

# NATIONAL INSTITUTE OF ADVANCED STUDIES

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**Abstract** A well-characterized sequence length polymorphism in the serotonin transporter promoter region (5-HTTLPR) influences individual behavioural traits and cognitive abilities in humans and rhesus macaques. Macaques have been classified into four continuous grades on the basis of their behavioural attributes, ranging from highly hierarchical and nepotistic species to the most egalitarian and tolerant ones. A comparative study of several species revealed that only rhesus macaques are polymorphic at the 5-HTTLPR and concluded that the aggressive behaviour (Wardlaw et al., *Behav Genet* 36:563–172, 2006). We studied wild populations of three other species and found that the egalitarian and tolerant bonnet and Arunachal macaques are also polymorphic

Edited by Sushro Misra.

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Ecosystems

PUBLICATION

SCIENCE  
TECHNOLOGY  
AND SOCIETY

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Chakraborty ·  
Ramakrishnan ·

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**Keywords**  
Arunachal  
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**Introduction**

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# From the Director

It is my proud privilege to present this report on the activities of the National Institute of Advanced Studies for the period April 2009 to March 2010.

Let me begin with the stated vision of Mr JRD Tata in founding this institute - to bring together exceptionally gifted and able persons from different streams of national life who are leaders in their own field to work on new methodologies of creative action. The highly popular programme for senior executives has indeed remained, for more than two decades, the flagship programme of NIAS in realising what can be referred to as the 'Tata vision'. The twenty-fourth edition of this programme was held on the theme Excellence in Leadership in January 2010. After a brief introduction to the basic concepts related to the theme of the course, the participants were encouraged and enabled to evaluate themselves on the basis of their own experience and share their results with the rest of the group. The end-of-course feedback from the participants confirmed that the course was well received. A number of similar programmes with specific focal themes were also organised during the year specifically targeting senior scientists and science and technology (S&T) managers in the government and outside, and were fully supported by the Department of Science and Technology, Government of India. NIAS has indeed emerged as a major training centre on a wide range of multidisciplinary and interdisciplinary topics having implications for policy.

We also recognise that core competence in some relevant areas and a track record in addressing policy issues are necessary for establishing one's credibility amongst the stakeholders even while organising training programmes. NIAS faculty has already carved a niche for itself in the areas of mathematics, philosophy, psychology, sociology and several other fields. This has certainly enhanced our competence to address more complex issues of national importance. We also recognise that in addressing many of the real-life problems, excessive subject specialisation could actually be a weakness. Every effort has been made to make multidisciplinary our core competence. I am particularly happy to see a large number of young faculty and research scholars in the corridors of NIAS.

The year 2009-10 also marks the beginning of a new phase in the history of NIAS when a generous grant



provided by the Jamsetji Tata Trust enabled the institute to substantially expand its research activities through the creation of five new research programmes in addition to the consolidation of existing ones. In line with the original mandate of NIAS to enable persons of exceptional quality to address complex and important problems facing the country in a multidisciplinary approach, the new programmes cover the areas of Cognition, Urban Policy and Research, Education, Water, and Conflict Resolution. The overall emphasis on these programmes also provided a more concrete direction to the programme on Interdisciplinary Approaches to Economic Issues supported by a special grant from the Reserve Bank of India. The ongoing programmes on International Strategic and Security Studies; Archaeometallurgy and Heritage Science; Ecology, Environment and Primate Studies; and Philosophy and Consciousness Studies, and several others were further consolidated.

While deciding the quantum of support, the Jamsetji Tata Trust had also desired that NIAS should raise additional resources from other sources for its activities. Members of the NIAS faculty have accordingly been submitting funding proposals and securing support for specific projects from various national and international agencies. In some cases, the programmes themselves have been able to generate support from outside agencies. For example, The International Strategic and Security Studies Programme has been carrying out a five-year DRDO sponsored study relating to Science and Technology Dimensions of National Security. The Bureau of Energy Efficiency is supporting a study on estimating energy savings by modifying Indian Standard Time. A number of other proposals have also been developed and submitted for support to funding agencies. On the whole, there has been a substantial increase in the research portfolio of the NIAS faculty during the year resulting in an increasing number of articles in national and international journals, books, and NIAS reports.

Before I present to you an overview of the various programmes under implementation, let me start with a more fundamental question. Where do we position ourselves in the coming years? Being a small institution with limited resources, we have no option but to develop a sharp focus. The Tata vision clearly sets the goal - to groom a core group of leaders who can plan, strategize and implement steps for national development at its most fundamental level. However,

it is well known that development at the collective level, development at the individual level, development at the economic level and development at the social level are all highly intertwined; one cannot take place without the other but one does not guarantee the other. For example, economic development, particularly at the collective level has received considerable attention in the past - science, technology, innovation, entrepreneurship, investments, manufacturing industry, and services, are all on the front burner, across the world. Similar attention has certainly not been paid to social and individual development. It is not uncommon that major developmental projects have the unintended consequence of leading to untold miseries to small groups of people. Not surprisingly, we often see resistance to projects such as the dams on River the Narmada that are clearly for collective good. Lack of equity and justice, real or perceived, lie at the bottom of these conflicts, and drive many of the distortions in society across the world. How do we resolve such conflicts? That clearly is the challenge of today, challenge not to one country or another but to the entire world, to the entire humanity. Technology alone does not hold the key to facing this challenge. We need sociology, psychology and governance; that too at the interface. That is the area that is vacant today, and that is the area that NIAS can fill in with its multidisciplinary and interdisciplinary expertise. I see every area of research being pursued today in NIAS as an effort in conflict resolution.

The three schools and the International Strategic and Security Studies Programme at NIAS are designed to help this pursuit. The School of Humanities, the School of Natural Sciences and Engineering, and the School of Social Sciences all study specialised sciences as a step towards addressing specific problem areas with a multidisciplinary approach. Thus each school carries out work on specific fields even as it anchors specific programmes. And the multidisciplinary approach results in faculty often contributing to more than one programme. Let me now give a brief report on some on-going training/research programmes in NIAS.

The International Strategic and Security Studies Programme, keeping in mind the current geopolitical scenario and the challenges facing India, maintained its focus on China, Pakistan and the USA as well as on other specific global issues. A study, sponsored by the Defence Services, on the safety of Pakistan's



The Director, Prof VS Ramamurthy, presenting a memento to Air Chief Marshal SP Tyagi (Retd) after the inauguration of the 24<sup>th</sup> Senior Executives Course.

nuclear assets was completed. An analysis of Iran's Safir Launch vehicle was carried out to estimate its performance as a missile. NIAS was a member of the Working Group on space security of the Indian Pugwash Society. A prognostic study on terrorism has also been completed with Karnataka in focus.

Non-invasive studies of the socioecology of selected southern Indian and northeast Indian diurnal primates species continued to drive the Ecology, Behaviour and Conservation Programme. Distribution, abundance and conservation of the slender loris and the endemic bird, the white-bellied shortwing, in the Eastern and Western Ghats of southern India and flying squirrels in the Western Ghats were other lines of research of the group. Social cognition and communication in wild bonnet macaques is yet another study that is closely linked to the recently launched Cognitive Science Programme and Conflict Resolution Programme of the institute.

NIAS is one of the few institutions in the country having a sustained programme on scientific heritage, in particular, archaeometallurgy. The highly successful BUMA conference held in NIAS recently is recognition of our standing in the field. Founded in 1981, the International Conference Series on the

Beginnings of the Use of Metals and Alloys (BUMA) explored the symbiotic relationship between materials and civilisations. While a large number of the papers were centred on the metallurgy of China, the conference covered research from Europe in the West, through the Middle East and South East Asia to the Far East. BUMA-VII also provided an opportunity for Indian scientists with interests in archaeometallurgy to present their research. Under the UKIERI scheme of Indo-UK Research, NIAS and Exeter University have been awarded a grant for 2009-2011 to look at the archaeometallurgy of early iron and steel in southern India. We have also been recently invited to be a lead partner in a national programme on S&T for cultural heritage with specific reference to Hampi. A proposal for a center in NIAS with a focus on Heritage Science is under preparation.

Apart from fundamental studies on the conceptual foundations of Cognitive Sciences, the Cognitive Science Programme also includes sociocognition and language and thought in humans and non-humans. The work on sociocognition has developed an alternate perspective on the cognitive basis of social behaviour. Significant progress was also made in understanding the cognitive aspects of language and gestures in humans and higher level cognitive capacities such

as deception in non-human primates. An abiding interest of the members of the programme has been the relevance of Indian philosophical themes and ideas to current cognitive science. NIAS is the lead institution in the national programme on Cognitive Sciences supported by the Department of Science and Technology (DST), Government of India.

Globalisation of our times has increased dramatically the pace of movement of not only people and goods but also disease-causing organisms across boundaries. Biosecurity is the sum of risk management practices in defence against biological threats arising out of accidental or intentional release of disease-causing pathogens and toxins. After the 26/11 Mumbai terrorist attack and the outbreak of H1N1 flu, there is a new sense of vulnerability across the country to bioterrorism and onslaught of transboundary infectious diseases. The research programme on Biosecurity is aimed at developing a scientific approach to biosecurity and bringing about the right practices. Biosecurity is obviously a multidisciplinary field of study involving multiple stakeholders - academia, government, industry, NGOs, and the public at large. NIAS, with its multidisciplinary character, is ideally placed to take a lead in this area. NIAS has already conducted a national level seminar on building an agenda on biosecurity, and also brought out a monograph on biosecurity. A more ambitious proposal has been submitted to the funding agencies, DST and Department of Bio-Technology (DBT).

Water is a vital natural resource. It is also a limited resource and is emerging as a source of conflict at diverse levels - between villages, regions, countries, sectors, etc. The nature of these conflicts is diverse, and methods adopted in addressing them are often constrained by restrictive and short-sighted approaches and compounded by a lack of objective and validated facts to facilitate informed decision making. The NIAS objective is to provide platforms for data collection and for creating an information base, multidisciplinary research leading to new conceptual frameworks, and share them with all stakeholders. The existing principles and guidelines on which the sharing of water between states is based was analysed from a multidisciplinary perspective and the results have been published as a book. Efforts have also continued on the strengthening of Zonal Water Partnerships in India. A new project Water Conflicts in India: The State, the People and the Future has been launched under which a multi-stakeholder

consultation has already taken place. On invitation from NIAS, Prof TN Narasimhan and Prof VK Gaur developed a document A Framework of India's Water Policy.

Education is an area having a very broad range of stakeholders: the educational institutions in the government and in the private sector, the teachers, the students, the employers etc. What can NIAS do, and is doing, that others who are better endowed have not been able to do? NIAS is spearheading the creation of a consortium of educational institutions, EDGE, for developing policy initiatives in higher education. In collaboration with the Panel for Women in Science of the Indian Academy of Sciences, NIAS has completed a national study on Trained Scientific Women Power: How much are we losing and why? A similar study on trends in higher education is being carried out analysing the production of PhDs in the country over the ten-year period 1998-2007. NIAS is also a part of the expert committee constituted by IGNOU, New Delhi to create knowledge modules in the area of Management in Higher Education.

The Urban Policy and Research Programme has got on to a start with a study of the contested governance of wetlands in Bangalore's Metro area in collaboration with ATREE, Bangalore. The outputs of this study will feed into a State of the City report on civic infrastructure and governance. Projects on re-conceptualising Indian and Chinese urbanisms beyond Western concepts, subaltern urbanisation in India and Bangalore's contested governance are some of the other projects on the anvil. The programme is also in the process of building several international collaborations.

The Conflict Resolution Programme has sought to develop an inclusive knowledge base that would help effectively address the major conflicts that affect India or have the potential to do so. It has sought to use Gandhi's concept of action to understand conflicts based on identity politics. Studies were carried out on models of reservation, trans-boundary water sharing, illegal migration into Nagaland etc. The programme has also launched a series of backgrounders on conflicts, with the first backgrounder being on Manipur.

A very major thrust was provided to the expansion of the NIAS Library, thanks to the liberal support of the Tata Trust. Given the relatively small scale in

which the Library had operated in the past, this meant that not only procedures had to be set in place to ensure that the expansion was smooth but also a conscious effort had to be made to identify books and journals for procurement taking into account the needs of the faculty and students in NIAS, and their availability in the libraries of neighbouring institutions.

As has been the practice in the recent years, the Annual Faculty Review was held on March 30 and 31, 2010. The presentations and the ensuing discussions offered ample opportunities to the faculty for assessment and introspection.

On the whole, the year 2009-10 has been one of growth for NIAS. Not only have there been several new

programmes but there have also been several new inductions of faculty and scholars. Our outreach through the Associates Programme has also flourished during the year. I am thankful to Dr K Kasturirangan for not only holding the reigns of the institute for nearly half the period of the report but also for sowing the seeds of growth. I am also thankful to the Chairman of the Council of Management, Prof MS Swaminathan, and other members of the Council for their unstinted support. Last but not the least, we are thankful to the Jamsetji Tata Trust for giving us an opportunity to realise the dream and vision of JRD Tata in building an institute of excellence in areas of research that are critical for the very survival of humanity in the fast moving, technologically driven world of today, cutting across disciplines.



Shikumar

Dr Sudha Murthy, Mr NR Narayana Murthy, Dr K Kasturirangan, Dr LC Jain, Dr Arcot Ramachandran and Mr Xerxes Desai leaving a meeting held to bid farewell to Dr K Kasturirangan.

# School of Humanities

Prof S Ranganathan, *Homi Bhabha Visiting Professor and Acting Dean*

Prof Arindam Chakrabarti, *Professor*

Prof Sangeetha Menon, *Professor*

Prof Sundar Sarukkai, *Professor (till December 31, 2009)*

Prof Malavika Kapur, *Visiting Professor*

Prof S Settar, *Visiting Professor*

Prof BV Sreekantan, *Visiting Professor*

Dr Rajesh Kasturirangan, *Associate Professor*

Dr MG Narasimhan, *Associate Professor*

Dr Sharada Srinivasan, *Associate Professor*

Mr Samir Karmakar, *Research Associate*

The School of Humanities continued to reflect an eclectic mix of work drawing upon different disciplines and traditions, including philosophy, history, cognition and archaeometallurgy. Faculty members of the school are also anchors of two programmes, one on Cognition and the other on Heritage Science.

A three-day National Seminar on the subject of Science, Technology and Society was organised by **Prof BV Sreekantan** to bring to focus the series of problems that the Indian society is facing which are becoming more acute day by day. The contributions made by major scientists and technologists of India at this seminar have been brought out as a joint publication of NIAS and the Institute of Advanced Study, Shimla during the year under report. Another publication *Remembering Einstein* based on a series of lectures delivered by eminent scientists at the Nehru Centre, Mumbai, was edited by Prof Sreekantan and has been slated for publication by the Cambridge University Press in June this year. As part of the celebrations of the Homi Bhabha birth centenary year, Prof Sreekantan gave six lectures on different aspects of Homi Bhabha's life and works and Prof Sreekantan's interactions with him as his student, at various centres, namely TIFR Math Centre, Bangalore, RRCAT, Indore, BARC, TIFR Bombay; Atomic Mineral Division, Bangalore and also at some schools in Bangalore. His interview on the topic *Homi Jehangir Bhabha: A Visionary* with a journalist will appear in the May issue of *Resonance* 2010, which is Journal of Science Education of the Indian Academy of Sciences.

## COGNITION PROGRAMME

The Cognition Programme is based on the assumption that cognition and other mental phenomena are



Overview of Konasamudram, Andhra Pradesh from a presentation on Telangana Survey 2010.



central to the functioning of all living beings. The fundamental principles governing cognition run from single cells to human societies. Cognition should then be studied comprehensively as opposed to bits and pieces (which is the usual scientific approach), with the larger view of life on the one hand, and classical problems in the social sciences and the humanities on the other. Such a birds'-eye view of cognition inherently calls for an interdisciplinary approach, with crucial inputs from biology, philosophy, mathematics and cognitive science. This is of course an ambitious vision but it can be broken down into constituent parts that form the basis of the research agenda of the cognition programme at NIAS. These parts are: to explore a small set of key philosophical, psychological, mathematical and biological concepts; to flesh out the fundamental concepts in terms of detailed mathematical models; using the empirical research coming from different species to provide key data on integrating models across spatio-temporal scales and species boundaries; and using models of cognition to understand classical problems in the social sciences and humanities, such as violence. The faculty members who have committed to aspects of the cognition programme are: **Dr Rajesh Kasturirangan**, the coordinator of the programme, **Prof Arindam Chakrabarti**, and **Prof Anindya Sinha**. The Cognition Programme also has one Research Associate, **Mr Samir Karmakar**.

Dr Rajesh Kasturirangan has also been continuing his research on the creative interface between theories of consciousness, language and perception in Indian Philosophy and current scientific investigations of these topics. This work is being done in collaboration with Prof Chakrabarti Ram-Prasad of the University of Lancaster in England and Prof Arindam Chakrabarti.

Dr Kasturirangan has also worked on the nature and origin of mathematical structures and their relationship to mental faculties present in the human mind. He also plans to use the broad framework of 'embodied cognition' along with data from humans and other primate species, to help understand the evolution of key human capacities like imitation, social learning and cultural transmission of knowledge.

The programme has also been involved with **The National Cognitive Science Initiative**. The goal of this initiative is to address basic questions about

the human mind with a view towards applications that will have immediate impact on Indian society. The Cognitive Science Initiative is a collaborative enterprise spread across several institutions in India with NIAS acting as the central node. They will be collaborating with scientists at IISc, ISI Kolkata, and SN Bose Institute Kolkata on various theoretical aspects related to networks and language, with scientists at NCBS, Bangalore and NIMHANS who will be giving us crucial psychological, imaging and animal data, and with researchers at IIT-Hyderabad on building computer and robotic systems.

Within this initiative the focus in NIAS is on two projects: the cognitive networks project which is geared towards basic research and the language and cognition project which connects basic research with societal applications. The National Cognitive Science initiative involves two NIAS faculty: Dr Rajesh Kasturirangan and Prof Anindya Sinha who are part of both the cognitive networks project (of which Dr Kasturirangan is the Principal Investigator) and the language project. As of March 2009, DST has granted funding to the language and cognition project and funding for the cognitive networks initiative was granted in October 2009.

Mr Samir Karmakar is primarily concerned about the relation between language and cognition. He is approaching the problems of language and cognition from the interactionist and constructivist viewpoint, assuming that the act of construing meaning at the level of discourse presupposes complex interactions among different contextualities involving culture specific patterns of belief and habitual actions. Currently, he is working with Dr Rajesh Kasturirangan on the issues of discourse level spatial and temporal perspectives at NIAS. The work results into a theoretical framework of discourse processing and an understanding of underlying cognitive reality of perspectivization process. The research findings are accepted for a presentation in the coming CogSci 2010 conference at Portland. Besides this, Mr Samir Karmakar is also interested in documenting and understanding social and cultural practices of various marginalized communities of India. At present, he is concentrating on the fishing techniques, practices and beliefs of the fishermen community of Sagardweep in order to understand the dynamics of various socio-cultural forces that (re)shape the elaborated and non-elaborated art forms of a fishermen community in a peninsular region.

## CONSCIOUSNESS STUDIES

**Prof Sangeetha Menon** completed a study to suggest that the brain and self challenge each other in influencing experiences and consciousness. Self is debated as a cognitive concept that helps tie the missing ends between the physical and psychological functions; and, the self is argued to be the locus of conscious experience. However different the arguments for these two positions are, it is agreed that human behaviour, attitudes and emotions are intricately tied to the neural structures on one side, and the indivisible experiential self on the other. Brain and self are the common threads that are used by neuropsychiatry, neuropharmacology and philosophy to get some hold on one of the most intractable problems of humankind, namely *Consciousness*. This paper to be published by Nanzan University, Japan, tries to show with examples from current research in brain studies, neuropsychology, and neuropsychiatry that the significant problem in consciousness studies is perhaps not the 'hard problem', but how to trace the ways in which the brain challenges the self, and the self challenges the brain.

Prof Menon also continued studies on psychology of emotions with two specific themes, one suggesting a theory on the Indian approach to emotions, and the other on aesthetic emotions in *Natyasastra* in the context of Darwin's work on emotions. Both the studies were completed with two papers, one published and the other in press. The manuscript for the book *Body, Experience and Consciousness: A Dialogue on Agency in Science, Spirituality and Arts* has reached the draft stage.

Her work on the *Sourcebook of Indian Psychology*, a project supported by Indian Council of Philosophical Research, progressed through its initial stages. Two meetings of its Editors and Contributors were organised.

## HERITAGE SCIENCE PROGRAMME

A major part of this programme, anchored by **Prof S Ranganathan** and **Dr Sharada Srinivasan**, is the execution of a Standard Research Award as part of the prestigious UKIERI (UK-India initiative) scheme monitored by British Council. This award is for the project entitled *Pioneering Metallurgy: Origins of Steel-making in the Southern Indian Subcontinent*, a collaboration between Exeter University and NIAS,

involving Dr Sharada Srinivasan and Dr Gill Juleff of Exeter as Lead Researchers and with Prof Ranganathan as the Indian co-investigator to enable exchanges and archaeometallurgical field investigations of sites related to the production of early iron and steel, including megalithic sites in southern India.

The project commenced in January 2009 and from April 2009 to March 2010 there have been exchange visits between India and the UK of not only the senior staff but also Ph.D. students. A six-week NIAS-Exeter field expedition was undertaken in early 2010 to the Telangana region of Andhra Pradesh which has very rich archaeometallurgical evidence for pre-industrial production of crucible steel or wootz and iron smelting and over 120 sites surveyed and samples collected for archaeometallurgical study. Under the UKIERI project a mapping of the early development of iron and steel is under way. This will include geomatics. A joint NIAS-EXETER UKIERI pioneering metallurgy workshop was held on Feb 25<sup>th</sup> covering the background to the study of early iron and steel in the southern Indian subcontinent and the UKIERI NIAS-EXETER expedition to the Telangana region.

In the first theme on archaeometallurgy preliminary insights on megalithic iron technology with respect to the site of Kadabakele, southern India have been obtained in collaboration with Dr Sharada Srinivasan. Further analysis of the influence of the ancient wootz steel on the modern paradigm in materials science has been attempted. Experimental archaeology to reproduce ancient wootz steel with alloying additions have been planned in collaboration with Dr S Jaikishan.

The splendours of Indian bronzes are analysed from our knowledge of modern metallurgy. In particular the image casting at Swamimalai of icons and bronze mirrors at Aranmula are studied from the points of composition, processing and an unusual breadth in properties. Under collaboration with the Japanese a comparative study of bronze mirrors of China, Korea, Japan and India will focus on possible origins and diffusion of technologies.

Prof Ranganathan is also studying the *History of the Foundation of IISc and NIAS*, capturing the lively exchange about the early years of the Indian Institute of Science and the different perspectives on the role

of Burjori Padshah. The roles of JN Tata and sons, Burjori Padshah, Swami Vivekananda, Viceroy, Maharajas and Dewans are being delineated. The extraordinary stamp of the scientists from England and in particular the University College London and Cambridge and the Knights of the Realm at Bangalore will be emphasised. The question of the late start of the Metallurgy Department (it ought to have been the first Department in 1909) in 1945 will be answered in collaboration with the historian Prof Kim Sibal. The concept and gestation of NIAS as seen through the eyes of JN Tata, B Padshah, John Matthai and JRD Tata over a century before its birth in 1988 will be described. The creative tension between Science and Humanities and the necessity for their harmonious existence will be touched upon.

Prof Ranganathan is also through a project with support from the Office of Naval Research, USA exploring the scientific landscape with respect to institutions of excellence and significant conferences in India. He is also looking at the tension between the Sciences and the Humanities from a historical viewpoint. The use of the Periodic Table, the lives of the renaissance men, Georgius Agricola and Cyril Stanley Smith, will be profiled. A contrast and comparison of the creative impulse in the Arts and the Sciences is attempted. Art and Crystallography, NanoART and Digital Hampi present a consilience between the Sciences and the Humanities.

Dr Sharada Srinivasan completed in July 2009 the DST project on *Ancient Harappan Metallurgy with respect to the Newly Excavated Site of Dholavira* undertaken with co-operation of ASI. Dholavira is one of the five largest of Harappan cities and is situated in the isolated island of Khadir in the Great Rann of Kachchh in Gujarat, and has been excavated for several seasons by Archaeological Survey of India (ASI). Numerous specimens of copper-bronze artifacts were sampled during two field trips to Dholavira and explorations were made with respect to pyrometallurgical or pyrotechnical evidence include remains of furnaces and related debris and slag etc. Samples of copper alloys specimens were taken of some 30 artifacts including metal specimens and a few slags from the various major stages of Dholavira and parts the citadel, middle town, lower town and reservoirs. The copper alloy artifacts were subjected to metallographic study and some slag and ores specimens to spectro-chemical analysis and lead isotope analysis.



A smith at work repairing tools in Shekalla village, Telangana, Andhra Pradesh.

Dr Srinivasan is also working on a pilot project on scientific studies related to heritage with the objective of both developing a larger programme at NIAS and to support investigations in relation to the UKIERI project. On this project Dr Srinivasan also made a field visit to the Hassan district to explore aspects related to archaeometallurgical evidence for old workings near the Kalyadi region and to explore links between sculptural and bronze traditions as exemplified by Hoysala and Ganga art and architecture in Hassan district.

Dr Sharada Srinivasan and Prof S Ranganathan completed the CBS Archaeoastronomy and Archaeometallurgy project supported by Centre for Basic Sciences, Mumbai. Dr Sharada Srinivasan's activities and research under this project covered aspects of the interfaces between archaeo-astronomy, archaeo-metallurgy and ethnometallurgy. The project also met a part of the expenses towards the costs of mounting an exhibition on the art-science-dance and archaeometallurgical and archaeoastronomical insights on the Nataraja bronze held at the venues of science museum of Cite De L'Espace, Toulouse, for the art-science La Novela Festival; at Indian Institute of Astrophysics, CREST, Hoskote; Alliance Franchise Bangalore (coinciding with the Beginning of Use of Metals and Alloys conference); and Tata Institute of Fundamental Research, Homi Bhabha Fellows Conclave, over the months of September to November 2009.

