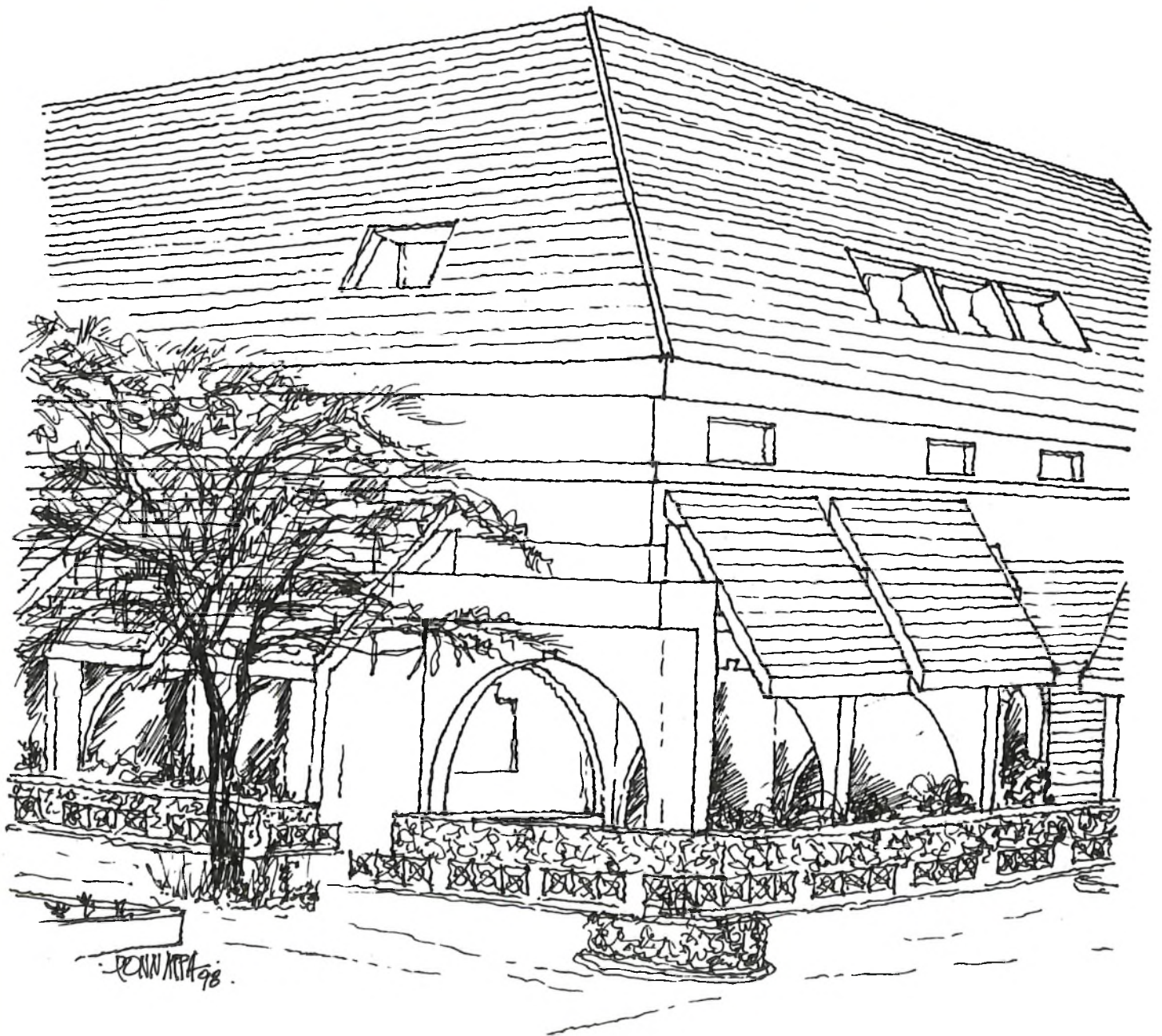


NIAS NEWS

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EDITORS' NOTE

NIAS NEWS has provided a critical window for the outside world and for our many friends into the workings at the National Institute of Advanced Studies for over five years. Under Major General M.K. Paul's dedicated stewardship, this newsletter has been continually expanding its scope and reach. As the new editors, we hope to uphold the tradition of excellence already set. Our objective is to bring you newsworthy information which will be appreciated by both the specialists in the various disciplines that the NIAS research units represent, as well as by the more general reader.

Anindya Sinha and Deepa M. Ollapally, Editors
July 1998

FROM THE DIRECTOR'S DESK

This Newsletter comes to you in a slightly different format, and is being edited by my colleagues Dr Anindya Sinha and Dr Deepa Ollapally. I want to take this opportunity to thank Maj Gen Paul who has meticulously brought out the Newsletter every six months since the first one appeared in January 1993.

