manjunath and Associates

Saxophone Recital

February 13, 2020



Nrityagram

Bengaluru

Odissi Dance Performance

January 10, 2020



Vidwan Dr HG Amrutha Varshini

Carnatic Classical Vocal Concert

August 29, 2019



LITERARY, ARTS AND HERITAGE FORUM

The Literary, Arts and Heritage Forum aims to be an innovative platform for occasional lectures on diverse topics of cultural interest and of interest to science and culture, science and society, including literature, the arts and aspects of heritage. Major events and public lectures were held over the past year.

Dr Annu Palakunnathu Matthew

Professor of Art and Director, Centre for the Humanities, University of Rhode Island

Between Three Worlds

November 18, 2019

Mr Madhav Ajjampur

Writer and Poet

Shades of the Sun: English Translations of Bendre's Poetry

August 28, 2019

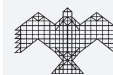
Dr Anjali Gera Roy

Professor, Indian Institute of Technology, Kharagpur

Memories of Lost Homes – Shahr Ashob of Lahore, Lyallpur and Bhakkar

May 16, 2019

Prof Sharada Srinivasan and Prof Sangeetha Menon are the Coordinators of the NIAS Literary, Arts and Heritage Forum.



LIBRARY

The NIAS Library has continued to acquire the needed resources throughout the year and is committed to supporting faculty and students of all research programmes and disciplines. 430 books have been acquired and displayed during the year. Among them are the *Oxford Handbook of Public Heritage Theory and Practice* edited by Angela M Labrador and Neil Asher Silberman, *Women, Science, and Technology: A Reader in Feminist Science Studies* by Mary Wyer, et al. *Handbook of Psychophysiology* edited by John T Cacioppo et al. *The Handbook of Science and Technology Studies* edited by Ulrike Felt et al., *Handbook of Cultural Psychology* edited by Dov Cohen and Shinobu Kitayama. *Palgrave Handbook of Research in Historical Culture and Education* edited by Mario Carretero et al. In addition, the Library subscribes to 68 print journals.

Donations

Prof S Settar was generous in bequeathing his personal collection of books to NIAS Library. NIAS Library has been enriched greatly with this rare and special collection of a life time. NIAS will forever remain grateful to Prof Settar for this kind gesture. The collection was catalogued and displayed in the Library during the year.

Electronic Resources

The Library continues its subscription to the special collection of 1500 e-journals from Taylor and Francis publishers and 54 e-journals from other reputed publishers. Data resources include *Indiastat.com*, a portal for India's socio-economic data and *Economic and Political Weekly Research Foundation India Time Series Data* with 20 modules. Archival resources include *JSTOR* and *Economic and Political Weekly Archives*. These electronic resources can be accessed within the campus as well as remotely. The Library suspended its subscription to two e-journals namely – *Journal of Educational Research* and *Educational Philosophy and Theory* during the year.

Plagiarism Software

The support service for plagiarism detection in papers, theses and proposals is being provided by the Library using Turnitin software. All faculty and students have also been provided with Turnitin user accounts. A webinar was conducted for users to familiarise them with the work flow of Turnitin.

Facilities

The Library provides a conducive environment for reading and learning. The Library website provides online access to licensed content and Library catalogue. Users are provided with facilities for browsing and desktop applications. There has been a continuous flow of readers and researchers throughout the year.

Website Activities

The Library provided active support in website related activities in addition to keeping the webpages updated on a daily basis.

Institutional Repository

National Digital Library of India (NDLI) has harvested records from NIAS Institutional Repository during the year and made them visible from NDLI website also.

Publication Activities

The NIAS Coffee Table titled *Transformation through Research, Dialogues and Policies* was successfully completed and brought out during the year. The book captures the history and activities of NIAS over the last three decades of its existence.



PROFESSORS EMERITUS



Prof Roddam Narasimha

Prof Roddam Narasimha was the Director of the National Institute of Advanced Studies during 1997-2004. He is currently the DST Year-of-Science Chair Professor at Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru, and concurrently holds the Pratt and Whitney Chair in Science and Engineering at the University of Hyderabad.



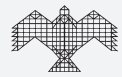
Dr K Kasturirangan

Dr K Kasturirangan was the Director of the National Institute of Advanced Studies during 2004-2009. He is presently Chairman, Inter-University Centre for Astronomy and Astrophysics (IUCAA), Chancellor, Central University of Rajasthan, Chairman, Public Affairs Centre, Bengaluru, Chairman, Karnataka Knowledge Commission and Member, Atomic Energy Commission.



Prof VS Ramamurthy

Prof VS Ramamurthy was the Director of the National Institute of Advanced Studies during 2009–2014. His current research interests span the areas of managing public perceptions of public good and public risks associated with emerging technologies, identification and mentoring of children with unusual learning capabilities and science and technology communication.



CHAIR PROFESSORS

SCHOOL OF CONFLICT AND SECURITY STUDIES



V Bhujanga Rao
ISRO Chair Visiting
Professor

Room No. F 22
Teel: 080-22185074
Fax: 080-22185028
Email: vbhujangarao@
nias.res.in

Joined NIAS on: April 20, 2016

Research Areas: Medical Implants/Devices; Grassroots Innovation; Defence Manufacturing Technologies; Science, Technology and Innovation.

Research Contributions

As Chief Designer of Indigenous Cochlear Implant Programme of DRDO, undertaken multi centric human clinical trials at 4 reputed hospitals and doctor's evaluation is under process.

As PI, work is under progress on Development of Secure Ultrasound Scanner for Foetus Evaluation without Gender Determination. This is a joint EPSRC, UK sponsored project with Cranfield University, Indian Institute of Science and St John's Hospital.

Studies are carried out to develop a vision prosthesis (bionic eye) which will be put as project to INAE – DST as emerging technology.

Design of Protectors – Face Shield and Face Mask (integrated) – for COVID-19 Prevention submitted to PSA and DST offices as part of call received from Government of India. PSA office conveyed through a letter that they are considering design details for densely populated areas.

Improved the design of a paddy planter from TRL 5 to TRL 9 of a grassroots inventor for commercialisation purpose with the support of IISc faculty. NIF is also involved throughout the work.

Conducted an Executive Training Programme on Leadership in Defence Manufacturing Technologies for Director grade scientists numbering 24 from DRDO, ADA, OFB – all from Ministry of Defence at NIAS – one week and at Cranfield University, UK – three weeks. NIAS took complete responsibility to conduct this programme with DRDO sanctioning Rs.2.8 Crores funds. A strategising report was submitted to DRDO at the end of the programme. It received so much appreciated that DRDO has asked NIAS to conduct for one more batch of Scientists in the year 2020.



Outreach

Was Chairman for INAE's Frugal Innovation Nurturing Programme and sanctioned Rs.23 lakhs to convert nearly 20 grassroots innovations to marketable products using the assistance of local engineering college faculty.

As Founder President, Condition Monitoring Society of India organised a two-day National Conference (NCCM 2019) at KL University, Vijayawada during August 2019.

Edited a quarterly newsletter, SPACE for the benefit of researchers and technologists in 2019 (four issues).

Edited quarterly newsletter MONITOR for Condition Monitoring Society of India in 2019 (two issues).

Lectures

Talk to Your Babies a Lot: From Science to Policy (Brain Development in Infants and Toddlers through Sound and Music), Public Lecture at NIAS, May 13, 2019.

Delivered more than 10 lectures in DRDO Labs, Engineering Colleges, Indian Institute of Science, etc.

Memberships

Fellow, Indian National Academy of Engineering.

Fellow, Andhra Pradesh Academy of Science.

Fellow, Condition Monitoring Society of India.

Fellow, Indian Institution of Plant Engineers.

Fellow, Acoustical Society of India.

Member, Governing Council, Indian National Academy of Engineering (2018 onwards).

Chairman, National Committee on Mechanical Engineering (2015 onwards).

Chairman, Innovation Promotion Committee (INAE) (2018 onwards).

Chairman, Research Advisory Committee, National Innovation Foundation, Ahmedabad (2018 onwards).

Founder and Current President, Condition Monitoring Society of India (2003 onwards).

Member, R&D Board, Ministry of Earth Sciences, Government of India (2016 onwards).

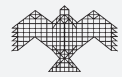
Member, Project Review Committee, National Institute of Ocean Technology, Government of India (2017 onwards).

Member, Scientific Advisory Committee, TDU, Bengaluru (2018 onwards).

National Council Member, Project Management Associates – International Project Management Association, New Delhi (2017 onwards).

Honorary Professor, Department of Mechanical Engineering, Andhra University.

Alumnus, Harvard Kennedy School, Harvard University, USA.



S Chandrashekar
JRD Tata Visiting
Professor
School of Conflict and
Security Studies

Room No. F 08
Tele: 080-22185084
Fax: 080-22185028
Email: schandra@nias.
res.in

Joined NIAS on: July 2, 2004

Research Areas: Space, Business Corporate and National Strategies, Strategic Studies, Missiles, Nuclear Weapons, War and Deterrence, Technology and Development, Technological Competitiveness, Game Theory and Applications, Social Networks and Applications, Technology and Business, Innovation, Competitive Benchmarking, Crisis Management in Complex Systems.

Lectures

Purpose: The Forgotten Pillar of Strategy, Strategy Conclave 2020 organised by the Narsee Mongee Institute of Management Studies, Bengaluru, February 8, 2020.

China's Internal and External Vulnerabilities, Chennai Centre for China Studies (C3S), Chennai, January 23, 2020.

China Aero-engine Developments – Trends and Directions, Conference on Sino-India Cooperation on Science and Technology organised by the Chennai Centre for China Studies (C3S), Chennai, December 21, 2019.

Capacity Building for Space Activities – The Indian Case, Workshop on Space Warfare and Technology, Integrated Defence Services College, New Delhi, May 2, 2019.

Sino-US Competition and the Space Domain, 5th Kalpana Chawla Observer Research Foundation, Space Policy Dialogue, New Delhi, April 30, 2019.

Membership

Member of a high-level Indian delegation on Japan India Strategic Dialogue held in Tokyo on May 15 and 16, 2019. Made a 20-minute presentation on Japan India Space Cooperation. The presentation emphasised why the rise of China and its competition with the US made it imperative for Japan and India to work together in space.



SCHOOL OF HUMANITIES



Jahnvi Phalkey
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Mukherjee Chair
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Joined NIAS on: October 15, 2019

Research Areas: History of Science and Technology; Science and the State; Public Engagement with Science.

Lectures

A Political History of Technology in India, Panel Discussion, Carnegie India, New Delhi, February 27, 2020.

Gender and the Practice of Science, NIAS-DST Training Programme for Women Scientists on Social Responsibility of Scientists: Pathways and Outcomes, February 12, 2020.

Big Science in Twentieth-Century India, Institutional Legacies in India's Thought and Practice, 1919- 2019, Ashoka University, February 1, 2020.

Women in STEM: Influence of a Changing World and Scientific Communications, Panel Discussion, International Summit on Women in STEM-2020, Department of Biotechnology, Ministry of Science and Technology Government of India, January 24, 2020.

Science and the Public at Science Gallery Bengaluru, Panel Discussion, Moving Crops Research Group International Meeting, Indian Institute of Technology Madras, December 10, 2019.

Science Society and Development: Prospects and Challenges for 2020, Panel Discussion, NIAS-DST Training Programme on Policy for Science and Science for Policies, October 23, 2019.

Memberships/Appointments

Member, Steering Committee, Bangalore Sustainability Forum, an inter-institutional collaborative initiative (National Centre for Biological Sciences and WIPRO Foundation).

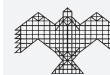
Member, Core Committee, Bangalore Science Habba (a city-wide science festival in planning).

Invitee, Metro Neighbourhood Initiative, Bengaluru Metro Rail Corporation Limited.

Founding Director, Science Gallery, Bengaluru.

Senior Associate, International Centre for Theoretical Sciences.

Visiting Senior Lecturer, King's College London.



Consciousness Studies Programme



Tilak Agerwala
S Radhakrishnan Chair
Visiting Professor
(November 11 to
December 10, 2019)

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Research Areas: Interdisciplinary research in Cyber (-Physical) Systems, Artificial Intelligence, Cognitive Sciences, Psychology and Ethics. The goal is to identify the opportunities that emerging technologies offer (to improve social conditions, to accelerate science and engineering discovery, and to improve efficiencies) and to understand the social and ethical implications of widespread adoption.

Research Contributions

“Inclusive Leadership: A Technology Perspective,” in “Inclusive Leadership: Perspectives from Tradition and Modernity, 1st Edition, Editors: Swami Bodhananda, Tilak Agerwala, Sangeetha Menon, Routledge India, 2019.

Lectures

The Promise of Artificial Intelligence: Current State of the Art and Way Forward for India, Public Panel (Other Panelists: Dr SR Sudarshan Iyengar and Prof Anjula Gurtoo), Chaired by Prof Sangeetha Menon, 34th NIAS Programme for Senior Executives, January 9, 2020. <https://youtu.be/W24VEldDTtg>

Cyber(-Physical) Systems and Machine Learning: Systems Research Challenges, Computer Science and Automation Lab, Indian Institute of Science, December 6th, 2019.

Career Development, NIAS, December 4, 2019.

Ethical Design: An Artificial Intelligence Imperative, Svasthya Rasa Bodhini Public Lecture, NIAS, November 29, 2019. <https://youtu.be/Wm-CHGVmw8o>

The ‘Fragile’ Human Experience and the ‘Strong’ Artificial Intelligence, Public Panel (Other Panelists: Dr Sudarshan Iyengar, Dr Saurabh Todariya, Dr NC Narayanan and Prof Sangeetha Menon), NIAS, November 20, 2019. <https://youtu.be/DIGVZsW9gy4>

Emerging Technologies: Impact and Opportunities, Part 3: Collective Intelligence, NIAS, November 15, 2019. <https://youtu.be/UxdfPXIytPY>

Emerging Technologies: Impact and Opportunities, Part 2: The Internet of Things (IoT), NIAS, November 14, 2019. https://youtu.be/1_VG0cmhxaM

Emerging Technologies: Impact and Opportunities, Part 1: AI and Related Technologies, NIAS, November 13, 2019. https://youtu.be/4_nfUE2yJpI

Memberships

Executive-in- Residence and Advisory Committee Member, Grove School of Engineering, City College of New York, USA.

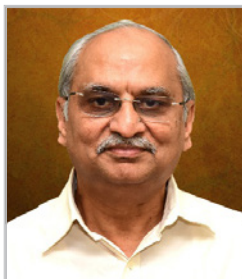
Member of three Advisory Committees of the National Science Foundation, USA: Division of Engineering, Office of Advanced Scientific Computing, and Business Operations.

Chair of the NSF OAC Working Group on Cyberinfrastructure Research and Innovation.



SCHOOL OF NATURAL SCIENCES AND ENGINEERING

Science Communication Programme



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TV Raman Pai Chair
Visiting Professor

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Joined NIAS on: October 6, 2017

Research Areas: Science Communication

Lectures

Atomic Energy and Energy Security of India, to the students of Mahindra Ecole Centrale, Hyderabad, March 6, 2020.

Personnel Reliability – Goals, Challenges and Strategies, India-US Cooperation on Global Security Strategic Security Threats of 21st Century, NIAS, January 28, 2020.

Science, Technology, Society and Communication: The Challenge, IASS-IFSA Symposium on Frontiers of Science and Future of Societies (FSFS) – 2020, 43rd Indian Social Science Congress, Focal Theme – Current Science of Nature-Human-Society in India, Bengaluru Central University, Bengaluru, January 17, 2020.

Science, Technology and Society: The Challenge of Reaching Out, NIAS-DST Training Programme on Science and Technology: Global Developments and Perspectives, December 12, 2019.

In Pursuit of Excellence: Being an Engineer, Trainee Scientific Officers of NFC-HWB Training School, NFC, Hyderabad, November 29, 2019.

Meeting the Challenge of Safety in Nuclear Reactors: Role of R&D, PDPU University, Gandhinagar, November 21, 2019.

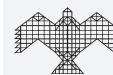
Training Workshop on Developing Emerging Nuclear Security Practitioners, Organised by Pacific Northwest National Laboratory, in cooperation with PDPU, Texas A&M University and Gujarat Forensic Sciences University, November 20 to 22, 2019

In Pursuit of Excellence: Being a Researcher, SIRC Lecture Series and Birth Anniversary Celebrations of Dr Homi J Bhabha, SIRC, BARC, Mysuru, October 18, 2019.

HRP challenges and Summary of April 2019 HRP Meeting, Core Group Meeting on Human Reliability Programme in Industries of National Importance, jointly organised by NIAS and Texas A&M University at NIAS, October 15, 2019.

Challenges of learning to be Industry Ready Managers, Orientation Day, Vivekananda Institute of Management, Bengaluru, October 14, 2019.

Doing Research and Communicating it Well: The Challenge, Applied Sciences Department, AMITY University, Noida, September 27, 2019.



Nuclear Safety and Security, Amity University, Noida, September 26, 2019.