Prof S Ranganathan and Dr Sharada Srinivasan served as co-chairs for the seventh international conference on the Beginnings of the Use of Metals

and Alloys, BUMA VII. This prestigious international conference was brought to India for the first time and held at NIAS from September 13 to 18, 2009. More than 100 delegates from 25 nations drawn from leading museums and research institutions across the five continents assembled together to present more than 70 papers covering various aspects of contemporary research shedding new light on ancient use of metals and alloys and the links between metallurgy and civilisation. Delegates were from leading institutions such as Metropolitan Museum of Art, British Museum and C2RMF, Louvre. The conference was a huge success and was much appreciated both in the quality of the technical papers as well as the arrangements and hospitality as also recorded by the past and present Conference Chairmen, Profs Robert Maddin, Thilo Rehren and Jianjun Mei, with Prof Maddin rating it as the best he had attended.

Prof S Ranganathan, Dr MG Narasimhan and Dr RV Krishnan organised during the X Plan four one-week workshops on *Dimensions of Nanotechnology: Science, Technology, Business and Society*. They were also identified by India-Brazil-South Africa programme on Nanotechnology to help with Education and Human Resource Development. The societal implications of nanotechnology for the Indian society are being explored from the perspectives of education, commercialisation and nanotoxicology. A comparative study of the development of nanotechnology in the West, China, India, Brazil and South Africa has been completed.

## HISTORY

**Prof S Settar's** major engagement has been the continuation of the Annotated Kannada Lexicon of the first millennium A.D. An ambitious project, on which he has already spent two decades, it is now taking final shape and it may be possible to bring out the first two volumes in the next twenty months. This is a self supporting project, worked from NIAS.

A script Prof Settar had prepared for production of sound and light show on Hampi has been accepted by the Ministry of Culture and Tourism and the production is expected to be completed during this year. During the current year, Prof Settar provided the concept, text, and English subtitles to two documentaries made on *Kumaravyasa Bharata*, (*Draupati Svyamvara* and *Draupati Vastrapaharan*).

In addition to this, five documentaries covering the history, architecture, rituals, and the festivities of Sravana Belgola, one of the foremost Jaina centres, have been completed this year. All these are based on his scripts and completed with his personal anchoring. These form a part of the IGNCA archives and get broadcast in the Doordarshan International Channel.

Prof Settar was also given the *Scholar in Residency* position by the Central Sahitya Academy. He is using this privilege to write on the early Kannada script and language.

## PHILOSOPHY

**Dr MG Narasimhan** has been working in the area of Philosophy of Biology with special focus on theory of evolution and related topics. Within this he has been examining various issues related to the structure and development of theory of evolution. Currently he is doing a detailed study of the conceptual framework of the theory of evolution as found in such concepts as Natural Selection, Adaptation and Fitness. In addition to the above, he is doing a study of Risk Perception in the contest of Nanotechnology, specifically Nanotoxicology. These two areas put together constitute what might be called as theoretical and applied studies in the fields of Biology and Biomedicine.

## OUTREACH AND OTHER ACTIVITIES

**Prof Malavika Kapur** was the chief guest for Reliance Time Out Story Competition Prize Distribution in Bangalore on May 16, 2009. She runs free Child Guidance at Prasanna Counselling Centre, Bangalore. She was nominated by the ICSSR to Central Institute of Indian Languages Mysore, for the Language Translation Mission (a spinoff of the Knowledge Commission) as Psychology Advisor to language texts for psychology; appointed the member of the Departmental Advisory Board (DAB) of the Department of Educational Research & Policy Perspectives (DERPP) of the NCERT, New Delhi; member of the Departmental Advisory Committee (DAB) of the International Relations Division, NCERT, New Delhi and member of the Advisory Group on the revision of International Classification of Mental and Behavioural Disorders (ICD-10) of Child and Adolescent disorders at the Mental Health and Substance Abuse Division, WHO headquarters,

Geneva in January 2009 for a period of two years. She was elected the President for a term of two years to the Indian Association of Clinical Psychologists, on February 2, 2010 at the 36<sup>th</sup> National Annual Conference of Clinical Psychologists at NIMHANS, Bangalore.

**Dr Rajesh Kasturirangan** and **Dr Carol Upadhy**a organised a seminar on *Structure and Its Discontents* on February 26, 2010. The Structure seminar consisted of seven talks by NIAS faculty on the theme of structure and structuralism. Dr Rajesh Kasturirangan continued the seminar series called *Spacecollab* that he is co-organising with Prof Geetanjali Sachdeva of the Srishti School of Arts, Design and Technology. There have been five spacecollab seminars, three at NIAS and two at Srishti.

**Prof Sangeetha Menon** was invited to be a member of the panel to review the Annual Progress Presentations (APR) at Industrial Design Centre, IIT Mumbai. She coordinated NIAS Wednesday Discussion Meetings and with Dr Sharada Srinivasan and Ms Leena Pascal, NIAS Literary, Arts and Heritage Forum. She coordinates NIAS Canteen Committee. She is the member of NIAS Course Cell Committee and NIAS Library Committee. She designed and put together NIAS Brochure for 2010. She coordinates NIAS website reorganising and regular updates.

Prof Sangeetha Menon organised a discussion meeting for the *Sourcebook of Indian Psychology*, sponsored by Indian Council of Philosophical Research at NIAS on August 3 and 4, 2009.

During December 2009, Prof Sangeetha Menon visited and lectured at Nanzan Institute for Religion and Culture, Nanzan University, Nagoya Japan. She also visited Melbourne to speak at the World Parliament of Religions.

**Dr MG Narasimhan** organised three seminars in three prominent colleges of Bangalore as part of Darwin's 200<sup>th</sup> birth anniversary. Of the three, on September 4 and 5, 2009 a two day seminar was held in the NMKRV College for Women. In the seminar, he made the inaugural presentation on *Charles Darwin – A Complete Biologist*. This was then

followed by other talks on topics related to evolutionary biology and immunology. An important aspect of this event was that it received substantial financial support from all the three science academies of the country through the help of the Indian Academy of Sciences.

**Prof S Ranganathan** and **Dr Sharada Srinivasan** have been engaged with the DST in developing with other IT professionals a project on India Digital Heritage with a closer focus on Hampi in relation to the cultural component.

**Prof S Settar** inaugurated three national level seminars, on each of which occasion he delivered keynote addresses, delivered the ninth annual convocation address at the Karnataka State Open University, Mysore, examined a Ph.D. thesis of the Jawaharlal Nehru University, New Delhi, reviewed Delhi University Post-Graduate History Syllabus, wrote forewords to the books *The Torana in Indian and Southeast Asian Architecture* by Dr Parul Pandya Dhar, *Samsodhana – Chaturmukha* (in Kannada) by Dr BV Sirur and *Sahitya – Samskriti Anveshane* (in Kannada) by Dr Nagabhushana, organised a two-day seminar on *Early Kannada Language and Script* at IGNCA, SRC, Bangalore. Kannada and Culture Department, Bangalore invited him as guest for the programme titled *Maneyangaladalli Matu Kate* on February 20, 2010.

Dr Sharada Srinivasan participated in a seminar at the Tate Museum, London on 'Eye of the storm' on art-science and sustainability issues on June 19, 2009. She also visited the Science Museum of Cite De L'Espace in Toulouse at the invitation of City of Toulouse to discuss the proposal to participate in the La Novela Festival for an event for the International Year of Astronomy.

## RESEARCH ASSOCIATE

**Mr Samir Karmakar**, joined NIAS as *Research Associate* on October 1, 2009. He is working with Dr Rajesh Kasturirangan primarily on the issues of spatial and temporal perspectives at the level of discourse. The work results into a theoretical framework of discourse processing and an understanding of the underlying cognitive reality of perspectivization.



Prof PK Shetty, *Professor and Dean*  
Prof Anindya Sinha, *Professor*  
Prof Prabhakar G Vaidya, *Professor*  
Prof K Ramachandra, *Visiting Professor*  
Dr Sindhu Radhakrishna, *Associate Professor*  
Dr Kshama Lakshman, *Post-doctoral Associate*

The School of Natural Sciences and Engineering covers the fields of engineering, mathematics, biosecurity, agriculture, ecology, animal behaviour and conservation biology. Current research interests of the faculty members include various aspects of signal and image processing; cryptography; number theory; mathematical modelling of complex chaotic systems; studies on agro-ecology and plant and animal biosecurity; pesticide and environmental stewardship; animal ecology and behaviour, particularly of primates; animal cognition and human-wildlife conflict.

**Prof Prabhakar G Vaidya, Ms PS Sajini Anand and Mr Nithin Nagaraj** published their research on *A Non-linear Generalization of Singular Value Decomposition and its Application to Mathematical Modeling and Chaotic Cryptanalysis*. The paper introduced a method based on a nonlinear generalization of Singular Value Decomposition (SVD) of specially augmented time series. SVD is a useful tool to find hidden structure in the data. Using embedding of data one can perform functional regression in the feature space of smooth functions.

In the paper, it is proposed an extension of SVD for both the qualitative detection and quantitative determination of nonlinearity in a time series. The method is to augment the embedding matrix with additional nonlinear columns derived from the initial embedding vectors and to extract the nonlinear relationship using SVD. The paper demonstrates an application of nonlinear SVD to identify parameters when the signal is generated by a nonlinear transformation. Examples of maps (Logistic map and Henon map) and flows (Van der Pol oscillator and Duffing oscillator) are used to illustrate the method of nonlinear SVD to identify parameters. The paper presented the recovery of parameters in the following scenarios: (i) data generated by maps and flows (ii) comparison of the method for both noisy and noise-free data (iii) surrogate data analysis for both the noisy and noise-free cases. They discussed two applications of the method in the paper:

# School of Natural Sciences and Engineering

MD Madhusudan

Arunachal Macaque, Tawang, Arunachal Pradesh.

(i) Mathematical Modeling and (ii) Chaotic Cryptanalysis.

Prof Vaidya's student Mr Nithin Nagaraj successfully defended his Ph.D. thesis titled *Novel Applications of Chaos Theory to Coding and Cryptography* on January 29, 2010.

## BIOSECURITY PROGRAMME

**Prof PK Shetty** conducted a study of *Integrated Pest Management in Agro Ecosystems in India*. Although total area under IPM is estimated to be only 2% in India, in recent years, the consumption of bio pesticides has been increased steadily in many parts of the country. About 64% from a total of 1039 respondents (farmers) in this survey followed at least one of the IPM tools in different agro ecosystems in India. No significant difference was noticed among the farming categories regarding the awareness of IPM tools. Literacy level of farmers had no significant influence on the awareness of IPM. Repeated sampling showed only slight improvement on the adoption of IPM tools. Easy availability of good quality IPM components and speedy, effective and timely dissemination of information were the main constraints in implementation of IPM at farm levels.

Prof Shetty and **Mr Muthuswamy Murugan** studied *Rainfall Changes over Tropical Montane Cloud Forests of Southern Western Ghats, India*. Three out of four montane cloud forest sites studied in the southern Western Ghats had experienced diminishing trends of seasonal average and total rainfall, especially during summer monsoon season. The study looked at the variability in rainfall across these sites to understand the extent of rainfall reduction and probable effect on cloud forest ecosystem. The variability in annual rainfall observed in our study, compounded the decrease in stream water flow and thus affected the hydrology of cloud forest system.

Prof Shetty along with Mr Muthuswamy Murugan studied the *Soil and Surface Air Warming in Cardamom Ecosystem in Southern Western Ghats*. Climatic variables for the period 1986-2004 were recorded in highly disturbed wet tropical agro forest in the Cardamom Hill Reserves (CHR), where monoculture of small cardamom (*Elettaria Cardamomum M*) has been practiced since 1895. The mean annual soil temperatures at depths of 5 cm, 10 cm and 15 cm showed an increase. Mean

annual air temperature also rose by 0.4° C, with the greatest increase in April (considered the hottest month). Relative humidity declined significantly by an order of 9.1%, over the same period. The lowest relative humidity value of 44.2% was registered only in the last five years. Organic carbon content dropped by 0.24% and 0.41% in cardamom and black pepper fields respectively. The soil and air temperatures recorded from undisturbed tropical ever green forests (Eravikulam National Park, Munnar; Thrissur, Kerala) for the same period showed no significant difference. The interplay of climatic variables and human-induced agricultural manipulations as evident from land use changes, are expected to severely negatively impact the sustainability of cardamom ecosystem. Soil warming and soil microclimate can have profound influence in disease spread in crop fields. Additionally, the soil nutrient dynamics can also be altered depending on the prevailing soil climatic condition, which in turn can change insect pest population dynamics.

Prof Shetty and Mr Muthuswamy Murugan also studied *The Physiological Ecology of Cardamom (Elettaria Cardamomum M) in Cardamom Agroforestry System*. Since 1895 cardamom has been cultivated in the cardamom hills of Western Ghats, India, which form a part of global biodiversity hot spots. These tropical forests in the last couple of decades have been subjected for severe periodical shade lopping and selective felling for maximising cardamom production. This study was undertaken to fix the optimum shade level for cardamom so that the forest structural and functional biodiversity of cardamom hills can be maintained. The optimum shade level for cardamom plantations has been recommended considering all aspects of the ecosystem.

## ECOLOGY, BEHAVIOUR AND CONSERVATION PROGRAMME

The Ecology, Behaviour and Conservation Programme has been largely exploring the ecology, behaviour, cognition, genetics and conservation status of several species and populations of primates across the country. Over the last year, the principal projects it has initiated or continued include long-term studies on the demography, behavioural ecology, population genetics and conservation of two macaque species, the bonnet macaque of southern India and the Arunachal macaque of Arunachal Pradesh as well as relatively short-term studies on the behavioural

ecology of mixed troops of rhesus and bonnet macaques in Maharashtra, community ecology and conservation of primates in Assam, foraging ecology of the liontailed macaque, and the distribution and conservation status of the slender loris in southern India. The programme has also initiated a new collaborative project on behavioural genetics, involving the serotonin uptake pathway, in macaques and continued social network analysis of primate societies, based on behavioural data on bonnet macaques. Finally, the programme has continued to explore the ecology and behaviour of several non-primate species including elephants, flying squirrels and shortwings.

### **Ecology, Demography, Behaviour, Genetics and Conservation of Southern Indian Diurnal Primates**

**Mr Subhankar Chakraborty, Mr Mayukh Chatterjee,** Mr Debapriyo Chakraborty, Dr Uma Ramakrishnan and **Prof Anindya Sinha** researched the *Distribution, Morphology, Behavioural Ecology and Phylogenetics of the Bonnet Macaque: A Comparative Account of the Two Subspecies*. Over the year they examined the morphology, demography and life history strategies of identified individuals in selected troops of the two subspecies in two protected areas – Bandipur National Park and Kalakad-Mundanthurai Tiger Reserve – within their respective distributions. This investigation aims to confirm the biological legitimacy of the two subspecies using several alternative empirical field and laboratory approaches, including geographical distribution, morphometric analysis and population genetic differentiation.

Mr Mayukh Chatterjee, Dr Kakoli Mukhopadhyay and Prof Anindya Sinha studied the *Demography, Ecology and Social Evolution in Wild Bonnet Macaques*. They continued their demographic monitoring of twenty-two troops of the species and quantitative observations on the socioecology of five of these groups. During this work, they were able to document the influence of tourist traffic through these sanctuaries on the evolution of a new unimale form of social organisation in this species, characterised by certain unique demographic and behavioural features. Their studies on the socioecology of selected multimale and unimale troops in this population have allowed them to evaluate the ecological and anthropogenic factors that may have influenced the trajectories of social change in this population.

**Mr Rishi Kumar** and Prof Anindya Sinha studied *Social Organisation and Social Relationships in Wild Bonnet and Rhesus Macaques*. They completed a field study on the demography and socioecology of pure and mixed-species troops of rhesus and bonnet macaques in the states of Andhra Pradesh and Maharashtra last year. Two important accomplishments of this project include the delineation of the distribution boundary of rhesus and bonnet macaques in peninsular India, and studies on the behavioural ecology, demography and conservation status of the two species and their mixed troops in selected sites in western Maharashtra.

**Dr HN Kumara** and Prof Anindya Sinha researched the *Ecology and Conservation of the Lion-Tailed Macaque in Karnataka State*. The lion-tailed macaque is a highly endangered primate that is facing imminent local extinction or is on a sharp decline in many protected areas over its distributional range in the Western Ghats Mountains of peninsular India. The newly discovered Sirsi-Honnava population of the macaque marks the northernmost point of its distribution. They have continued studies on the ranging and feeding ecology of this population, and initiated conservation measures to protect its last constituent groups.

### **Ecology, Behaviour and Conservation of Northeast Indian Diurnal Primates**

**Mr Narayan Sharma,** Dr MD Madhusudan and Prof Anindya Sinha researched *Community Ecology and Conservation of Primate Communities in the Lowland Rainforests of the Brahmaputra Valley, Assam State*. They were continuing their research on the distribution and community ecology of four macaque species – the Assamese macaque, pigtailed macaque, rhesus macaque and the stumptailed macaque, together with the hoolock gibbon and the capped langur – in the lowland rainforest fragments of the Upper Brahmaputra Valley in Assam. In the second phase of this project, they have been conducting a detailed observational study on the resource utilisation, competition and niche partitioning displayed by the above-mentioned primate community in the Hollongapar Gibbon Wildlife Sanctuary of upper Assam. Local people – students, teachers, researchers, conservationists and forest management personnel – in upper Assam are also being trained in some basic methodologies to enable them to monitor specific macaque communities, identified as threatened, and implement



appropriate management strategies for their conservation.

Ms Sumithra Sankaran, Mr Narayan Sharma, Mr R Suresh Kumar, Dr Gopal Singh Rawat and Prof Anindya Sinha researched *Social Behaviour and Communication in the Hoolock Gibbon*. The hoolock gibbon, the only anthropoid primate found in India, is a pair-living, territorial species, which duets extensively. This study aims to understand the nature of social behaviour of this species, and how duetting contributes to the repertoire of social behaviour in this primate. Preliminary results suggest significant differences in the patterns of social behaviour across the three study groups, a rather more dominant role of the adult male in the monogamous relationship in contrast to the predicted equality of dominance status across the two sexes and considerable infant care by the adult males in the study groups.

### **Distribution and Conservation of the Two Nocturnal Indian Prosimians in Southern and Northeastern India**

**Dr Sindhu Radhakrishna**, Dr HN Kumara and Prof Anindya Sinha researched the *Distribution, Abundance and Conservation Status of the Slender Loris in the Eastern and Western Ghats*. Their studies on the slender loris continued to explore the geographical range limits of the two Indian subspecies, the Mysore slender and the Malabar slender loris, their population densities, and factors affecting their abundance in the Eastern and Western Ghats mountains. Field surveys investigating the presence and abundance of lorises were conducted in the states of Tamil Nadu, Kerala, Maharashtra and Goa. Apart from exploring the distribution patterns of these two subspecies, an important aim of the study is also to examine the conservation status of the species, with particular reference to the effects of hunting and habitat degradation.

Dr Sindhu Radhakrishna and Prof Anindya Sinha carried out a *Population Survey of the Bengal Slow Loris in Northeastern India*. The project on the Bengal slow loris, initiated last year, has been surveying forested areas in Mizoram and Meghalaya in northeastern India, in order to estimate the population status of this highly endangered, though virtually completely unknown, species. This study is part of a long-term effort to map the distribution of the species in all the states of northeastern India, determine

critical conservation threats to its survival and study the socioecology of the species.

### **Individual Temperament, Social Cognition and Communication in Nonhuman and Human Primates**

Mr Sartaj S Ghuman, **Dr Rajesh Kasturirangan**, Dr Michael A Huffman and Prof Anindya Sinha continued their study of *Social Cognition, Communication and Culture in Wild Bonnet Macaques*. This follows a long-term interest to investigate the social cognitive abilities of wild bonnet macaques, particularly from the perspective of both distributed and/or embodied cognition as well as individual internal processes such as theory of mind. Their earlier studies had focused on specific behavioural processes including the acquisition of social knowledge and tactical deception in this species. The effort now is to continue to document the phenomena of behavioural transmission in this macaque and investigate the cognitive processes underlying tactical deception in wild groups of this species.

Mr Subhankar Chakraborty and Prof Anindya Sinha are researching *Temperament and Personality in Wild Bonnet Macaques*. They are currently in the process of devising novel methodologies that could be employed to not only define but to gain deeper insights into several issues of personality in a nonhuman primate species, typically characterised by remarkable variation in individual life-history strategies. These include, but are not restricted to, consistency/variability in personality traits, individual differences against the background of a ubiquitous species-typical nature, sex differences and similarities, age-graded and developmentally contingent personality phenomena, and the contextual determinants of personality.

**Ms Rolla Das**, Dr Rajesh Kasturirangan and Prof Anindya Sinha are exploring *Gestural Communication in Human Primates*. They hope to unravel the cognitive and neurobiological mechanisms underlying the creation and comprehension of different categories of gestures in accordance with differences in their encoding and function. They plan to characterise some of the Indian languages such as Bangla and Tamil in terms of their gestural richness, and the frequency of use of such gestures by native speakers, and follow this up by



Capped Langur, Hollongapar Gibbon Wildlife Sanctuary, Assam.

analysing the patterns of gestural code-switching across languages by Indian bi- and multilinguals in different linguistic contexts.

### **Molecular, Population and Behavioural Genetics of Indian Macaques**

Mr Debapriyo Chakraborty, Dr Uma Ramakrishnan and Prof Anindya Sinha are examining *Phylogenetics and Phylogeography of Bonnet and Arunachal Macaques*. This collaborative project has been exploring the molecular phylogeny of the *sinica* group of macaques, including the Arunachal macaque species complex and the bonnet macaque. They have now begun to employ species-specific microsatellite DNA sequence probes to investigate the population genetic structure of the Arunachal macaque and the macaques of central Arunachal Pradesh, and the molecular population genetics of bonnet macaques over its entire distribution range in peninsular India. Their most noteworthy achievements during the last year include a complete characterisation of about thirty bonnet macaque and Arunachal macaque microsatellite sequences and the successful isolation

and amplification of both mitochondrial and nuclear DNA from faecal samples.

Mr Subhankar Chakraborty, Mr Debapriyo Chakraborty, Dr Sanjeev Jain, Dr Uma Ramakrishnan and Prof Anindya Sinha are researching *Behavioural Genetics of Aggression in Bonnet Macaques*. In this collaborative project, initiated in May 2007, the genetic basis of certain social behavioural patterns in macaques is being explored. In this connection, the study looks at the genetic polymorphism of the promoter region of a gene, 5-HTTLPR, responsible for the uptake and transport of the important neurotransmitter serotonin, in three macaque species: the behaviourally well studied bonnet macaque, the recently-discovered Arunachal macaque complex, and the ecologically-restricted liontailed macaque.

### **Theoretical Analysis and Computational Modelling of the Structure and Dynamics of Primate Societies**

Mr Jayendra Baliga, Dr Sitabhra Sinha and Prof Anindya Sinha have researched the *Social Network Analysis of Bonnet Macaque Societies*. They are investigating the appropriate agent-based models that could account for several emergent properties of the bonnet macaque social networks that were observed earlier. An interesting issue that is also being addressed is the role played by interactions between general rule-based behaviours and individual-specific cognitive behaviours in the emergence of social networks such as those of cercopithecine primates, which perhaps represent an intermediate stage between the simpler prosimian groups and the much more complex human societies.

**Mr Kishor G Bhat**, Mr Mayukh Chatterjee, Mr Amit Sengupta and Prof Anindya Sinha are exploring the possibility of developing more robust statistical methods and computational tools to model complex social dynamics data and determine guidelines for the allocation of sampling effort when dealing with complex systems such as primate societies.

### **Ecology, Behaviour, Genetics and Conservation of Birds and Mammals in the Western Ghats Mountains, Southern India**

**Mr Robin Vijayan**, Ms Shreejata Gupta, Dr Uma Ramakrishnan and Prof Anindya Sinha have

researched the *Demography, Ecology, Behaviour, Population Genetics and Conservation of an Endemic Bird, the White-Bellied Shortwing*. They examined breeding song variation across two isolated, genetically different populations of the bird and also between two genetically similar populations in a single area separated by deforested lands. They found that all three populations were significantly different from each other with the most difference between the genetically different populations across the two isolated populations. They also found that in each population, there were individuals that sang songs that were typically of another population while some individuals sang only songs of its own type.

Ms Nandini R and Prof Anindya Sinha have been researching the *Behavioural Ecology and Conservation of Flying Squirrels*. India has upto eleven species of flying squirrels, and two of these are distributed in the Western Ghats: the endemic and vulnerable Travancore flying squirrel and the Indian giant flying squirrel. As part of their ongoing project on the behavioural ecology and conservation of these two species, they continued to explore if the two species are sympatric across different forest types and altitudes, and to record their natural abundance levels in such habitats.

### **Human-Wildlife Conflict and Cooperation**

Mr Raghav Saraswat, Ms Shreya Bhat, Dr Sanjay Sondhi, Mr Pushpendra Rana, Dr Sindhu Radhakrishna and Prof Anindya Sinha are researching *Rhesus Macaque-Human Conflict in Northern India: Attitudes and Perceptions*. The aim of this study, initiated earlier this year, is to document the nature of the rhesus macaque-human conflict in selected villages in the affected states of Uttarakhand and Himachal Pradesh in order to evaluate the attitudes and perceptions of the local agricultural community towards the problem macaques. The specific objectives of the study are to assess the nature of human-rhesus macaque conflict in these villages, evaluate the demography and foraging ecology of the problem macaque troops, particularly with reference to the extent of crop-raiding and other depredation displayed, assess the socio-economic impact of crop-raiding caused by the macaques, and evaluate the attitudes and perceptions of the local community towards the rhesus macaque and its conservation.