The Newsletter will give the reader an impression of what we have been busy with. Apart from our other programmes, we have now started a Wednesday Discussion Meeting, at which faculty of the Institute as well as some speakers from outside take part in an informal session that considers a variety of subjects – in the last six months from creativity among Indian scientists to the reaction to the Pokhran-II blasts.

We have also started a series of meetings that we call Round Table Discussions. These are small meetings of not more than about thirty people who consider some subject that is of current importance and make recommendations on projects and programmes that seem necessary in the area. The first such Round Table was on *Energy for the Future* and took place on 10 March 1998. I believe that the presentations made at this meeting have already had some influence on the serious problem involved in transmission and distribution of electricity. The second Round Table was held on 17-18 April on *The Indian Software Industry in 2010*. Both meetings were attended by leaders in government, industry and academia. We look forward to continuing these policy dialogues on matters of great current interest to the country.

I spoke last time about the nature of the Institute and of the need to raise resources for maintaining and enhancing the many programmes we have. At its meeting in March the Council approved our plans for raising our endowment funds. The first set of mailers with an appeal for funds have now been sent out. A brief extract from it also appears in this Newsletter. I am happy to report that we have the first contribution to the funds already from Dr Siva Mangalam, President, Tao Systems Inc., Virginia, USA. We have of course a long way to go still; and I would always be happy to hear any suggestions that any reader might have regarding people and agencies that we should approach – if the reader himself is going to contribute, it would of course be even more welcome!

RAJYA SABHA STATEMENT ON INDIA'S NUCLEAR TESTS

Dr Raja Ramanna, Vice-Chairman of the Council of Management of NIAS, Senior Homi Bhabha Fellow and Member of Parliament delivered an important statement in the Rajya Sabha on 28 May 1998, giving his perspectives on the Indian nuclear tests. Some excerpts from his speech are given below:

In the present case, the object of the debate is not only the concern of science and technology, but also geo-politics and the ethics of the use of nuclear armaments and the associated economic implications. I am happy that the recent decision of the Government to conduct this test is being discussed not as a party issue. From what I can recall from previous years, nearly seven successive Prime Ministers have declared the need for keeping our nuclear options open.....it seems to me that the decision had become necessary because of the threats from Pakistan, and all the previous Governments had agreed on the need for a nuclear option. But, I may recall that many, many years ago, when we tried to believe that the World had respect for people who tried to keep away from nuclear weapons and the like, when Dr Sarabhai was the Chairman of the Atomic Energy Commission, Mr L.K. Jha, then a very senior Secretary, was sent to the United States to ask for a possible nuclear umbrella. Of course, it did not come through because it was neither realistic nor possible.....

It is a great relief that the Prime Minister has declared a moratorium. He has stated that these tests were essential to show our defence capability. I believe we should sign the CTBT, as the CTBT was actually proposed by us quite a long time ago. The CTBT that we proposed was converted into a partial Test Ban Treaty.....

Since we have demonstrated our capability, the countries in the neighbourhood including Australia, will not treat us as a country with no capability for modern technology in defence. I specifically mention Australia because there was a seminar in Singapore recently. It was on defence capability in the coming century, and the Australian delegate referred to us as not being able to be listed even amongst the last of the second class in the use of modern technology for defence. And another journal said that it was not

even worthwhile mentioning India as an important country by way of defence in the coming years of the next century. I mention this because of the reputation we have abroad in some circles (perhaps a misinterpretation of Mahatma Gandhi's philosophy. When it comes to brass-tacks, I keep quoting that old saying "we should have the strength of a giant but not use it like one". Now if we could knit it into our philosophy, we would have made some progress..... I agree with the previous speakers that we should not get into the spiral of a cold war preparation.....

Before concluding, I would like to again stress the point that the five major countries of the world would like to have a new regime of their own so that they will go on becoming stronger and making more powerful things and we will be left alone. But fortunately, we have reached a stage when we can go ahead with computers and keep ourselves at an equal level. You may ask: How? Why do you want this equal level? What is security? What is the limit to security? These are deep philosophical question which I would like to pose on to you to discuss because just saying, "security against Pakistan, security against China, security against Diego Garcia" will lose its meaning very soon.

What can then be the solution? It is that we come to a general agreement on total disarmament and these points like scientific capability and other things should be taken up rather than smaller issues. But the fact is that the big five countries are not going to give up that easily and we must be prepared for a dialogue at a much higher level looking well into the coming years of the next century.

GROWING UP WITH NIAS

Maj Gen M.K. Paul (R),
Controller, NIAS

After more than three and a half decades of service as a Sapper in an organisation where Time meant "five minutes before time", operations were planned and executed with clockwork precision, speed and involvement rare to match, and where there was no looking back for reasons why, a mind-set develops which is not easy to change. Yet one is aware that there is something happening in the main

stream, which is equally interesting and exciting. And then comes a stage where one opts for such a change in environment and assignment, however, both with trepidation and expectation.