Training Course on Integrated Nuclear Safety and Security Culture, Amity Institute of Nuclear Science and Technology (AINST) in collaboration with World Institute for Nuclear Security Academy and Oak Ridge National Laboratory, September 26-28, 2019.

Importance of Being Student of Nuclear Engineering, Student Chapter of The Institute of Nuclear Materials Management at Amity University, Amity Institute of Nuclear Science and Technology, Noida, September 26, 2019.

Decoding Science Communication, Interaction with the Students of Science Communication of NISCAIR, NISCAIR, New Delhi, September 21, 2019.

From Providing Information Resources to Knowledge Networking: Making the Transition in the Digital Era, Digital Economy: The Space for Science and Technology Information, ICST-DST-NISCAIR International Conference, NASC Complex, PUSA, New Delhi, September 19, 2019.

In Pursuit of Excellence: Being an Engineer, Student Chapter of IICChE, Bangalore Regional Center, as part of the inauguration of the Student Chapter for the year 2019-20, MSRIT, Bengaluru, August 30, 2019.

Science, Technology, Society and Communication, NIAS-DST Training Programme on Science, Technology and Innovation Policy, NIAS, August 26, 2019.

Information Resource Providers to knowledge Networking Managers: The Transition, Challenge and Opportunities, Seminar on Knowledge Networking for Excellence, organised by Bombay Science Librarians Association (BOSLA) and SIRD, BARC, Mumbai, August 10, 2019.

Artificial Intelligence: Economy and Society, Workshop on Human Future in Digital Era, jointly organised by NIAS and Indian Social Science Academy at NIAS, August 5, 2019.

Investment in Humanities is the Future, Interview appeared in the magazine Brainfeed Higher Education Plus, Experts Speaks: Law and Humanity Colleges, May 17, 2019. <https://highereducationplus.com/investment-in-humanities-is-the-future/>

Manpower Training and Development of Human Resources for Skill India, 5th India Nuclear New Build Congress 2019, Mumbai, May 16, 2019.

Human Reliability Programme and Importance of Communication, Workshop on Incorporating Both Technical and Human Elements to Reduce Hazards and Vulnerabilities in Sensitive Facilities", PDPU, Gandhinagar, May 15, 2019.

Communicating Ancient Knowledge Systems, National Level Technical Meeting on Communicating Ancient Indian Knowledge System for the Holistic Development of the School Students for their Physical, Mental and Spiritual Well-Being, jointly organised by NIAS and Chinmaya Vishwavidyapeeth, Ernakulam, May 8, 2019.

Memberships

High-level Committee on S&T Institutional and Human Capacity Building, constituted by DST, Government of India.

Expert Committee, UGC-SERO, Hyderabad, Constituted by UGC, Government of India.

Committee of experts constituted by DST, to review research activities of the policy research centers, suggest some new initiatives/modalities and to discuss further strengthening and making future roadmap in STI sector in the country.

Editorial and Scientific Committee of the International Journal of Nuclear Knowledge Management published by WONUC.

Member of the Advisory Board, Governing Council of Hindustan Institute of Maritime Training Group of Educational Institutions, Chennai, Run under the Shri Krishna Educational Trust, Madhurika Educational and Charitable Trust, HIMT College Trust and HIMT Offshore.



Energy and Environment Programme



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Joined NIAS on: August 30, 2019

Research Areas: Energy, Environment, Regulation, Culture.

Research Contributions

Contributed to a chapter on Regulation in India's Natural Gas Industry to a report being published by Brookings India.

Lecture

India's Energy Security, NIAS-DST Training Programme on Science and Technology: Global Developments and Perspectives, December 11, 2019.

Energy and Environment Programme



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Homi Bhabha Chair
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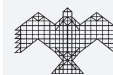
Joined NIAS on: August 5, 2019

Research Areas: Electromagnetic and Heavy Flavour Probes of Quark-Gluon Plasma.

Research Contributions

Quark Gluon Plasma: In a pioneering study, we calculated the directed flow of thermal photons from "event by event" studies of collisions of non-identical nuclei. We find that these are uniquely sensitive to the quark gluon plasma phase of the interacting system formed following the collision (In collaboration with Pingal Dasgupta and R Chatterjee, Variable Energy Cyclotron Centre, Kolkata, Submitted for publication).

Energy: Studies have been initiated to find optimal energy options for India, considering climate change. Studies have also been initiated to find solutions for plastic waste and medical waste, using cold plasma pyrolysis and plasma pyrolysis.



Lectures

Climate Change and Energy Options for a Sustainable Future, Centenary Celebration Symposium, Aligarh Muslim University, March 2, 2020.

Why Should You Do Basic Research, Aligarh Muslim University, March 1, 2020.

Discovery of Quark Gluon Plasma, Aligarh Muslim University, February 29, 2020.

Climate Change and Energy Options for a Sustainable Future, Aligarh Muslim University, Science Day Celebration, February 28, 2020.

Discovery of Quark Gluon Plasma: Open Questions, Islamic University of Science and Technology, Awantipora, Kashmir, February 20, 2020.

Why Should We Do Basic Research, Islamic University of Science and Technology, Awantipora, Kashmir, February 19, 2020.

Why Should We Do Basic Research, Science Congress, Jammu, December 20, 2019.

Science, Technology and International Cooperation, NIAS-DST Training Programme on Science and Technology: Global Developments and Perspectives, December 16, 2019.

Technology has Destroyed Our Culture, Debate, Calcutta Debating Club, November 23, 2019.

Discovery of Quark Gluon Plasma, Amity University, Noida, September 27, 2019.

Why Should We Do Basic Research, Amity University, Noida, September 26, 2019.

Why Should We Do Basic Research, ML Sodha Memorial Lecture, IIT Delhi, September 25, 2019.

It is the Best Time to Join Basic Research, Agastya Foundation, Bengaluru, September 17, 2019.

Fair Questions for FAIR, Vigyan Samagam, Visvesvaraya Museum, Bengaluru, September 7, 2019.

Memberships

Selection Committee for Extraordinarily Talented Children for the Advanced Learning Centre, NIAS.

Chair, Selection Committee for PDF for Science Communication Programme, NIAS.

Member, International Advisory Committee, Hard Probe Conference 2020, Texas A&M University.

Member, Advisory Committee, Centenary Celebration of Aligarh Muslim University.

Member, Raja Ramanna Fellowship Programme Review Committee, DAE, Mumbai.

Editorial Board Member, Pramana, Journal of Physics.

Editorial Board Member, Scientific Reports, Nature Group of Publications, UK.

President, Indian Physical Society.

Member, Executive Council, National Academy of Sciences India, till December 2019.



MEMBERS

Members of the Conflict Resolution and Peace Research Programme



D Suba Chandran
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Joined NIAS on: November 18, 2015

Research Interests: Peace Research Initiative (IPRI), NIAS Science Diplomacy, Global Politics.

Academic Courses

NIAS Course on Global Politics – During 2019-20, taught a course titled “Global Politics: Contemporary World Affairs” in both the semesters, and also as a summer course. As a part of the Course, he maintains a portal – www.globalpolitics.in, where the young scholars publish their research as short commentaries and briefs.

Course Weekly: The World This Week – As a part of the Course, edits a weekly – “The World This Week” published as an e-Alert every Saturday. The Weekly is contributed primarily by the Course scholars and interns – present and former.

NIAS Quarterly on Contemporary World Affairs – A significant contribution during 2019 was the launch of NIAS Quarterly on Contemporary World Affairs. The NIAS Quarterly is edited by Prof Chandran, and is also a part of the NIAS Course on Global Politics.

NIAS Course on Effective Research Writing at the Institute level, focussing on research writing – short commentaries, essays, proposals etc, and also on making presentations. The course included a series of workshops as well.

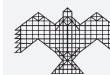
School Course on Conflict and Security – Coordinated the orientation course during August to November 2019, offered by the School in collaboration with other faculty from the School.

Lectures

Arctic is Not Far: An Indo-Arctic Strategy for India, Panel Discussion, ICWA Dialogue on Arctic, March 4, 2020.

Water Security and Disaster Management, Panel Discussion, KAS Water Dialogue, Colombo, March 3, 2020.

India and the Arctic, Panel Discussion, NIAS, February 6, 2020.



Radicalization in South Asia: Readings and Misreadings, United by Violence, Divided by Cause?: A Comparison of Drivers of Radicalisations in Asia and Europe, Singapore, January 14, 2020.

India and the Global Order: Between Interests, Capabilities and Challenges, China Foreign Affairs University, Beijing, December 26, 2019.

India and the Belt and Road Initiative, China Foreign Affairs University, Beijing, December 19, 2019.

Radicalization in Pakistan, NIAS-KAS Workshop, Pondicherry, November 29, 2019.

Managing the Energy Circles of Central Asia, South Asia and Beyond, KAS-RECAP Energy Dialogue, Kathmandu, November 21, 2019.

Role of Think Tanks: Managing Economic and Security Issues, Panel Discussion, Asia-Pacific Think Tanks Meeting, Bangkok, November 13, 2019.

Indo-Pacific: The Middle Path, Panel Discussion, COSATT, Colombo, October 19, 2019.

Extremism and Violence in South Asia: New Trends, Panel Discussion, INSSSL, Colombo, October 19, 2019.

Pakistan and J&K: Psyche and Mindset, Air War College, Secunderabad, September 3, 2019.

Contemporary Global Politics and Technology: Dawn of a New Era, NIAS-DST Training Programme on Science, Technology and Innovation Policy, August 21, 2019.

Pakistan: Psyche and Mindset, Air War College, Secunderabad, July 17, 2019.

From Act East to Bring East: An agenda for India towards Southeast Asia, Peninsular Foundation, Chennai, July 12-13, 2019.

India, China and the New World Order: Maximising Cooperation, Managing Competition and Minimising Confrontation, Jinjiang Forum, Chengdu, June 12, 2019.

Nature and Source of Conflict in South Asia: An Assessment and Forecast, Briefing, GPPAC South Asia, Kathmandu, July 2, 2019.

J&K: As the Conflict Expands, Indian Institute of World Culture, May 31, 2019.

India and the Indo-Pacific: Interests and Challenges, Briefing to the RCDS Delegation, NIAS, May 20, 2019.

Indo-Pacific: Democracy, Security and Development, Presentation, University of Heidelberg, Heidelberg, May 5, 2019.

Memberships

Member, Board of Studies, Department of Political Science, St Joseph's College, Bengaluru.

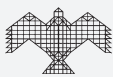
Member, Board of Studies, Department of International Studies, University of Mysore.

Visiting Fellow, Institute of National Security Studies Sri Lanka, Colombo, Sri Lanka.

Visiting Fellow, China Foreign Affairs University, Beijing, China.

Member, Global Partnership to Prevent Armed Conflict, South Asia.

Member, Consortium of South Asian Think Tanks, Kathmandu, Nepal.



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Joined NIAS on: January 31, 2014

Research Areas: Conflict Resolution, Internal Conflicts in India, Nepal and Bangladesh, Terrorism in South Asia, Religious Radicalisation.

Academic Courses

Three credit course on Theoretical Constructs of Conflict, NIAS.

Classes on Social Theory and Research Methodology, NIAS Foundation Course.

Full Course on Contemporary Political Theory, School of Liberal Studies, Pandit Deendayal Petroleum University, Gandhinagar.

Lectures

The Social and Political of People's Movements, Department of Sociology and Social Work, Christ University, Bengaluru, February 7, 2020.

Future Course of Naxal Movement and Its Impact on Internal Security, Internal Security Seminar organised by Defence Services Staff College, Wellington, February 5, 2020.

Terrorism: A Continued Challenge for Business Processes, Training Programme organised by COVINTS, Bengaluru, January 18, 2020.

S&T Development and Social Conflict, NIAS-DST Training Programme on Science and Technology: Global Developments and Perspectives, December 16, 2019.

Peaceful resolution of violent conflicts: A Gandhian way, Seminar organised by Conflict Resolution Programme, NIAS on 'Gandhi at 150: Ideas and relevance to contemporary societal challenges on September 16, 2019.

Tackling Insurgent Ideologies, Conference on Countering Violent Extremism organised by Observer Research Foundation, New Delhi, August 9, 2019.

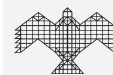
Insurgency in Chhattisgarh—Orienting the approach to Peace-Security-Development, presented to Chhattisgarh Government, Raipur, May 24, 2019.

Insurgencies and Ungoverned Territories at India-Myanmar Border: Implications on Bilateral Relationship, Conference on India-Myanmar: Political and Security Cooperation, organised by Indian Council for World Affairs, New Delhi, May 15, 2019.

Memberships

Member, Board of Studies, Department of International Relations and History, Christ University, Bengaluru.

Associate Member, Institute for Defence Studies and Analyses, New Delhi.



Members of the International Strategic and Security Studies Programme



Srikumar Pullat
Visiting Professor
School of Conflict and
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Joined NIAS on: May 24, 2017

Research Areas: Unmanned Aerial Vehicles for Civil and Military applications; Space Environment, Space Security and Space Situational Awareness; Systems Analysis and Systems Engineering.

Lectures

Guest of Honour at “Udaan”, the Technology Festival at NITTE Meenakshi Institute of Technology, Bengaluru; delivered a lecture titled My Experiments with Aeronautics, February 13, 2020.

Unmanned Aerial Systems in India’s National Air Space Some Issues and Concerns, XIV International Conference on Public Policy and Management, at Indian Institute of Management (IIM), Bangalore, August 2019.

Panelist in discussions held at NIAS as part of “Science Diplomacy” and “Conflict Resolution and Peace Research” programmes.

Memberships

Aeronautical society of India; Astronautical Society of India.

Co-chairman of the NIAS–CISAC Dialogue on India-US Cooperation on Global Security – Strategic Security Threats of 21st Century, held at NIAS during January 27 to 29, 2020.

Core Member, Annual Assessment Board for Scientists of DRDO at Hyderabad and at Bengaluru in 2019.

Other Activities

Initiated an MoU with Defence Institute of Advanced Technology (DIAT), DRDO, Pune for joint Research programmes, exchange of Researchers and Faculty and registration of PhD students between NIAS and DIAT. The MoU was finalised between the two institutes in January 2020.



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Joined NIAS on: February 1, 2007

Research Areas: Weapon Systems and Advances in Weapon Systems.

Memberships

Invited to be a member of COSPAR Panel on Social Sciences and Humanities related to Space Science Activities.

Reviewer, International Journal of Energetic Materials and Chemical Propulsion (Reviewed one referred paper in March 2020).

Lectures

S&T and Security, NIAS-DST Programme on S&T: Global Development and Perspectives, December 10, 2019.

Spin-offs from Space, NIAS-DST Programme on Science, Technology and Innovation Policy, August 27, 2019.

Space and Security, Invited Distinguished Lecture Series, Defence Institute of Advanced Technology, Pune, August 9, 2019.

Space and Security, as part of An Introduction to Conflict and Security Studies Course at NIAS, June 10, 2019.

Personnel Reliability in Launch Vehicle Systems to the participants of NIAS-Texas A&M Programme on HRP in Industries of National Importance, April 25, 2019.

Panellist in the discussion on Science Diplomacy at NIAS-RIS event at RIS, New Delhi, April 22, 2019.

Memberships

Chaired the PDR and Post flight analysis committees of Advanced Systems Lab, DRDO in 2019-2020.

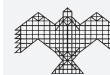
Chaired a Design Review Committee for GTRE, DRDO in 2019-2020.

Member, Selection Committee, C-SAG in 2019-2020.

Other Activities

Was a reviewer, International Journal of Energetic Materials and Chemical Propulsion (Reviewed one referred paper in March 2020).

Finalised a Memorandum of Understanding (MoU) with DRDO to continue the cooperation and conduct further research studies in areas of strategic importance pertaining to national security.



PM Soundar Rajan
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Joined NIAS on: May 17, 2017

Research Areas: Advanced Weapon Systems – Directed Energy Weapons –Laser – Microwave; Avionics-Fifth Generation Avionics Systems; Cyber Security – Weapon System Cyber Security Vulnerabilities- Space Assets Security; Artificial Intelligence – Defence Applications of AI- AI in Strategic Decision Making – Cognitive Electronic Warfare Systems – AI in the Cockpit – Reliable, Ethical AI; Air Power Assessment – India, China, Pakistan – With emphasise on Radar, EW, Avionics; Chinese Defence Technology Assessment particularly with reference to Electronics, AI, SW, Robotics, etc; Study of Lethal Autonomous Weapon Systems – Legal, Ethical issues; Science Diplomacy.

Lectures

Science Diplomacy and Security, Chief Guest Lecture, National Science Day Celebrations, Society of the Institution of Electronics and Telecommunication Engineers, Bengaluru, February 28, 2020.

Discussant – Trans Himalayan Science and Technology in the 20th Century China and India by Dr Arunab Ghosh, Harvard University, Christ University, Bengaluru, January 20, 2020.

AI for Defence Applications, FULCRUM, AI Conclave, Aditya Birla Group, Mumbai, December 2, 2019.