Ms Shreya Bhat, Dr Sindhu Radhakrishna and Prof Anindya Sinha are studying the *Human-Hanuman Langur Conflict at Dakshineswar, West Bengal*. This project examined the nature of conflict between a troop of hanuman langurs and humans at the Dakshineswar Kali Temple and Debottar Estate, Kolkata. The aims of this investigation were to examine a consolidated time-activity budget of the troop, determine dietary composition and its variation during the course of the day, observe and categorise human-langur interactions at the temple and identify the key individual adult females who contribute to these interactions, and finally, conduct a survey of people's perceptions and attitudes towards the langurs, a threatened species increasingly facing conflict with people over much of its distribution range in eastern India.

Mr Nishant M Srinivasaiah, Mr V Srinivas, Dr Vijay D Anand and Prof Anindya Sinha have initiated a study of *Human-Elephant Conflict around Bannerghata National Park, Karnataka*. The study proposes to estimate resource availability and human disturbance in the human-dominated elephant habitats around the Bannerghata National Park and evaluate the demographic, foraging, social and ranging behaviour of elephants in this area. The data thus collected will be analysed to assess the behavioural adaptations of elephants to the prevailing conditions of resource availability and human disturbance, the nature of interactions between humans and elephants, the possible temporal and spatial separation between the two species and the management of the affected elephant population.

Ms Coralie D'Lima, Dr Helene Marsh, Dr Rohan Arthur and Prof Anindya Sinha are studying the *Irrawaddy Dolphin-Human Interactions at the Chilika Lagoon, Orissa*. They use the interaction between the Irrawaddy dolphin and fishers of Chilika lagoon as an example of a human-wild species relationship. The objectives of this study have been to (a) understand the feeding behaviour of dolphins at fishing nets, (b) determine perceptions of fishing communities towards the Irrawaddy dolphin at Chilika Lagoon, and (c) explore the socio-economic, political, historical, ecological and cultural drivers of fisher attitudes towards dolphins.

### **Conservation Education**

Dr Sindhu Radhakrishna, **Dr BK Anitha**, Dr VV Binoy and Prof Anindya Sinha have initiated a project

on *Conservation Education through Citizen Science: A Pilot Study in Malappuram District, Kerala*. The project aims to develop conservation education through citizen science. The more specific aims of our project are to improve students' understanding of biodiversity and raise awareness about threats to biodiversity. In the pilot phase of the project, a study was initiated Malappuram district of Kerala, involving students in the age group of 13-15 from 15-20 schools.

## OUTREACH AND OTHER ACTIVITIES

**Prof PK Shetty** organised a discussion meet on *Climate Change and Agriculture-The Israeli Experience* on December 11, 2009 at NIAS. Prof Raanan Katzir, a world-renowned agronomist and who has more than forty years of working experience with the Israeli Ministry of Agriculture was the key speaker. Many stakeholders in the agricultural sector attended this meeting.

Prof Shetty coordinated Associates' Programmes.

**Prof Anindya Sinha** guided a dissertation entitled *A Preliminary Study of the Ecology and Behaviour of a Troop of Hanuman Langurs in Dakshineswar Kali Temple, Kolkata* by Shreya Bhat, submitted in partial fulfilment for a Master's degree in Ecology and Environmental Science at Pondicherry University, Puducherry, May, 2009. He also guided a dissertation entitled *Social Behaviour and Duetting of the Western Hoolock Gibbon Hoolock Hoolock in the Hollongapar Gibbon Wildlife Sanctuary, Assam* by Sumithra Sankaran, submitted in partial fulfilment for a Master's degree in Wildlife Science at the Wildlife Institute of India, Dehradun, under the aegis of Saurashtra University, Rajkot, July, 2009.

Prof Anindya Sinha coordinated and taught a three-credit course, consisting of lectures, seminars, project assignments and fieldwork techniques, on *Behavioural Ecology* for Master's degree students of the Post-Graduate Programme in Wildlife Biology and Conservation, Bangalore, April to May 2009.



Southern Flying Lizard, Dandeli-Anshi Tiger Reserve, Karnataka.

# School of Social Sciences



Dr Kirit S Parikh speaking on 'Globalisation, Climate Change and India's Options'.

Shivkumar

Prof Narendar Pani, *Professor and Dean*  
Prof Dilip R Ahuja, *ISRO Professor of Science and Technology Policy*  
Prof N Shantha Mohan, *Professor*  
Prof AR Vasavi, *Professor*  
Prof Malati Das, *Visiting Professor*  
Prof DP Sen Gupta, *Visiting Professor*  
Prof SS Meenakshisundaram, *Visiting Professor*  
Dr BK Anitha, *Associate Professor*  
Dr Solomon Benjamin, *Associate Professor*  
Dr Carol Upadhya, *Associate Professor*  
Dr M Amarjeet Singh, *Assistant Professor*  
Ms Shivali Tukdeo, *Research Associate*

The School of Social Sciences consolidated its efforts to research problems facing India's economy, polity and society, and to disseminate the results to the bureaucracy, industry and civil society. In keeping with the overall thrust of the institute towards programmes, the school played a leading role in six programmes: energy, water, urban studies, education, interdisciplinary approaches to economic issues, and conflict resolution.

While much of the work was focused on specific programmes some faculty members had other concerns as well. **Prof AR Vasavi's** work focused on consolidating research from various projects and working on the data and ideas to turn them into publishable materials and also delivering lectures based on them. She tried to interlink the three key domains of her academic interest, Sociology of India, Agrarian Studies and Sociology of Education. She did field work and continued to engage in advocacy issues, especially pertaining to elementary education and agrarian issues. Her work on *Four Emblematic Figures and the Making of a New India* draws on data from various projects and seeks to provide a sociological commentary on India in the period 1997–2007. *Suicide and the Predicament of Rural India* is an extension of the arguments made in the essay, 'Suicides and the Making of Agrarian Distress in India'. *Review of Data from Vidyankura (Chamarajnagar) Project* covers the period 2002–2007. It provides a critical review of the project, its potential and problems. She edited a book, *The Inner Mirror: Translations of Kannada Writings on Society and Culture* which was published by the Book Review Press, New Delhi. Providing continuity to her earlier work (1989–1990) in Bijapur, and focusing on the new alterations in agriculture and rural life, she also carried out a *Revisit Study of Agrarian*

and *Rural Trends in Bijapur District in 2009*. **Dr Carol Upadhy**a has been consolidating her publications from the earlier IDPAD-funded project on Indian IT professionals (carried out at NIAS with Prof AR Vasavi) and ongoing work on globalisation processes in Bangalore.

**Prof Malati Das** co-authored a theme paper on *Civil Services in 2020 - Vision and Strategy*. The paper addresses the issues of building a competent civil service that can improve India's governance in the context of the strategic, technological and economic challenges posed by this decade.

## EDUCATION PROGRAMME

The Education Programme at NIAS seeks to build on previous research, advocacy and teaching experiences that the various faculty have undertaken. It draws on NIAS's mandate of being a multidisciplinary institute that can generate new ideas and knowledge and act as a think-tank to government and private sectors and agencies. The focus of the work has been on independent research in key areas of education; creation of a platform for education policy; and curricular development and exchange network. The programme is anchored by Prof AR Vasavi and **Dr BK Anitha**.

A national study on *Trained Scientific Women Power: How much are we Losing and Why?* has been undertaken in collaboration with the Panel for Women in Science of the Indian Academy of Science. Dr BK Anitha was the co-principal investigator of this project along with the Chair of the Panel for Women in Science, Prof Rohini Godbole, IISc, Bangalore. Through the project NIAS has conducted a large scale qualitative survey, for the first time in the country, covering 568 women scientists and 226 men scientists. A countrywide database of women scientists who have completed Ph.D. in sciences, medicine and engineering was developed. This database is hosted on the Indian Academy of Sciences website that is online and operated by individual passwords given to each scientist. A total of nearly 2000 women scientists are registered as on date. The NIAS Team was headed by Dr Anitha and supported by Ms R Maithreyi, as a Research Associate and Mr B Kantharaju as a Statistical Assistant.

The project on *Trends in Higher Education* has been undertaken by Dr Anitha as a Principal Investigator

in collaboration with INFLIBNET, Ahmedabad and TCS to analyse the production of Ph.Ds in the country for a ten-year period, between 1998 and 2007. **Ms Hamsa Kalyani**; Ms R Maithreyi; Mr B Kantharaju are also associated with the project. The project initiated the creation of the first authentic single point data reference large-scale inter-institutional database of doctoral theses, by disciplines, regions and gender. The project will post decade-wise statistics along with graphic representation on the INFLIBNET site with periodic updating.

NIAS is a part of the Expert Committee constituted by the IGNOU, New Delhi, to create Knowledge Modules in the area of Management in Higher Education. The attempt is to create a cadre of educational managers and provide intensive training adopting innovative methodology for existing educational leaders of higher education institutions in the country leading to an MBA (Higher Education). Dr Anitha, represented NIAS, which was a part of an eight institutions collaboration on the project, with IGNOU as the nodal agency. Eight courses have been developed, among which the course on *Management of Education, Research and Collaboration* was conceptualized and led by Dr Anitha. The others from NIAS involved in this project are Ms Hamsa Kalyani; Ms R Maithreyi and Ms Ambika Mohan.

NIAS is one of the driving forces of the initiative, Emerging Directions in Global Education (EDGE). This initiative brings together NIAS, Manipal University; IGNOU, BITS Pilani; Symbiosis University, Pune and ICFAI, Hyderabad. The broad aims of EDGE forum are to provide global inspiring thought leadership to reform higher education; undertake research in critical areas of higher education that can impact policy at all levels; develop and sustain national and international peer networks of high quality education institutes, professionals, government and business leaders; provide directions for reforms in pedagogy, teaching practices and assessment; develop EDGE Forum as a 'premium league' through sharing of best practices and mutual support; and develop a think tank through national and international consultative groups to chart direction for global education.

EDGE successfully organised the third edition of a three-day international conference on the theme

Catalysing Change between March 3 and 5, 2010 at New Delhi. The representation from NIAS was **Prof VS Ramamurthy**, Director, who was the chairperson of the vision group and Dr Anitha who was the convenor of the Programme Academic Committee. NIAS has led the documentation and dissemination front of EDGE. As a team, Dr Anitha and Dr Patwardhan have directed the preparation of four research reports. Ms Ambika Mohan is also associated with EDGE work.

Dr Anitha is a special invitee to the Karnataka Knowledge Commission (KKC) constituted under the Chief Minister of Karnataka. She has been working closely with the Chairman, Dr K Kasturirangan of the KKC, in efforts to reform education. Dr Anitha is the member of the working group on Literacy and School Education. Dr Anitha is a special invitee to the working group on Higher Education, Science and Technical Education, Human Resources and Vocational Education as well as Library and Knowledge Networks, and thus has been providing inputs in these areas also.

Dr Anitha is a member of the core team member of Comparative Education Research Group (CERG), India consisting of NIAS, Bangalore; TISS, Mumbai; JNU, New Delhi; IIT, Kanpur; University of Hyderabad, Hyderabad. The CERG is to initiate state specific documentation of research efforts in education and undertake research studies in important areas of research either within the state or across the states. It also aims to create a forum for network and exchange of ideas for research scholars engaged in comparative education work.

As a part of its efforts to develop a Curriculum Exchange Network, a *Support Programme for Disadvantaged Students in Technical Education Institutions* has been set up. Based on work with CREST (Centre for Research and Education in Social Transformation, Kozhikode) where NIAS is a founding institution, faculty from the old IITs and a representative of VTU, Karnataka attended a one-day workshop held at NIAS on January 30, 2010. The result of the workshop led IIT, Mumbai to request CREST faculty to conduct a two-day workshop for their mentors at IIT Mumbai. Currently, IIT Delhi is considering sending their new batch of reserved category students to CREST for a three-week training programme in Kozhikode. Prof AR Vasavi is an academic advisor to the course and to the programme.

## ENERGY PROGRAMME

**Prof Dilip R Ahuja** and **Prof DP Sen Gupta** began their study *Estimating Energy Savings by Modifying Indian Standard Time*. The Bureau of Energy Efficiency made a grant of Rs.33 lakhs to study the effect of three proposals of modifying Indian Standard Time (IST), namely: (a) introduction of bi-annually cycling Daylight Saving Time (b) advancing IST ahead by 30 minutes and (c) having 2 time zones in the country. Based on a collection of five minute electricity consumption data over a year in relevant geographical regions, the study will estimate the scope for electricity and fossil fuel savings. It will identify states and sectors which are likely to get affected and compare the advantages and disadvantages of each option. Finally, the study will draft recommendation on the best option for India.

Prof Ahuja and Prof J Srinivasan worked on *Why Controlling Climate Change is More Difficult Than Stopping Stratospheric Ozone Depletion*. Before despairing at the world's inability to address climate change, it is useful to recall that we are well on the way to solving another global problem, that of stratospheric ozone depletion. This has led some analysts to expect that similar success would be forthcoming in the climate arena. They examine the lessons from the ozone problem, and the factors that make the climate problem tougher. They surmise that progress in addressing climate change will be slow in the absence of a large event such as the Antarctic ozone hole.

Prof Ahuja is also looking at the *Multiple Pressures on India on Climate Change*. This work describes the multiple and orchestrated pressures put on India through political channels, civil society groups, scientific organisations, multilateral institutions, the media, and the Indian diaspora to get India to change its announced positions prior to the Copenhagen Climate meeting.

## PROVINCIAL GLOBALISATION PROGRAMME

A new international collaborative research programme entitled *Provincial Globalisation: The Impact of Reverse Transnational Flows on India's Regional Towns* was launched with Prof Mario Rutten of the Amsterdam Institute for Social Science Research, University of Amsterdam, and



Prof Veena Das delivering the Tenth MN Srinivas Memorial Lecture on 'The Scenic and the Narrative: Anthropology in the Times of Violence'.

Dr Carol Upadhyas as Programme Directors. It was submitted to WOTRO (the Dutch social science funding agency) and sanctioned. The programme was initiated on January 1, 2010. Preparatory work and background research is in progress.

Most studies of globalisation in developing countries have focused on national level processes or mainly on transformations in large metropolitan cities. However, there is evidence that the impact of globalisation has been especially significant in smaller urban centers and their rural peripheries, especially in those regions with significant patterns of international migration. Transnational linkages and flows have become significant agents of globalisation and socio-economic transformation throughout the global South, with both positive and negative impacts on development.

This five-year research programme will investigate processes of 'provincial globalisation' in India by tracing transnational reverse flows of resources sent by migrants to their home regions. These include economic resources such as remittances, investments and charitable donations, as well as 'social remittances' and cultural flows. The programme will

examine the influence of these 'reverse flows' on political and economic processes and the alteration or reinforcement of social or religious identities in three selected regions, focusing on the key towns and their rural hinterlands.

The programme consists of five independent research projects – three doctoral projects and two post-doctoral - and includes both Dutch and Indian researchers. The Ph.D. projects will be intensive micro-level studies carried out in three different regions – central Gujarat, coastal Andhra Pradesh and coastal Karnataka – which have diverse histories of international migration. The two post-doc projects will be macro-level studies of the geography and economics of transnational linkages and flows at the regional, state and national levels.

#### URBAN RESEARCH AND POLICY PROGRAMME

The overall objective of the Urban Research and Policy Programme is 'to effect a change in people's understanding of, and attitudes towards, urban processes and issues, with the aim of creating urban settlements that are functional, socially just, economically dynamic, culturally vibrant,



ecologically sustainable and politically participative'. The activities that were envisioned to achieve these objectives include original, grounded, multi-disciplinary research with policy relevance; creation of a non-partisan platform for fostering public debate on urban issues; networking and collaboration with other similarly oriented institutions and persons; advocacy, including targeted interventions in decision-making by governments; and consultancy for government and civil society. The programme is co-anchored by Dr Carol Upadhyaya and **Dr Solomon Benjamin**.

Dr Solomon Benjamin, **Ms Sanam Roohi** and Dr HS Sudhira have been studying *Governance, Infrastructure, and Poverty in Greater Bangalore*. This research will lead to the first 'State of the City' Report. This is an overarching project examining infrastructure access, and its relation to poverty in the core city area as well as the newly urbanising peripheries of the Greater Bangalore Metropolitan Region. There are several institutions whose empirical work looks at gaps in infrastructure and services. NIAS's URPP team focuses on networking with these institutions to provide a much needed conceptual and theoretical framework that draws from international experiences. This project forms the basis for a longer-term research programme on urban poverty and governance in Karnataka and in other states of South India with outputs being both policy oriented papers and academic journal articles.

The URPP programme, in collaboration with ATREE, Bangalore has been studying *Contested Governance of Wetlands in Bangalore's Metro Area*. Dr Benjamin and Dr Harani Nagendra of ATREE with support from Mr Rohan D'Souza and Mr H Manjunath are looking at contestations over access to tanks (*keres*) in Bangalore's peripheries and their associated wetlands to chart out institutional and managerial conflicts over these common property resources.

This focus on Bangalore's periphery relates to the central concerns of a large international multi-sited research programme, *Global Suburbanisms: Governance, Land, and Infrastructure in 21st Century*, coordinated by York University's City Institute (Toronto, Canada). It brings together, within an interdisciplinary frame, internationally renowned academics from geography, urban studies and planning, sociology, anthropology, and history. Dr Solomon Benjamin is one of the co-applicants.

The programme has recently been funded for CAD \$ 2.6 million by the Canadian SSHRC's Major Collaborative Research Initiatives (MCRI) programme.

Following the global financial crises, and the emergence of India and China as influential global actors, there is a new and innovative comparative research area that looks at the interconnected genealogy and structure of Indian and Chinese urbanism. Dr Solomon Benjamin and Prof Wing Shing Tang (Hong Kong Baptist University) have obtained preliminary research funding from the Department of Geography, Hong Kong Baptist University towards joint fieldwork and meetings to develop a major collaborative research proposal *Re-conceptualising Indian and Chinese Urbanisms beyond Western Concepts*. This project includes co-researchers from Mumbai, Shenzhen, Guangzhou and Hong Kong. Joint fieldwork and meetings have already happened in Guangzhou and Shenzhen, Hong Kong, and further fieldwork is planned for Bangalore, Mumbai, and Delhi in the first two weeks of June 2010.

While much of academic and policy focus has been on metropolitan growth, much of India's future urbanisation will be centred in smaller town regions. A proposal to research this was submitted to the French National Research Agency by the Centre De Sciences Humaines (CHS), New Delhi for the *Subaltern Urbanisation in India* (SURBININ project). This project looks at smaller towns and rapidly urbanising villages, where Dr Solomon Benjamin will coordinate research in various sites in India for the urban land component of the project (one of the three research components).

The programme organised an international workshop on *The Street*, in collaboration with A.R.T. (Art, Resources and Teaching, Bangalore) on January 2, 2010. It also organised a discussion meeting on *Mapping the Maps* and another on *Governance, Development and Poverty in Bangalore - Focus on Urban Land and Commons*.

An Urban Documentation Centre and Archive is under construction, including an on-line index. An Urban Social-Ecological Atlas project (in collaboration with the Urban Ecology Research Group, ATREE, Bangalore) aims to create an interactive web-based spatial, open access dataset incorporating basic

ecological, environmental socio-economic and institutional parameters on Bangalore. The pilot phase has been completed and a full proposal is being developed.

## WATER PROGRAMME

The main objectives of the Water Programme are to generate a data and information base and analysing them using a multidisciplinary perspective; provide platforms for sharing the results of the research and facilitate multi-stakeholder dialogues to influence policy; strengthen networks and facilitate partnerships from the local to the global (Zonal, Country to Global Water Partnerships) in research, dialogue and advocacy; publication and dissemination.

The project undertaken on *Inter-state Transboundary Water Sharing and Conflict Resolution (2007–2009)* with support from Global Water Partnership (GWP), Stockholm and the active involvement of GWP–South Asia (GWP–SA) and India Water Partnership (IWP) fructified into a book this year. The book *River Water Sharing: Transboundary Conflict and Cooperation in India* and edited by **Prof Shantha Mohan, Mr Sailen Routray and Mr N Sashikumar** consists of papers on interstate water sharing and mechanisms for conflict resolution with the Cauvery dispute as a point in case from a multidisciplinary perspective.

Building on this initiative, Prof Shantha Mohan has initiated a project on *Water Conflicts in India: The State, the People and the Future*. Papers have been generated by professionals drawn from various disciplines, the civil society and policy makers. The issues covered include the history of the interstate conflicts, a philosophical discourse on ownership of water and the states in India, case studies to understand the ways in which rivers play an important role in imagining Indian States and regionality, inter-sectoral conflicts surrounding water and their implications for the future of water conflicts in India.

The programme has also continued its efforts at the *Generation of Knowledge Systems on River Basin Water Sharing Through the Active Participation of Zonal Water Partnerships (ZWPs) in India*. The ZWPs are engaged in the generation of data, information and papers relating to interstate river

basins across the country. The basins covered are the Indus and Jhelum in the North, Cauvery in the South, Brahmani in the East, Narmada in the West and Dhansiri in the Northeast. Prof Mohan continues to engage with the ZWPs in facilitating their involvement in the generation of papers, participating in consultations and enabling them in establishing equitable and effective governance structures.

## CONFLICT RESOLUTION PROGRAMME

The Conflict Resolution Programme at NIAS was set up in 2009 with the aim to develop an inclusive knowledge base that would help effectively address the major conflicts that affect India or have the potential to do so. The programme hopes to directly address the knowledge deficits that may impede the resolution of major conflicts of interest to the country. Such conflicts could be at any level from the local to the national, regional and global as long as they have an impact on India.

The programme tries to achieve its objectives by being sensitive to the interface between the understanding of individual conflicts and the larger conceptualisation of conflict. It studies individual conflicts in depth with the twin purpose of identifying elements that can be used to resolve them, as well as to further develop the understanding of conflicts and their resolution. In the process it seeks to link up with individuals and institutions to generate information and analytical tools to understand conflict. It also uses a variety of tools, including backgrounders on individual conflicts, to disseminate the results of the work done.

One component of the research carried out by **Prof Narendar Pani** was to use theoretical innovations based on the inclusive Gandhian method to understand major conflicts in India. An attempt was thus first made to identify the limitations of viewing democracies entirely in terms of systems. It then went on to argue that Gandhi's method of exploring political reality through political actions provides a more effective means of understanding conflicts. This argument was elaborated with the example of identity politics, namely the destruction of the Babri Masjid in Ayodhya.

Prof Narendar Pani also looked at the question of whether the type of reservations implemented in each

region influences the nature and extent of conflict. He made an attempt to answer this question by comparing the Mandal Commission Report with the experience of princely Mysore, and later Karnataka. Abstracting from these experiences he developed two concepts: reservations with exclusion and reservations without exclusion. He went on to argue that reservations with exclusion create greater conflict.

There was also an effort by Prof Pani to use the Gandhian method to reinterpret the interstate dispute over the water of Cauvery. This inclusive method helped identify the conflict-easing and conflict-enhancing aspects of the dispute. In the process, the limitations of the existing institutions in addressing the conflict became evident. In continuation of this effort Prof Pani also addressed the question: What role, if any, can Tribunals play in resolving interstate river water disputes in India? Based on an appropriate concept of institutions he argued that while the Tribunals have an essential role to play in addressing the technical and judicial aspects of interstate river water disputes, there are other dimensions to these disputes that are equally important to address which fall well beyond the capabilities of even the best equipped Tribunal. The effectiveness of a Tribunal then depends not just on what it does, but also on what is done to address factors beyond its control.

**Dr M Amarjeet Singh** also completed his study of illegal immigration into North-East India, taking the case of Nagaland. Migration is a global phenomenon, and will continue to do so in the near future. This study was aimed at understanding the

nature and extent of illegal immigration in Nagaland; the local perception towards illegal immigration; and the overall impact of illegal immigration. He suggested that there is a need, among other things, to strengthen border policing; introduce a 'national identity card'; introduce temporary work permits for immigrants; evaluate the Inner-Line Permit system; and to engage civil society.

Work on a series of backgrounders was initiated during the year. These reports are targeted at the intelligent layperson who requires a quick and yet reliable account of conflicts. A template was designed to produce accessible and broadly comprehensive backgrounders. Drafts of the backgrounders are also sent to referees who are experts in the field. The first backgrounder, on conflicts in Manipur, was brought out by Dr Amarjeet Singh.

### RBI PROGRAMME ON INTERDISCIPLINARY APPROACHES TO ECONOMIC ISSUES

This Programme seeks to use the knowledge gained from a variety of disciplines to understand economic issues. Unlike conventional interdisciplinary economics which takes the methods of economics to other areas, the RBI programme seeks to work in the opposite direction. Its effort is to enhance economic analyses by adding to established economic methods the perspectives gained from other disciplines.

To launch a new conversation about the ways that India's poor are being re-imagined, a one-day workshop on 'The Poor as an Emerging Market: Strategies, Research,



Prof Madhu Purnima Kishwar during the panel discussion on 'Women's Reservation Bill and Beyond'.

and Implications' was organised at NIAS on November 6, 2009. The workshop was organised by Dr Carol Upadhyia in collaboration with Dr Jamie Cross, a visiting scholar from the National University of Ireland. The workshop brought together twenty participants from academia, industry, and the NGO sector from Bangalore, Chennai, Hyderabad, and New Delhi.

An effort was made to explore methods that were sensitive to the subjective dimensions of understanding social issues. Prominent among these methods is that of the eighteenth century Italian philosopher Giambattista Vico. This approach, while recognising the role of subjective judgements in the perceptions of history, tries to provide primacy to the perceptions of the participants in history. It tries to present history through the imaginations of its participants with as little influence of the present as possible. Using this method, Prof Narendar Pani, **Dr Sindhu Radhakrishna** and **Mr Kishor G Bhat**, put together in a book a series of documents that captured the imaginations of those who participated in the events that marked the turning points in Bangalore's history.

Prof Narendar Pani and **Ms Nikky Singh** looked at globalisation from below. Using a multistage stratified cluster sample of garment workers in Bengaluru followed by detailed qualitative interviews, their research made it quite evident that there were elements beyond what are usually seen as the boundaries of globalisation that affect this process. And this influence was through institutions that are not always seen as playing a prominent role in aiding globalisation, like the family. Making use of a field view of the households of women working in Bengaluru's garment industry they went on to develop concepts of collective households and collective families. They then used a modified version of the concept of migration capital to argue that collective families played a critical role in the process of migration, cutting across the economic, the social and the cultural.

Prof Narendar Pani and **Mr K Jafar** looked at the long-term consequences of policies based on the capabilities approach. A combination of a simple mathematical model and the experience of Kerala was used to suggest some patterns of development over the long term that this approach to policy threw up. It argued that the effects of this approach to policy were wide-ranging, including contributing to the creation of non-agrarian villages.

**Prof Dilip R Ahuja** was part of the Academic Review Panel for the project undertaken by MacKinsey and Company, Mumbai on *Environmental and Energy Sustainability: An Approach for India*, published in 2009. He also reviewed the draft document for the National Solar Energy Mission, September 2009. He is the Chair for NIAS Course Cell. The Course Manual has been published. He is also Chair for NIAS Faculty and Postdoctoral Associates' Selection Committee. Prof Ahuja organised public lectures by Prof Lord Julian Hunt on *Insights from Global System Dynamics into Complex Issues in the Environment, Decision-making and Society* on February 24, 2010; Dr Otis Moss on *The Gandhi-King Impact on Human Rights* on January 7, 2010 (together with Sarvodaya International Trust) and Dr Satish Kumar on *Ecology and Sustainable Living* on December 3, 2009 (together with RRI and Prof Narendar Pani). He peer-reviewed papers for Current Science and a draft paper for NSAB. He also reviewed IPCC work on monsoon prediction and on Indian glaciers. He carried out informal consultations on HIVOS (Dutch Development Agency) future work Programme on Energy. He also evaluated the Comprehensive Exam of a PhD student of Management Studies at IISc. He attended the IGNOU Board Meeting on July 31, 2009. Along with Prof DP Sen Gupta he secured funding of Rs.33 lakhs from Bureau of Energy Efficiency, Ministry of Power, Government of India for the project on Indian Standard Time. He also secured Rs.10 lakhs plus travel costs for 20 Indian and 10 US participants for the Science and Diplomacy Workshop (with AAAS and Dr Tom Wang) to be held in 2010-2011.

**Dr Solomon Benjamin** co-organised international workshop on *Streets* on January 2, 2010 (under URPP). Dr Benjamin's concept of *City Porosities* (in his essay *The Nomadic City Appropriates the Street* in online journal Cluster 2010 (<http://www.cluster.eu/the-nomadic-city-appropriates-the-street/>) has been adopted by the Program Director of the 'Digital Video Production' of the Srishti School of Art, Design and Technology as an organising principle for the project *Letters from Bangalore*.

**Prof DP Sen Gupta**, on invitation from Bose Research Institute, Calcutta, produced a Bengali version of the documentary on JC Bose, October 20, 2009.

**Prof SS Meenakshisundaram** attended Task force meetings to finalise MOUs between public sector petroleum units and the Government of India.

**Prof N Shantha Mohan** organised a one day closed door meeting on the *Mulla – Periyar Dispute* on September 5, 2009 at NIAS and subsequently another meeting on October 7, 2009 at the Madras Institute of Development Studies, Chennai. She also organised a two day consultation on *Water Conflicts in India: The State, the People and the Future* at NIAS on March 15 and 16, 2010.

**Dr Carol Upadhyia** visited the Amsterdam School of Social Sciences, University of Amsterdam, for consultations to develop a proposal to be submitted to WOTRO for a new collaborative research programme, during August 27 to September 5, 2009. She co-organised the international workshop on *Streets*, January 2, 2010 (under URPP). She was Academic Head, NIAS Doctoral Programme till January 2010. Dr Carol Upadhyia served as Expert Member of Scientific Working Group of the India-EU Partnership on Mobility. She participated in two meetings held at European University Institute, Florence, Italy; July 6 and 7, 2009, and Bangalore, October 26 and 28, 2009. She co-authored the policy paper and recommendations, *EU-India Mobility Cooperation: A Strategic Asset in the Global Competition for Talent*, submitted to EU-India Mobility Partnership group, November 2009.

**Prof AR Vasavi** organised a one-day workshop on *Review of Support Programmes in Technical Education Institutions* for IITs and VTU (Karnataka) at NIAS on January 30, 2010. She taught a course on Sociology of Education for NIAS doctoral students from January to March 2010. She continued as Governing Council Member of CREST (Centre for Research and Education in Social Transformation), Kozhikode, and continued as Advisor to VIDYANKURA; functioning in Chamrajnagar. Between September 21 and October 18, 2009 Prof Vasavi delivered several lectures at various universities in the U.S. including three key lectures at Yale University, to which she was invited as a Visiting Professor.

## NEW FACULTY

**Dr Solomon Benjamin**, joined NIAS as *Associate Professor* on June 15, 2009, relocating from the University of Toronto. A doctorate from the Department of Urban Studies and Planning, Massachusetts Institute

of Technology and a Masters in Settlement Studies from MIT's Department of Architecture, his research interests include city economy, land, politics and poverty. Dr Benjamin has led teams as part of several international research projects on issues of chronic poverty, governance and land and has published a book on these issues and in top-ranking peer reviewed international journals. Dr Benjamin's significant theoretical contribution is his concept of 'Occupancy Urbanism' that encapsulates a complex phenomenon of transforming urban land tenures that re-constitutes property in real estate, commodity, and shape the popular appropriation of institutional politics.

**Prof DP Sen Gupta**, joined NIAS as *Visiting Professor* on October 1, 2009. An Honours graduate in Physics from Calcutta Presidency College and in Electrical Engineering from I.I.T, Kharagpur, Prof Sen Gupta took his Ph.D. from Liverpool University where he taught for five years before he joined the Indian Institute of Science (IISc), Bangalore, and carried out teaching and research for about three decades. He received awards for teaching excellence at both Liverpool University and IISc where he was awarded a special chair for Energy Studies. He had research links with a number of overseas universities, particularly with the University of Liverpool and Cavendish Laboratory, Cambridge, and the University of Illinois, Urbana Champaign.

**Dr M Amarjeet Singh**, joined NIAS as *Assistant Professor* on October 1, 2009. A doctorate in sociology from the North Eastern Hill University, Shillong, Dr Singh was earlier a research scholar at the Institute for Defence Studies and Analyses, New Delhi. While at IDSA, he was closely associated with the Journal of Defence Studies as Assistant Editor. He was also one of the Associate Editors of the Eastern Quarterly, New Delhi.

## RESEARCH ASSOCIATE

**Ms Shivali Tukdeo**, is a graduate from the University of Illinois, Urbana-Champaign, where she has specialized in Education Policy Studies. She joined NIAS as a *Research Associate* on March 15, 2010. Her research focuses on education policy; critical social and political theory; globalisation; and technology and education. She is currently working on a book manuscript tentatively titled *India Goes to School: Education Policy and the Politics of Diasporic Action*.



Prof Rajaram Nagappa, *Visiting Professor and Head*  
Prof S Chandrashekar, *JRD Tata Visiting Professor*  
Prof Narayan Ramani, *Visiting Professor*  
Prof Lalitha Sundaresan, *Visiting Professor*  
Dr Manabrata Guha, *Assistant Professor*

The work of the International Strategic and Security Studies Programme (ISSSP) during the year was centred around the sponsored study on Science and Technology Dimensions of National Security. As part of this study, the focus was on status, events and trends of strategic importance in China and Pakistan. In addition, developments in the US and international fora, which shape responses and strategies in the neighbourhood are also matters of interest and study for the programme. During the year a study of Chinese capabilities in select sectors like military aircraft and their power plants was undertaken.

The spread of terrorism to many parts of the country has prompted the programme to take up studies relating to the underlying causes, the socio-economic and other causative factors and look for patterns.

In order to evaluate the vulnerabilities of Pakistan's nuclear weapons a series of scenarios were developed. The study concluded that while direct attack of a weapon storage site is an option, the more likely route for acquiring a weapon would be to get access to the nuclear material by attack or subterfuge. Further expertise has to be garnered to build a weapon using the stolen material.

A database on China, its demographic details, socio-economic status along with the higher education status with special emphasis on science and technology aspects has been developed. Data on universities/institutions carrying out training and research on science and technology, particularly electronics has been collected. This study was carried out in collaboration with Karnataka State Council for Science and Technology, Bangalore.

The development of military aircraft technology in China was researched. The study noted that starting from licence production of MiG 21 aircraft and its power plant in the late 50's, China successfully reverse-engineered the aircraft and produced it in numbers for use by its air force. China also exported the aircraft to countries in Asia. Minor modifications and updates resulted in a number of variants. Exposure to US and European civilian aircraft technologies and

# International Strategic and Security Studies Programme



A detail from the presentation by Prof S Chandrashekar at the seminar on 'The Andaman and Nicobar Islands and the Future of India'.

off-set arrangements starting in the early 80's resulted in assimilation of current aircraft engineering practices. China also exploited the situation after the break-up of the Soviet Union by hiring Russian aircraft experts to accelerate their development projects. The result was the 4<sup>th</sup> generation JF-17 aircraft which is also going to be produced in Pakistan and the J-10 aircraft for use by the PLA-Air Force. The timeline of events is shown in the visual on the next page.

China started work on the development of the WS-10 turbofan engine in the mid 80's and managed to do the ground test by December 1992. Its flight test could be done only in 2002 and the engine is yet to be incorporated in the J-10. China had carried out research to develop single crystal alloy material for use in the turbine blade, but this technology also has not found application.

The development of the single crystal turbine blade alloy material in China was researched vis-à-vis the international development of this material. In the US, where the development of this material was pioneered, the development started in 1960, first patent was applied for in 1966 and it was granted in 1970. Publication of research papers started appearing only after the grant of the patent. In a span of four to five years competing engine manufacturers in the UK and France had also developed this material. The first research paper on the subject from China appeared in 1993 and facilities for development were in place in 1995. As part of the study, the research institutes, their possible linkages, the number of papers in the field and patents profile was also researched. In spite of being involved in the development since 1993 and with 27 research papers of international standing—some presented in conferences, the

development has not found application in the latest Chinese engines. It is concluded that unlike the US and Western system, where the demand market is high and barriers to technology adoption few, in China, the demand is far less and the barriers to technology adoption could be high.

The work on the missile trajectory has been completed. Two versions of the programme in two different coordinate systems (ECEF and NEU) have been developed. Test trajectory results from both these match well. With the completion of this the next step would be independent validation of the results and the addition of a display capability to show the trajectory on a map or in some other visual form.

At the request of the Andaman and Nicobar Command, ISSSP helped the Command organise a major national seminar on *Security and Development of Andaman and Nicobar Islands*.

Prof Chandrashekar was invited to give a talk at the seminar on *The Andaman and Nicobar Islands and the Future of India*.

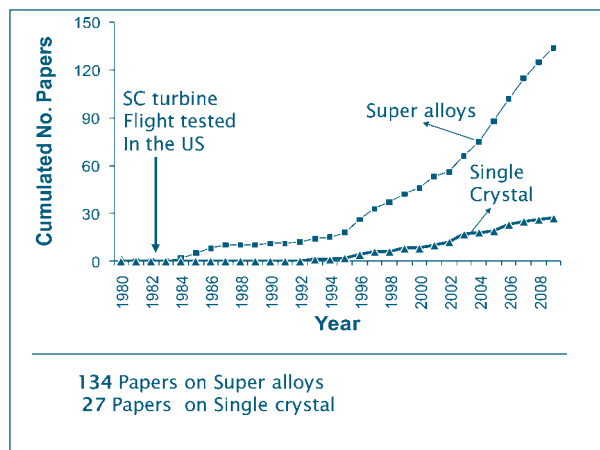
A prognostic study of terrorism with Karnataka as a case study has been carried out. The study examines the incidents, funding sources, their promoters, background of terrorists and case history available in the public domain to discern if any patterns emerge.

Preliminary assessment of *Over-the-horizon-radar* tracking capabilities, target discrimination and employment of ballistic missiles against carrier battle group formations has been carried out.

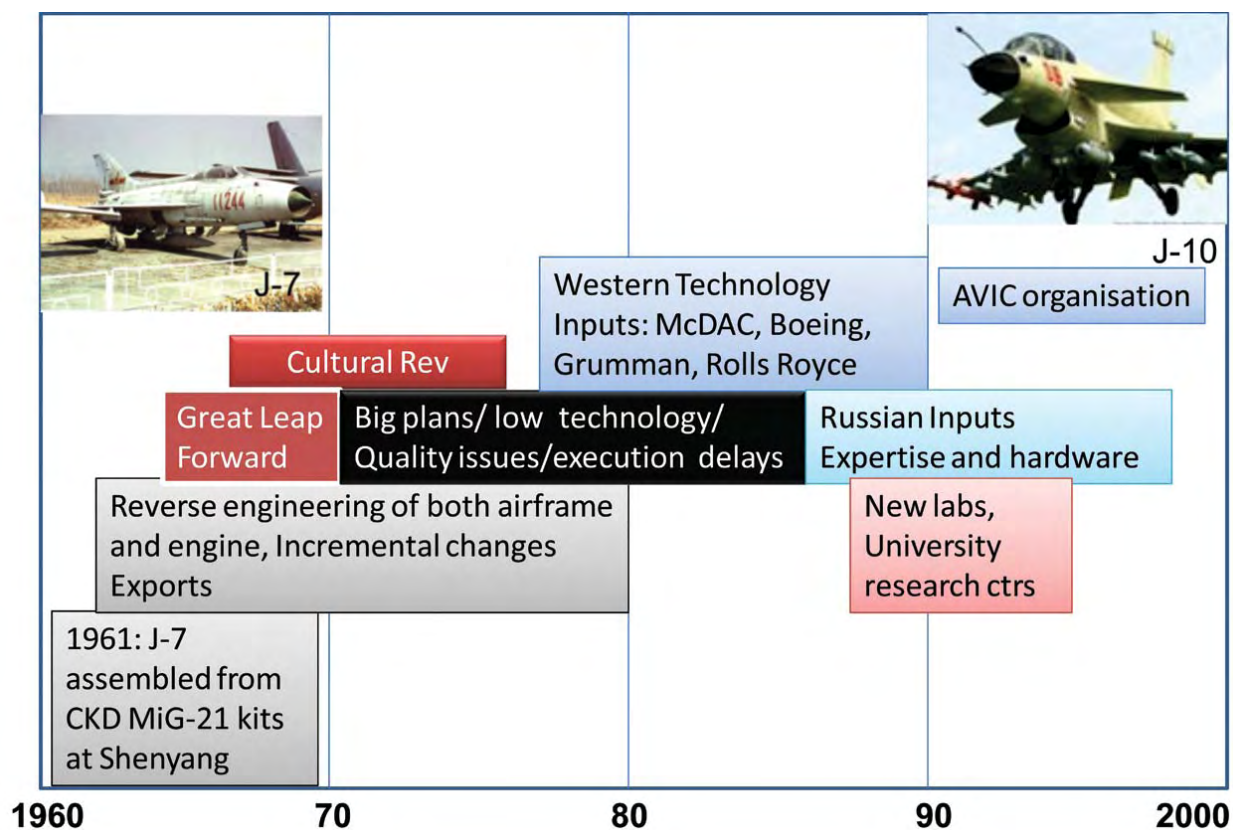
## OUTREACH AND OTHER ACTIVITIES

Discussions were held with the following invitees. In some instances, special lectures were also arranged:

1. May 21, 2009 – *Net Assessment*, talk by Brig Arun Sahgal, USI, New Delhi.
2. September 10, 2009 – Discussion meeting with Ms Rosie Oglesby, King's College, London on *The Humanitarian Future Crisis Drivers Project*.
3. September 25, 2009 – Discussion with Prof Subbiah Arunachalam, Distinguished Fellow, Swaminathan Research Foundation, Chennai on Citation, Database and Patent Search.
4. September 25, 2009 – *Quantifying India's Research Output*, talk by Prof Subbiah



Chinese Papers on Super Alloys and Single Crystal Turbine Blade Material



Timeline of the development of military aircraft technology in China.

5. October 13, 2009 – Discussion meeting on *The Taliban Resurgence and Global Terrorist Overhang* with Dr Rodney Jones, President, Policy Architects International, USA and Mr S Gopal, Former Special Secretary, Cabinet Secretariat, Government of India as Lead Presenters.
6. November 16, 2009 – Discussion meeting with Dr Geoffrey Forden, MIT, USA on the topic of *International Missile Proliferation Consortium – The Cases of Iran and North Korea*.
7. December 1, 2009 – *Pokhran II Nuclear Explosions - Some Technical Aspects*, lecture by Dr SK Sikka, Homi Bhabha Fellow, BARC.
8. January 17, 2010 – Workshop on *Terrorism in South Asia – Problems, Issues and Solutions* (Speakers: S Gopal, Nathaniel Fick, A Arjunan, Ajay Kumar Singh and Toby Simon).
9. January 25, 2010 – *The Challenges to Space Security* Public Lecture by Prof Ram S Jakhu, McGill University, Canada.
10. March 12, 2010 – Discussion meeting on *Enabling Beat Constable Report – Collation and Analysis of Data* – Presentation by Honeywell Inc towards adapting business security strategies.

## NEW FACULTY

**Dr Manabrata Guha**, joined NIAS as *Assistant Professor* on December 18, 2009. His research interests include the philosophy of war, the history and evolution of military theory, and future warfare “concepts” of operations. His current work includes the re-theorization of war and combat based on counter-tactical and counter-strategic concepts of operations.





# Courses



Prof Vijayalakshmi Ravindranath delivering the valedictory address on 'Altruism in Leadership: Exploring the Power of the Brain' during the 24<sup>th</sup> Senior Executives Course.

Shivkumar

## Senior Executives Course

The course for senior executives is the cornerstone on which the National Institute of Advanced Studies builds its efforts to help develop an effective and sensitive leadership in India. First organised more than two decades ago in January 1989 with the involvement of Mr JRD Tata and Dr Raja Ramanna, the course has developed a niche for itself over the years. It brings senior executives in touch with a variety of disciplines and experiences to help them evolve fresh perspectives of their own specialised fields. The course does so through lectures, panel discussions, field visits and special sessions designed to help participants link their experiences to established analytical concepts.

The 24<sup>th</sup> edition of this course for senior executives on *Excellence in Leadership* was organised between January 18 and 23, 2010. Inaugurated by Air Chief Marshal SP Tyagi (Retd), Former Chief of Air Staff, the course had 23 participants, including three women. The participants were from government, various public and private sector companies, research institutions and armed forces.

The speakers invited to address the participants also came from backgrounds ranging from culture, sports and media to information technology. They included Mr TK Arun, Mr Bishan Singh Bedi, Prof André Béteille, Mr Prem Chandavarkar, Mr Anal K Jain, Mr Mukund Padmanabhan, Dr A Ravindra, Mr MS Sathyu and Mr MMK Sardana. In addition there were also speakers from NIAS including the Director, Prof VS Ramamurthy, Dr Rajesh Kasturirangan, Prof SS Meenakshisundaram, Prof Narendar Pani and Prof Anindya Sinha. The cultural programme featured Odissi Dance Recital by The Nrityagram Dance Ensemble, Bangalore. In the visit to Kannamangala village the participants met Women Leaders of its Gram Panchayat.

The fifth Annual Raja Ramanna Memorial Lecture was organised in conjunction with the course, with Ambassador Saurabh Kumar, Former Ambassador of India, Vienna speaking on *Towards a Nuclear Weapon Free World*. The Tenth Annual MN Srinivas Memorial Lecture was also organised during this course with Prof Veena Das, Professor, Johns Hopkins University, USA speaking on *The Scenic and the Narrative: Anthropology in the Times of Violence*.

The valedictory address was given by Prof Vijayalakshmi Ravindranath, Chairperson, Centre for Neuroscience, Indian Institute Science, Bangalore.

The course was coordinated by Prof Narendar Pani and co-coordinated by Dr M Amarjeet Singh.

### Summer School on Philosophy for the Social Sciences and Humanities

A three week summer school was held from June 8 to 26, 2009. The aim of the workshop was to introduce Ph.D. and M.A. students to some important themes of philosophy to understand certain issues in social sciences and humanities. Around 40 students drawn across all the disciplines and from different parts of the country were selected for the course. Students were provided with accommodation in the NIAS campus. This enabled the students across different disciplines to interact amongst themselves. Speakers drawn from different institutions across the country and abroad included Dr Vrinda Dalmiya, Dr Raghuram Raju and Dr Shiv Viswanathan. Speakers from NIAS faculty included Dr BK Anitha, Prof Arindam Chakrabarti,



Dr Anil Kakodkar delivering the inaugural address on 'Towards Energy Independence: What Nuclear Energy Can Do?' during the third NIAS-DST programme on Energy Security and Management.

Dr Rajesh Kasturirangan, Prof Sangeetha Menon, Prof N Shantha Mohan, Dr MG Narasimhan, Prof Narendar Pani, Dr Srinath Raghavan, Prof Sundar Sarukkai and Dr Carol Upadhy. Various topics in philosophy included logic, epistemology, metaphysics, phenomenology, philosophy of language and philosophy of science along with subjects such as economics, literature and anthropology. There were three sessions in a day of one and half hours each. As part of this workshop the students were required to write a paper drawing upon the various course topics and their area of work. The valedictory session was addressed by the Director of NIAS, Dr K Kasturirangan.

### Multidisciplinary Perspectives on Science, Technology and Society

The Seventh NIAS-DST Training Programme on *Multidisciplinary Perspectives on Science, Technology and Society* was organised from August 10 to 22, 2009 for senior scientists-cum-administrators. The participants were drawn from various research institutions of the Department of Science and Technology, government departments and ministries. The programme was mainly focused on multidisciplinary perspectives with implications for social, economic and political, scientific, and technological issues in the country.

The programme was inaugurated by Prof M Vijayan, Honorary Professor and Distinguished Biotechnologist, Molecular Biophysics Unit, Indian Institute of Science with a lecture on *Development of Biological Macro-molecular Structural Studies in India* and the valedictory address was delivered by Prof Goverdhan Mehta, Professor Emeritus, Department of Organic Chemistry, Indian Institute of Science on *Science Education*. Other eminent speakers included Dr Vineeta Bal, Prof Rupa Chanda, Prof VK Gaur, Prof Ravinder Kaur, Prof N Kumar, Dr Sudha Mahalingam, Dr Prabha D Nair, Ambassador PA Nazareth, Prof G Padmanabhan and Prof Shobini L Rao. Speakers from NIAS were Prof Dilip R Ahuja, Prof DP Sen Gupta, Prof SS Meenakshisundaram, Dr MG Narasimhan, Prof Narendar Pani, Dr Srinath Raghavan, Prof S Ranganathan, Prof S Settar and Prof Anindya Sinha. An outdoor programme was organised at the Kabini River Jungle Lodges to enable the participants to present their work related experiences and they were also taken to visit to ISTRAC, Department of Space, as part of the programme. Music Concert

(Jugalbandhi) was performed by Mr Parasuram Sriram and Ms Anuradha Sriram, Chennai.

The programme was coordinated by Dr MG Narasimhan and co-coordinated by Dr Sharada Srinivasan.

### Impact of Globalisation

The Second NIAS-DST Training Programme on the *Impact of Globalisation* for science-administrators was organised between October 5 and 9, 2009. The objective of the programme was to provide an overview of the process of globalisation through lectures by academics and practitioners in their respective fields; updates about the latest research findings from around the world; and the presentation of case studies ranging from the rise of Indian multinationals to the strategy of space commerce.

The programme was inaugurated by Dr Kirit S Parikh, Former Member, Planning Commission of India with a lecture on *Globalisation, Climate Change and India's Options* and the valedictory lecture was given by Mr Vivek Kulkarni, Chairman and Managing Director of Brickwork India, Bangalore on *When Will the Indian Economy Return to Normal?*. The other experts included Prof Prakash Apte, Prof Rupa Chanda, Mr Anal K Jain, Dr K Ullas Karanth, Mr Sashi Kumar, Prof Sourav Mukherji, Prof Roddam Narasimha, Dr Srinath Raghavan, Prof S Sadagopan, Mr V Shanmugam and Ms TS Shoba in addition to Prof Dilip R Ahuja and Prof Narendar Pani of NIAS. The film-based discussions scheduled during the programme were well received by the course participants. Fusion music with a troupe led by Mr Guy Mauffait of France was organised as a part of the programme.

The course was coordinated by Prof Narendar Pani and co-coordinated by Dr M Amarjeet Singh.

### Dimensions of Nanotechnology

Under the aegis of 'Women's Component Plan' of Department of Science and Technology, the First NIAS-DST Programme on *Dimensions of Nanotechnology: Nano-Science, and Society* for Women Scientists and Technologists was organised between December 14 and 18, 2009. The main objective of the programme was to expose women scientists and technologists to various developments in the field of nanotechnology such as nano-science,

nano-electronics and nano-materials with pros and cons ranging from the macro to the nano level.