Ageing Avionics, Indo-US Lecture Series on Ageing Aircraft, Indian Institute of Science, Bengaluru, November 27, 2019.

Two talks – Hardening of Satellites to Prevent Harm to Own Space Assets and Formulation of General Staff Qualitative Requirements by Industry for Futuristic Military Technologies, Seminar on Space, Center for Joint Warfare Studies, Ministry of Defence, New Delhi, October 10, 2019.

Aviation Cyber Security and the Connected Aircraft, Workshop on Air Traffic Modelling and Aviation Safety, Automatic Control and Dynamic Optimization Society, Indian Institute of Science, Bengaluru, September 27, 2019.

Fourth Generation Warfare: Emerging Trends in the 21st Century, International Relations and Foreign Policy Committee, School of Law, Christ University, Bengaluru, September 20, 2019.

Electronic Warfare and Rotary Wing Aircraft, Rotary Wing R&D Centre, HAL, Bengaluru, September 20, 2019.



Mil-Std-1553B Avionics Data Bus, BEL Academy, Bengaluru, September 17, 2019.

Avionics in the Connected World, Guest Speaker, Collins Aerospace, Bengaluru, September 5, 2019.

Talks on Avionics, EW, Combat Aircraft Upgrades, Cyber Security in Aerospace Systems, Fifth Generation Fighter Technologies etc., Institute of Defence Scientists and Technologists, DRDO Training Programme on Avionics and Electronics Warfare, BEL Academy, Bengaluru, July 22 to 27, 2019.

Indian Defence Manufacturing, International Conference on Industry 4.0 and Advanced Manufacturing (I4AM), Indian Institute of Science, Bengaluru, June 28, 2019.

Talks on Technology and Public Policy and Technology and International Relations, QIP for Department of International Studies and History, Christ University; Bengaluru, May 21, 2019.

Aerospace in Science Diplomacy, RIS-NIAS Seminar on Science Diplomacy, New Delhi, April 22, 2019.

Overview of Chinese Electronics, Visit of 31st Naval High Command Course, NIAS, April 16, 2019.

S&T Cooperation on Cyber, NIAS-ICWA Dialogue on India Vietnam and the World Order, April 5, 2019.

Memberships

Chairman, Preliminary Design Review Committee, Avionics and Weapon Systems for LCA Mk II, December 20, 2019 to March 20, 2020.

Member, Review Committee for Avionics, Electronic Warfare, and Electro Optics, Advanced Medium Combat Aircraft Programme, ADA, DRDO, November to December 2019.

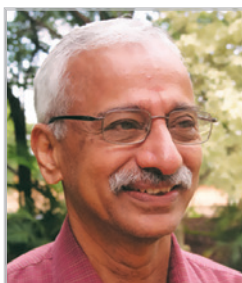
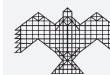
Chairman, Aerospace and Electronic Systems Society, IEEE, Bengaluru.

Member, Aeronautical Society of India.

Other Activities

Conducted a Training Programme on “Avionics and Electronics Warfare” for Institute of Defence Scientists and Technologists (IDST), DRDO at BEL Academy, Bengaluru during July 22 to 27, 2019.

Co-authored an article on “Cyber Security and Space Cooperation” for European Space Policy Institute; ESPI Report No.69, April 2019.



N Ramani
Visiting Professor
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Joined NIAS on: November 1, 2007

Research Areas: Development of Tools for Missile and Space Asset Capability Assessment.

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Lalitha Sundaresan
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Joined NIAS on: May 14, 2008

Research Areas: Satellite Imagery Analysis.

Lecture

The Need for a Rare Earth Ecosystem in India, Conference on Science, Technology and Application of Rare Earths (STAR 2019), Bhabha Atomic Research Centre, Mumbai, December 5, 2019.

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Joined NIAS on: November 2, 2010

Research Areas: Strategic and Security Issues Concerning India and India's Neighbourhood, Indian Ocean/Indo-Pacific, Foreign Policies of China, Japan and the US, Security Perspective of Climate Change, Refugees Issues and Non-Traditional Security Issues.

Lectures

Climate Change and National Security: Implications for Defence Establishments, International Conference on Climate Change and Security: Implications of 'Securitization' for International and National Realms, organised jointly by the TERI with KAS, Zuri, Kumarakom, February 21, 2020.

BRI, China's Great Power Strategy and India's Concern, National Seminar on China's One Belt and One Road Initiatives and Its impacts on India's Foreign Policy, organised by Government Bernnen College, Thalassery, Kerala, at Thalassery, February 14, 2020.

Exploring The Potential and Prospects of Japan's Role in BIMSTEC, International Seminar on BIMSTEC: Constructing New Pathways in the Context of Rising Asia, organised jointly by the UGC Centre for Maritime Studies, Pondicherry University in collaboration with Observer Research Foundation (ORF), Kolkata, at Pondicherry, February 11, 2020.

The Emerging Strategic Trends in the Indo-Pacific and India-Malaysia Relations, International Seminar on The Geopolitics of Indo-Pacific: Perceptions, Opportunities and Challenges, organised by the Department of Political Science, University of Kerala, Thiruvananthapuram, Kerala, India jointly with Indian Council of Social Science Research and Indian Council of World Affairs, New Delhi, Thiruvananthapuram, December 12, 2019.

Memberships

Member, Association of Asian Studies, Wisconsin, USA, 2019-2020.

Member, Advisory Committee of Department of Political Science, Kumaraguru College of Liberal Arts and Science, Coimbatore, Tamil Nadu, 2019-2020.



Amit Mukherjee
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Joined NIAS on: October 3, 2017

Research Areas: Defence and Strategic Studies – Geospatial Analysis.

Academic Course

GIS Training Course for National Security, School of National Security Studies, Central University of Gujarat, February 28 to March 7, 2020.

Lectures

Geographic Information System in National Security, Pandit Deendayal Petroleum University, Gandhinagar, Gujarat with School of Liberal Studies and NIAS – National Seminar on India's National Security: Challenges and Options, PDP University, Gandhinagar, Gujarat, March 12, 2020.

Geospatial Analysis of Coral and Mangroves Change in Selective Study Areas: India, Myanmar and Indonesia – Framework for International Cooperation through Advances in Coastal Research in Indo Pacific, International Symposium on Advances in Coastal Research with Special Reference to Indo Pacific AdCoreIP 2019, Chennai, December 18, 2019.

Geo-Smart India, Open Source Geospatial Intelligence in National Security, Hyderabad, December 5, 2019.

GOI – Security Agency – GIS and Coastal Security, Bengaluru, May 17, 2019.

GOI – Security Agency – Strategic Studies and National Security, Bengaluru, May 17, 2019.

Memberships

Board of Adviser 2020: For 2019 Conflict Report – Heidelberg Institute of International Conflict and Security Studies, Heidelberg, Germany, 2020.

Board of Governors, Internal Security, Safety and Protection Industry Association, New Delhi.

NIAS-Institutional Member, OGC Geospatial Consortium India.

Member, Indian National Cartographers Association.

Member, Editorial Review Board: Electronic Journal of Social and Strategic Studies – Chennai, July 1, 2019.

Other Activities

Initiated an MoU between NIAS and Geospatial Media and Communications (GWC), Noida to work in collaboration for research, research publications, joint proposal for funding, co-hosting of conferences, knowledge sharing and pursuing other engagement models.



**Prakash
Panneerselvam**
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Joined NIAS on: December 1, 2015

Research Areas: Defence and Strategic Studies – Maritime Security.

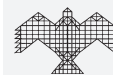
Academic Course

One credit course on Introduction to Maritime Security: Concepts, Principles and Practices for NIAS doctoral students, August to December 2019.

Lectures

Japan-South Korea Trade War at the National Seminar on “Strategic Foreign relations for Sustainable Trade” organised by ICWA and Ramaiah Institute of Technology, Bengaluru, January 9, 2020.

Emerging Security Dimension in the Indo-pacific: Assessing the India-Japan Strategic-Maritime Cooperation at the India’s Maritime Security: Issues and Perspectives, organised by University of Madras, October 18, 2019.



Members of the Consciousness Studies Programme



Sangeetha Menon
Professor and Dean
School of Humanities

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Joined NIAS on: January 8, 1996

Research Areas: The broad area of research work is 'consciousness studies', and the specific focus is the experiential self, with: (i) the implications of experience, (ii) the place of emotions, self-identity and self-transformation, and (iii) the possible interdisciplinary dialogues that promote psychological health and deeper well-being.

Academic Courses

Conceptualised and designed a Three Credit Course (2020-P101) on "Knowing, Experiencing and Being: Methods, Applications and Philosophies inspired by Phenomenology, Collective Frameworks, and Reflective Capabilities" from January to April 2020

"Basics in Philosophy": Fourteen Online YouTube Mini Lectures

- i. Freedom: What is it to be Free? Can someone or something bind you or make you free, which means – freedom as an external entity which can be controlled and manipulated by an external source, a person etc. Or is it an inner gift, the expression of inclusion and contentment? URL: <https://youtu.be/0TytIwxctqU>
- ii. Flowing with Time: Flowing with time is also to recognise and respond to few could be blocks that stay against the flow, but also are enhancers enriching our experience - people, desires, perceptions, and the question 'what is the purpose'. URL: <https://youtu.be/-dpaaXwv3EA>
- iii. Can You Self-introduce?: Self-introduction is about Connecting with one-self, and then with the other. Best Connect happens when you can engage fully, and detach too in the same degree at the same moment! URL: <https://youtu.be/P-lQz3GzFpc>
- iv. Are You Good?: Often philosophers debate about the notion of goodness in life ... goodness as more of an ethical principle or of some teleological value with a normative perspective to it. But then have we thought about the huge phenomenological impact of not "just goodness" but "being good"? - Being "good to oneself", and "good to another". Such a discussion will help give a "flesh and blood" angle to an otherwise detached and depersonalised abstraction. URL: <https://youtu.be/Xww2lArGcN4>
- v. Are You Excited?: Philosophy starts with the ability to be awe-struck - to be overwhelmed by the seen and the unseen; To be Excited as if a million flowers open to your eyes at once. URL: <https://youtu.be/8Zpa2LOTfcE>



- vi. How to Feel Time?: Flow with Time – And that lets you know and take with you what is around. Experience the Timelessness every moment. URL: <https://youtu.be/wjz2PnGFQ1c>
- vii. How to Connect?: We wish to Connect with Everything around us. How to connect? URL: <https://youtu.be/BvMZ02YFv8E>
- viii. How to Dream?: Best insights and solutions to problems come in your dreams. They are there all the time. Learn to be with them and travel with them. URL: https://youtu.be/HuZhYHqr_Sk
- ix. How to Argue?: Why are our arguments often weak, and make us fail in conveying what we have in mind? Argument is not showing your prowess, or your power to defeat another. Argumentation is the tool that allows to lighten and enlighten yours and another's mind. URL: <https://youtu.be/NMmXuZBYP4Y>
- x. What is the Cause?: In our daily life we tend to find meaning and cope with agreeable and disagreeable matters by claiming or blaming something to be the cause, and effect following that. For good things we wish to claim cause as belonging or originating from us. And for not so good things, the cause is always the other. URL: <https://youtu.be/v2cvUKXwdng>
- xi. What is it to Feel?: It cannot be described easily, or logically because feeling involves many aspects of our personality, the pointers we have inside us to relate with people. URL: <https://youtu.be/NGfK8glbOGU>
- xii. How to Think?: Thinking is what we do all the time. Yet we do not think right all the time. Why are you not thinking right? URL: <https://youtu.be/f3l3U1vcS5Y>
- xiii. Do You have Empathy?: Empathy is related to how you communicate and connect with another person. URL: <https://youtu.be/nTcOsDjHXmI>
- xiv. What is the Purpose of Philosophy? URL: <https://youtu.be/oT58GVogpS4>

Lectures

Communication and Purpose, Workshop at the Shankar IAS Academy, Chennai, March 2, 2020.

AI, Self and the Humanities, Panel Discussion on The Future and Promise of Artificial Intelligence, Centre for Society and Policy, Indian Institute of Science, Bengaluru, February 28, 2020.

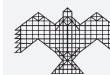
The Magical Weaving of the Now and to Connect that Moment of the Now to a Never Ending History of the Present, Workshop at the Shankar IAS Academy, Bengaluru, February 20, 2020.

Andrew's Love and Will's Garden: Exploring the Lives and Minds of Humans and Machines - A Discussion on Two Sci-Fi Movies that Straddles the Identity, Love and Intelligence Discourses, Centre for Society and Policy, Indian Institute of Science, Bengaluru, February 7, 2020.

The Mysticism of Consciousness in Indian Wisdom Traditions, Public Lecture, Theosophical Society Adyar (Blavatsky Bungalow), Chennai, February 3, 2020.

Experiencing Consciousness through the Self: Importance of Love, Empathy and Wisdom, Public Lecture, Theosophical Society Adyar (Blavatsky Bungalow), Chennai, February 2, 2020.

Beyond Body, and Experiencing Consciousness: Distinguishing the Ontology of the Brain and the Self, IIT Chennai, January 31, 2020.



The Promise of AI: Current State of Art and Way Forward for India, Thematic Introduction and Moderation, Public Panel Discussion at NIAS January 9, 2020.

The “Fragile” Human Experience and the “Strong” Artificial Intelligence: Limits, Possibilities, and Challenge, Thematic Introduction and Moderation, Public Panel Discussion at NIAS, November 20, 2019.

Dialogue Meeting at Mauritius Institute of Education (MIE) on Teacher Training and Curriculum Development, October 17, 2019.

Consciousness, Emotion Studies and Creativity, National Prime Time Programme of Srijan with Vinay Goodary for the national television channel of Mauritius Broadcasting Corporation (MBC), October 16, 2019 at 19.00 hours.

Is Consciousness a Principle of Creativity: Contemporary Discussions in Natyashastra and Emotion Studies, Lecture Theatre, Mahatma Gandhi Institute, Mauritius, October 15, 2019.

Finding Purpose: Self-Management and Consciousness, Université Des Mascareignes, Mauritius, October 14, 2019.

Understanding Mind, Body and the Self, Université Des Mascareignes, Mauritius, October 7, 2019.

Research and Policy Actions on Local Health Traditions”, Seminar on Policy Dialogue on Local Health Traditions, Government Ayurveda College, September 26, 2019.

Science, Society and the Self, Annual Postgraduate Science Week, Directorate of Postgraduate Studies, University of Agricultural Sciences, Bengaluru, May 22, 2019.

Memberships

Academic Council Member, The University of Trans-Disciplinary Health Sciences and Technology (TDU).

Member, National Task Force for Cognitive Science Research Initiative, DST – 2019-2023.

Member, IISc Institutional Human Ethics Committee.

Member, Institutional Stem Cell Ethics Committee, NCBS.

Member, Institutional Stem Cell Ethics Committee, JNCASR.

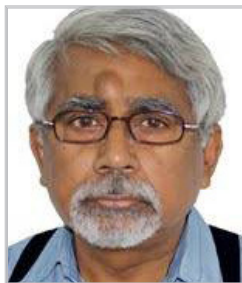
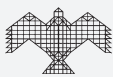
Member, Institutional Stem Cell Ethics Committee IISc.

Advisory Council Member – METI International, San Francisco.

Fellow, International Society for Science and Religion (ISSR), Cambridge.

Invited Expert, IIT Jodhpur, Course Design on “Social Connect”.

Advisor and Expert, National Advisory Committee (NAC) to examine Interdisciplinary Programme in Cognitive Science, IIT Kanpur.



Sisir Roy
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Joined NIAS on: November 5, 2014

Research Areas: Current Debates on Some of the Concepts in Modern Science and Ancient Indian Wisdom; Yoga, Meditation and Progress in Consciousness Research and Modern Neuroscience; Microbial Communication, Noise and Bacterial Intelligence.

Award

Appointed as Honorary Visiting Professor in The Centre of Foundational Studies, Poornaprajna Institute of Scientific Research, Bengaluru, December 2019 to January 2022.

Lectures

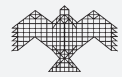
Quantum Reality, Space-Time Ontology and Akasha in Vedanta, Keynote Address, International Conference on Acharyo Shankor's Advaito Vedanta: Philosophy of Universal Oneness, Sagar University, Madhya Pradesh, December 8, 2019.

Ontology of Time and Quantum Physics, Public Lecture, Indian Institute of World Culture, Bengaluru, October 14, 2019.

Molecular Intelligence, Public Lecture, Indian Institute of World Culture, Bengaluru, September 17, 2019.

Meditation Research and Challenges, International Conference on Elevating Consciousness through Meditation for Global Harmony, Keynote Address, Indian Institute of Management Bangalore, August 2, 2019.

Ontology of Time: Dogen to Einstein; Studies in the History and Philosophy, Two-day Symposium in Philosophy Department, Jadavpur University, Kolkata, jointly organised by Jadavpur University and Indian National Science Academy, New Delhi, July 18, 2019.



Nithin Nagaraj
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Joined NIAS on: October 15, 2015

Research Areas: Causality, Scientific Measures of Consciousness, Neuro-chaos inspired AI.