The course was inaugurated by Dr Vijayalakshmi Ravindranath, Chairperson, Centre for Neurosciences, Indian Institute of Science with a lecture on *Women in Science: Gender Differences in Brain Function* and the valedictory address was delivered by Dr Usha Vijayraghavan of Indian Institute of Science. The other prominent speakers included Dr Rinti Banerjee, Prof Navakant Bhat, Prof Yamuna Krishnan, Dr Prabha Nair, Prof Ramakrishna Ramaswamy and Prof AK Sood. Dr MG Narasimhan, Dr Sindhu Radhakrishna, Prof S Ranganathan, Prof BV Sreekantan and Dr Sharada Srinivasan from NIAS also gave lectures. The participants were also encouraged to make presentations to share their experiences among the co-participants. As part of the programme, the participants were taken to visit the Nanocentre Unit of Indian Institute of Science, Bangalore. Ninada Carnatic Classical and Hindustani Jugalbandhi was performed by Vidushi Kanchana S Sriranjani and Vidushi MD Pallavi.

The course was coordinated by Dr MG Narasimhan and Dr Shobhana Narasimhan (Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore).

### Energy Security and Management

The Third NIAS-DST programme on the theme of *Energy Security and Management* for senior scientists and science administrators was organised from February 8 to 12, 2010. The programme addressed the issues of supplying modern energy services to the majority of our people currently unserved; environmental challenges especially those relating to climate change; impacts of liberalization and deregulation; policy initiatives needed to drive diversification and development of indigenous sources of energy; initiatives needed to intensify R&D in advanced energy technologies; intensifying the development and use of renewable sources of energy; and implementing energy conservation and energy efficiency measures.

Dr Anil Kakodkar, Former Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy inaugurated the programme with his talk on *Towards Energy Independence: What Nuclear Energy Can Do?* Mr V Raghuraman, Chief Advisor, Jaguar Overseas Limited, New Delhi delivered the

valedictory talk on *Energy as a Factor in India's External Policies*. Other energy specialists in the programme included Mr R Jeyaseelan, Former Chairman, Central Water Commission, New Delhi, Dr Ajay Mathur, Bureau of Energy Efficiency, New Delhi, Mr RV Shahi, Chairman, Energy Infratech Private Limited, New Delhi, and Prof Dilip R Ahuja, Prof Arindam Chakrabarti and Prof DP Sen Gupta of NIAS. The dance recital by Dr Malavika Sarukkai was widely appreciated.

The course was coordinated by Prof Dilip R Ahuja and Prof DP Sen Gupta.

### Gender Issues in Science and Technology

As a subsequent initiative of 'Women's Component Plan of DST', the First NIAS-DST Training Programme on *Gender Issues in Science and Technology* was organised for scientists and administrators from March 22 to 26, 2010. The theme of the programme was *Transcending Barriers to Performance: The Woman in Science*. The aim of the programme was to encourage and facilitate women in their effective participation at all levels.

The course was inaugurated by Dr Manju Sharma, Former Secretary, Department of Biotechnology with a lecture on *Role of Women Scientists in National Development* and the valedictory talk was delivered by Dr T Ramasami, Secretary, Department of Science and Technology. Other speakers included Ms MP Geetha Devi, Prof Rama Govindarajan, Dr Sumi Krishna, Prof Rajni Palriwala, Prof Vibhuti Patel, Prof Ramakrishna Ramaswamy, Dr Vinita Sharma, Prof Prajval Shastri and Dr Nimish Vachharajani in addition to Dr BK Anitha, Prof SS Meenakshmisundaram, Prof N Shantha Mohan and Prof Narendar Pani of NIAS. There were two panel discussions in which panelists were Prof Madhu Purnima Kishwar and Dr Ranjana Kumari. Ms Rani Satish, Former Minister of Government of Karnataka and Prof Archana Bhattacharya, Director, IIGM, Mumbai received appreciation from the course participants. The participants also made presentations to share their experiences. The Carnatic Vocal Concert was performed by Vidushi Bombay Jayashri.

The course was coordinated by Prof N Shantha Mohan.



Dr Malavika Sarukkai performing during the third NIAS-DST programme on Energy Security and Management.

# Doctoral Programme

Prof BV Sreekantan, *Chairman*  
Dr Rajesh Kasturirangan, *Academic Head*  
Dr Carol Upadhy, *Member*  
Prof Anindya Sinha, *Member*  
Dr Sindhu Radhakrishna, *Member*  
Dr MG Narasimhan, *Member*

The NIAS Doctoral Programme was initiated at the institute in 1999 in collaboration with Manipal University (then Manipal Academy of Higher Education), with the aim of developing a cadre of young scholars who could pursue and develop multi-disciplinary research in a variety of areas. In 2005, the Programme was given a more formal structure with course work and student fellowships initiated with the financial support received from the Indian Space Research Organisation, and the Department of Science and Technology, Government of India. The Programme also admits project-based research scholars, whose funding comes either from their own projects (such as NET-UGC/CSIR fellowships) or from project grants obtained by the faculty (in terms of Junior Research Fellowships or other such fellowships); such students also register with various universities under the NIAS Doctoral Programme.

NIAS has received recognition as a research centre from Manipal University, University of Mysore, and now also the Indira Gandhi National Open University (IGNOU). NIAS faculty members are eligible for recognition by these institutions as Ph.D. guides. A Doctoral Programme Committee oversees the functioning of the Programme with the NIAS faculty offering a range of courses keeping in view the research interests and needs of the students. Dr Rajesh Kasturirangan took over as Academic Head from Dr Carol Upadhy in January 2010.

Seven batches of students have been admitted to the Programme so far, with the number of current students, including project-based students, being twenty-four in 2010-11: six in the School of Humanities, nine in the School of Natural Sciences and Engineering, and nine in the School of Social Sciences. One student, Dr Nithin Nagaraj, has been awarded the Ph.D. degree by Manipal University in 2010.

The NIAS Doctoral Programme is thus developing into a well-integrated and unique programme with an emphasis on multidisciplinary research. Most of our students are working across disciplines, often in areas that they have not earlier studied, creating a vibrant



A view of Ph.D. Scholars' cubicles.

intellectual atmosphere on campus. For instance, interdisciplinary projects are marrying philosophy with biology, environmental science with sociology, cognitive science with behavioural biology, education with anthropology, and remote sensing with archeology.

The programme is growing in strength, enabling the institute to produce a set of scholars who will carry forward the research programmes and traditions already established by the distinguished faculty of the Institute. In future, the Doctoral Programme will be put on a more sustainable foundation and will expand both in terms of its scope and depth in order to meet the upcoming challenges of the nation. Towards this end, NIAS, under the leadership of our current Director, Prof VS Ramamurthy, is initiating new areas of research and is upgrading the research facilities in accordance with international standards. Recently a new residential hostel facility for Ph.D. scholars was inaugurated by our Director.

*A list of the students who have registered with a university and their dissertation topics is given below:*

#### SCHOOL OF HUMANITIES

**Ms Meera Baidur**, Philosophy and Wildlife Biology  
*Conceptualization of Nature: Towards a Philosophy of Conservation and Action from Indian Traditional Thought*

**Mr SK Arun Murthi**, Philosophy  
*Philosophical Problems of Laws of Nature and Explanation*

**Ms MB Rajani**, Space Archaeology  
*Archaeological Investigations using Remote Sensing Techniques*

**Ms Rolla Das, Ms K Lakshmi and Ms Hema Thakur**  
*Not yet registered*

#### SCHOOL OF NATURAL SCIENCES AND ENGINEERING

**Ms PS Sajini Anand**, Mathematics  
*Nonlinear, Multidimensional Transformations and Its Applications to Signal Processing*

**Mr Kishor G Bhat**, Mathematics  
*Games in the Garden of Numbers*

**Mr Mayukh Chatterjee**, Ecology, Behaviour and Conservation  
*Social Behaviour, Ecology and Population Dynamics of the Northern Bonnet Macaque (*Macaca radiata radiata*)*

**Mr Rishi Kumar**, Ecology, Behaviour and Conservation  
*Behaviour and Ecology of Selected Indian Macaques*

**Ms Swarnali Majumder**, Mathematics  
*Theory and Practice of Inverse Problem: Finding Equation from ECG and Speech Data*

**Dr Nithin Nagaraj**, Mathematics (Degree Awarded)  
*Novel Applications of Chaos Theory to Coding and Cryptography*

**Mr Muthuswamy Murugan**, Environmental Science  
*Factors and Patterns of Pesticide Usage in Cardamom Hill Agro Ecosystem and its Impact on Ecosystem Sustainability*

**Mr Narayan Sharma**, Ecology, Behaviour and Conservation  
*Behavioural Ecology and Conservation of Primate Communities in the Lowland Evergreen Forests of Upper Brahmaputra Valley, Assam*

**Ms KG Sreeja**, Environmental Science  
*Emergent Non-Agrarian Livelihoods and Resource Linkages in the Agroecosystems of a River Basin: A Case Study of Chalakudy River Basin, Kerala*

**Mr Robin V Vijayan**, Ecology, Behaviour and Conservation  
*Conservation Biology of a Threatened Endemic Bird – the White-Bellied Shortwing *Brachypteryx major* – in the Western Ghats, Southern India*

#### SCHOOL OF SOCIAL SCIENCES

**Mr K Jafar**, Economics  
*The Impact of Education-Led Growth on Human Development: A Case Study of Malappuram*

**Ms Anu Joy**, Education  
*Children's Understanding of Scientific Concepts*

**Mr Rahul Mukhopadhyay**, Social Anthropology  
*Anthropology of the Education Bureaucracy*

**Ms Leena Pascal**, Art Education  
*Pictorial Representation and its Development in Children*

**Ms Sowjanya R Peddi**, Social Anthropology  
*Food Retail Practices in Bangalore: A Comparative Anthropological Study*

**Mr Sailen Routray**, Development Studies  
*Shifting Waterscapes: Tradition, Development and Change in Orissa*

**Ms Sahana Udupa**, Social Anthropology  
*Informing News: Information Revolution and the Transformation of News Media in Bangalore*

**Ms Indira Vijayasimha**, Education  
*Understanding Science Teachers' Praxis*

**Ms KG Asha**  
*Not yet registered*

#### STUDENTS' WEDNESDAY PRESENTATIONS

**Mr Kishor G Bhat**  
*An Introduction to Trigonometry (A New Outlook)*  
May 27, 2009

**Ms Swarnali Majumder and Mr Rahul Mukhopadhyay**  
*Tagore as seen by Ray and Ghatak*  
December 30, 2009



A detail from a presentation by a Ph.D. Scholar.

The NIAS Library was the beneficiary during the year of an extremely generous grant from Jamsetji Tata Trust, awarded to it in the year 2009. This grant has been and continues to be judiciously utilised by the Library to build up its reference collection, infrastructure development, and extensive digital library activities.

## I. Book Collections

### (i) Library Book Acquisition Procedures

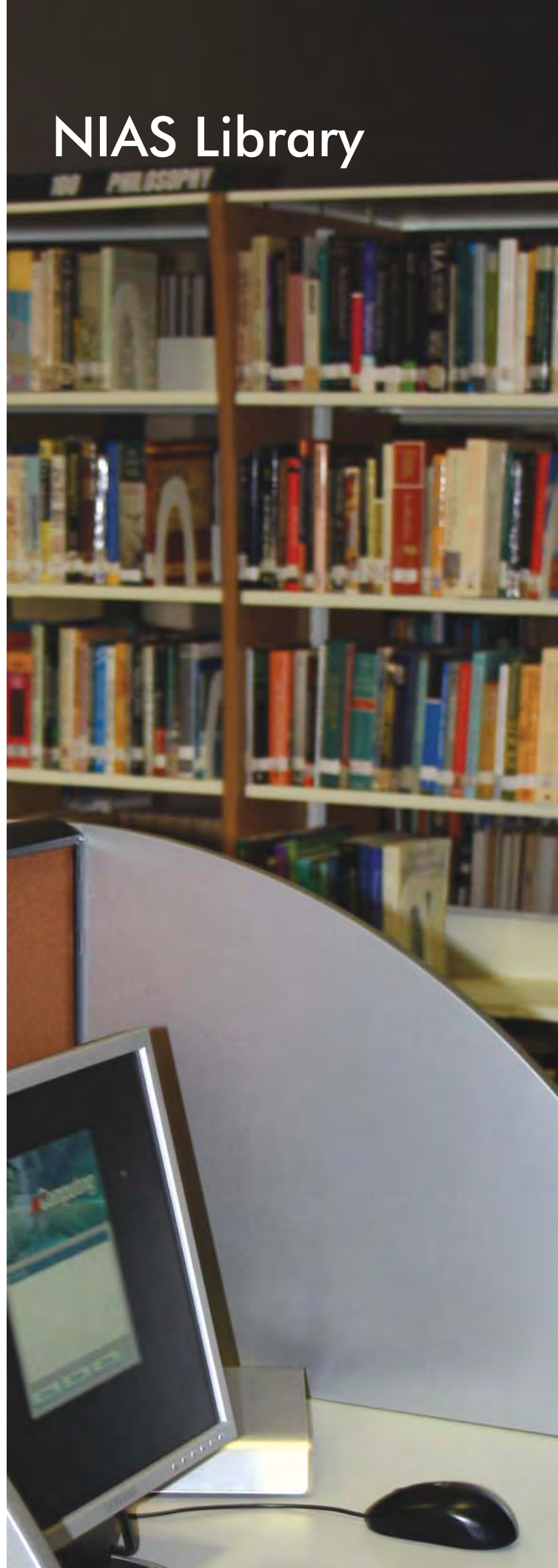
The faculty of the institute has always played a very major role in selecting books and journals for the library collection. As the acquisition procedures for books, however, had earlier not been very regular, there were clear lacunae in the library's collections. In order to identify these gaps and facilitate a process for the systematic collection of books, the number of books in each discipline in the existing collection was provided to the Library Committee to identify the lacunae in the collections. An intensive, systematic effort was then launched to uniformly strengthen the collection of books across disciplines. A Special Grant of Rs.50 lakhs was budgeted for purchasing classic books, textbooks, seminal works, reference works and datasets across all the disciplines in which research is being conducted in the institute. Relevant handbooks, encyclopedias and technical reports from reputed publishers like Sage, Routledge and Oxford University Press have been acquired using this Special Grant. Datasets such as the Indian Census Data and reports of the National Sample Survey Organization have also been acquired in electronic form. The number of books acquired either with the Special Grant or the Annual Budget for 2009-2010 is shown in Table 1.

Serial Number	Budget	Number of Books
1.	Special Grant	654
2.	Annual Budget	1370
<b>Total</b>		<b>2024</b>

**Table 1: Books acquired by the NIAS Library during 2009-2010**

A comparative study of the library acquisition procedures practiced in institutions such as the National Law School of India University, Institute of Social and Economic Change, Indian Institute of Astrophysics, Indian Institute of Science, Indian Satellite Research Organisation, Centre for Study of

# NIAS Library





Culture and Society, all in Bangalore, was conducted and compared with those in the institute. Suggestions and recommendations for best practices in book acquisition for the NIAS library were then discussed, and a distinctive procedure was approved by the Library Committee for immediate implementation.

The Committee selected five book vendors out of fifteen regular vendors for the year 2009-2010. The criteria for selecting a vendor were based on the discount offers made by them as well as their past performance with regard to the efficiency with which books had been supplied within a stipulated time period. The Committee later decided to also include an online bookstore in the vendors' list, as books in interdisciplinary areas and most classical texts are not easily available from regular vendors. Our past experience has revealed that regular vendors often have to make special efforts to source books for the NIAS library as our requirements are usually very different from that of other academic libraries in the city.

### (ii) Automated Procedures

The Library had been using Libsys software for housekeeping operations in the past. The automated book acquisition module of the software facilitates every step in the process of book acquisition - from ordering, sending reminders, receiving, accessioning, cataloguing to sending email alerts to users about the arrival of books. During the year 2009, all the features of the acquisition module, including cataloguing and circulation, were customised to suit the needs of the Library.

### (iii) Automated Services

Several new services were facilitated Libsys for the faculty and students of the institute.

The Library catalogue is accessible on the Internet; Library users can log into their accounts to view their book transaction details, recommend books as well as reserve books online. The faculty can also see the status of their book recommendations online by logging into their accounts; Email alerts are sent to users for books borrowed and returned; and Book arrival notices are provided to the concerned faculty for books recommended by them.

## II. Journal Subscriptions

The NIAS library, like most academic libraries, has a space constraint. A conscious decision was, therefore, made to opt for electronic journals whenever possible.

To facilitate journal selection for the library, NIAS faculty and students were provided with a list of relevant journals from major publishers. It was decided that journals subscribed by the Indian Institute of Science Library would not be duplicated by NIAS. To the current subscriptions list, 39 new journals were added this year, taking the total number of individually subscribed journal titles to 89. Journals from major publishers such as Wiley InterScience, Blackwell, and Sage, among others were included in the list of journals.

NIAS obtained membership to UGC-INFONET Digital Library Consortium in 2009 and subscribed to journal collections from the Oxford University Press, Cambridge University Press, and Taylor and Francis Publishers. The total number of journals accessible through this Consortium is 1786 (shown in Table 2).

Serial Number	Journal Collections	Number of Journals
1.	Oxford University Press	198
2.	Cambridge University Press	223
3.	Taylor and Francis Journals	1364
<b>Total</b>		<b>1786</b>

**Table 2: Journals subscribed to by the NIAS Library during 2009-2010**

The faculty and students of NIAS have complete access to all e-journals and databases from the NIAS Library website. The library subscribes to JSTOR and IndiaStat.com (Education).

## III. Digital Library Activities

### NIAS Repository

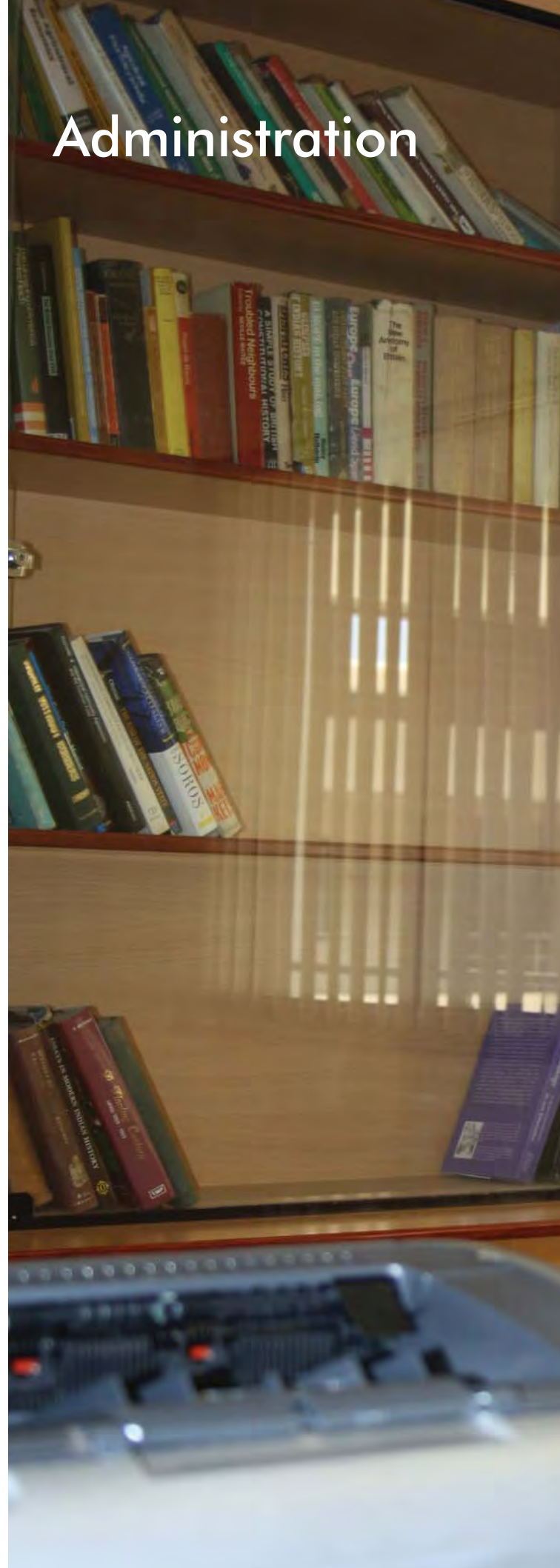
As scholarly communication is progressively restructured in a digital environment, the challenge for the library is to efficiently deal with the information output that researchers are producing. Most librarians appear to have found an answer in the Institutional Digital Repository. The NIAS Library has now developed an institutional repository using Eprints software, which centralises, preserves and makes accessible the knowledge generated by the faculty and students. This repository is now visible on the web and can be accessed at <http://eprints.nias.res.in:8081>. The library is currently actively engaged in populating the repository with full-text articles, reports and other publications with additional features being incorporated into it to make the repository more user-friendly.

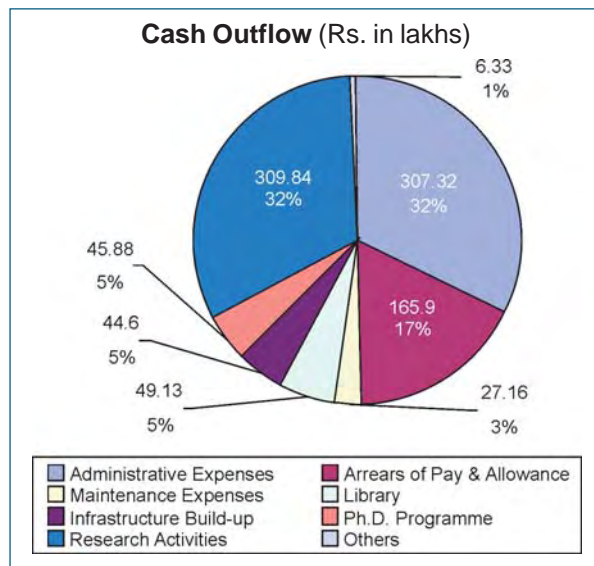
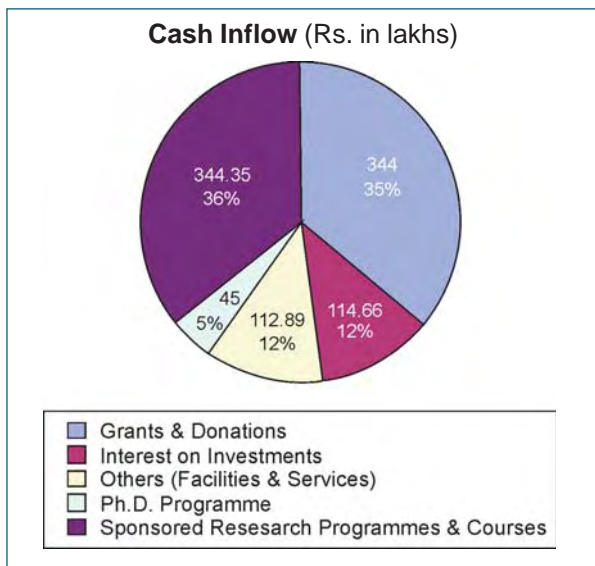
As a registered society, NIAS derives its administrative and financial authority through the society, represented by the general body. The Council of Management which is currently chaired by Prof MS Swaminathan, is vested with full power and authority to do all acts, deeds, etc which are necessary for the promotion and fulfillment of the objectives set out in the Memorandum of Association. The Director, presently Prof VS Ramamurthy, 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. & Finance).

Besides management of all resources such as infrastructure, finance, human resources, estates etc., general administrative matters are also handled by Head (Admin. & 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 twenty-four students work for their Ph.D. 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, Income Tax, etc. is also taken care by administration. The administrative set up consists of, in addition to the Head (Admin. & Finance), an Office Manager, two Assistant Managers in the area of Administration and Accounts & Finance and other Secretarial / Office / Supporting Staff, in all numbering 29.

Finance management, accounting, auditing, resource mobilization and expenditure control are carried out systematically. An overview of finances for the year 2009-2010 can be seen in the charts on the next page.

# Administration





NIAS has a specified investment of Rs.1564.39 lakhs (exclusive of project funds) as on March 31, 2010. During the year, NIAS has implemented the recommendations of the 6<sup>th</sup> Central pay commission for its employees.

Hostel accommodation with 8 rooms has been dedicated for the use of Ph.D. students. Two new visiting chairs have been created during 2009-2010: one with the financial support of Rs.1.50 crore from the Department of Atomic Energy in the name of our founder Director 'Dr Raja Ramanna' and other

one with the financial support of Rs.1.00 crore by Mr Mohandas Pai in the name of 'T V Raman Pai'.

The agreement with Global Water Partnership (GWP) to host the GWP-South Asia Regional Secretariat in NIAS came to an end as on December 31, 2009. As host institution, NIAS has handled foreign exchange worth Rs.136.32 lakhs in 2009-2010 in close liaison with GWP, Stockholm and Regional Water Partnerships of six countries in this region. This has enhanced the revenue of NIAS by Rs.10.82 lakhs in 2009-2010.



Mr Xerxes Desai, Dr K Kasturirangan, Prof VS Ramamurthy, Prof Roddam Narasimha and Mr MAS Rajan on the occasion of an 'At Home' organised in honour of Dr K Kasturirangan.

As in other years NIAS saw a stream of visitors in a variety of fields. These visitors play an important role in keeping the institute and indeed the city of Bangalore in touch with the latest intellectual and other trends across the country.