Academic Course

Two credits course on Topics in Information Theory, Chaos and Causal Learning for PhD Scholars (NIAS and external), January to May 2020.

Lectures

Introduction to the Mathematics of Machine Learning, Refresher Course for Computer Science, UGC-HRDC, University of Calicut, January 20, 2020.

Consciousness, Causality and Artificial Intelligence, Student-Scientist Interaction, NIAS, January 14, 2020.

When Neuro-Chaos Meets Machine Learning, Keynote Lecture, 4th IEEE International conference on Computational Systems and Information Technology for Sustainable Solutions (CSITSS-2019), RV College of Engineering, Bengaluru, December 21, 2019.

Mathematical Foundations of Machine Learning, **invited expert for a one-day workshop as a part of 9th International Symposium on Embedded Computing and System Design (ISED 2019)**, Amrita Vishwa Vidyapeetham, Kollam, December 16, 2019.

Consciousness Connectedness (in successful leadership efforts), Keynote Address, National Workshop on Youth Empowerment (NWEY2019), Vivekananda Janoththana Trust, Bengaluru, December 7, 2019.

Re-visiting the XOR Problem: From Perceptron to Chaos, Guest Lecture, Department of Computer Science and Engineering, PES University, Bengaluru, November 20, 2019.

What is Mathematics? and Principles of Mathematical Modeling, two lectures as a part of NIAS Research Methodology Course, November 5 and 7, 2019.

Consciousness and Causality: Perspectives from Integrated Information Theory, Kashmir Shaivism and Phenomenology, Reading Glass Thematic Discussion, NIAS Consciousness Studies Programme, October 25, 2019 (along with Dr Shankar Rajaraman and Dr Saurabh Todariya).

A Brief History of the XOR Problem, IEEE Computer Society Experts Lectures (CS Connect), Government College of Engineering, Karwar, October 5, 2019.

When Chaos Theory Meets Machine Learning, IEEE Computer Society Experts



Lectures (CS Connect), KLE Technological University, Hubballi, October 4, 2019.

Introduction to Information Theory and Its Applications to Machine Learning; Introduction to Chaos Theory and its Applications to Computing and Learning, as a part of GirlGeeks Outreach Programme organised by IEEE Computer Society, Bengaluru Chapter, BMSIT&M, Yelahanka, Bengaluru, September 14, 2019.

The Limits of Knowing in Science and Mathematics, NIAS-DST Training Programme on Science, Technology and Innovation Policy, August 22, 2019.

What is Mathematics?, Vidyashilp Academy, Bengaluru, August 13, 2019.

The XOR Problem: From Perceptron to Chaos, IEEE Computer Society Experts Lectures (CS Connect), Central University of Karnataka, Kalaburagi, August 9, 2019.

ChaosNet: Chaos Theory Meets Machine Learning, NeuroAI.in: India's First-ever Symposium at the Interface of Neuroscience and Data Science, Infosys, Bengaluru, August 3, 2019.

Mathematical Foundations of Neuroscience and Consciousness Studies Research, a series of lectures at NIMHANS, Bengaluru, May to August, 2019.

Prospects of Multidisciplinary Research, NIAS MIAYA Talent Search Mentor Mentee Workshop 2019-20, organised by NIAS Gifted Education Programme, May 9, 2019.

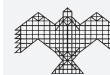
An Introduction to Cryptography, Department of Computer Science and Engineering, RV College of Engineering, Bengaluru, April 4, 2019.

Memberships

IEEE Senior Member, October 2019. Only 10% of more than 400,000 IEEE members have achieved this level.

Technical Programme Chair and Committee of Integrity, International Conference on Modeling Machine Learning and Astronomy (MMLA 2019), PES University, Bengaluru, November 22 and 23, 2019.

Advisory Council Member – METI International, San Francisco.



Shankar Rajaraman
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Joined NIAS on: August 1, 2018

Research Areas: Kashmir Shaivism, Causality and Information Theory.

Academic Course

A Module titled Articulating Experience – Understanding Mental States from an Indian Aesthetics perspective, under the 3-credit course on Knowing, Experiencing and Being: Methods, Applications and Philosophies inspired by Phenomenology, Collective, Frameworks, and Reflective Capabilities for NIAS PhD Scholars on March 12 and 13, 2020.

Lectures

Consciousness and Causality: Perspectives from Integral Information Theory, Phenomenology and Kashmir Shaivism, October 25, 2019 (co-presented under Reading Glass at NIAS).

The Structuredness of Kavya with Special Reference to Chitrakavya, co-organised by the Centre for Soft Power, Indic Academy, and Heritage Trust at Heritage Trust, Bengaluru, August 31, 2019.



VK Deepa
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Joined NIAS on: September 6, 2018

Research Areas: Tribal Medicinal Knowledge.



Members of the Heritage, Science and Society Programme



Sharada Srinivasan
Professor
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Joined NIAS on: June 10, 2001

Research Areas: Archaeometallurgy.

Lectures

Sustainable Craft, Unsustainable Heritage: The Aspect of Re-Cycling in Metal Crafts, Craft and Sustainability in South Asia an International Conference, Shiv Nadar University, March 6, 2020.

Artistic and Technical Analysis of South Indian Bronzes, Government Museum, Chennai, February 27, 2020.

Vijayanagar Heritage and Digital Perspectives, National Museum, New Delhi, Curatorial Talk, as partner of month-long exhibition on 'Indian Heritage in Digital Space' including 3-D printed models and mixed reality tours, February 22, 2020.

https://www.facebook.com/Nationalmuseumnewdelhi/videos/287500025545107/?v=287500025545107&external_log_id=0934c2791752058abb04e492584cfe3a&q=NIAS%20Heritage%20Forum%20national%20museum

Interview with Pallava Bagla on the Digital Hampi Exhibition and Gallery Tour, 'When Science Meets Art' on use of laser-scanning, 3-D scanning and augmented reality in exploring heritage, February 22, 2020. <https://youtu.be/inIrP0oYaNc>

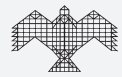
Marginalised Crafts of Metal Musical Instruments from Southern India, University of Liverpool, School of Architecture, UK, December 6, 2020.

Nataraja and 'Cosmic Dance': A contemporary re-envisioning of a classical icon, University of Liverpool, School of Architecture, UK, December 5, 2020.

Peripherals of Performance, Peripheral Performance: Marginalised crafts and Repertoires of metal musical instruments in southern India', University of Liverpool, UK, November 27, 2019.

Exhibition as Padma Awardee in Archaeology and Craft History, Festival of Art, Craft and Design, Art Mantram Felicitation of Padma Awardees, ITC Windsor, Bengaluru, October 24, 2019.

Metallurgical Heritage: Insights from Karnataka and South India, Bapuji Institute of Engineering and Technology, Davangere, October 22, 2019.



Metallurgical and Cultural Heritage of India, Kurukshetra University, Haryana, October 1, 2019.

Chair for Session on Legacy of Carnatic Musician DK Pattamak, Ooty Literary Festival 2019, Ooty, September 13, 2019.

'Karu', The Womb: Art and Science of Image Casting (Technical Workshop, Lectures, Interaction with Sthapathi, Exhibition and Performance interventions) in NIAS, September 5 and 6, 2019.

Hampi and its Environs: Insights into Techno-Cultural and Geological Landscapes", Centre for Society and Policy, IISC Campus, Bengaluru, August 21, 2019.

International Day for Worlds Indigenous People, Indira Gandhi Rashtriya Manav Sangraharaya, in Bhopal, August 9, 2019.

Material Heritage of India, CSMVS Museum Metal Conservation workshop. Tata Trusts Art Conservation Initiative Training course, July 31, 2019.

Metal Craft and Design, Design Dialogues 6, Play of knowledge systems, The Courtyard, Bengaluru, July 28, 2019.

Some Insights into Areas for Capacity Building for Geospatial Heritage, Conference on Geospatial Technologies for Heritage Conservation and Management, NIAS, July 19, 2019.

Explorations into the Mural Heritage, 'Interweavings of Tangible and Intangible Heritage: A Case Study of the Historic Town of Srirangapatna', NIAS, July 8, 2019 (along with Mr Venkateh KN).

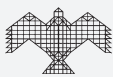
An Archaeomaterials and Archaeometallurgical Approach to Intangible Heritage and Some insights on Tipu's Legacy' for conference on 'Interweavings of Tangible and Intangible Heritage: A Case Study of the Historic Town of Srirangapatna', NIAS, July 8, 2019.

Nilgiris Archaeometallurgy, Rotary Club of Nilgiris West, Ooty, April 29, 2019.

Memberships

Nomination as a member of the Board of Studies for the Department of Science in Archaeology at the Pandit Deendayal Upadhyaya Institute of Archaeology, Greater Noida, UP.

Invited Reviewer for Journal of Metals.



S Ranganathan
Honorary Visiting
Professor
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Joined NIAS on: July 2, 2004

Research Areas: Materials Heritage.

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Srikumar M Menon
Associate Professor
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Joined NIAS on: March 1, 2016

Research Areas: Archaeoastronomy, Ancient Architecture, Monumental Architecture of Ancient Southern India.

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Academic Courses

One credit course on Temple Architecture in South India – Origins and Evolution for NIAS doctoral students, August to November 2019.

Lectures

Significance of Historical Data in Understanding and Interpreting Archaeological Heritage – A Study of the Artisans of Vatapi, Expert Lecture Series, Wadiyar Centre for Architecture, Mysuru, March 6, 2020.

Teaching Climatology – The Why and the How, Council of Architecture Workshop on Teaching Climatology, KS School of Architecture, Bengaluru, January 27, 2020.

Two lectures on Indian Megaliths and The World of the Harappans, BMS College of Architecture, Bengaluru, August 27, 2019.

Stories from Silent Stones: Tracking Ancient Artisans of South India, Hands-on Heritage Workshop Series, Mason's Ink Architecture Studio, Bengaluru, July 2, 2019.



MB Rajani
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Joined NIAS on: January 1, 2015

Research Areas: Geospatial Analysis for Cultural Heritage, Musicology.

Academic Courses

One credit course on Carnatic Music Theory for NIAS PhD Scholars, August to December 2019.

Two credits course on GIS for Spatial Data Visualization and Analysis for NIAS PhD Scholars, January to May 2020.

Lectures

The Untold Tales of Srirangapatna's Myriad Monuments, Mysore School of Architecture, Mysuru, February 24, 2020.

Clues in the Landscape, Bihar Heritage Development Society, Patna, January 24, 2020.

Talk in the series TEDxGurugram Women Bold+Brilliant!, The Westin, Iffco Chowk, Gurugram, December 14, 2019.

Landscape Archaeology and Geospatial Analysis, Workshop on Applications of Geoinformatics, Karnataka Science and Technology Academy, Bengaluru, December 4, 2019.

What Can Satellites Reveal about Our Past?, Ashoka University, Haryana, November 27, 2010.

Panelist, Women Writers Festival, Bengaluru, August 31, 2019.

Technologies for Surveying and Mapping of Heritage Sites, and Technological Capacity Building for Heritage Conservation, Conference on Geospatial Technologies for Heritage Conservation and Management, jointly organised by FICCI and NIAS at NIAS, July 19, 2019.

Geospatial Approaches on Srirangapatna's Heritage, Seminar on Interweavings of Tangible and Intangible Heritage: A Case Study of the Historic Town of Srirangapatna, conducted by University of Liverpool and Mysore School of Architecture in association with NIAS, at NIAS, July 8, 2019.

Five Degrees of Variation at Nalanda: A Stellar Hypothesis, Indian Institute of Astrophysics, Bengaluru, June 13, 2019 (Jointly delivered with Dr Viraj Kumar, IISc). Presentation and discussion in panel on Excitement in Science, Post Graduate Science Week, University of Agricultural Science, GKVK, Bengaluru, May 23, 2019.

Membership

Nomination as a member of the Board of Studies for the Department of Science in Archaeology at the Pandit Deendayal Upadhyaya Institute of Archaeology, Greater Noida, UP.

**Smriti Haricharan**

Assistant Professor
School of
Humanities

Joined NIAS on: January 2, 2017

Research Areas: Archaeological field methods, Landscape, Iron Age Early Historic south India, Archaeology of death, Disseminating Archaeology, Contemporary Archaeology.

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Academic Courses

Two credit course on Contemporary archaeology: The subject and the objective foundation course for Humanities Department at NIAS, August to November 2019.

Lectures

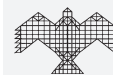
Craft Specialisation and Mass Production of Bronze and Brass Images, Workshop on Craft and Sustainability in South Asia, Shiv Nadar University, Delhi, March 5, 2020.

The Politics of Performance in the Urban Periphery. Heritage for Global Challenges Conference, Lebanon, February 25, 2020 (along with Dr Turner C).

The Past Before Us, Series of Talk on Culture of Reason, Bharath Gyan Vigyan Samhiti, Indian Institute of Science, Bengaluru, August 31, 2019.

Archaeology and Schools, Workshop on Developing Model for Activity Based Learning for Children, Bharath Gyan Vigyan Samhiti, Hampi University, July 30, 2019.

A Critique of Analogy in Indian Archaeological Discourse and Practice, 24th Theoretical Archaeology Group, Syracuse, USA, May 5, 2019 (along with Dr Kadambi H and Dr Das R).



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Joined NIAS on: October 1, 2018

Research Areas: Geology, Geo-Archaeology.

Lecture

Preliminary Investigation of Active Faults and Tectonic Geomorphology in North West Himalaya, India, Pt Ravishankar Shukla University, Raipur, January 7, 2019.



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Joined NIAS on: January 1, 2018

Research Areas: Archaeology.

Lectures

Comparative Analysis of South Indian Bronze Technology and Korea Bronze Technology with the Light of Technological Aspects, Government College of Architecture and Sculpture, Mamallapuram, January 21, 2020.

Investigating Ancient Indian Heritage of Iron Smelting Technology: An Experimental Approach, Workshop on Archaeological Resources in the Reconstruction of Ancient History of Tamil Nadu and the Application of Recent Technological Studies, School of History and Tourism Studies, Tamil Nadu Open University, Saidapet, Chennai, June 27, 2019.



Members of the Animal Behaviour and Cognition Programme



Sindhu Radhakrishna
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Joined NIAS on: September 1, 2001

Research Areas: Animal Behaviour and Cognition, Primate Behavioural Ecology, Human-Animal Studies, Environmental Decision-Making, Human-Wildlife Conflict, Conservation Biology, Environmental Education.

Academic Courses

Human-Environment Interactions Course, (with Dr VV Binoy) NIAS Doctoral Programme, August – October 2019.

Proposal Writing Course, NIAS Doctoral Programme, August – October 2019.

Lectures

Science and Policy in Wildlife Conservation, NIAS-DST Training Programme on Science, Technology and Society, August 23, 2019.

Why Does Climate Change Matter?, BAI Seminar on World Environment Month in Mysuru, June 5, 2019.

The Science of Studying Animal Behaviour, DST-INSPIRE Workshop, Mar Ephraem College of Engineering and Technology, Marthandam, July 16, 2019.

Memberships

Chairperson, NIAS Internal Complaints Committee (2019 onwards).

Member, NIAS Doctoral Studies Committee (2019 onwards).

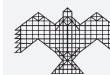
Member, Research Scholar Evaluation Committee, CES, Indian Institute of Science, December 2019.

Editorial Board Member, Resonance (2018 onwards).

Executive Committee Member, Governing Board, Yakshi (2016 onwards).

Commission Member, IUCN SSC Primate Specialist Group - South Asia (2013 onwards).

Member, Research Advisory Board, Nature Conservation Foundation, Mysuru (2013-2020).



Anindya Sinha
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Joined NIAS on: November 15, 1996

Research Areas: Mammalian Behavioural Ecology and Cognitive Psychology, Animal Molecular and Behavioural Genetics, Evolutionary Biology, Conservation Studies, Urban Ecologies and Human-Nonhuman Relationships, Animal Studies, Performance and Heritage Studies and Philosophy of Biology.

Academic Courses

Two four-credit courses on Doctoral Thesis Proposal Writing, consisting of discussions and presentations for doctoral degree students at NIAS, August to December 2019 (one course with Dr MB Rajani).

One lecture on Research Design in the Natural Sciences and one panel discussion (with Anitha Kurup and Narendar Pani) on Framing Research Problems as part of the four-credit course on Research Methodology for doctoral degree students at NIAS, August 2019.

A three-credit course on Animal Behavioural Ecology, consisting of lectures, field methods, paper presentations and discussion sessions for master's degree students of the Postgraduate Programme in Wildlife Biology and Conservation, National Centre for Biological Sciences, Bengaluru, February to May 2019.

Lectures

Ethos, Pathos, Logos: Affective Ethologies of Primate Lives, Plenary Talk, International Conference on Affect, Embodiment and Ecology: Multidisciplinary Perspectives, Gandhinagar, March 4, 2020.

A Beautiful Mind: Social Cognition in a Wild Nonhuman Primate, the Bonnet Macaque, Public Lecture, Cotton University, Guwahati, February 13, 2020.