## MEMORIAL LECTURES

FIFTH RAJA RAMANNA MEMORIAL LECTURE

**Ambassador Saurabh Kumar**

Former Ambassador of India, Vienna

*Towards a Nuclear Weapon Free World*

January 18, 2010

TENTH MN SRINIVAS MEMORIAL LECTURE

**Prof Veena Das**

Johns Hopkins University, USA

*The Scenic and the Narrative: Anthropology in the Times of Violence*

January 19, 2010

## PUBLIC LECTURES

**Prof Abhijit Banerjee**

Massachusetts Institute of Technology, USA

*Economic Lives of the Poor*

July 7, 2009

**Prof Crispin Bates**

Edinburgh University, UK

*An Uneasy Commemoration: 1957, the British in India and the 'Sepoy Mutiny'*

April 21, 2009

**Dr Geoffrey Forden**

Massachusetts Institute of Technology, USA

*How China Loses a War in Space - and the Consequences for All of Us*

November 17, 2009

**Prof Lord Julian Hunt**

University of Cambridge, UK

*Insights from Global System Dynamics into Complex Issues in the Environment, Decision-making, and Society*

February 24, 2010

**Dr Nanditha Krishna**

CP Ramaswamy Aiyar Foundation, Chennai

*South Indian Jewellery*

September 16, 2009

# Visitors



Shivkumar

Ambassador Saurabh Kumar delivering the Fifth Annual Raja Ramanna Memorial Lecture on 'Towards a Nuclear Weapon Free World'.

**Prof John Moolakkattu**

University of KwaZulu-Natal, South Africa  
*Forgiveness in Politics*  
August 11, 2009

**Ms Rajyashree Reddy**

University of Minnesota  
*Producing Abject Citizens: The Politics of Toxic Waste Management in Bangalore*  
August 31, 2009

**Prof EC George Sudarshan**

University of Texas, USA  
*Homi Bhabha - The Scientist*  
July 25, 2009

**Dr Andrew Willford**

Cornell University, USA  
*The Indian Uprising and the Haunting of Justice in Malaysia*  
August 27, 2009

**GUEST AND SPECIAL LECTURES****Prof Ram S Jakhu**

McGill University, Canada  
*Challenges to Space Security*  
January 25, 2010

**Ms Marzena Jakubczak**

Pedagogical University of Krakow, Poland  
*Nature and Goddess: Some Reflections on the Ecofeminist Mythization*  
February 10, 2010

**Mr Samir Karmakar**

Indian Institute of Technology Kanpur  
*Time in Discourse*  
August 14, 2009

**Prof Raanan Katzir**

Sustainable Agriculture Consulting Group (SACOG), Israel  
*Climate Change and Agriculture-The Israeli Experience*  
December 11, 2009

**Dr Niranjana Mohapatra**

University of Hyderabad, Hyderabad  
*Strategic Dimensions of Indo-Russian Relations (1991 - 2008)*  
August 28, 2009

**Dr Otis Moss**

Olivet Institutional Baptist Church, USA  
*The Gandhi-King Impact on Human Rights*  
January 7, 2010

**Prof Vasudha Narayanan**

College of Liberal Arts and Sciences, University of Florida  
*Mapping Cosmos, Creating Communities: Sacralizing and Sharing Temple Space Outside India*  
December 21, 2009

**Prof Ramakrishna Ramaswamy**

Jawaharlal Nehru University, New Delhi  
*Women in Science: The Lilavati's Daughters Project*  
December 16, 2009

**Dr TV Reshmidevi**

Bangalore  
*Feasibility of Payment for Watershed Services in an Indian Catchment - A Hydrologic Perspective*  
August 26, 2009

**Mr Partha Saha**

Jawaharlal Nehru University, New Delhi  
*Land Relations and Asset Holdings: A Study Based on Village Level Evidence from Uttar Pradesh*  
August 19, 2009

**Mr Samanta Sahu**

University of Hyderabad, Hyderabad  
*Access to Water: Some Issues of Governance*  
September 4, 2009

**Dr Suma Scaria**

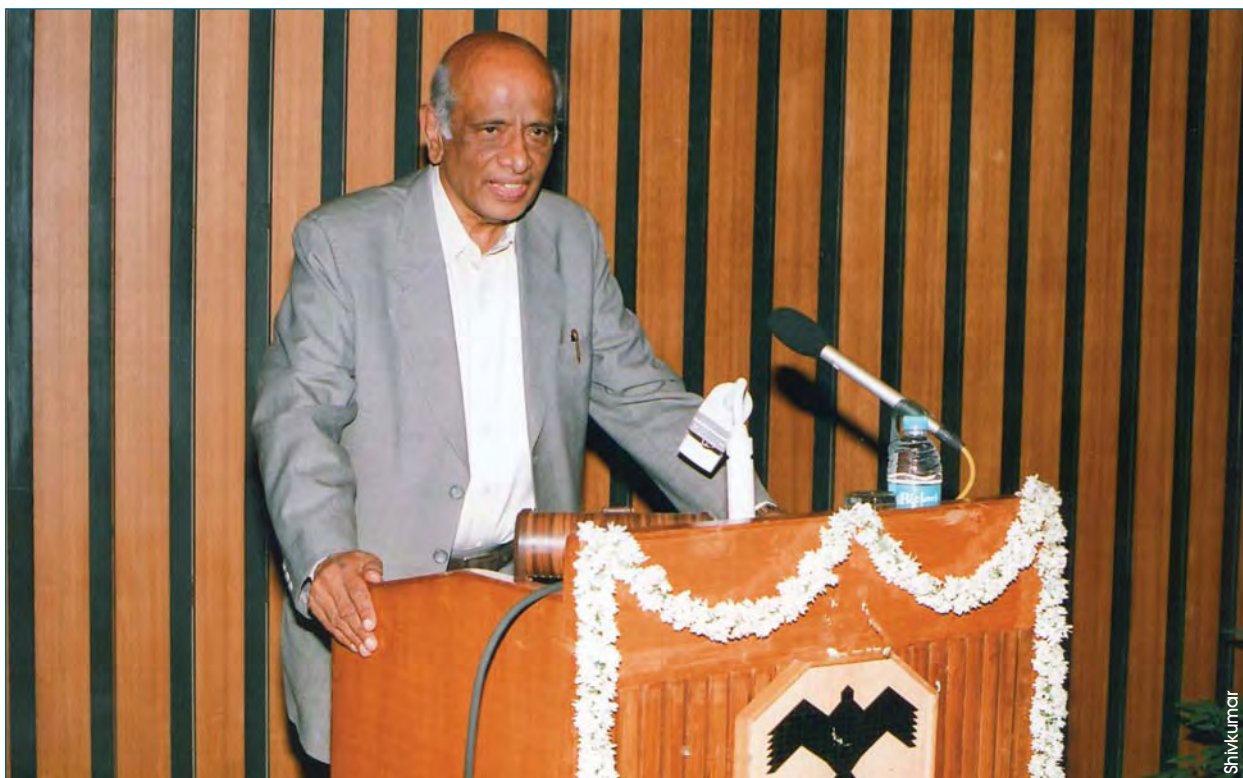
Gujarat Institute of Development Research, Ahmedabad  
*A Dictated Space? Women and Their Wellbeing in a Kerala Village*  
August 19, 2009

**Dr S Shaji**

Hyderabad  
*Transfer of Technology and India's Foreign Policy since 1990s: Emerging Trends*  
August 28, 2009

**Dr M Amarjeet Singh**

Institute for Defence Studies and Analysis, New Delhi  
*Security and Development in Northeast India*  
August 27, 2009



Dr VS Arunachalam speaking during the discussion meeting of the first Rajiv Gandhi Memorial Series on Technology and Society organised by Environment and Good Governance Trust (EGGT) in association with NIAS.

**Dr Mahesh Pratap Singh**

Roulac India Investment Advisory Private Limited,  
Uttar Pradesh

*Greening Economy – A New Agenda of Development:  
Relevance for India*

September 29, 2009

**Dr BK Anitha**

*Comparative Study of Higher Educational  
Institutions in India*

May 20, 2009

**Prof Prakash Apte**

*Globalisation and the Financial Crisis*

October 7, 2009

**Dr Solomon Benjamin**

*Reflections of Work in Progress: ‘Subaltern’  
Globalism to Think Beyond ‘The Designed City’*

September 23, 2009

**Dr Shashidhar Buggi, Dr S Cheluvraj,  
Lt Gen D Raghunath, Dr V Ravi and  
Dr S Yathiraj**

*Swine Flu in Bangalore – Lessons Learnt and  
Preparedness*

August 26, 2009

**Dr Jamie Cross**

*Neoliberalism as Un-Exceptional: Economic Zones  
and the Everyday Precariousness of Working Life in  
South India*

August 5, 2009

WEDNESDAY DISCUSSION MEETINGS

NIAS Wednesday Discussion Meeting is one of the outreach events that have continued since the inception of the institute. The faculty of the institute meets every Wednesday morning for semi-formal 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.

Prof Sangeetha Menon is the Coordinator of Wednesday Discussion Meetings.

**Prof Dilip R Ahuja and Prof DP Sen Gupta**

*Potential Electricity Savings from Changes in Indian  
Standard Time*

December 9, 2009

**Dr Malati Das**

*The Scheduled Castes and Scheduled Tribes in Karnataka and Human Development Indicators*  
May 13, 2009

**Mr Tapas Datta**

*Vivekananda, Ancient Wisdom and Nineteenth Century Science*  
January 13, 2010

**Dr Rahul De**

*Caste Structures and E-Governance in a Developing Country*  
December 16, 2009

**Prof DP Sen Gupta**

*Remembering Acharya Jagadish Chandra Bose*  
April 29, 2009

**Prof Malavika Kapur**

*Visual Media and Violence Among Children*  
April 1, 2009

*Bridging the Gap between Child Development and Education with Children as the Resource*  
January 6, 2010

**Mr Samir Karmakar**

*The Role of Expression in Discourse Analysis*  
March 17, 2010

**Dr Rajesh Kasturirangan**

*Cognitive Semiotics: Explorations in Conceptual Structure*  
July 22, 2009

*Conceptualization: The Anatomy of a 'Sense'-Organ*  
October 28, 2009

**Dr Sumi Krishna**

*Gender Equity and / in Institutions*  
March 24, 2010

**Prof Roopen Majithia**

*Reflections on the Moral Philosophy of Aristotle and its Relation to Some Aspects of Contemporary Western Thought and Traditional Indian Philosophy*  
June 10, 2009

*Aristotle and Śāṅkara on Action, Agency and the Ultimate Human Ends*  
July 15, 2009

**Dr Anant Maringanti**

*Post-Reform Struggles Over Development: A Geographic Perspective on Telangana*  
February 17, 2010

**Prof Sangeetha Menon**

*Brain, Self and Their Interrelations: Fewer Answers, More Questions*  
November 18, 2009

**Prof N Shantha Mohan**

*CEDAW, Substantive Equality and Governance*  
October 14, 2009

**Dr MG Narasimhan**

*There is Grandeur in This View of Life ... Reflections on Darwin's Work and His Worldview*  
July 1, 2009

**Prof G Padmanabhan**

*Growth of Bio-Technology in India*  
August 12, 2009

**Prof Narendar Pani**

*Globalisation and Governance in Indian Cities: Towards a Conceptual Framework*  
July 8, 2009

*The Borders Within Women, Work and Family at the Far End of Globalisation*  
January 27, 2010

**Dr Sindhu Radhakrishna**

*The Macaque Connection: Cooperation and Conflict between Humans and Macaques*  
March 31, 2010

**Prof K Ramachandra**

*Square-free Numbers and Generalisations*  
April 22, 2009

*Analytic Theory of Numbers*  
November 25, 2009

**Prof S Ranganathan**

*Ancient Alloys and Modern Science*  
December 2, 2009

**Prof Girish Sant**

*Need for Prioritization of Efforts to Deal with Energy Security – A Case of Energy Efficiency*  
February 10, 2010

**Prof S Settar**  
*Sangam Tamilagam*  
May 6, 2009

**Prof S Shankar**  
*Caste and the Difference It Makes: Postcolonialism and the Vernacular*  
June 3, 2009

**Dr BS Shylaja**  
*Astronomical Aspects in Temple Architecture*  
June 24, 2009

**Dr Yumna Siddiqi**  
*Migration and the Inheritance of Loss*  
December 23, 2009

**Dr M Amarjeet Singh**  
*Conflict Transformation and Peace Building in Manipur: Issues and Concerns from the Field*  
March 10, 2010

**Prof Anindya Sinha**  
*A Cultured Mind? Phenotypic Flexibility, Behavioural Traditions and Distributed Cognition in Wild Bonnet Macaques*  
November 11, 2009

**Prof G Srinivasan**  
*Space Science*  
August 19, 2009

**Dr Sharada Srinivasan**  
*Large Bronze Castings in Southern India and Europe: Some Comparative Insights*  
September 9, 2009

**Dr Arun P Sripathi**  
*Seeing Locally, Perceiving Globally: How the Brain Accomplishes Perception*  
July 29, 2009

**Dr HS Sudhira**  
*Multiple Dimensions in the Transformation of Bangalore to Greater Bangalore*  
September 30, 2009

**Prof Lalitha Sundaresan**  
*Assessment of Science and Technology in China – A Case Study on Single Crystal Turbine Blades Development*  
February 24, 2010

**Ms Anjali Vaidya**  
*Creativity, the Brain, and the Mind*  
June 17, 2009

**Prof Prabhakar G Vaidya**  
*Some New Ideas for Teaching of Mathematics*  
April 8, 2009

**Prof AR Vasavi**  
*Four Emblematic Figures and the Making of a 'New India'*  
September 2, 2009

## OTHER VISITORS

**Prof TN Narasimhan**, Professor Emeritus, University of California, Berkeley visited NIAS from July 23 to August 28, 2009. During his stay Prof Narasimhan in collaboration with Prof Vinod K Gaur, Distinguished Professor, Indian Institute of Astrophysics, Bangalore drafted a framework for India's water policy which was published as a NIAS Report.

## 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. During the year 2009-2010 the number of Associates was 125. The Associates' Programme included the fifth Raja Ramanna Memorial Lecture titled *Towards a Nuclear Weapon Free World* by Ambassador Saurabh Kumar, Former Ambassador of India, Vienna on January 18, 2010. The other major events of the year 2009-2010 were:

**Vidushi Bombay Jayashri**  
Chennai  
Carnatic Classical Vocal Recital  
March 25, 2010

**Vidushi MD Pallavi and Vidushi Kanchana S Sriranjani**  
Bangalore  
*Carnatic-Hindustani Jugalbandhi Music Concert*  
December 17, 2009

**Mr Sriram Parasuram and Ms Anoorada Sriram**  
Chennai  
*Carnatic-Hindustani Jugalbandhi Music Concert*  
August 21, 2009



**Ms Malavika Sarukkai**

Chennai  
*Bharatanatyam*  
February 12, 2010

CULTURAL PROGRAMME

**Dancers and Students of Natyapriya**

Bangalore  
*Natyapriya's Navarasa Gejje*  
September 14, 2009

**Mr Guy Mauffait and Mr David Mosckzo (French) Mr Ranjan Kumar and Mr Gopinath Mohan (Indian)**

*Rythms and Raagas (Indo-French Fusion)*  
October 9, 2009

**The Nrityagram Dance Ensemble**

Bangalore  
*PRATIMA - Odissi Dance Recital*  
January 22, 2010

NIAS LITERARY, ARTS AND HERITAGE FORUM

The NIAS Literary, Arts and Heritage Forum aims to facilitate the appreciation, promotion

and study of these crucial cultural and artistic aspects. Apart from lectures and book readings the forum aims to hold screenings of films and to promote art appreciation related to exhibitions.

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

**Mr Jonathan Parsons**

Creative Producer and Arts Consultant, Brisbane, Australia  
*Intersections of Art, Science, Technology and Community through Celebration*  
February 16, 2010

**Ms Girija Ravishankar**

Bangalore  
*Carnatic Vocal Recital*  
August 4, 2009

**Prof Mayank Vahia**

Tata Institute of Fundamental Research, Mumbai  
*Indus People and Their Script*  
June 9, 2009



Shivkumar

Mr Bishan Singh Bedi speaking on 'Leadership in Indian Sport'.

The faculty at NIAS reflects the multidisciplinary character of the institute. Coming from specialisations as diverse as satellite technology and heritage they are held together by their focus on multidisciplinary work, and a willingness to engage with the larger community. This is captured by this list of awards received by them, the lectures delivered, and the papers presented in conferences during the year.

## HONOURS AND AWARDS

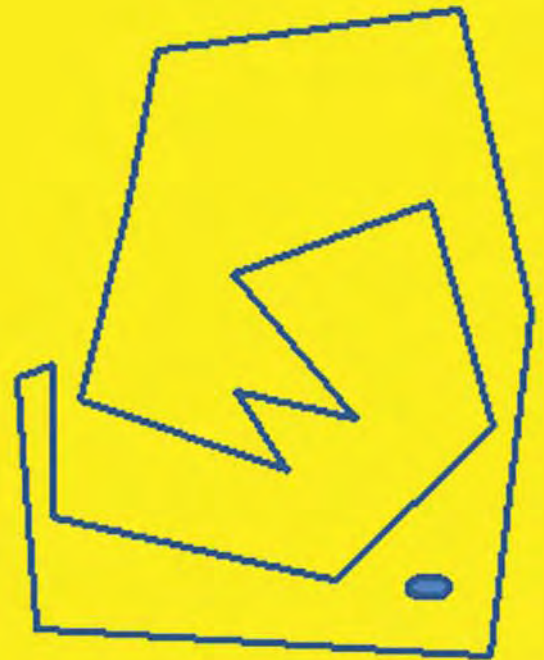
**Dr BK Anitha** is the member of the Sub Committee on Education, under the proposed Council for International Cooperation in Indian Systems of Medicine (CICISM), Department of AYUSH, Ministry of Health and Family Welfare, Government of India. She was special invitee for the Karnataka Knowledge Commission constituted by the Karnataka state government under the Chairmanship of Dr K Kasturirangan. She is member of the Working Group on Literacy and School Education constituted by the Karnataka Knowledge Commission, Government of Karnataka. She is executive committee member of Mahila Samakhya, Karnataka, a government of India project working in nine districts in Karnataka from 2006 to date. She is member of the Third World Organisation for Women in Science (TWOWS), Trieste, Italy, from 2006. She is Organising Secretary (Academics) of EDGE, a National Initiative to transform higher education in India, from 2008 and member, Expert Committee constituted at the National level to create knowledge modules for higher education managers in the country from 2008.

**Dr Manabrata Guha** has been invited to be the keynote speaker at the Second International Nietzsche Workshop being held at the University of Western Ontario, London, Canada on May 6, 2010.

**Prof Malavika Kapur** continues to be the council member of the Indian Council of Social Science Research, New Delhi; member, Research Institutes Committee of the ICSSR; member, Research Committee of the ICSSR and member, Committee on International Relations- ESRC (UK) and ICSSR (India) representing Psychology and led the Indian delegation of Scholars to Cambridge, UK in September 2009.

**Prof Sangeetha Menon** was an invited panelist representing the ISSR (International Society for Science and Religion, Cambridge) for three panels

# Faculty



A detail from the presentation Conceptualization: The Anatomy of a 'Sense'-Organ' by Dr Rajesh Kasturirangan

on Science, Spirituality and Environment at the World Parliament of Religions, December 3 to 6, 2009, Melbourne, Australia. Panelists included Nobel Prize winner for Medicine (1996), Dr Peter Doherty. She was nominated and invited to be a Founder Member of the International Board for Transpersonal Psychology. She was invited to be a Contributing Editor to the International Society for Science and Religion, Cambridge.

**Prof N Shantha Mohan** was elected Vice-president of SasiWaters (South Asian Integrated Water Resources Management Consortium), Board of Governors, Hyderabad. She is member of the National Resource Group, Mahila Samakhya, Ministry of Human Resources, Government of India, New Delhi and also Member of the Board of Governors, Best Practices Foundation, Bangalore. She is Joint Secretary, Board of Governors, India Water Partnership, New Delhi.

**Prof S Ranganathan** was co-chair for the international conference on the *Beginnings of Use of Metals and Alloys (BUMA-VII)* at NIAS, 2009. He was elected as member, Standing Committee for International Conference Series of the Beginnings of Use of Metals and Alloys, (BUMA) in 2009.

**Prof S Settar** is a member of Central Advisory Board of Archaeology, Government of India. He is also member of Selection Committee of National Fellows (Fellowships carrying Rs.80,000 per month, with Rs.3,50,000 contingent grant per annum) under the Ministry of Culture, Government of India, (nominee of the Prime Minister).

**Prof PK Shetty** was appointed as a member of Board of Governors – National Design and Research Forum (BOG – NDRF), The Institution of Engineers (India), Kolkata, February 16, 2010; member of the Scientific Advisory Board of a proposed journal of Springer, Netherlands on *Philosophy and Technology*, January 8, 2010; member of Governing Body of the State Compensatory Afforestation Green Management and Planning Authority (The Chief Minister of Karnataka is the Chairperson of the Governing Body), Government of Karnataka, July 2009; member of Advisory Board of Eminent Experts for assisting POWERGRID in the Research and Development, Power Grid Corporation of India Limited, Government of India, February 2009; member of

ESPP Review Committee of Eminent Experts, Power Grid Corporation of India Limited, Government of India, February 2009, and member of Technical Committee for the implementation of Solid Waste Management Programme in Karnataka, Directorate of Municipal Administration, Government of Karnataka, December 2008. He was appointed as Chairman of the Expert Committee constituted by the Honorable High Court of Karnataka (In compliance of the order dated 28/01/2010 passed in W.P. No.28040/2009(LB-RES-PIL), February 2010.

**Prof Anindya Sinha** was nominated member of Task Force to strengthen the scientific and technical capacity of the Botanical and Zoological Surveys of India, July to December 2009. He is nominated member, IUCN/SSC Primate Specialist Group, Species Survival Commission of the International Union for the Conservation of Nature, Gland, Switzerland, 2009-2012, and also nominated member, Karnataka State Wildlife Board, April 2009 to March 2012. He was elected Vice-President, Indian Association of Teachers in Biological Sciences, Mumbai, May 2009 to April 2012, and TEDIndia Fellow, TED, New York, USA, September 2009 to September 2011.

**Dr Sharada Srinivasan** was awarded UKIERI (UK-India Education and Research Initiative) Standard Research Grant 2009-2011; Lead researcher in project on *Pioneering Metallurgy: Origins of Steel Making in the Southern Indian Subcontinent* with Exeter University (2009-2010). She was elected as Member, Standing Committee for International Conference Series of the Beginnings of Use of Metals and Alloys, (BUMA) in 2009. She was selected at Homi Bhabha Fellows Conclave 2009, to represent History Panel and make presentation and present exhibition. She was the only Indian selected for La Novela, First Festival of Knowledge of the City of Toulouse, France to make a presentation and exhibition at the museum of Cite De L'Espace for the International Year of Astronomy 2009, reported in international websites like Aeronautics and Space News, Communications of the ACM (Association of Computing Machinery).

**Dr Carol Upadhya** has been awarded Senior Visiting Fellow, Max Planck Institute for the Study of Religious and Ethnic Diversity, Göttingen, Germany for April to May 24, 2010.

**Prof VS Ramamurthy**, Director

*The Challenges of Building the Human Resource Pipeline in Research Intensive Organizations*, CSIR Foundation Day Celebration, Central Scientific Instruments Organisation, Chandigarh, September 26, 2009.

*Reaching the Unreached: The Challenge of Making Nuclear Technologies Acceptable, Accessible and Affordable*, International Conference on Peaceful Uses of Atomic Energy-09, New Delhi, September 30, 2009.

*The Nuclear Option: Harmonizing India's Strategic and Energy Dimensions*, National Defence College, New Delhi, October 14, 2009.

*Nuclear Science and Technology Education in the 21st Century*, Foundation Day Lecture, Inter-University Accelerator Centre, New Delhi, December 19, 2009.

Chief Guest Address, International Symposium on *GENE to VIAL Concept in Biotechnology for Health Care*, VIT University, Vellore, February 7, 2010.

**Prof Dilip R Ahuja**

*Mitigating the Risk of Climate Change, Southern Policy Platform for Climate Change*, Indian Institute of Science, Bangalore, August 2, 2009.

*Difficulties in Addressing the Risks of Climate Change*, St Thomas Syrian Christian Church, Bangalore, November 28, 2009.

*Will a New Climate Regime Emerge from the Ashes in Copenhagen?*, Plenary Lecture, Indo-French Conference on Environment, Climate Change and Sustainable Development, Bangalore, January 29, 2010.

**Dr BK Anitha**

*Educational Statistics for District Planning*, Orientation Programme for District Collectors and UN Officials on Use of Data for Monitoring Development Programmes at Institute for Social and Economic Change, Bangalore, December 4, 2009.

*Developing Multiple Inclusive Models for Gifted Children in India: Issues and Challenges*, Indo-US

Round Table on Identification of Giftedness with special focus on Science and Mathematics, organised by INSA at New Delhi, January 27, 2010.

*Changing Pedagogy in Higher Education: Challenges and Concerns*, National Seminar on Quality in Higher Education: From Assurance to Enhancement, Stella Maris College, Chennai, February 2, 2010.

*Gender Issues in Research*, National Seminar on Paradigms of Research Culture – Exploring New Directions, St Joseph's College of Commerce, Bangalore, February 26, 2010.

**Dr Solomon Benjamin**

*Re-Politicizing Bangalore's Governance*, Keynote Address, National Seminar on the Urban Growth of Bangalore with special reference to Bangalore Cantonment (1809-2009), Christ University, Bangalore, February 18, 2010.

*Master Planning and Its Discontents*, NIAS Interdisciplinary Symposium on Structure and Its Discontents, February 26, 2010.

*Bangalore IT and Other Economies*, City Planning Institute Guangzhou, (The City Planning Authority) Guangzhou, China, March 12, 2010.

**Prof S Chandrashekar**

*The Emerging World Space Order and Its Implications for National Space Policies*, Symposium on Earth Observation System, Abu Dhabi, March 23, 2010.

**Prof DP Sen Gupta**

*JC Bose*, Raman Research Institute, Bangalore, April 16, 2009.

Showing the DVD on *JC Bose and Speaking on Him*, NIAS, May 13, 2009.