Research Design and Observational Methods in the Biological Sciences, Workshop, Cotton University, Guwahati, February 13, 2020.

When is a Species a Species? The Story of the Munzala, Masterclass, Department of Environmental Biology and Wildlife Sciences, Cotton University, Guwahati, February 12, 2020.

Ecology, Behaviour and Evolution: Perspectives, Masterclass, Department of Environmental Biology and Wildlife Sciences, Cotton University, Guwahati, February 11, 2020.

Parental Care and Mating Systems: A Behavioural Ecological Approach, Masterclass, Department of Environmental Biology and Wildlife Sciences, Cotton University, Guwahati, February 11, 2020.



The Weed Macaques: Uniquely Adaptable, but Ultimately Threatened?, Plenary Talk, 7th Asian Primate Symposium 2020 and 1st International Conference on Human-Primate Interface, Guwahati, February 10, 2020.

Political Ecologies of Urban Macaques in India, NIAS-DST Training Programme on Science and Technology: Global Developments and Perspectives, NIAS, December 17, 2019.

Primate Performances in a Contact Zone: Interspecies Communication in a Synurbising Forest of Southern India, Concluding Symposium, Research Network on Politics of Performance at the Urban Periphery in South India, Exeter, United Kingdom, November 27, 2019.

Ethology and Geography: An Ongoing Conversation, Masterclass, Department of Geography, University of Cambridge, Cambridge, United Kingdom, November 21, 2019.

Political Ecologies of Urban Macaques in India, Political Ecology Group, Department of Geography, University of Cambridge, Cambridge, United Kingdom, November 19, 2019.

The Weed Macaques of India: Uniquely Adaptable, but Ultimately Threatened?, Cambridge Conservation Initiative, University of Cambridge, Cambridge, United Kingdom, November 13, 2019.

The Urban Macaques of India, Workshop on Urban Environments: International Perspectives, Rachel Carson Center, Ludwig Maximilian University, München, Germany, October 10, 2019.

City of the Apes: How Urban Macaques See the World, Panel Discussion on Urban Animals: Ecologies, Politics, Spaces, RC21 in Delhi – International Conference on In and Beyond the City: Emerging Ontologies, Persistent Challenges and Hopeful Futures, New Delhi, September 20, 2019.

Men without Women? Biological and Ecological Determinants of Mammalian Sex Ratios, Panel Discussion on Understanding Skewed Sex Ratios in India, NIAS, August 19, 2019.

Scio Ergo Sum: Cognitive Knowledge and Conception of the Self in Wild Bonnet Macaques,

Spectrum Lecture, Indian Institute of Science, Bengaluru, August 6, 2019.

Rolling Stones Do Gather Moss: Insights into Primate Lives, Third Talent Search Workshop, NIAS–Maiya Prodigy Programme, NIAS, May 10, 2019.

Social Behaviour, Networks and Communication in Adélie Penguins: A Proposal for Antarctica, International Workshop on Social Network of Animals in Extreme Environments of Antarctica with Special Reference to Penguins and Including Field Studies, Port Blair, Andaman and Nicobar Islands, April 23, 2019.

Memberships/Appointments

Member, IUCN/SSC Primate Specialist Group – South Asia Section, Species Survival Commission of the International Union for the Conservation of Nature, Gland, Switzerland; March 2013 onwards, renewed in March 2020.

Vice-President, International Organising Committee, 7th Asian Primate Symposium 2020 and 1st International Conference on Human-Primate Interface, Guwahati, February 8 to 10, 2020.

Visiting Fellow, Department of Geography, University of Cambridge, Cambridge, United Kingdom, October 15 to December 15, 2019.

International Advisor, Thirtieth International Biology Olympiad, Szeged, Hungary; July 7 to 21, 2019.

Vice President, Indian Association for Teachers in the Biological Sciences, Mumbai, May 2015 onwards, renewed in May 2019.

Adjunct Professor, Cotton University, Guwahati, March 2019 till present.

Member, Conservation Committee, International Primatological Society; January 2019 till present.



Member, Research Advisory Committee, Department of Life Sciences, Presidency University, Kolkata, September 2018 till present.

Adjunct Professor, Indian Institute of Science Education and Research, Kolkata, April 2018 till present.

Member, Institutional Ethics Committee, Institute of Public Health, Bengaluru, August 2017 to September 2019.

Adjunct Faculty, Nature Conservation Foundation, Mysuru, July 2017 till present.

Honorary Research Fellow, School of Humanities, University of Exeter, Exeter, United Kingdom, August 2015 till present.

Scientific Advisor and Research Coordinator, Dhole's Den Research Foundation, Bandipur National Park, Karnataka, October 2012 till present.

Adjunct Faculty, Centre for Neuroscience, Indian Institute of Science, Bengaluru, June 2011 till present.

Adjunct Teaching Faculty, National Centre for Biological Sciences, Bengaluru, August 2010 till present.

Member, Steering Committee, Postgraduate Programme in Wildlife Biology and Conservation, National Centre for Biological Sciences, Bengaluru, July 2004 till present.

Outreach

Participated in two workshops – one on Urban Environments at the Ludwig Maximilian University in Munich and the other on Research Design and Observational Methods in the Biological Sciences at Cotton University, Guwahati – and in two panel discussions – one on Understanding Skewed Sex Ratios in India in NIAS and the other on Urban Animals in New Delhi, as part of the International Conference on In and Beyond the City.



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Joined NIAS on: September 2, 2010

Research Areas: Animal Behaviour, Social Cognition, Science Communication, Risk Communication.

Academic Courses

One credit course on Bridging Science with Society: Understanding the Role of Communication for doctoral degree and postgraduate students at NIAS, August to November 2019.

One credit course on Human-Environment Interactions for doctoral degree and postgraduate students (with Prof Sindhu Radhakrishna) at NIAS, August to October 2019.

One credit course on Introduction to Animal Cognition for doctoral degree and postgraduate students (with Dr Vishwanath Varma) at NIAS, August to October 2019.



Lectures

Converging Behaviour, Cognition and Conservation, 43rd Annual Conference of the Ethological Society of India and National Symposium on Animal Behaviour – NASAB2020, Maharshi Dayanand Saraswati University, Ajmer, March 6, 2020.

Research Resources for Biology Teachers in Higher Education, National Workshop on Research Methodology Resources for Teachers in Higher Education, National Resource Centre for Education, National Institute of Education Planning and Administration, New Delhi, January 31, 2020.

Climate Change Mitigation: The Role of a Science Communicator, Christ University, Bengaluru, December 19, 2019.

Connecting Science Communication with Science Education, Bharat Petroleum Corporation Limited, Kochi, December 10, 2019.

Science of Science Communication, Pre-Congress Seminar on Whither Science Communication, 43rd Indian Social Science Congress, National College, Bengaluru, December 10, 2019.

Integrating Animal Cognition and Conservation Science, Student Conference on Conservation Sciences-2019, Indian Institute of Science, Bengaluru, October 17, 2019.

Let Us Study the Behaviour of Fishes, Homi Bhabha Centre for Science Education, Tata Institute of Fundamental Research, Mumbai, October 11, 2019.

Social Cognition and Social Inclusion. Inaugural lecture, Stimuli-2019, National level Intercollegiate Fest of Psychology Students. Kristu Jayanti College, Bengaluru, September 18, 2019.

Memberships

Fellow, Intercontinental Academia, University-Based Institutes for Advanced Study.

Secretary, Ethological Society of India.

Research Affiliate, Centre for the Study of Neuro-Economics, George Mason University, USA.

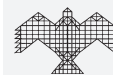
External Affiliate, Krasnow Institute of Advanced Study, George Mason University, USA.

IUCN Freshwater Specialist Group, South Asia.

IUCN Fish Conservation Network, South Asia.

Outreach

Organised four workshops – two for students on Animal Behaviour and Cognition, one on student scientist interactions and one on Science Communication.



Shaurabh Anand
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Joined NIAS on: February 12, 2019

Research Areas: Primate Ecology and Behaviour, Human-Primate Conflict.

Academic Course

Part of Human-Environment Interaction Course at NIAS (August 2019).



Arijit Pal
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Joined NIAS on: September 4, 2019

Research Areas: Animal Behavioural Ecology, Animal Cognition, Evolutionary Biology, Evolutionary Anthropology, Human-animal Interactions and Conservation Biology.

Lecture

When Not to Fight? Between-Group Encounters in Nicobar Long-Tailed Macaques (*Macaca fascicularis umbrosus*), First Meeting of Association of Indian Primatologists, Centre for Ecological Sciences, Indian Institute of Science, Bengaluru, November 1, 2019.



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Joined NIAS on: July 31, 2018

Research Areas: Animal Behaviour and Cognition

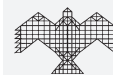
Academic Course

One credit course on Introduction to Animal Cognition for doctoral degree and postgraduate students (with Dr VV Binoy) at NIAS, August to November 2019.

Lecture on 'Animal Decision-making and Applications in Conservation' as part of Human-Environment Interactions for doctoral students at NIAS, August to November 2019 (two credits).

Lecture

Agent-based Modeling of Social Cognition, Student-Scientist Interaction at NIAS, January 14, 2020.



Members of the Complex Systems Programme



Janaki Balakrishnan
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Joined NIAS on: July 10, 2012

Research Areas: Nonlinear Dynamical Systems, Complex Systems, Nonlinear Oscillations, Ecological Modelling.

Academic Course

Introduction to Dynamical Systems Theory (MA 278), Department of Mathematics, Indian Institute of Science, Bengaluru (January to May 2020).

Lectures

Applied Mathematics for Research – Dynamical Systems Theory: The Toolbox for Exploring Complex Systems, a two-session invited lecture as part of the Continuing Education Programme Course titled Research Methodology and Formalizing Resultant Intellectual Property, Centre for Artificial Intelligence and Robotics, DRDO, Bengaluru, February 7, 2020.

Dynamics of Complex Behaviour in Natural Systems, Invited Samvaad Lecture in the Computational Models for Complex Problems Series, International Institute of Information Technology Bangalore (IIIT-B), January 13, 2020.

Memberships

Reviewer for Physical Review E (published by the American Physical Society), Scientific Reports (Nature Publishing Group), Europhysics Letters (IOP Publishing), Physica D: Nonlinear Phenomena (published by Elsevier), Physics Letters A (published by Elsevier), Physics of Fluids (published by the American Institute of Physics).



Sudharsana V Iyengar
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Joined NIAS on: July 4, 2016

Research Areas: Modelling Ecological Systems, Complex Systems.



Members of the Energy and Environment Programme



R Srikanth

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Joined NIAS on: August 22, 2016

Research Areas: Sustainable Development, Energy Governance, Environment, Minerals.

Lectures

Talks in several DST training programmes conducted by NIAS.

Thermal Power Plants – Present and Near Future Scenarios for South India. NIAS-MOES Workshop held at NIAS on January 17, 2020. <<https://www.nias.res.in/publication/optimal-electricity-mix-southern-region-summary-report-nias---moes-workshop-17th-january>>

Clean Energy, Coal and Environment, National Law School University of India, Bengaluru, January 7, 2020.

Implementation of Clean Coal Technologies to comply with “New Emission Norms” for Thermal Power Plants – Priorities for Way Forward,” at the XIXth International Coal Preparation Congress held at New Delhi, November 15, 2019.

Coal Regulations, Mines and Minerals, and the Energy Sector, National Law School University of India, Bengaluru, November 11, 2019.

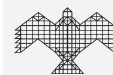
Air Quality in and around Thermal Plants. NITI Aayog-DST-NIAS Workshop, NIAS, September 17, 2019. <<https://www.nias.res.in/publication/implementation-clean-coal-technologies-comply-“new-emission-norms”-thermal-power-plants>>

Academic Course

Taught the EEP component of the Foundation Course of the School of Natural Sciences and Engineering.

Membership

Member, Department of Scientific and Industrial Research’s Technical Advisory Committee for “A2K+ Studies” Programme.

**AV Krishnan**

Principal Scientist
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Joined NIAS on: May 15, 2019

Research Areas: Currently engaged in the EEP group on “Clean Coal Technologies” under the DST project – An Integrated Approach to Development and Environment in the Power Sector.

Membership

Member, Project Monitoring and Review Committee for the ‘Advanced Ultra Supercritical’ (AUSC) constituted by the Principal Scientific Advisor (PSA), Government of India.

**Sheela K Ramasesha**

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Joined NIAS on: September 28, 2017

Research Areas: Energy and Environmental Science.

Academic Course

A one credit course on “Power Generation Technologies – Pros and Cons” for NIAS doctoral students during, August to December 2019.

Lectures

Power Scenario in India – Role of Renewable Resources, Public Lecture, University Distinguished Lecture Series, National Science Day Celebration, Central University of Rajasthan, February 28, 2020.

Science Careers in Industries, Young Scientists Conference (YSC) in Indian International Science Festival, Biswa Bangla Convention Centre, Kolkata, November 6, 2019.

Rapid Urbanization and Sustainability, Public Lecture, Institute of Engineers, Bangalore Chapter, on August 22, 2019.



Tejal Kanitkar
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Joined NIAS on: June 14, 2019

Research Areas: Climate Change Mitigation, Climate Policy and Negotiations; Energy Modelling, Renewable Energy Transitions and Energy Policy; Exploring Energy-Environment-Economy Linkages and Methods of Studying the Same; Social and Economic Impact Assessment: Focus on Energy, Irrigation and Agriculture.

Academic Courses

Taught a three credit post-graduate course on “Energy Modelling” at NIAS from August 2019 to December 2019.

Taught a three credit advanced post-graduate course on “Energy and Climate Change Mitigation” at TISS from June 2019 to September 2019.

Taught a three credit post-graduate elective course on “Energy Modelling” (Elective) at TISS from June 2019 to September 2019.

Created and submitted two courses to be taught in the Master’s Programme in Sustainable Technologies at IISc. One course on Sustainable Development (Core course) and one course on Energy Modelling (Elective course).

Lectures

Science, Scientific Temper, and Uncertainty, on the occasion of Science Day, Government Science College, Bengaluru, February 27, 2020.

Climate Change Policies in India, as part of a Special Course on Science, Technology, and Innovation Policy for a group of Deans/Vice-Chancellors of about 25 Universities in Ecuador, organised by the Centre for Nano Science and Engineering, Indian Institute of Science, Bengaluru, February 26, 2020.

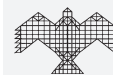
Electricity Bill 2018, Workshop on Challenges of Fiscal Federalism in India, on special invitation of Dr TM Thomas Isaac, Hon’ble Finance Minister of Kerala, in Pondicherry, November 21, 2019.

Panellist in a Programme organised by Bengaluru Sustainability Forum on Energiewende – Switch to the Future, Exhibition at National Centre for Biological Sciences, Bengaluru, November 18, 2019.

Sustainability and Climate Change: The Indian Context” for the Manufacturing Thought Leaders’ Summit organised by the International Research Institute for Manufacturing, ITC Maratha, Mumbai, October 18, 2019.

Membership

Member of the Steering Committee for Bengaluru Sustainability Forum.



Rudrodip Majumdar

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Joined NIAS on: August 23, 2019

Research Areas: Solar Thermal Applications; Clean Energy Technologies; Thermal Energy Storage; Industrial Applications of Plasma; Nuclear Energy; Applications of the Nuclear Radiation Technology.



Harini Santhanam

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Joined NIAS on: July 29, 2019

Research Areas: Water Environment Research over Land-Water-Energy Nexus.

Academic Courses

Offered two credit course on Integrated Water Resources Management for NIAS doctoral students for the semester January to May 2020.

Gave additional lectures on GIS Applications to Environmental Studies during the course on GIS for Spatial Data Visualization and Analysis for NIAS doctoral students offered by Dr MB Rajani for the semester January to May 2020.

Lectures

Gave lectures and conducted theory and practical sessions as a part of the NIAS Workshop on Making Inquiries in Archaeology: Research Methods Workshop at the Madras Institute of Development Studies, Chennai, January 4, 2020.

**Chanchal Chauhan**

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Joined NIAS on: August 14, 2018

Research Area: Air Pollution.

Memberships

Life Member, Indian Aerosol Science and Technology Association, Bhabha Atomic Research Centre, Mumbai.

**Harikrishna M**

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Joined NIAS on: September 9, 2020

Research Areas: Power System Operational Studies, Energy Management, Electricity Mix, Computer Modelling and Simulation Analysis.

Memberships

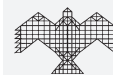
Member, IEEE.

Member, IEI.

Life Member, ISTE.

Member, IET.

Member, International Association of Engineers.



Members of the Science Communication Programme



Ipshta Chowdhury

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Joined NIAS on: September 11, 2019

Research Areas: Human Factors Engineering.

Lecture

Human Factors in Sociotechnical Systems, Core Group Meeting on Human Reliability Programme for Industries of National Importance, NIAS, October 21, 2019.

Memberships

Member, Chartered Institute of Human Factors and Ergonomics.

Member, Indian Science Congress.