*JC Bose*, Indian Institute of Science, Bangalore, August 14, 2009.

*Signal Transmission Across Millenia*, JBNSTS, Calcutta, September 12, 2009.

**Prof Malavika Kapur**

*Your Child and TV*, Hindu Seva Prathisthana, Bangalore, April 18, 2009.

*Violence at Home and Children*, Indian Institute of Advanced Study, Rastrapathi Nivas, Shimla, April 24, 2009.

*Continuing Medical Education of Indian Chapter of Child and Adolescent Mental Health*, National Science Centre, New Delhi, May 2, 2009.

*Child Development*, Residential Course for Rural Teachers and Parents, Shishu Vihar, Bangalore, May 11, 2009.

*Learning from Children*, Charity Programme of Fame India for Rehabilitation of Children with Neuro Muscular and Neuro Developmental Disabilities, Accenture, Bangalore, July 30, 2009.

*Visual Media and Violence among Children*, National Consultation on Child Rights, Indian Social Science Institute, Bangalore, February 19, 2010.

*Visual Media and Violence Among and Against Children*, Keynote Address, 19<sup>th</sup> Annual Conference of National Academy of Psychology, Bangalore University, March 8, 2010.

#### **Mr Samir Karmakar**

*Viewing 'Expression' From Different Perspectives: Unfolding the Hidden Intricacies of Human Cognition*, National Seminar on Epistemology and Cognitive Science: Their Interplay in Knowledge Analysis, organised by the Philosophy Department, Sree Sankaracharya University of Sanskrit, Kalady, March 30-31, 2010.

#### **Dr Rajesh Kasturirangan**

*Beliefs, Signals and Informal Networks*, Annual Workshop of the Multiple University Research Initiative on Modeling Social Networks, Massachusetts Institute of Technology, Cambridge, MA, April 23, 2009.

*Conceptualization: The Anatomy of a 'Sense'-Organ*, International Conference on From Experience to Thought: Debates in Consciousness, Cognition and Agency, JNU, Delhi, January 8, 2010.

Two lectures on *Conceptualization*, University of Hyderabad, Hyderabad, February 23 and 24, 2010.

#### **Dr Kshama Lakshman**

*Impact of Pesticides on Health and Environment*,

Fifth International Conference on Children's Health and the Environment, organised by International Network on Children's Health Environment and Safety (INCHES) H.P. Foundation Bangalore, February 3, 2010.

*Pesticides and Chemical Terrorism*, Fifth International Conference on Children's Health and the Environment, organised by International Network on Children's Health Environment and Safety (INCHES) H.P. Foundation Bangalore, February 3, 2010.

#### **Prof SS Meenakshisundaram**

*How a Proposal Becomes Law in India?*, IIM Kozhikode, February 22, 2010.

*Implications of Research on Social and Economic Policies*, ISEC, Bangalore, March 4, 2010.

*Reforming Public Services for Good Governance*, Gandhigram Rural University, March 11, 2010.

#### **Prof Sangeetha Menon**

*Basic Concepts: Body (food and consumption in Indian tradition)*, Humanities Course, April 1, 2009.

*Basic Concepts: Mind (in Yogasutra)*, Humanities Course, NIAS, April 7, 2009.

*Basic Concepts: Self (in Upanishads)*, Humanities Course, NIAS, April 9, 2009.

*Introduction to the Sourcebook of Indian Psychology*, Sourcebook of Indian Psychology, Editors and Authors Meeting, NIAS, August 3, 2009.

*Communicating an Idea, Communicating a Visual*, Workshop on Effective Communication for NIAS Doctoral Students, NIAS, October 29 and 30, 2009.

*Indian Psychology*, Foundation Course Lecture for Doctoral Students, NIAS, October 19, 2009.

*Brain-challenged Self and Self-challenged Brain*, International Conference at Nanzan Institute for Religion and Culture, Nanzan University, Nagoya, Japan, November 28, 2009.

*The Natural Brain and the 'Super'natural Self*, Conference on Parapsychology at Andhra University, Visakhapatnam, January 11, 2010.

**Prof N Shantha Mohan**

*Women's Empowerment, Social Justice and Inclusive Development*, Keynote Address, National Seminar on Women's Empowerment, Social Justice and Inclusive Development, Kannur University, Kerala, February 10, 2010.

*Women's Equality and Social Justice*, Inaugural Address, International Women's Day, Jnana Bharathi, Bangalore, March 8, 2010.

**Prof Rajaram Nagappa**

*Vikram Sarabhai* on the occasion of his 90<sup>th</sup> Birth Anniversary, All India Radio, Bangalore, August 12, 2009.

**Dr MG Narasimhan**

The year 2009 was celebrated as the 200<sup>th</sup> birth anniversary of Charles Darwin and 150<sup>th</sup> anniversary of the publication of Darwin's major work *The Origin of Species*. In this context, he delivered altogether seven lectures from September 16 to 27, 2009 on various issues related to Darwin and Darwinism. He was invited to deliver this series as a Visiting Professor by the Department of Philosophy, Central University of Hyderabad, Hyderabad.

**Prof Narendar Pani**

*Probity in Corporate Governance*, Vigilance Study Circle, Bangalore Chapter, Bangalore, February 5, 2010.

**Prof K Ramachandra**

*Little Flowers to Srinivasa Ramanujan*, Conference on Ramanujan Rediscovered - Mathematics and IT Conference, Infosys, Bangalore, June 5, 2009.

*Transcendental Numbers*, NIAS, September 22, 2009.

*S Ramanujan*, TIFR, Bangalore, December 22, 2009.

**Dr Sindhu Radhakrishna**

*We and Other Lives*. Citizen Science Workshop, MES KEVEEYEM College, Valanchery, January 25, 2010.

**Prof S Ranganathan**

*Ancient Alloys and Modern Science*, Department of Archaeology, Exeter University, October 12, 2009.

*Sciences and the Humanities: Conflict and Consilience*, Inaugural Address, Science and Humanities Forum, Amrita School of Engineering, Bangalore, February 3, 2010.

**Prof PK Shetty**

*Challenges in Biosafety and Biosecurity in India*, Conference on Indian Youth Science Congress: Youth and Shaping the Future of Innovations in Science for Societal Needs, Sriperambudur, Chennai, organised by M.S. Swaminathan Research Foundation and SRM University, Chennai, June 5, 2009.

*Are We Biosecure?*, Adharsha College, R.T. Nagar, Bangalore, organized by Manthana, Hebbal, June 28, 2009.

*Bioterrorism: Threats and Preparedness*, Meeting on IEEE Women in Engineering Congress, WIE'CON '09, organised by IEEE Bangalore Section and Sri Venkateswara College of Engineering, Bangalore, October 24, 2009.

*Science for Human Security and Well Being*, Conference on Addressing the Challenges of Young Professionals and Next Generation Leaders, Dayananda Sagar College of Engineering, Bangalore, December 6, 2009.

*Impact of Pesticides on Health and Environment*, Fifth International Conference on Children's Health and the Environment, organised by International Network on Children's Health Environment and Safety (INCHES) H.P. Foundation Bangalore, February 3, 2010.

**Prof Anindya Sinha**

*Primate Worlds: Demography, Ecology, Behaviour and Conservation of Indian Macaques*, Keynote Address, Annual Meeting of the Indian Association of Teachers in Biological Sciences, Mumbai, May 2, 2009.

*The Discovery of the Arunachal Macaque, a New Monkey from Northeastern India*, Summer School in the Natural Sciences for High School Students, Indian Association for Cultivation of Science, Kolkata, May 14, 2009.

*Human Cloning*, Summer School in the Natural Sciences for High School Students, Indian Association for Cultivation of Science, Kolkata, May 15, 2009.

*How Monkeys See the World: The Search for the Animal Mind*, Institutional Colloquium Indian Association for Cultivation of Science, Kolkata, May 15, 2009.

*When is a Species a Species? The Tail and Other Stories of the Arunachal Macaque, a Newly-*

*discovered Indian Primate*, Homi Bhabha Centre for Science Education, Mumbai, July 7, 2009.

*Food, Sex and Society: Ecological Variability in Social Organisation and Individual Behavioural Strategies among Wild Bonnet Macaques*, UGC-NRCBS School on Animal Behaviour and Chronobiology, Madurai Kamaraj University, Madurai, September 5, 2009.

*Animal Watching: Field Observational Methods in Animal Behaviour*, UGC-NRCBS School on Animal Behaviour and Chronobiology, Madurai Kamaraj University, Madurai, September 5, 2009.

*Of Memes and Macaques: Phenotypic Flexibility, Behavioural Traditions and Cultural Evolution in Wild Bonnet Macaques*, UGC-NRCBS School on Animal Behaviour and Chronobiology, Madurai Kamaraj University, Madurai, September 6, 2009.

*How Bonnet Monkeys See the World: The Search for an Animal Mind*, UGC-NRCBS School on Animal Behaviour and Chronobiology, Madurai Kamaraj University, Madurai, September 6, 2009.

*Theory of Mind: A Natural History*, Centre for Ecological Sciences, Indian Institute of Science, Bangalore, October 16, 2009.

*Selected Topics in Biology: Genetics, Genetic Engineering and Evolution*, A series of 18 Lectures for Class X and XI Students, Poorna Learning Centre, Bangalore, October 19 to 23 and November 9 to 13, 2009.

*Not Just a Slimy Mango: The Mind of the Bonnet Macaque*, TED Talks, Mysore, November 4, 2009.

*The World of the Munzala*, TED Talks, Mysore, November 5, 2009.

*Conceptual Foundations in Biology*, Foundation Course, NIAS Doctoral Programme, NIAS, November 13, 2009.

*Observational Methods in Biology*, Foundation Course, NIAS Doctoral Programme, NIAS, November 16, 2009.

*Do Species Really Exist? Insights from the Arunachal macaque, a Newly-discovered Species Complex from*

*Arunachal Pradesh, Northeastern India*, Third International Congress on the Future of Animal Research: Biomedical and Field Research with Non-human Primates, Bangkok, Thailand, November 21, 2009.

*Of Monkeys and Men: Studying Primates in India, Darwin 200: Lectures in Entomology and Plant Pathology*, University of Agricultural Sciences, Bangalore, December 17, 2009.

*The Complex World of the Bonnet Macaque: The Society and Its Culture*, Winter School on Complex Systems, Institute of Mathematical Sciences, Chennai, January 13, 2010.

*The Complex World of the Bonnet Macaque: The Individual and its Mind*, Winter School on Complex Systems, Institute of Mathematical Sciences, Chennai, January 13, 2010.

*How Monkeys See the World: The Search for an Animal Mind*, Institutional Colloquium National Institute of Science, Education and Research, Bhubaneswar, January 22, 2010.

*Animal Watching: Observational Methods in Ethological Studies*, National Seminar on Developing and Nurturing Research Culture in Biological Sciences and the Third Convention of the Indian Association for Teachers in the Biological Sciences, Mumbai, February 5, 2010.

*Cultured Minds? Phenotypic Flexibility, Behavioural Traditions and Distributed Cognition in Wild Bonnet Macaques*, Departmental Colloquium, Department of Mental Health and Social Psychology, National Institute of Mental Health and Neurosciences, Bangalore, February 18, 2010.

*The Monkey in the Mirror: Social and Cultural Evolution in Wild Bonnet Macaques*, National Symposium on Recent Trends in Biology, Department of Zoology, University of Pune, Pune, February 27, 2010.

*Almost Minds? Attribution and Intentionality in Non-human Primates*, Plenary Talk, National Symposium on Mind and Meaning, Department of Philosophy, University of Hyderabad, Hyderabad, March 15, 2010.

**Prof BV Sreekantan**

*Advances in the Frontiers of Physical Sciences*, Valedictory Function, Vignaan 2009, Vijaya College, Bangalore, April 9, 2009.

*Indian Knowledge System and Modern Science*, Foundation for Revitalisation of Local Health Traditions (FRLHT), Bangalore, December 21, 2009.

*Front Ranking Cosmic Ray Experiments carried out in the Late 40's and 50's*, Panel Discussion, Home-Made Detectors and Electronics, TIFR, Mumbai, January 15, 2010.

*Multi-spectral Astronomy*, Science Day 2010, Bangalore, February 28, 2010.

**Dr Sharada Srinivasan**

*Report on Dholavira: Studies on Harappan Archaeometallurgy*, SERC-DST Projects Review, NIT, Raipur, April 6, 2009.

*Archaeology, Art and Culture in Relation to Digital Heritage*, India Digital Heritage (IDH) Workshop on Digital Heritage, DST supported PMC Meeting, NIAS, April 15, 2009.

*Nataraja et le Cosmos*, event for International Year of Astronomy, featured simultaneously via internet at Cite De L'Espece (Space City) Toulouse and Indian Institute of Astrophysics, Bangalore, October 17, 2009.

*Analytical and Digital Approaches in the Study of Vijayanagara Bronzes*, Hampi Digital Heritage Project, DST supported PMC Meeting, Indian Institute of Science, Bangalore, January 10, 2010.

*Phases and Faces: Bronze and High-tin Bronze Metalware Traditions from Southern India*, Centre for Contemporary Studies, Indian Institute of Science, Bangalore, February 4, 2010.

*Analytical and Archaeometallurgical Studies on Early Iron and Steel and Crucible Steel from Southern India*, NIAS-EXETER UKEIRI Seminar on Pioneering Metallurgy: Work in Progress, NIAS, February 25, 2010.

*Art and Science*, National Science Day Celebrations, ISRO Telemetry Tracking and Command Network, Bangalore, March 10, 2010.

**Dr Carol Upadhya**

*What is Ethnography and What is it Good For?*, NIAS Summer School in Philosophy, June 18, 2009.

*Global Indians: Negotiating Identity in the Software Industry*, Lecture and Film Screening, Raman Research Institute Colloquium Series, Bangalore, July 16, 2009.

*Social Structure – An Idea We Can't Live Without*, interdisciplinary symposium on Structure and Its Discontents, NIAS, February 26, 2010.

**Prof Prabhakar G Vaidya**

*A Single Parameter Model of a Heartbeat*, Mathematics Department, University of North Carolina, November 10, 2009.

**Prof AR Vasavi**

*Elementary Education: Challenges at a State Level*, Presentation to Visiting Delegation of UNESCO Teachers, NIAS (Jointly with Mr Rahul Mukhopadhyay) April 16, 2009.

*Development and the Crisis of Governance in Karnataka*, Social Watch, Karnataka, Bangalore, June 16, 2009.

*Configurations of Rurality: Some Challenges for Understanding Migration*, Centre for Women's Development Studies, Hyderabad, June 24, 2009.

*Agrarian Distress in India*, Brecht Forum, New York, September 19, 2009.

*Differentiated Schooling and the Neoliberal Education Regime in India*, Department of Education, University of Massachusetts, September 21, 2009.

*Teachers, Agency and the Neo-liberal Education Regime*, Department of Education, University of Massachusetts, September 22, 2009.

*Four Emblematic Figures and the Making of a New India*, School of International Studies, Brandeis University, Massachusetts, September 24, 2009.

*Vernacular Voices: Kannada Writings and the Sociology of India*, Department of Anthropology, Yale University, Connecticut, September 27, 2009.



*Four Emblematic Figures and the Making of a New India*, South Asian Studies Programme, Yale University, September 29, 2009.

*Suicides and the Making of Agrarian Distress in India*, Agrarian Studies Program, Yale University, October 2, 2009.

*Some Queries on the Poor as an Emerging Market*, Workshop on the Poor as Market, NIAS, November 6, 2009.

*The Contemporary Predicament of Rural India*, National Law School, Bangalore, November 24, 2009.

*Agriculture, Society, Agriculturists*: Presentation made to the Farmers' Jury (*Raitha Theerpu*), Bangalore, December 2, 2009.

*Marginal Groups and Household Level Capabilities*, MS Ramaiah Medical College, Bangalore, December 22, 2009.

*Introductory Comments to the Inner Mirror*, ART, Bangalore, February 20, 2010.

*Facing the Challenges of a Differentiated Education System*, St Joseph's College, Bangalore, March 13, 2010.

## PAPERS PRESENTED IN CONFERENCES

### **Dr BK Anitha**

*Gender, Science and Technology Education in India*, Peer Reviewed Workshop on Gender and Science organized by IAWS at SNTD University, Mumbai, February 17, 2010.

*Catalyzing Change*, Round Table organized by EDGE at the Habitat Centre, New Delhi, March 3, 2010.

*Quality Assurance Mechanism as a Tool for Transforming Higher Education*, National Seminar on Education, State and Globalization: Issues and Challenges organized by University of Hyderabad, March 6, 2010.

### **Dr Solomon Benjamin**

*Participatory Environmental Planning, Community Based Urban Design and Planning* Annual Conference of the Southern Chapter, Indian Institute of Urban

Designers (IUDI), Ernakulam, Kerala, October 3, 2009.

*Thinking City Politics Ground Up*, Symposium on The Un-disciplined City, City Centre for Policy Research, New Delhi, November 30, 2009.

*'Subaltern' Globalism: Thinking Beyond the 'Designed City'*, International Conference on Making Global Cities and the World Economic Crisis, University of Minnesota and Beijing University, Shenzhen, Shenzhen, China, January 6, 2010.

*Keeping Out the Rif-Raf: Panoptic Desires Confront an Unruly Poor*, National Conference on Power in Modern India, Centre for Political Studies, JNU, New Delhi, March 25, 2010.

### **Prof S Chandrashekar**

*Chinese and Other Regional Power's Interest*, Seminar on Security and Development of Andaman and Nicobar Islands, Port Blair, September 5, 2009.

### **Prof Malavika Kapur**

*Learning from Children What to Teach Them*, Seminar on Bridging the Gap Between Developmental Psychology and Education, Cambridge University, UK, September 25, 2009.

*Learning from Children What to Teach Them*, Panel Discussion on Community Health, Centre Badenya a Nouna, Burkina Faso, West Africa, December 4 and 5, 2009.

*Focus on Intervention*, WHO Advisory Group Meeting on Revision of ICD 10 on Child and Adolescent Psychiatric Disorders, Geneva, March 25, 2010.

### **Prof Rajaram Nagappa**

*Technology and Capability Assessment of Iran's Safir Launch Vehicle*, National Seminar on Regional Security in South Asia, Department of Geopolitics, Manipal University and Indian Council of World Affairs, Manipal, April 10, 2009.

*Chinese Missiles, Space, Counterspace and Electronic Warfare*, Seminar on China's Defence Modernisation Posture and Implications for India, Asia Centre, Bangalore, October 24, 2009.

### **Prof Narendar Pani**

*The Appropriateness of the Water Disputes Tribunal*

*Framework, Workshop on Changes in Water Governance in Tungabhadra and Krishna: The Longer View, Hyderabad, June 30, 2009.*

*The Life and Death of an Urban Culture: Bangalore Cantonment, 1809-1983, National Seminar on the Urban Growth of Bangalore with special reference to Bangalore Cantonment (1809-2009), Christ University, Bangalore, February 19, 2010.*

*Between Ideas, Rules and Practice: The Space for Exclusion in Devaraj Urs' Land Reforms, Conference on 60 Years of the Indian Constitution, International Training Centre, National Law School of India University, Bangalore, March 6, 2010.*

### **Prof S Ranganathan**

*From an Imperial University to an Indian Institute of Science – A Journey of Sixty Years (1888 –1948), Department of Materials Engineering, IISc, Bangalore, May 18, 2009.*

*Splendours of Indian Bronzes, Microstructural Engineering, NRC-M, Department of Materials Engineering, IISc, May 20, 2009.*

*IISc as the Fountainhead of Indian Materials Science and Technology, IISc Centenary Seminar on Science, Technology and National Security - The Role of Indigenous Developments, IISc Alumni Association, May 23, 2009.*

*Alloy Design: Some Vignettes, Microstructural Engineering, NRC-M, Department of Materials Engineering, IISc, May 25, 2009.*

*Materials, Civilization and Choices, Indo-US Workshop on Designing Sustainable Products, Services and Manufacturing Systems, Indian Institute of Science, Bangalore, August, 18, 2009.*

*Unleaded and High-tin Bronzes: Further Insights from Indian and Southeast Asian Finds (along with Dr Sharada Srinivasan and Dr Ian Glover), Seventh International Conference on the Beginning of the Use of Metals and Alloys (BUMA-VII), NIAS, September 15, 2009.*

*Ancient Indian Iron and Steel and Modern Scientific Insights (along with Dr R Balasubramaniam and Dr Sharada Srinivasan), Seventh International*

*Conference on the Beginning of the Use of Metals and Alloys (BUMA-VII), NIAS, September 15, 2009.*

*New Geometries for New Materials, Cambridge Materials Science around the World in the 21<sup>st</sup> Century, Cambridge University 800<sup>th</sup> Anniversary Celebrations, Cambridge, UK, September 25, 2009.*

*The Indian Institute of Science: A Case Study of Academia- Strategic Sector Interactions, Indian National Science Academy Theme Meeting on Materials Science Challenges in Strategic Sectors, Indira Gandhi Centre for Atomic Research, Kalpakkam, October 20, 2009.*

*Ancient Steels Meet Modern Science, Course on Latest Trends in Aluminum Alloys, Composites and Nanosmart Materials, National Academy of Defence Production and IISc, Bangalore, October 30, 2009.*

*Ancient Alloys and Modern Science, Seminar on the History of Science, Indian National Science Academy, Centre for Contemporary Studies, Indian Institute of Science, Bangalore, November 2, 2009.*

*Solidification Processing: Indian Heritage, 4<sup>th</sup> International Conference on Solidification Sciences and Processing, Indian Institute of Technology Madras, Chennai, November 21, 2009.*

*The Fountainhead of Science and Technology in India, National Seminar on the Urban Growth of Bangalore, Christ University, Bangalore, February 19, 2010.*

*Imaging Nanomaterials, IBSA Workshop, Mamallapuram, February 21, 2010.*

*Discovering the Nanoscale, International Conference on Nanoscience and Nanotechnology (ICON 2010), SRM University, Kattankulathur, February 24, 2010.*

*Konasamudram: Remembering a Forgotten Village, UKIERI Seminar on Pioneering Metallurgy National Institute of Advanced Studies, Bangalore, February 25, 2010.*

*The Search for Structure in Materials, Symposium on Structure and Its Discontents, NIAS, February 26, 2010.*

### **Dr Sharada Srinivasan**

*Archaeometallurgical and Ethnoarchaeological Insights on Copper Alloy Works and Statuary Making in Tanjavur District*, The 7<sup>th</sup> International Conference on the Beginning of the Use of Metals and Alloys, NIAS, September 16, 2009.

*High-tin Bronzes: Archaeometallurgical and Ethnoarchaeological Insights*, History Panel, Homi Bhabha Fellows Conclave, Homi Bhabha Centenary Celebrations, Tata Institute of Fundamental Research, Mumbai, November 20, 2009.

### **Prof Prabhakar G Vaidya**

*A Preliminary Investigation of the Feasibility of using SVD and Algebraic Topology to Study Dynamics on Manifold* (with Ms Swarnali Majumder), CAT 09, Warsaw, Poland, July 11, 2009.

*Modifying Some Foliated Dynamical Systems to Guide their Trajectories to Specified Sub-Manifolds*, (with Ms Swarnali Majumder), EQUADIFF 12, Brno, Czech Republic, July 20, 2009.

*Connecting Fourier Analysis of Dynamical Systems to the Topology of Underlying Manifolds*, 44<sup>th</sup> Spring Topology and Dynamics Conference 2010, Mississippi State University, Starkville, Mississippi, March 18, 2010.

### **Prof AR Vasavi**

*Child Rights; Some Cautionary Notes*, Child Rights Trust, Bangalore, November 20, 2009.

*The Constitution and Marginal Communities*, National Law School, Bangalore, March 7, 2010.

## CONFERENCES ATTENDED

### **Prof Dilip R Ahuja**

*The World Bank Energy Week*, Washington DC, April 1 to 2, 2009.

*Adaptation Workshop* organised by the Global Leadership for Climate Action, at the UN Foundation, Washington, DC, April 28, 2009.

*Governing India's Cities: Deepening Democracy and Improving Services*, Workshop at the Johns Hopkins School of Advanced International Studies, Washington, DC, May 7, 2009.

Indo-US Workshop on *Energy and Climate Futures*, Chair Session, Science and Research Challenges in Energy and Climate, GRT Temple Bay Resort, Mahabalipuram, Chennai, October 27, 2009.

*Climate Change and Opportunities for India*, Dinner Discussion organized by e-Parliament for the Honourable Members of Indian Parliament, New Delhi, March 3, 2010.

*Best Practices in Energy and Water Conservation*, Divecha Centre for Climate Change, IISc, Bangalore, March 13, 2010.

### **Dr Solomon Benjamin**

Discussant in panel on *The Civic and the Public in Urban Environmental Conflicts* in the International Conference on Urban Ecologies in Asia, Yale University and the University of Hong Kong, March 12 to 14, 2010.

Discussant in the international workshop on *Contesting The Indian City: State, Space, And Citizenship In The Global Era* co-sponsored by the University of Michigan at Ann Arbor and the Centre for Studies in the Social Sciences, Calcutta, March 5 and 6, 2010.

### **Dr Manabrata Guha**

Seminar on *Security and Development of Andaman and Nicobar Islands*, Port Blair, September 4 and 5, 2009.

*China – India Military Balance – 2020*, Presentation at DRDO HQ, New Delhi, March 17, 2010.

### **Prof N Shantha Mohan**

National Dialogue on *Water Entitlements and Allocations for Livelihoods and Ecosystem Needs and the Legal-Institutional Framework for Conflict Resolution*, the Forum for Policy Dialogue on Conflict Resolution in India, Pune, February 25 and 26, 2010.

### **Prof Rajaram Nagappa**

Seminar on *Security and Development of Andaman and Nicobar Islands*, Port Blair, September 4 and 5, 2009.