Other Members



V Jayasree

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Joined NIAS on: June 15, 2016

Research Areas: Water Management, Sanitation and Hygiene, Environment Education, Ancient Indian System of Water Management, Aquatic Weeds for Environment and Economy.

Lectures

Managing Water Scarcity in a Water Rich Region: A Case Study from Kerala, Central Plantation Crops Research Institute, Kasargod, Kerala, February 27, 2020.

Water Hyacinth – Challenge vis-à-vis Opportunity, International Conference on Environment Challenges and Solutions, Manava Rachana University, Faridabad, Haryana, February 2, 2020.

Managing the Growing Water Crisis in a Mega City in Kerala, Manava Rachana University, Faridabad, Haryana, February 2, 2020.

Impact of Food Wastage on Environment Sustainability, Manava Rachana University, Faridabad, Haryana, February 1, 2020.

Water, Energy, Food and Environment – Interweave Linkages, Bharathiya Vidya Mandir, Girinagar, Kochi, Kerala, October 4, 2019.

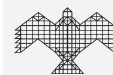
Making a Difference through Water Footprints, Saraswathi Vidya Niketan, Mamangalam, Kochi, Kerala, October 3, 2019.

Imparting Education –Ancient Times and Now, National Level Technical Meeting on Communicating Ancient Indian Knowledge System for the Holistic Development of the School Students for their Physical, Mental and Spiritual Well-Being, jointly organised by NIAS and Chinmaya Vishwavidyapeeth, Ernakulam, May 8, 2019.

Memberships

Lifetime Member, Vigyan Bharathi, New Delhi.

Member, Shiksha Sanskriti Utthan Nyas, New Delhi.



**Sapam Tuleshwori
Devi**

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Joined NIAS on: April 22, 2019

Research Areas: Genomics, Bioinformatics and Structure-based Drug Development in Chikungunya Virus Research.

Lecture

Combating Chikungunya Virus Infection through Comparative Genomic Studies and Big Data Analysis, Poster Presentation, National Workshop on Big Data and Artificial Intelligence in Biotechnology and Healthcare, organized by Amity University and EMBL-EBI during September 23 and 26, 2019.



Members of the Education Programme



Anitha Kurup
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Joined NIAS on: January 2, 1995

Research Areas: Sociology of Education, Education Leadership, Gender and Science, Education of the Gifted and Talented.

Academic Courses

Research Methodology (Critical Review of Research Proposals) for NIAS doctoral students, August to November 2019.

Perspectives and Processes in Education for NIAS doctoral students, January to April 2020.

Lectures

Diversity and Women in Science: The Indian Perspective, Special Lecture on the occasion of International Women's Day, Tata Institute of Fundamental Research, Mumbai, March 9, 2020.

Responsible Resource Management for a Sustainable Society, Plenary Session, International Conference on Emerging Research Paradigms for Sustainable Development: A Move towards Quality Enhancement in Education, Christ University, Bengaluru, January 17, 2020.

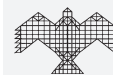
Education and Inclusiveness, Inaugural Address, National Seminar on Transforming Lives through Inclusiveness, Kristu Jayanti College, Bengaluru, January 9, 2020.

Promoting Lifelong Learning: The Future of Higher Educational Institutions, Keynote Address, National Conference on Role of Higher Educational Institutions in Promoting Lifelong Learning and Inclusiveness, Kristu Jayanti College, Bengaluru, November 14, 2019.

Career Options: Need to Integrate Passion and Skills, DST-INSPIRE Science Camp for 12th Grade Students from Karnataka, Bangalore University, Bengaluru, October 24, 2019.

Special Lecture on Indian Women in Science and Engineering: A Peek into their World of Work, Florida International University, Miami, USA, September 27, 2019.

Chaired a Plenary Session on Different Angles on Promoting Gender Equity in Pressing for Progress IPA National Conference Towards Gender Equity in Physics, Hyderabad Central University, Hyderabad, September 21, 2019.



Science in Education Policy, NIAS-DST Training Programme on Science, Technology and Innovation Policy, August 28, 2019.

The Changing Landscape of Education: School System, Teacher Education and Research, Plenary Session, National Seminar on Education System, Practices and Research, Christ University, Bengaluru, August 22, 2019.

Memberships

Member, Balaram Committee to review rules and regulations for MPhil and PhDs in India and Improve the Quality of Research by Faculty and Creation of New Knowledge and Strategies for Improving Research in universities.

Member, Expert Committee to review proposals of Scheme for Transdisciplinary Research for India's Developing Economy (STRIDE) – A new scheme to support innovative projects for smaller universities and colleges across India.

Member, Academic Council of Christ deemed to be University in Bengaluru.

Member, Expert Committee for Sustainable development Goals (Education-4) for the Planning Department, Government of Karnataka.

Member, Expert Committee in Literacy and School Education and Higher Education, Government of Karnataka.

Expert Member on the committee of preparing a 4-year pre-service BEd integrated course to prepare professional teachers for schools in India. Currently, an expert to Christ University (preparatory phase) and NMKRV College for the 4-year BEd integrated course in the respective institutions.

Member, Comparative Education Society of India.

Member, Local Review Committee on Project on Democracy: An Educational Urgency in Multicultural and Multi-Religious Contexts, a project initiated and supported by the Pontifical Foundation Gravisium Education, which is of the Congregation for Catholic Education, Vatican. Christ (Deemed to be University) is one of the 14 universities from five continents which are part of this collaborative project.



Shivali Tukdeo

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Joined NIAS on: March 10, 2010

Research Areas: Sociology of Education Policy and Sociology of Education.

Lectures

The Scope of Educational Choice, Indian Institute of Technology, Gandhinagar, February 20, 2020.

Urban Dislocations and Educational Strategies: Metro Colonies, Bengaluru. Panel organised at the German Historical Institute, London, June 26, 2019.

**Shalini Dixit**

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Joined NIAS on: December 21, 2015

Research Areas: Psychology of Education; Education for Sustainability; Historical Understanding; Education of Gifted and Talented.

Academic Courses

Social Psychology for PhD Students at NIAS, August to November 2019.

Perspective and Processes in Education for PhD Students at NIAS, January to April 2020.

Lecture

What Affects Strength of the Gender Bias: Social-Psychological and Educational Factors, Panel Discussion on Understanding Skewed Sex Ratio *in India* at NIAS, August 19, 2019.

**Jeebanlata Salam**

Assistant Professor
School of Social
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Joined NIAS on: February 22, 2016

Research Areas: Sociology of Education, Social Exclusion, Education Policies, Vocational and Skill Education, Studies in Ethnicity, Conflict, Violence and Human Rights issues.

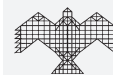
Academic Courses

Taught "Sociology of Education", "Social Exclusion and Education" for NIAS doctoral students, October, 2019.

Taught "Cultural Studies" as Visiting Faculty at National Institute of Design, Bengaluru, August 2019.

Lecture

Sectoral Skill Interventions among School Going Adolescent Youth in Karnataka on World Skill Youth Day, organised by FICCI at Jyothy Laboratories Limited, Manipal Centre, Bengaluru. July 15, 2019.



Memberships

Member, American Sociological Association

Member, Indian Sociological Society.

Member, Comparative Education Society of India



Malavika Kapur
Visiting Professor
School of Social
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Joined NIAS on: May 1, 2003

Lectures

Managing Vulnerable Children, Five-Day Workshop for 50 IPS/RPF Officers and District Protection Officers, Sardar Vallabhbhai Patel National Police Academy, Hyderabad, January 20, 2020.

Chief Guest Lecture, High School Sports Day, Women's Peace League School, Bengaluru, January 17, 2020.

Prof Durganand Sinha Memorial Lecture, XXIX Annual Convention of National Academy of Psychology, India and the International Conference on Making Psychology Deliverable to the Society, Puducherry University, December 21, 2019.

Bridging the Gaps Between Child Development, Mental Health and Education, Indian Institute of Technology, Hyderabad, December 13, 2019.

Invited series of 10 lectures on Counselling Skills at the Amity Institute of Applied and Behavioural Sciences, Mumbai, October 21 to 23, 2019.

School Mental Health and Wellbeing: Present Scenario, National Conference on Promotion of School Mental Health Programme: Current Scenario and Future Direction, Amritha Institute of Medical Sciences, Kochi, July 12, 2019.

New Education Policy, Panel Discussion with Dr MK Shridhar, Samvit, Bengaluru, June 21, 2019.

Discussion on Ancient Indian Knowledge System: Holistic Development of Children, NIAS, May 8, 2019 (along with Dr NC Induchoodan, Shiksha Sanskriti Utthan Nyas, Kochi).

Child Mental Health, 9th Body, Mind and Life Conference on Nurturing Child's Mental Health organised by Body, Mind and Life Department, Men-Tsee-Khang (Sowa – Rigpa) at Men-Tsee-Khang Wellness Centre, Bengaluru, April 13, 2019.



Tribal Outreach Programmes

Conducted demonstration of play-based activities and provided free school supplies to 500 children from class 6 to 9 in Ekalavya High School in HD Kote and Morarji Desai School.

Science Workshop for hundred 10 graders in Ekalavya School and provided Rs.750 worth science kits to each of them in Sollepura, HD Kote and in Antarasanthe, HD Kote.

Urban Outreach Programmes

A 10-session course was conducted with the help of volunteers of Child Centred Play for 84 pre-schoolers joining the first graders at Women's Peace League School, Bengaluru, June 10 to 18, 2019.

Parents and Adolescents: An interactive session was conducted in Ananda, Bengaluru, September 7, 2019.

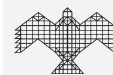
Free Child Guidance Centre at the Prasanna Counselling Centre at Bengaluru under the auspices of the Hindu Seva Prathisthana (jointly with Dr Geetha). It runs on all Saturday afternoons from 2.00 to 5.30. It runs psychological assessment, intervention and referral services for child mental health problems, along with other outreach programmes with the help of 9 volunteers.

An orientation course over 5 weeks with 6 sessions was conducted for 47 teachers on the theme of Child Mental Health and Development, with four external faculty members, November 18 to December 14, 2019.

Art Therapy Workshops – Ms Jackie Chandani facilitated two workshops on February 22, 2020 for the counsellors and the new trainees.

Self-expression through Art Work – Art to be viewed as a modality of communication of emotions and thoughts.

Demonstration session on how to use free art as a mode of communication with children.



Members of the Urban and Mobility Studies Programme



Carol Upadhya
Professor
School of Social
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Joined NIAS on: September 1, 2003

Research Areas: Urban Studies, Anthropology of Work, Migration.

Academic Course

Workshop on Writing Ethnography for advanced NIAS doctoral students, January 24, 2020.

Lectures

Becoming Urban: Caste and Land on the Periphery of Bangalore. Making of Social Science Seminar, French Institute of Pondicherry, February 13, 2020.

Peripatetic Labour in Bangalore's New Service Economy: Aspirations and Pathways of (Im) mobility in the Global City, with Harpreet Kaur. Urban ARC, Indian Institute for Human Settlements, Bengaluru, January 17, 2020.

Peripatetic Labour in Bangalore's New Service Economy, Workshop on Educational Transformations and Societal Change in Liberalizing India, Ahmedabad University, January 10, 2020.

Becoming Urban: Land and Caste at the City's Edge, RC21@Delhi, Panel S18 - The Peri-urban Question: Renewing Concepts and Categories (with Sachinkumar Rathod), September 19, 2019.

Speculative Development: State Planning, Vernacular Capitalism and Land in Amaravati. Work-in-Progress talk, South Asia Center, University of Pennsylvania, May 22, 2019.

Mobilizing the Youth? Peripatetic Labor in India's New Service Economy. CASI, University of Pennsylvania, May 1, 2019.

Memberships

Co-editor, Journal of South Asian Development.

Member, Editorial Advisory Board, Contributions to Indian Sociology.



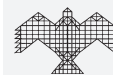
Library



Hamsa Kalyani
Library and
Information Officer

Joined NIAS on: May 1, 1992

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Director



Shailesh Nayak
Director

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Joined NIAS on: March 19, 2018

Research Areas: Earth System Science, Blue Economy, Science Diplomacy, Sustainability.

Memberships/Honours

Honorary Member, The Association of Hydrologists, Visakhapatnam, (December 2019).

Chancellor, TERI School of Advanced Studies, New Delhi.

Honorary Scientific Consultant, Office of the Principal Scientific Adviser, Government of India.

Fellow, National Academy of Sciences, India, Allahabad.

Fellow, Indian Academy of Sciences, Bengaluru.

Fellow, International Society of Photogrammetry, Remote Sensing and Spatial Sciences. Academician, International Academy of Astronautics, Paris.

Member, Governing Board, The Energy and Resources Institute, New Delhi.

Member, Governing Board, Foundation for Ecological Security, Anand.

Member, Governing Board, Indian Council of World Affairs, New Delhi.

Member, Governing Board, Research and Information System for Developing Countries, New Delhi.

Chair, Research Council, ESSO-National Centre for Polar and Ocean Research, Goa.

Chair, Research Council, CSIR-National Environmental Engineering Research Institute, Nagpur.

Chair, Research Council, Wadia Institute of Himalayan Geology, Dehradun.

Chair, Blue Flag National Jury – India.

Chair, National SCAR Committee, Indian National Science Academy, New Delhi.



Chair, Monitoring Committee of CSIR Mission 'Safety and Security of Vital Installations', New Delhi.

Member, Steering Committee, 2nd International Indian Ocean Expedition (IIOE-2).

Member, National Committee of IIOE-2.

Member, Apex Committee on STI Policy, Technology-led- Innovation Policy Framework 2020, Department of Science and Technology, Government of India. (January 2020).

Member, Indian National Commission for Cooperation with UNESCO (INCCU), New Delhi. Sub-Commission on Natural Sciences, January 2020.

President, Federation of Indian Geoscience Associations, Hyderabad.

President, Indian Geophysical Union, Hyderabad.

President, Mangrove Society of India, Goa.

Vice-President, Geological Society of India, Bengaluru.

Member, Council, National Academy of Sciences, India (2019 onwards).

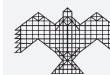
Member, Scrutiny Committee for Selection of Fellows, Selection Committee for NASI-Reliance Industries Platinum Jubilee Awards, NASI.

Member, Steering Committee, 2nd International Indian Ocean Expedition (IIOE-2).

Regional Member for Asia, International Society of Photogrammetry, Remote Sensing and Spatial Sciences (ISPRS).

Member, International Science Advisory Committee, ISPRS.

Member, Fellows Selection Committee, ISPRS.

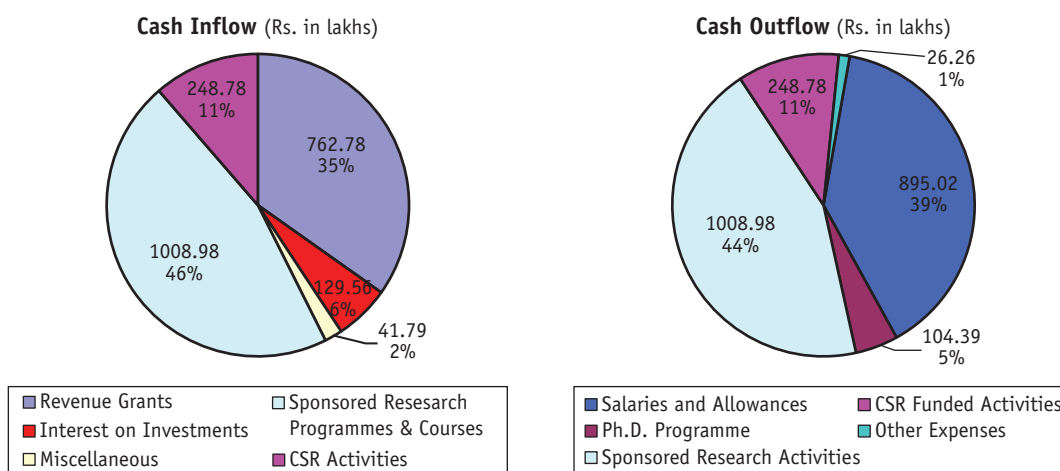


ADMINISTRATION

As a registered society, NIAS derives its administrative and financial authority through the society, represented by the General Body. The Council of Management, which is currently chaired by Mr S Ramadorai, is vested with full power and authority to do all acts, deeds etc. which are necessary for the promotion and fulfilment of the objectives set out in the Memorandum of Association. The Director, presently Dr Shailesh Nayak is the chief executive and exercises general, administrative and financial control over the affairs of NIAS. The Director is assisted in the administrative and finance matters by Head (Admin. and Finance).

Besides management of all resources such as infrastructure, finance, human resources, estates etc., general administrative matters are also handled by Head (Admin. and Finance). Administration enables recruitment and deployment of staff, servicing their needs and empowering them to effectively contribute to the objectives of NIAS. It services the students programme in which fifty-nine students work for their PhD degrees. Administration also takes care of the campus, its facilities such as the Auditorium, lecture halls, meeting rooms, classrooms, guesthouse, dining halls etc. and all other infrastructure of NIAS. Administration also plays a unique role in conducting various programmes including training courses. Procurement of materials and consumables, maintenance of facilities, inventory control, etc are also done by Administration. Compliance with various statutory requirements such as Provident Fund, Professional Tax, Income Tax, etc., is also taken care by Administration. The administrative set up consists of, in addition to the Head-Administration, an Office Manager, two Assistant Managers in the area of Administration and Accounts and Finance and other Secretarial/Office/Supporting Staff, in all numbering 28.

Finance management, accounting, auditing (internal and statutory), resource mobilisation and expenditure control are carried out systematically. An overview of finances (unaudited) for the year 2019-20 is given below:



NIAS has a specified investment of Rs.1902 lakhs (exclusive of project funds) as on March 31, 2020.

During the year, the Institute has received 10 new research projects with a total value of Rs.219.90 lakhs. Total value of projects handled during the year including the projects sanctioned in the earlier years was Rs.3381.19 lakhs. This is inclusive of CSR funded initiatives. Foreign exchange component included in this sum was Rs.451.79 lakhs.



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Joined NIAS on: November 1, 1995



B Lalu

Office Manager

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Joined NIAS on: April 16, 2012



A Deva Raju

Assistant Manager (Administration)

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Joined NIAS on: March 27, 1989



P Satish Bhat

Assistant Manager (Accounts and Finance)

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Joined NIAS on: June 22, 2009



V Girija

Administrative Coordinator

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Joined NIAS on: March 26, 1992



KS Rama Krishna
Administrative Coordinator

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Joined NIAS on: December 10, 1990



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Joined NIAS on: October 1, 1992



VB Mariyammal
Senior Executive Assistant

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Joined NIAS on: December 1, 2006



JN Sandhya
Senior Executive Assistant

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Joined NIAS on: February 11, 1997



R Vijayalakshmi
Senior Executive Assistant

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Email: vlakshmi@nias.res.in

Joined NIAS on: October 9, 1996



V Ravisha
Executive Assistant (Accounts)

Room No. Admin Block
Tele: 080-22185130
Fax: 080-22185028
Email: ravisha@nias.res.in

Joined NIAS on: February 3, 2020



MS Shivakumar
Executive Assistant (Accounts and Admin)

Room No. Admin Block
Tele: 080-22185030
Fax: 080-22185028
Email: skumar@nias.res.in

Joined NIAS on: July 7, 2008



AS Mary Stella
Executive Assistant

Room No. Reception
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Fax: 080-22185028
Email: stella@nias.res.in

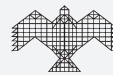
Joined NIAS on: June 23, 1994



VA Ramesh
Junior Executive Assistant

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Fax: 080-22185028
Email: ramesh@nias.res.in

Joined NIAS on: July 1, 2011



SUPPORT STAFF



*Left to Right Row-1: R Harish, N Rajesh, B Shivanandappa, Shivakumar, S Sampath, Mohammed Umar
Row-2: SR Rathnam, Chandrashekar, N Ramesh, V Srinivasa, G Nagaraja
Row-2: Mujeeb Pasha, G Venugopal, Gajanana S Naik*



NIAS FINANCIAL REPORTS

NATIONAL INSTITUTE OF ADVANCED STUDIES

SIGNIFICANT ACCOUNTING POLICIES AND NOTES ON ACCOUNTS FORMING PART OF THE FINANCIAL STATEMENTS AS AT MARCH 31, 2020

1) (a) Organization Overview:

The National Institute of Advanced Studies ("Society/Institute") is registered as a Society under the Karnataka Societies Registration Act, 1960, vide No.139/88-89 dated June 20, 1988.

Society is registered under Section 12A (a) of the Income Tax Act, 1961, vide No. Accts/718/10A/VOL./A II/N-110, dated February 13, 1990.

Society is registered under Foreign Contribution (Regulation) Act, 1976 ("FCRA") vide registration no. 094420614 dated October 1, 1993.

FCRA authorities have renewed FCRA certificate for the period starting from November 1, 2016 to October 31, 2021 vide letter dated August 5, 2016.

(b) The main objectives of the Society include:

- I. To establish and develop an Institute of Advanced Studies in order to impart higher knowledge and conduct Research;
- II. To set up and sponsor research groups on problems relating to the development of the country and for identifying problems which require immediate study and resolution; and
- III. To provide programmers of varying duration for executives and officers of Government, Public and Private Enterprises, and Personnel of Universities, Defense services and the Professions, to broaden their cultural and academic background for the successful performance of their duties.

2) Significant Accounting Policies:-

A. Basis of Preparation of Financial Statements:

The financial statements have been prepared in accordance with historical accounting convention and on the accrual basis of accounting. The Accounting Policies adopted in preparation of financial statements are consistent with those followed in the previous year.

B. Fixed Assets:

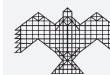
Fixed assets are stated at written down values i.e. cost of acquisition less accumulated depreciation. Cost of acquisition of fixed assets includes all direct expenses relating to acquisition of the asset.

C. Depreciation:

Depreciation on the fixed assets has been provided on written down value basis, in accordance with the rates prescribed under Income Tax Act, 1961.

D. Revenue Recognition:

- a) Donation/Revenue Grants are recognized as income in the Income and Expenditure Account in the period in which the collections are actually received.
- b) Earmarked grants are initially credited to a liability account in the Balance Sheet and are transferred to Income and Expenditure Account in the year in which and to the extent to which the Institute complies with the conditions attached to them.



- c) Interest Income is recognized in the time proportion basis taking into account the amount outstanding.
- d) Income from symposia, seminars and workshops are recognized as income as and when symposia, seminars and workshops are organized and held.

E. Foreign Exchange Transactions:

Transactions denominated in foreign currency are accounted at the transacted exchange rates.

F. Investments:

Investments are stated at cost less provision for diminution, other than temporary, in the value of such investments.

G. Employee Benefits:

Employee benefits include provident fund, gratuity fund and compensated absences.

Short Term Benefits:

Short term Employee Benefits are accounted as expenses in the income and expenditure account in the year in which service is rendered. These benefits include compensated absences, which are expected to occur within twelve months after the end of the period in which the employee renders the related service.

Post Employment Benefits and Other long term Employee Benefits:

The society's contribution to the provident fund is recognized as expenses in the Income and Expenditure account of the year in which the contribution is paid to the provident fund trust. Any deficit in the Provident Fund Trust is recognized as expense in the Income & Expenditure Account of the Society.

For defined benefit plans in the form of gratuity fund, the cost of providing benefits is determined using the Projected Unit Credit method, with actuarial valuations being carried out at each Balance Sheet date. Actuarial gains and losses are recognized in the Income & Expenditure Account in the period in which they occur. Past service, cost is recognised immediately to the extent that the benefits are already vested and otherwise is amortised on a straight-line basis over the average period until the benefits become vested.

Compensated absences, which are not expected to occur within twelve months after the end of the period in which the employee renders the related services, are recognised as an actuarially determined liability at the present value of the defined benefit obligation at the balance sheet date, as reduced by the fair value of scheme assets.

H. Provisions and Contingent Liabilities:

Provisions are recognized when the society recognizes that it has a present obligation as a result of past events, it is more likely than not that an outflow of resources will be required to settle the obligation and the amount can be reasonably estimated.

Provisions are not discounted to their present value and are determined based on best estimate required to settle the obligation at the balance sheet date. These are reviewed at each balance sheet date and adjusted to reflect the current best estimates.

Contingent liabilities are not recognized but disclosed in the notes to financial statement. Contingent assets are neither recognized nor disclosed in the financial statement.

I. Revolving Fund:

Revolving Fund is in the nature of contingency reserve fund. The interest earned on investment made out of the Revolving fund is used to meet the revenue expenditure of the Institute and the fund may be used to meet shortfall, if any, in general fund and replenished back as and when surplus funds are available, in order to keep the revolving fund intact.



J. Recognition of Capital Grants:

Capital Grants received towards cost of fixed assets is credited to Capital fund. The society has adopted Accounting Standard -12 issued by ICAI, in the case of Capital Grants. Accordingly, an amount equal to the depreciation on the assets created out of such grants is transferred from Capital fund to Income and Expenditure Account.

18. Section 12A Registration:

The Society is registered under Section 12A (a) of the Income Tax Act, 1961, vide No. Accts/718/10A/VOL./A II/N-110, dated February 13, 1990 which entitles it to claim an exemption from Income tax provided certain conditions laid down in the Income Tax Act 1961 are complied with. Provision for tax will be made only in the year in which the Society is unable to establish reasonable certainty of its ability to fulfill these conditions.

19. Income Taxes Paid:

In the current year, the Institute received an Income Tax order from the Income tax department, relating to the assessment year 2012-13 raising the demand of Rs.11,52,046/= (including interest). Based on the reassessment proceedings, the institute has filed a revised return under Section 12A(a) of Income Tax Act, 1961. The assessment resulted into the taxable income of Rs.26,79,100/= on which the aforesaid tax demand is raised. Institute has accepted this demand and accordingly paid the tax liability and charged to Income and Expenditure Account.

20. TCS Knowledge Centre:

With the financial support from TCS Foundation, an extension to the existing Faculty Block named "TCS Knowledge Centre" has been constructed by NIAS. The construction begun during November 2016 and was completed in all respects on 1st July 2019. This new facility has 14 faculty rooms, 2 discussion rooms, a heritage room, state-of-the-art e-class room, library annex and a conference room. These facilities would augment the growing requirement of faculty and their activities. The total cost incurred on construction of "TCS Knowledge Centre" as at the end of the year is Rs.5,41,46,483/=.

21. Land Lease:

The NIAS had entered into lease agreement with Indian Institute of Science, Bangalore ("Institute") dated August 28, 1990 for plot of land of 5 acres for establishment of NIAS by way of license to NIAS, for the organisation and functioning of the NIAS at the Institute. The institute will levy a nominal amount of Rs.1/- (Rupee One only) per annum on the NIAS as license fee for the use of Institute ground. The said lease is perpetual in nature till the conditions specified in the agreement is observed. In failure to non-observance of the said conditions the Institute will revoke the licence and enter upon the site and buildings.

22. Coronavirus Impact (COVID-19):

A nationwide lockdown was imposed during March, 2020 due to COVID 19 pandemic, National Institute of Advance Studies being an Associate Organization of Tata Trust is following all protocols to curtail the epidemic spread in the campus. NIAS is involved in advanced multidisciplinary research, outreach programs, collaborations with various institutions to conduct different programs and projects, also carries several residential courses, trainings, conferences and workshops for educational Institutions and government establishments. However, the financial impact for the financial year 2019 -20 from these activities are not material.

23. Previous years' figures have been regrouped/ reclassified wherever necessary.

For and on behalf of National Institute of Advanced Studies

Place: Bengaluru
Date: October 15, 2020

Dr. Shailesh Nayak
Director

P. Srinivasa Aithal
Head-Administration



BALANCE SHEET AS AT MARCH 31, 2020

Particulars	As at March 31, 2020 (In Rupees)	As at March 31, 2019 (In Rupees)
FUNDS AND LIABILITIES		
Funds		
(a) Corpus Fund	3,35,00,000	3,35,00,000
(b) Fixed Assets Fund	7,29,14,871	2,27,52,392
(c) Earmarked Funds	6,70,13,400	7,02,29,444
(d) Other Funds	15,78,76,229	20,64,09,716
(e) Income & Expenditure Account	3,71,67,534	4,28,38,959
	36,84,72,034	37,57,30,511
Current Liabilities and Provisions		
(a) Current Liabilities	26,82,930	45,10,462
(b) Provisions	71,29,000	33,09,556
	98,11,930	78,20,018
TOTAL	37,82,83,964	38,35,50,529
ASSETS		
(a) Fixed assets		
-Tangible Assets	9,68,32,037	4,74,49,679
-Capital Work-in-Progress	13,44,000	4,60,52,867
(b) Investments	17,97,34,600	17,97,34,600
(c) Loans and advances	1,26,98,932	1,83,42,908
(d) Cash and bank balances	8,76,74,395	9,19,70,475
TOTAL	37,82,83,964	38,35,50,529

In terms of our report attached.
For **Deloitte Haskins & Sells LLP**
Chartered Accountants

For **National Institute of Advanced Studies**

Sd/-
Joe Pretto
Partner

Sd/-
Dr. Shailesh Nayak
Director

Sd/-
P. Srinivasa Aithal
Head-Administration

Place : Mumbai
Date : October 15, 2020

Place : Bangalore
Date : October 15, 2020



INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED MARCH 31, 2020

Particulars	2019-20 (In Rupees)	2018-19 (In Rupees)
Income		
Grant income	22,64,96,343	21,06,06,649
Other income	2,44,42,989	2,51,06,502
Total Income	25,09,39,332	23,57,13,151
Expenses		
(i) Sponsored Research Expenditure	14,82,10,945	13,53,09,307
Total (A)	14,82,10,945	13,53,09,307
(ii) Employee Benefit Expenses	8,64,19,768	7,95,93,769
(iii) Other Expenses	1,49,19,051	57,12,778
(iv) Depreciation	59,08,947	32,69,725
Total (B)	10,72,47,766	8,85,76,272
Total expenses	25,54,58,711	22,38,85,579
Excess of (Expenditure over Income)/Income over Expenditure for the year	(45,19,379)	1,18,27,572
Income Taxes Paid for Earlier Years (Refer Note 19)	11,52,046	-
Excess of (Expenditure over Income)/Income over Expenditure for the year carried to Balance Sheet	(56,71,425)	1,18,27,572

In terms of our report attached.
For **Deloitte Haskins & Sells LLP**
Chartered Accountants

For **National Institute of Advanced Studies**

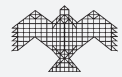
Sd/-
Joe Pretto
Partner

Sd/-
Dr. Shailesh Nayak
Director

Sd/-
P. Srinivasa Aithal
Head-Administration

Place : Mumbai
Date : October 15, 2020

Place : Bangalore
Date : October 15, 2020

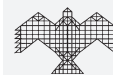


RESEARCH PROGRAMMES AND PROJECTS

Sl No.	Title of the Research Project	Funding Agency	Name of the Project Investigator	Duration	Sanctioned Amount (Rs. in lakhs)
School of Conflict and Security Studies					
1	Study on Armed Conflicts and Peace Process: A Global Primer (IPRI)	KAS	Prof D Suba Chandran	Jun'18 – Nov'20	32.49
2	Study on Adopting Sustainability into the Tourism Development	Department of Tourism, Government of Karnataka	Dr Anshuman Behera	Jan'19 – Jun'20	23.75
3	Natural Resources, Conflict and Consciousness: Dissecting People's Movements in Odisha	ICSSR	Dr Anshuman Behera	Jan'18 – Apr'20	6.45
4	RIS and NIAS Joint Programme in Science Diplomacy	DST	Prof D Suba Chandran	Feb'18 – Jan'21	45.14
5	Advanced Weapon System	DRDO	Prof Rajaram Nagappa	Sept'17 – Aug'20	93.65
6	Distributed Intelligent Ultrasound Imaging System for Secure in-Community Diagnostics (Secure Ultrasound)	EPSRC	Prof V Bhujanga Rao	Feb'18 – Jan'21	105.86
7	Frugal Innovation Nurturing Programme	INAE	Prof V Bhujanga Rao	Feb'19 – Mar'21	28.00
School of Humanities					
8	Beyond Casual Structures: Consciousness and Self Reflection in Kashmir Saivism	ICPR	Prof Sangeetha Menon	Jun'17 – May'19	4.00
9	Casual Structure, Vimarsa and the Pratyabhijna: A Comparative Research Study on Kashmir Saivism and Information Theory	TET	Prof Sangeetha Menon	Mar'18 – Feb'22	161.15
10	Documentation and Study of Alternate and Indigenous Psychiatric and Psychological Practices of Healing and Wellness (with a pilot project of model building focusing on Kerala)	TET	Prof Sangeetha Menon	Mar'18 – Feb'22	125.91
11	Causality Testing in Cognitive Neuroscience with Applications to Measures of Consciousness	DST	Dr Nithin Nagaraj	Jul'18 – Jun'21	20.04
12	A Study of Consciousness Measures and Synchrony between Brain Cardiovascular Dynamics in Yoga Experience	DST	Dr Nithin Nagaraj	Aug'18 – Jul'21	33.08
13	Metal Craft Heritage in the Cauvery Region	TCS-CSR	Prof Sharada Srinivasan	Mar'16 – Mar'20	294.95
14	Advancing Landscape Archaeology Using High-resolution Digital Elevation Models	SERB	Dr MB Rajani	Jan'16 – Jan'20	30.80