*China – India Military Balance – 2020*, Presentation at DRDO HQ, New Delhi, March 17, 2010.

**Prof K Ramachandra**

*Ramanujan Rediscovered* - Mathematics and IT Conference, Infosys, Bangalore, June 1 to 5, 2009.

**Prof N Ramani**

Seminar on *Security and Development of Andaman and Nicobar Islands*, Port Blair, September 4 and 5, 2009.

**Prof Anindya Sinha**

*Annual Meeting of the Indian Association of Teachers in Biological Sciences*, Mumbai, May 2 to 3, 2009.

UGC-NRCBS School on *Animal Behaviour and Chronobiology*, Madurai Kamaraj University, Madurai, September 5 to 6, 2009.

*TED India Conference*, Mysore, November 4 to 9, 2009.

Third International Congress on *The Future of Animal Research: Biomedical and Field Research with Non-human Primates*, Bangkok, Thailand, November 21 to 25, 2009.

*Winter School on Complex Systems*, Institute of Mathematical Sciences, Chennai, January 13 to 17, 2010.

National Seminar on *Developing and Nurturing Research Culture in Biological Sciences and the Third Convention of the Indian Association for Teachers in the Biological Sciences*, Mumbai, February 5 to 6, 2010.

National Symposium on *Recent Trends in Biology*, Department of Zoology, University of Pune, Pune, February 26 to 27, 2010.

National Symposium on *Mind and Meaning*, Department of Philosophy, University of Hyderabad, Hyderabad, March 15 to 17, 2010.

**Dr Sharada Srinivasan**

Co-Chair, *Materials and Civilization, the 7<sup>th</sup> International Conference on the Beginning of the Use of Metals and Alloys*, NIAS, September 13 to 17, 2009.

*Homi Bhabha Fellows Conclave*, Homi Bhabha Centenary Celebrations, Tata Institute of Fundamental Research, Mumbai, November 20, 2009.

**Prof BV Sreekantan**

Birth Centenary Celebrations of Dr Homi J Bhabha, Atomic Energy Retired Officers' Association, Bangalore, October 24, 2009.

Summit Meeting on *Bhabha the Founder of Modern Science in India*, TIFR, Mumbai, May 27, 2009.

**Prof Lalitha Sundaresan**

Seminar on *Security and Development of Andaman and Nicobar Islands*, Port Blair, September 4 and 5, 2009.

*China – India Military Balance – 2020*, Presentation at DRDO HQ, New Delhi, March 17, 2010.



Field work during the study on Lakes.

# Publications

## BOOKS

**Malavika Kapur** and Dorothy Buglass (eds.) (2009) *Another Way to Live* by RL Kapur. New Delhi: Penguin.

**Mohan Shantha N, Sailen Routray** and **N Sashikumar** (eds.) (2010) *River Water Sharing: Transboundary Conflict and Cooperation in India*. New Delhi: Routledge.

**Pani Narendar, S Radhakrishna** and **Kishor G Bhat** (eds.) (2010) *Bengaluru, Bangalore, Bengaluru: Imaginations and Their Times*. New Delhi: Sage Publications.

**Routray Sailen** (2009) *Bidyalayamukta Samaja* (Oriya translation of 'Deschooling Society' by Ivan Illich). Bhubaneswar: Siksha Sandhan.

**Shetty PK** and VK Agrawal (eds.) (2009) *Grid Security and Management*. New Delhi: Power Line Publishing.

**Sreekantan BV** (ed.) (2009) *Science Technology and Society*. Shimla: IAS and Bangalore: NIAS.

**Vasavi AR** (ed.) (2009) *The Inner Mirror: Translations of Kannada Writings on Society and Culture*. New Delhi: The Book Review Press.

## EDITED PROCEEDINGS

Krishnamurthy KV, Mangala Sundarkrishnan and **Anitha Kurup [Anitha BK]** (2009) *Management of Education, Research and Collaboration*. New Delhi: IGNOU Publications.

**Ramachandra K** (2009) *Hardy-Ramanujan Journal* Vol.32.

## PAPERS

**Ahuja Dilip** and J Srinivasan (2009) 'Why Controlling Climate Change is Tougher than Stopping Stratospheric Ozone Depletion', *Current Science* 97(11): 1531-1534.

**Ahuja Dilip** (2009) 'Multiple Pressures on India on Climate Change', *Current Science* 97(10): 1414-1415.

- Ahuja Dilip** and Marika Tatsutani (2009) 'Sustainable Energy for Developing Countries', *SAPIENS* 2(1).
- Anitha BK** (2009) 'Transforming Educational Institutions for Global Opportunities: Directions for Higher Education'. Bangalore: EDGE Publications (co-author).
- Baindur Meera** (2009) 'Nature as Non-Terrestrial: Sacred Natural Landscapes and Place in Indian Vedic and Puranic Thought', *Environmental Philosophy* 6(2): 43-58.
- Benjamin Solomon** (2010) 'Manufacturing Neoliberalism: Life Styling Indian Urbanity' in *Accumulation by Dispossession: Transformative Cities in the New Global Order* (eds. Swapna Banerjee-Guha). New Delhi: Sage.
- Bhat Kishor G, K Ramachandra and Prabhakar G Vaidya** (2009) 'An Introduction to Trigonometry (A New Outlook)', *Mathematics Student* 78(1-4).
- Chandrashekar S** (2010) 'The Emerging World Space Order and Its Implications for India's Security', in *South Asia at a Crossroads: Conflict or Cooperation in the Age of Nuclear Weapons, Missile Defense, and Space Rivalries* (eds. Subrata Ghoshroy and Goetz Neuneck). Germany: Nomos Verlag Publishers.
- Goodale Eben, BZ Nizam, **VV Robin**, Hari Sridhar, Pranav Trivedi, SW Kotagama, UKGK Padmalal, Rahula Perera, P Pramod and Lalitha Vijayan (2009) 'Regional variation in the composition and structure of mixed-species bird flocks in the Western Ghats and Sri Lanka', *Current Science* 97(5):648-663.
- Guha Manabrata** (2010) 'Introduction to SIMADology: Polemos in the 21st Century Collapse', *Journal of Philosophical Research and Development* (ed. Robin Mackay) Vol.VI: Geo/Philosophy. Oxford: Urbanomic.
- Hamsa Kalyani** (2009) 'Scholarly Communication' in *Management of Education, Research and Collaboration* (eds. K.V Krishnamurthy, Mangala Sundarkrishnan and Anitha Kurup). New Delhi: IGNOU. pp.123-155.
- Karmakar S** (2010) 'Individuating and Ordering Situations in *Bāṅlā*', *Poznan Studies in Contemporary Linguistics (PSiCL)*, 46(1): 69-84. doi: 10.2478/v10010-010-0004-8.
- Karmakar S** (2009) 'Compositional to Contextual: Revisiting Certain Issues of Language Designing', *Indian Linguistics*, 70: 149-161.
- Kumara HN, S Kumar and M Singh** (2010) 'Of How Much Concern are the 'Least Concern' Species? Distribution and Conservation Status of Bonnet Macaques, Rhesus Macaques and Hanuman Langurs in Karnataka, India', *Primates* 51: 37-42.
- Kumara HN and Anindya Sinha** (2009) 'Decline of the Endangered Lion-Tailed Macaque *Macaca Silenus* in the Western Ghats, India', *Oryx* 43: 292-298.
- Kurup Anitha** (2009) 'Introduction and Overview of Management of Education, Research and Collaboration' in *Management of Education, Research and Collaboration* (eds. KV Krishnamurthy, Mangala Sundarkrishnan and Anitha Kurup). New Delhi: IGNOU. pp.1-32.
- Kurup Anitha** (2009) 'Management of Education, Research and Collaboration in Natural Sciences Collaboration' in *Management of Education, Research and Collaboration* (eds. KV Krishnamurthy, Mangala Sundarkrishnan and Anitha Kurup). New Delhi: IGNOU (co-author). pp.34-78.
- Kurup Anitha** (2009) 'Management of Education, Research and Collaboration in Humanities and Social Sciences Collaboration' in *Management of Education, Research and Collaboration* (eds. KV Krishnamurthy, Mangala Sundarkrishnan and Anitha Kurup). New Delhi: IGNOU (co-author). pp.79-122.
- Kurup Anitha** (2009) 'Leadership' in *Management of Education, Research and Collaboration* (eds. KV Krishnamurthy, Mangala Sundarkrishnan and Anitha Kurup). New Delhi: IGNOU (co-author). pp.238-256.
- Kurup Anitha** (2009) 'Integrated Water Resource Management – An Alternative Paradigm' in *River Water Sharing: Transboundary Conflict and cooperation in India* (eds. N Shantha Mohan, Sailen Routray and N Sashikumar). New Delhi: Routledge. pp.156-182.
- Kurup Anitha** (2009) 'Does Indian Higher Education Resonate with the Global Knowledge

Economy' *SRDE's Higher Education Journal (SHEJ)* 1(5): 1-8.

**Kurup Anitha** (2009) 'Emerging Directions in Global Education –A Meeting Report' *Current Science* 96(10): 1301- 1303 (co-author).

Mendiratta, U, A Kumar, C Mishra and **Anindya Sinha** (2009) 'Winter Ecology of the Arunachal Macaque *Macaca munzala* in Pangchen Valley, Western Arunachal Pradesh, Northeastern India', *American Journal of Primatology* 71: 939-947.

**Menon Sangeetha** (2009) 'The Puzzle of Consciousness and Experiential Primacy: Agency in Cognitive Sciences and Spiritual Experiences' in *Global Perspectives on Science and Spirituality* (ed. Pranab Das Jr.). Templeton Press. pp.3-20.

**Menon Sangeetha** (2010) 'The Rain Clouds of Mind-Modifications and the Shower of Transcendence: Yoga and Samadhi in Patanjali Yoga Sutra' in *Yoga and Parapsychology: Empirical Research and Theoretical Essays* (ed. K Ramakrishna Rao). Delhi: Motilal Banarsidass Publishers, pp.169-199.

**Menon Sangeetha** (2010) 'The Concept of Consciousness' in *Indian culture: Encyclopaedic Survey; Science and Society* (eds. Jaikishandas Sadani and Bithaldas Mundra), Bikaner: Bharatiya Vidya Mandir. pp.316-337.

**Mohan N Shantha** (2010) 'Locating Transboundary Water Sharing in India', in *River Water Sharing: Transboundary Conflict and Cooperation in India* (eds. N Shantha Mohan, Sailen Routray and N Sashikumar). New Delhi: Routledge.

**Mukhopadhyay Rahul**, N Ramkumar and **AR Vasavi** (2009) 'Management of Elementary Education Structures and Strategies' (Education for All – MID Decade Assesment). New Delhi: NUEPA. pp.1-61 (Monograph).

**Murti SK Arun** (2009) 'Mulavidya Controversy in Advaita Vedanta: Was Sankara Himself Responsible?' *Journal of Indian Philosophy* 37: 149-177.

**Murti SK Arun** and **Sundar Sarukkai** (2009) 'Multisemiosis and Incommensurability' *International Studies in Philosophy of Science* 23 (3): 297-311.

**Murugan M, PK Shetty**, A Anandhi, R Ravi, S Alappan, M Vasudevan and **KG Sreeja** (2009) 'Rainfall Changes over Tropical Montane Cloud forests of southern Western Ghats, India', *Current Science*, 97(12): 1755-1760.

**Murugan M, PK Shetty**, V Mukund, B Panigrahy and A Josephraj Kumar (2009) 'Soil and Surface Air Warming in Cardamom Ecosystem in Southern Western Ghats, Kerala, India', *International Journal of Agriculture and Rural Development* 11(2): 52-64.

**Nagaraj Nithin** and **Prabhakar G Vaidya** (2009) 'Multiplexing of Discrete Chaotic Signals in Presence of Noise' *Chaos: An Interdisciplinary Journal of Nonlinear Science* 19, 033102. doi:10.1063/1.3157183.

**Nagaraj Nithin, Prabhakar G Vaidya** and **Kishor G Bhat** (2009) 'Arithmetic Coding as a Non-linear Dynamical System', *Communications in Nonlinear Science and Numerical Simulation*, 14(4): 1013-1020 doi:10.1016/j.cnsns.2007.12.001.

**Nagappa R** (2009) 'Space Security: Need for Proactive Approach' in *Report of the IDSA-Indian Pugwash Society Working Group on Space Security*. New Delhi: Academic Foundation (Working Group Member and Contributor to the Report).

Nandini R, K Kakati and N Ved (2009) 'Occurrence Records of the Bengal Slow Loris (*Nycticebus bengalensis*) in Northeastern India', *Asian Primates Journal* 1: 12-18.

**Pani Narendar** and **K Jafar** (2010) 'Mass Education-led Growth and Non-Agrarian Villages: Long-Term Results of the Kerala Model', *Oxford Development Studies* 38(1): 25–42.

**Pani Narendar** (2010) 'Imaginations of Bengaluru' in *Bengaluru, Bangalore, Bengaluru: Imaginations and their Times* (eds. Narendar Pani, Sindhu Radhakrishna and Kishor G Bhat) New Delhi: Sage.

**Pani Narendar** (2009) 'Boundaries of Transboundary Water Sharing' in *River Water Sharing: Transboundary Conflict and Cooperation in India* (eds. N. Shantha Mohan, Sailen Routray, and N. Sashikumar). New Delhi: Routledge. pp.47-65.

- Pani Narendar** (2009) 'Institutions that cannot Manage Change: A Gandhian Perspective on the Cauvery Dispute in South India', *Water Alternatives* 2(3): 315-327.
- Rajani MB**, SK Patra and Mamta Verma (2009) 'Space Observation for Generating 3D Perspective Views and its Implication to Study the Archaeological Site of Badami in India', *Journal of Cultural Heritage* 10(1): 20-26.
- Rao P Rama** and **BK Anitha** (2009) 'Challenges in Higher Education in the Face of India's Demographic Ascendancy' in *Science, Technology and Society* (ed. BV Sreekantan). Shimla: IAS Publications. pp.83-113.
- Routray Sailen** (2010) 'The Water Sector in India: An Overview' in *River Water Sharing: Transboundary Conflict and Cooperation in India* (eds. Shantha Mohan, N, Sailen Routray, and N Shashikumar). New Delhi: Routledge. pp 23-46.
- Sarukkai Sundar** (2009) 'Science and the Ethics of Curiosity', *Current Science* 97(6): 756-767.
- Sarukkai Sundar** (2009) 'Phenomenology of Untouchability', *Economic and Political Weekly* XLIV(37): 39-48.
- Shetty PK** and Mariam Sabitha (2009) 'Economic and Ecological Externalities of Pesticide Use in India' in *Integrated Pest Management: Innovation - Development Process*, Vol.1 (eds. R. Peshin and AK Dhawan). Netherlands: Springer.
- Shetty PK** (2009) 'Energy revolution for Sustainable Human Development: The Challenge' in *Grid Security and Management* (eds. PK Shetty and VK Agrawal). New Delhi: Power Line Publishing.
- Shetty PK**, MB Hiremath, M Sabitha and **M Murugan** (2009) 'Integrated Pest Management Strategies and Agricultural Sustainability in India', *International Journal of Agriculture and Rural Development*, 11(2): 45-51.
- Singh Amarjeet** (2009) 'A Study on Illegal Immigration into North-East India: The Case of Nagaland', IDSA Occasional Paper No. 8. New Delhi: Institute for Defence Studies and Analyses.
- Sreekantan BV** (2009) 'Development of High Energy Astronomies: Indian Contribution in the 20<sup>th</sup> Century' in *Science in India* (ed. JV Narlikar). New Delhi: Viva for PHISPC.
- Srinivasan Sharada** (2009) 'Ancient Singing Rocks of Neolithic Kupgal, Karnataka', *Songlines* 60: 54-7.
- Swapna N, **S Radhakrishna**, AK Gupta and A Kumar (2009) 'Exudativory in the Bengal Slow Loris (*Nycticebus bengalensis*) in Trishna Wildlife Sanctuary, Tripura, Northeast India', *American Journal of Primatology* 71: 1-9.
- Udupa Sahana** (2009) 'Mediatized Terror: Terror in the Age of Media Explosion' *Economic and Political Weekly* XLIV(9): 18-21.
- Upadhyaya Carol** (2009) 'Imagining India: Software and the Ideology of Liberalisation', *South African Review of Sociology* Special issue on Sociology in India 40(1): 76-93.
- Upadhyaya Carol** (2009) 'Law, Custom, and Adivasi Identity: Politics of Land Rights in Chotanagpur' in *Legal Grounds: Natural Resources, Identity, and the Law in Jharkhand* (ed. Nandini Sundar). New Delhi: Oxford University Press. pp.30-55.
- Upadhyaya Carol** (2009) 'India's 'New Middle Class' and the Globalising City: Software Professionals in Bangalore' in *The New Middle Classes: Globalizing Lifestyles, Consumerism, and Environmental Concern* (eds. Hellmuth Lange and Lars Meier). Dorchecht: Springer. pp.253-268.
- Upadhyaya Carol** (2010) 'Taking the High Road? Labour in the Indian Software Outsourcing Industry' in *Labour in Global Production Networks in India* (eds. Anne Posthuma and Dev Nathan). New Delhi: Oxford University Press. pp.300-320.
- Vaidya Prabhakar G** and S Majumder (2010) 'Modifying Some Foliated Dynamical Systems to Guide their Trajectories to Specified Sub-Manifolds', *Mathematica Bohemica* (special issue).
- Vaidya Prabhakar G**, **PS Sajini Anand** and **Nithin Nagaraj** (2010) 'A Nonlinear Generalisation



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His Excellency the then Governor of Karnataka Shri Rameshwar Thakur releasing the book on 'Grid Security and Management' by presenting a copy to Dr Arcot Ramachandran. To his right are Dr K Kasturirangan and Prof PK Shetty.

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University of Delhi & National Research Professor  
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A Deva Raju

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S Lalitha  
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S Revanna  
S Sampath  
N Sathyamurthy  
B Shivanandappa  
V Srinivasa  
MV Sudhakara  
Mohammed Umar  
G Venugopal



# Financial Statements

For the year 2009-2010

## **NATIONAL INSTITUTE OF ADVANCED STUDIES**

Indian Institute of Science Campus  
Bangalore 560 012

## **BRV GOUD & CO.**

**Chartered Accountants**

'Sai Complex' 1<sup>st</sup> Floor  
1/1, Museum Road  
Bangalore - 560 001

# Auditors' Report

1. We have audited the attached Balance Sheet of "NATIONAL INSTITUTE OF ADVANCED STUDIES", Indian Institute of Science Campus, Bangalore – 560 012, as at 31st March 2010, the General Income and Expenditure Account and Sponsored Projects Income & Expenditure Account for the year ended on that date, annexed thereto. These Financial Statements are the responsibility of the Institute's Management. Our responsibility is to express an opinion on these Financial Statements based on our Audit.  
  
We conducted our audit in accordance with Auditing standards generally accepted in India. Those Standards require that we plan and perform the audit to obtain reasonable assurance about whether the Financial Statements are free of material misstatement. An Audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the Financial Statements. An audit also includes assessing the accounting principles used and significant estimates by Management, as well as evaluating the overall Financial Statement presentation. We believe that our audit provides a reasonable basis for our opinion.
  2. We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our Audit.
  3. In our opinion, proper Books of Accounts as required by law have been kept by the Institute so far as appears from our examination of such books.
  4. The Balance Sheet and the Income and Expenditure Account dealt with by this report are in agreement with the books of account.
  5. In our opinion and to the best of our information and according to the explanations given to us, the said accounts read with the schedules and notes thereon give a true and fair view in conformity with the accounting principles generally accepted in India:
    - a) In the case of the Balance Sheet, of the state of affairs of the Institute as at 31<sup>st</sup> March 2010,
- AND
- b) In the case of Income and Expenditure Account, of the Deficit in the General Income and Expenditure Account and Surplus in the Sponsored Projects Income and Expenditure Account for the year ended on that date.

for BRV GOUD & CO.  
Chartered Accountants

PLACE : BANGALORE  
DATE : MAY 24, 2010

Sd/-  
(AB SHIVA SUBRAMANYAM)  
PARTNER  
M.NO. 201108



**NATIONAL INSTITUTE OF ADVANCED STUDIES**  
Indian Institute of Science Campus, Bangalore 560 012

**BALANCE SHEET AS AT MARCH 31, 2010**

Particulars	As on 31/03/2010 Rs.	As on 31/03/2009 Rs.
<b>I. SOURCES OF FUNDS:</b>		
a) Capital Fund	25464048	56373079
b) Other Funds	228505313	211843990
c) Current Liabilities	1171539	1434154
d) Depreciation Fund	71946419	63505622
<b>Total Rs.</b>	<b>327087319</b>	<b>333156845</b>
<b>II. APPLICATION OF FUNDS:</b>		
a) Fixed Assets	148954575	138979945
b) Investments	167009000	183079000
c) Advances, Deposits & Receivables	3267062	723427
d) Bank & Cash Balances	7856682	10374473
<b>Total Rs.</b>	<b>327087319</b>	<b>333156845</b>

As per our report of even date  
for BRV GOUD & CO.  
CHARTERED ACCOUNTANTS

Sd/-  
(PROF V S RAMAMURTHY)  
DIRECTOR

Sd/-  
(AB SHIVA SUBRAMANYAM)  
PARTNER

PLACE : BANGALORE  
DATE : MAY 24, 2010

Sd/-  
(P SRINIVASA AITHAL)  
HEAD-ADMINISTRATION

# NATIONAL INSTITUTE OF ADVANCED STUDIES

Indian Institute of Science Campus, Bangalore 560 012

## GENERAL INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED MARCH 31, 2010

Particulars	2009-10 Rs.	2008-09 Rs.
<b>A. INCOME:</b>		
Grants and Donations	2500000	35400000
Interest on Investments	10830658	10401773
Overhead & Administrative Charges	7609159	6923702
Research, Symposia & Courses	3583247	4507476
Miscellaneous Income	3634649	3178408
<b>TOTAL (A) Rs.</b>	<b>28157713</b>	<b>60411359</b>
<b>B. EXPENDITURE:</b>		
Administrative Expenses	45634574	16762518
Travelling Expenses	514747	386049
Repairs and Maintenance Expenses	2716320	2829702
Research, Symposia and Course Expenses	5058960	4647983
Professorship Expenses	1687749	1105512
Miscellaneous Expenses	50824	70982
<b>TOTAL (B) Rs.</b>	<b>55663174</b>	<b>25802745</b>
<b>C. SURPLUS/(DEFICIT) BEFORE DEPRECIATION (A-B) LESS: DEPRECIATION</b>	<b>(27505461) 8403570</b>	<b>34608614 6032088</b>
<b>D. SURPLUS/(DEFICIT) AFTER DEPRECIATION</b>	<b>(35909031)</b>	<b>28576526</b>

As per our report of even date  
for BRV GOUD & CO.  
CHARTERED ACCOUNTANTS

Sd/-  
(PROF V S RAMAMURTHY)  
DIRECTOR

Sd/-  
(AB SHIVA SUBRAMANYAM)  
PARTNER

PLACE : BANGALORE  
DATE : MAY 24, 2010

Sd/-  
(P SRINIVASA AITHAL)  
HEAD-ADMINISTRATION

# NATIONAL INSTITUTE OF ADVANCED STUDIES

Indian Institute of Science Campus, Bangalore 560 012

## SPONSORED PROJECTS INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED MARCH 31, 2010

Particulars	Scientific Research As on 31/03/2010 Rs.	Scientific Research As on 31/03/2009 Rs.	Social Science Research As on 31/03/2010 Rs.	Social Science Research As on 31/03/2009 Rs.
<b>A. INCOME:</b>				
Projects Receipts	34983170	29614408	13569198	18124400
<b>TOTAL (A) Rs.</b>	<b>34983170</b>	<b>29614408</b>	<b>13569198</b>	<b>18124400</b>
<b>B. EXPENDITURE:</b>				
Projects Expenditure	29217057	27939661	14391299	18861703
Depreciation	453966	468855	28722	46184
<b>TOTAL (B) Rs.</b>	<b>29671023</b>	<b>28408516</b>	<b>14420021</b>	<b>18907887</b>
<b>C. SURPLUS/(DEFICIT) FOR YEAR (A-B) TRANSFERRED TO PROJECTS FUND</b>	<b>5312147</b>	<b>1205892</b>	<b>(850823.36)</b>	<b>(783487)</b>

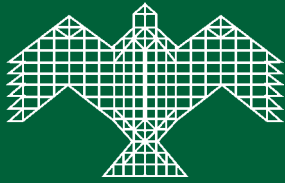
As per our report of even date  
for BRV GOUD & CO.  
CHARTERED ACCOUNTANTS

Sd/-  
(PROF V S RAMAMURTHY)  
DIRECTOR

Sd/-  
(AB SHIVA SUBRAMANYAM)  
PARTNER

PLACE : BANGALORE  
DATE : MAY 24, 2010

Sd/-  
(P SRINIVASA AITHAL)  
HEAD-ADMINISTRATION



The NIAS emblem can be traced back to a remarkable Sanskrit work called the *Sulva-sutras*, literally 'The rules of the cord'. The text is a handbook of ritual geometry, and describes a series of geometric 'constructions' or procedures (using only strings and pegs) for the layout of sacrificial altars and fires of various shapes and dimensions, usually specified with extraordinary precision. To this day a cord is a part of the basic equipment carried by an Indian mason, to be used in surveying or in laying out a structure in any construction activity.

Scholars are not agreed on the precise dates of the *Sutras*, but the text clearly pre-dates Panini and must have been composed before the 6<sup>th</sup> century BC. The text acknowledges that the procedures it describes were even older.

## NATIONAL INSTITUTE OF ADVANCED STUDIES

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