Sl No.	Title of the Research Project	Funding Agency	Name of the Project Investigator	Duration	Sanctioned Amount (Rs. in lakhs)
15	Exploring India's Medieval Coastline Using Geospatial Analysis and Historical Records	MoES	Dr MB Rajani	Mar'18 – Feb'22	52.12
16	Cultural Landscape Research: Characterising and Managing Built Heritage Sites	ISRO	Dr MB Rajani	Oct'19 – Sept'22	45.88
17	Cultural Landscape Research: Characterising and Managing Built Heritage Sites	ISRO	Dr MB Rajani	Oct'19 – Sept'22	45.88
18	Understanding the Past: Intervention through Dissemination to Explore the Idea of Teaching Archaeology	SFL	Dr Smriti Haricharan	Aug'17 – Dec'19	16.00
19	Research on Kannada Language, Literature and Script, but also Karnataka History, Arts and Culture, Making Use of Its Experience and Expertise in Applying Scientific Tools and Temper and Printing and Publishing of Halagannada Language Studies	Department of Kannada and Culture, Government of Karnataka	Prof Ravi Korisettar	Sept'19 – Sept'20	25.00
20	Philosophy in Action – Creating Public Citizenship	TSWT	Prof Sundar Sarukkai	Mar'18 – Apr'19	129.05
School of Natural Sciences and Engineering					
21	Nonlinear Oscillatory Phenomena in Sensory Systems	SERB	Prof Janaki Balakrishnan	Dec'15 – May'19	21.42
22	Complex Dynamics of Simple Nonlinear Mechanical Systems and Their Applications	SERB	Prof Janaki Balakrishnan	May'19 – Apr'22	6.60
23	Characterizing Role of Large Frugivores in Seed Dispersal Networks: Macaques and Hornbills in Asia	DST	Prof Sindhu Radhakrishna	Dec'17 – Nov'19	5.12
24	Project on Cost of Food Choices in India	HSI India	Prof Sindhu Radhakrishna	Oct'19 – Mar'20	13.60
25	Food Object Recognition in Primates: How do Monkeys Identify Novel Food as Edible Objects	DST	Prof Sindhu Radhakrishna	Mar'20 – Mar'23	24.56
26	Impacts of Land Use Changes on Human-Primate Conflict in India	ISRO	Prof Sindhu Radhakrishna	Jun'18 – May'20	22.19
27	The Politics of Performance on the Urban Periphery in South India	University of Exeter	Prof Anindya Sinha	Feb'18 – Dec'19	18.68
28	Ecological and Behavioural Adaptations of the Endangered Lion-Tailed Macaque to a Rainforest-Anthropogenic Habitat Matrix in India: Implications for Management	Rufford Foundation	Prof Anindya Sinha	Jan'20 – Dec'20	5.52
29	Urban Ecologies: Governing Nonhuman Life in Global Cities	ERC	Prof Anindya Sinha	Aug'18 – Jul'23	184.68



Sl No.	Title of the Research Project	Funding Agency	Name of the Project Investigator	Duration	Sanctioned Amount (Rs. in lakhs)
30	Early Fusion Music: Cross-Cultural Musical Exchanges in Colonial India from the Late 18 th to the Early 20 th Century	DST	Prof Anindya Sinha	Apr'19 – Mar'22	35.94
31	Research Project on Affordance Learning: From Object Play to Tool Use?	The Leakey Foundation	Prof Anindya Sinha	Jul' 19 – Jun'21	15.59
32	Advanced Epilepsy Research: A Multidisciplinary Approach	O/o PSA	Prof MV Hosur	Apr'18 – Mar'21	69.46
33	Drug Discovery Research Project on the Selection and Prioritization of Target and Lead Molecules for Neglected Diseases or Diseases of Interest to India such as Tuberculosis and Chikungunya	OSPF	Prof MV Hosur	Jun'18 – May'23	86.25
34	Interdisciplinary Forays into Human Environment Interactions: An Integrative Research Initiative in Energy, Ecology and Nonlinear Modelling	SERB	Prof R Srikanth, Prof Sindhu Radhakrishna and Prof Janaki Balakrishnan	Mar'17 – Sept'20	223.94
35	An Integrated Approach to Development and Environment in the Power Sector	DST	Prof R Srikanth	Jun'18 – May'21	150.76
36	To Understand the Interaction between Components of Earth Systems and Human Systems at Various Spatial and Temporal Scales	MoES	Prof R Srikanth	Jun'18 – May'23	318.00
37	Human Reliability Programme Studies	Texas A&M University	Prof M Sai Baba	Jul'19 – Jun'20	18.04
38	Determinants of Nuclear Risk Perception in India: An Integrated Analysis	DAE	Prof M Sai Baba	Jun'17 – Mar'21	34.98
39	Water Hyacinth: A Resource for Energy, Rural Enterprise and Women Empowerment in Kuttanad Region, Kerala	DST	Dr V Jayasree	Jan'19 – Jun'21	26.38
School of Social Sciences					
40	Education Programme at NIAS	TCS-CSR	Prof Anitha Kurup	Mar'16 – Mar'20	323.53
41	Inequality and Human Development Programme	TCS-CSR	Prof Narendar Pani	Mar'16 – Mar'20	333.14
42	Vulnerabilities and Political Aspects of Civil Society: Vulnerabilities and Volunteerism	DST	Prof Narendar Pani	Aug'17 – Jan'20	58.13
43	World-City Planning in Andhra Pradesh: A New Model for Urbanization?	APU	Prof Carol Upadhyaya	Jul'16 – Dec'19	12.36
44	Speculative Urbanism: Land, Livelihoods and Finance Capital	NSF	Prof Carol Upadhyaya	Jan'17 – Jun'20	57.33
45	India's Changing Cityscapes: Work Migration and Livelihoods	ICSSR	Prof Carol Upadhyaya	Mar'17 – Sept'19	12.50



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Sangeetha Menon, *Dean (School of Humanities)*
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M Mayilvaganan
Srikumar M Menon
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Assistant Professors

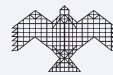
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Kshitija A Joshi (*till October 4, 2019*)
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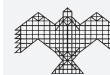
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Dr Asmita Sengupta
Dr Narayan Sharma

School of Social Sciences

Dr Michael Goldman
Dr Shailaja D Sharma



PUBLICATIONS

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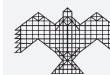
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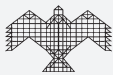
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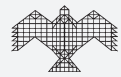
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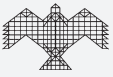
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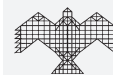
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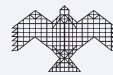


LIST OF COMMITTEES

Name of the Committee	Chairperson	Members
Grievance Redressal Committee	Prof SS Meenakshisundaram	Prof Anindya Sinha Prof Sangeetha Menon Dr Shalini Dixit Head-Administration, NIAS (Member Secretary)
Committee Against Sexual Harassment at the Workplace	Prof Sindhu Radhakrishna	Dr Anshuman Behera Ms S Lalitha Mr V Srinivasa Ms Madhu Bhushan (External Member)
Research Ethics Committee	Prof Carol Upadhyia	Prof Janaki Balakrishnan Prof Malavika Kapur Dr Anshuman Behera Dr VV Binoy Dr Smriti Haricharan
Committee to Oversee PhD Programme	Prof Anitha Kurup (Academic Head)	Prof Sindhu Radhakrishna Prof Sharada Srinivasan Dr M Mayilvaganan Dr Srikumar M Menon Dr Anshuman Behera Dr Harini Santhanam Ms JN Sandhya (Secretary)
Appointments Committee	Director, NIAS	Prof Narendar Pani Prof Anindya Sinha Prof Sangeetha Menon Prof D Suba Chandran Respective Programme Head Two Subject Experts
Faculty Renewal/Promotion Committee	Director, NIAS	Prof Narendar Pani Prof Anindya Sinha Prof Sangeetha Menon Prof Rajaram Nagappa Two Subject Experts
Applications Screening Committee for Affiliations (Post-Doctoral Fellowship/Young Scientist Award from Government Departments)	Prof Rajaram Nagappa	Prof Anitha Kurup Prof Sharada Srinivasan Prof R Srikanth Proposed Mentor/Guide
Library and Publications Committee	Prof Narendar Pani	Prof Carol Upadhyia Prof Janaki Balakrishnan Dr M Mayilvaganan Dr Smriti Haricharan Ms Hamsa Kalyani (Convener)
Committee to Oversee Website, Outreach and e-Newsletters	Prof D Suba Chandran	Prof N Ramani Dr Prakash Panneerselvam Ms Hamsa Kalyani (Convener)

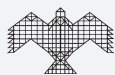


Name of the Committee	Chairperson	Members
Institutional Academic Integrity Panel	Prof Carol Upadhy	Prof Anindya Sinha Library and Information Officer, NIAS Prof TA Abinandanan (External Member)
Faculty Committee	Director, NIAS	Prof Janaki Balakrishnan Prof D Suba Chandran Prof Anitha Kurup Prof Sangeetha Menon Prof Rajaram Nagappa Prof Narendar Pani Prof Sindhu Radhakrishna Prof Anindya Sinha Prof R Srikanth (Convener) Prof Sharada Srinivasan Prof Carol Upadhy

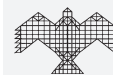


DETAILS OF MEMORANDUM OF UNDERSTANDING (MOU)

Sl. No.	MoU With	Areas of Cooperation
1	Acharya Institute of Management Studies	Collaborative research.
2	Center for Comparative Philosophy, Duke University	To support educational activities and projects between NIAS and CCP through collaborative academic research projects and mutual visits of faculty and students for shared learning.
3	Cranfield University, Cranfield, UK	To seek ways in which NIAS and Cranfield can co-operate to establish a firm relationship to assist in their aims and objectives and further agree that they shall at all times and within reason act in ways that are mutually beneficial and agree to consult with each other about the promotion of both Parties for recruitment of students.
4	Defence Research and Development Organization	To support and strengthen collaboration and cooperation in identified topics pertaining to national security.
5	DIAT, Pune	Collaborative research programmes, joint events and activities, Collaborative PhD programme, Exchange of research and faculty and collaborative projects
6	Exeter University, Exeter	Development of education and research activities, which may include: <ul style="list-style-type: none">• Research collaboration with the University of Exeter's South Asia Research Centre.• Collaborative split-site PhD supervision.• PhD student mobility. Faculty exchange.
7	Geospatial Media and Communications	Collaborate in conducting research; research publications; joint proposals for research funding; co-hosting of conferences etc.
8	Indian Heritage Cities Network	To establish a framework of co-operation to share knowledge and expertise towards strengthening the resource and projects taken up on mutual benefit.
9	Indian Institute of Science	Science to establish a framework that would guide both the Institutions in establishing a cooperative working relationship for planning and accomplishing mutually beneficial research projects, teaching programmes and other activities, as may be periodically discussed and mutually agreed upon.
10	Indira Gandhi National Centre for the Arts Southern Regional Centre	To establish a framework that will guide NIAS and IGNCASRC in creating a cooperative working relationship for generating a body of scholarship at the intersection of culture, cognition and consciousness studies pertaining to Indian arts and knowledge systems.
11	Institute of Frontier Science and Application	To create value-added policy advocacy and exploratory science for applications of science and technology for sustainable and holistic development at national and global scale.
12	Institute of Rural Management Anand, Gujarat	Academic collaboration between the Faculty and Staff of both Institutions.



Sl. No.	MoU With	Areas of Cooperation
13	Kyoto University, Inuyama, Japan	To exchange scientific information in the fields of primatology, wildlife biology, and conservation. Both Institutes will promote the development of joint research projects in the fields of primatology, wildlife biology, and conservation.
14	Liverpool University	Undertake collaborative, interdisciplinary research activities – heritage, conflict resolution and other fields of mutual interest.
15	Manipal University	NIAS PhD programme and collaborative research to address national challenges and priorities in areas including, but not limited to energy, healthcare, ecology, conservation of natural resources and education.
16	Mysore University, Mysuru	Recognition as Research Centre for the purpose of PhD programme.
17	National Centre for Biological Sciences	To promote joint research and development activities of mutual interest in accordance with their respective needs and objectives, and shall by joint agreement, determine the areas and subject of such collaboration, on the basis of understanding set out in the MoU.
18	National Innovation Foundation, Ahmedabad	To collaborate and further efforts in the areas of intersection of STI (Science, Technology and Innovation), public policy and, creative communities and individuals in the following ways.
19	National Institute of Science Technology and Development Studies	To create value-added policy analysis and policy advocacy for applications of science and technology for sustainable and holistic development at national and global scale.
20	NITI Aayog, Government of India	Part of SAMAVESH initiative and work under the S&T cluster group.
21	Open Source Pharma Foundation	Collaborative programme relating to open source approaches to the development of new affordable therapies and other pharmaceutical products in diseases of interest to India.
22	Sahapedia, New Delhi	Collaboration through various programmes in arts and humanities disciplines.
23	Swami Vivekananda Yoga Anusandhana Samsthana	Co-operation in the field of research and education.
24	Tata Institute of Social Sciences, Mumbai	On connected learning initiative. The initiative seeks to build a model at a scale that establishes the local ecosystem connecting youth and teachers with local communities, education institutions, domain experts and creating an environment that supports active learning and seamless technological use in the schools and the teaching-learning process.
25	Tennessee University, USA	Multi-disciplinary research and keeping in mind topics of interest and concern to the USA and India.
26	The Indian Council of Agricultural Research, New Delhi	For cooperation in agricultural research and education.
27	The Institute of Trans-Disciplinary Health Sciences and Technology	PhD programme.
28	UNDP	Collaboration on Policy Research Initiative on Inequality and Human Development.



REPORT ON COUNCIL OF MANAGEMENT

The 50th meeting of the Council of Management of NIAS was held on June 3, 2019.

The members of the Council, who attended this important meeting, included Mr S Ramadorai, Nominee of the Tata Trusts and Chairman of the Council; Dr Shailesh Nayak, Director, NIAS; Prof S Siraj Hasan, Mr B Muthuraman, Prof G Padmanaban, Ms Swati Ramanathan, Ambassador Nirupama Rao, all Nominees of the Council; and Prof Padma Sarangapani and Mr V R Mehta, both Nominees of the Tata Trusts.

The annual report of the Institute was presented by Dr Nayak while the heads of the various academic programmes, including the doctoral programme, made extensive presentations on the various institutional activities to the Council. The meeting concluded after widespread and in-depth discussions on both, the progress that the Institute has made in the recent past and the trajectories that could be followed in the years to come.

Prof Anindya Sinha

Secretary, Council of Management of NIAS



REPORT ON ACADEMIC COUNCIL

The NIAS Academic Council met for the first time on April 5, 2019, and held its second all-day meeting on December 10, 2019. The Academic Council is chaired by the Director of NIAS and consists of the following external experts in addition to NIAS Programme Heads and select faculty members.

- Prof Ravi B Grover, DAE Homi Bhabha Chair, Mumbai.
- Ambassador PS Raghavan, Chairman, National Security Advisory Board, New Delhi.
- Prof Mewa Singh, University of Mysore, Mysuru.
- Prof N Jayaram, Former Director of the Institute for Social and Economic Change, Bengaluru.
- Prof BN Gangadhar, Director, NIMHANS, Bengaluru.

During the first meeting of the Academic Council, Director, NIAS explained the key role that the Academic Council can play in guiding NIAS to cope up with changes in India and the World at Large while preserving the uniqueness of NIAS. He also explained the current leadership development courses in NIAS and the recently commenced course for DRDO. He explained that different Programmes also conduct Workshops and/or Courses that are oriented to increase NIAS's outreach while trying to build capacity in the country in select areas. He also stated that all NIAS programmes and leadership courses are also reviewed by the Council of Management during their regular meetings to assess their performance and to recommend future course of research.

The Director explained the details of the current faculty strength at NIAS and also stated that the strength of Assistant and Associate Professors is disproportionately less in the faculty list.

After extensive deliberations, it was recommended that NIAS can:

- utilise open (rolling) advertisements to recruit suitable faculty, particularly at the level of Assistant and Associate Professors;
- adjust faculty numbers as per the number of PhD students and research activities in each Program.
- provide a fixed grant to young faculty so that they can continue their research while developing their own sources of funding.
- recruit post-doctoral fellows with strong academic credentials to enhance policy-oriented research in NIAS, while giving them opportunities for careers in inter-disciplinary research.

During its two meetings, the programme heads and special invitees from NIAS made presentations on their programmes with specific reference to their current and future research areas. The Academic Council noted that NIAS faculty are contributing to various Government initiatives in addition to their core responsibilities in the areas of research, teaching, institutional work, and outreach activities. The Academic Council appreciated the unique research areas pursued by all these NIAS programmes and the rigor of the NIAS PhD programme. They also provided specific recommendations to various programmes.

Finally,

- Ambassador Raghavan recommended that NIAS may work towards securing research projects from actual users of the potential research findings. He also suggested that NIAS may organise capacity building programmes for conflict resolution in India.
- Prof Grover appreciated the intellectual rigor of NIAS research programmes and advised the faculty to maintain/enhance the same.
- Prof Mewa Singh stressed the need to strengthen the existing research programmes in NIAS so that there is a critical mass of faculty in each programme. He also suggested that NIAS may increase interaction with State Universities as well.
- Prof Jayaram advised NIAS to run more short-term courses/programmes to enhance the visibility of NIAS's thought leadership in chosen areas.

Prof R Srikanth
Convener, Academic Council of NIAS



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