When I was interviewed for the post at NIAS, I was told that as the main attraction I will have the rare opportunity to participate in building an Institution which was being designed as the only one of its kind in the country. Also, in view of the financial status of an autonomous Institute such as NIAS in its infancy, the emoluments may not match one's expectation, but there would be more than enough compensation by way of academic activities and creative opportunities that the position will offer. At that point of time, I could not clearly visualise what those intangible perks will be. However, what impressed me was the sense of frankness in the approach.

At the time of my joining NIAS, in August 1992, the faculty was small in size but a formidable one. The then Director was an Ex-Minister of State for Defence and one of the most renowned nuclear Scientists, and the Deputy Director, an eminent Psychiatrist. Among the Visiting Professors holding endowed chairs were a former Director of TIFR, a former Director of an Atomic Research Centre, and a world – renowned Sociologist, and there were hardly any junior members except the Librarian. Soon I realised that instead of functioning as a Controller, it would be in the interest of the Institute to allow myself to be controlled. I proceeded with the tasks, concentrating on the development of the Institute, and adapting my approach to match with the new environment.

Today, six years later, the faculty strength has grown to twenty one, with six core Units engaged in various multi-disciplinary subjects, as against only one in mid-1993. This is in addition to various other research activities. Younger people have joined the faculty. Now there is a blend of experience and youth, and a good percentage of women among the research staff.

One important event that stands out in my memory is the last visit of late Shri J.R.D. Tata to the Institute on March 19, 1993 where he planted a banyan sapling which is now well grown and stands erect as J.R.D. himself, as a dominant presence in the Campus.

When I joined, the western wing of the main building had been completed, along with the office complex-cum-sub-station, with the lecture hall half-way through. The eastern wing needed modification in design to accommodate the library, lounge and Dining Hall, as financially the original master plan for separate facilities had become non-viable. Services like electricity and water supply have been augmented, and can now cater to any conceivable future development. A fire-fighting system designed on the principle of wet-riser has also been incorporated for the entire Institute.

A major facility created during 1996-97 was the multi-purpose J.R.D. Tata Memorial Auditorium complex, with high quality acoustics and sound system. Today, sitting in the Auditorium, whenever any programme is in progress, I recall the situations where certain timely interventions saved excess expenditure, and ensured quality in construction.

NIAS is now fully grown and I share in the joy that I became a party to the growth of the Institute at an appropriate time. What satisfies me most is our compact but efficient administrative and office staff, who rise to every occasion with zeal and determination.

Looking back, over the last six years, I do feel that I have greatly benefited from the unique atmosphere that prevails at NIAS and the special character in the programmes that are organised here. For a person with my background, it has been a rare privilege to be exposed to such a vast and varied treasure. At a personal level, as I look inwards, I feel the growing up a second time around. Today, I have more patience, no-longer the man in a hurry, hopping to the next event even before the activities of the present one is half-way through. I can even smile in not so a perfect situation.

When the need was felt to keep a record of the growth of NIAS we launched the first issue of NIAS Newsletter on January 1, 1993. After publication of eleven issues till December 1997, the responsibility of publishing the future issues is now vested with Dr Deepa M. Ollapally and Dr Anindya Sinha. I wish them success in their endeavour.

IMPORTANT EVENTS

Complementing its research programmes, NIAS organises a variety of seminars, workshops, and academic courses each year. Two main events in the earlier part of this year were:

XII NIAS Course for Executives

The XII NIAS Course for Executives in Government and Private Sectors, with **Dr Sundar Sarukkai** as its Coordinator, was held from 5 - 24 January 1998. The theme of this course was "Management and Society". In a departure from our previous courses for executives, this course was for a duration of three weeks. The course was designed as three modules, each of which was one week long. The first module was "Financial Organization and Society", the second "Science & Technology Management and Society" and the third "HRD Management and Society". The course was inaugurated by Dr Ashok Ganguly, Chairman, ICI India Ltd., and the valedictory address was given by Mr K. Raghunath, Foreign Secretary. There were also special evening talks by eminent people like Dr V. Kurien, Chairman, NDDB, Anand; Mr Ashok Soota, Group President, WIPRO; Mr Soli Sorabjee, now Attorney General of India; Mr Balan Nambiar; Dr Raja Ramanna, NIAS and Prof Kenneth Keniston, MIT, USA. There was a lecture demonstration on Hindusthani classical music by Smt Aditi Upadhyaya and also a visit to Nrityagram as part of the course. There were sixteen participants representing TISCO, TELCO, BARC, DRDO, ISRO, ITC, DST, DAE and MEA. The course was seen to be highly successful in its aim of bringing senior people together and exposing them to the need for a more global and integrated approach to decision making.

A Colloquium on Theory in Social Science

A colloquium on "Theory in Social Science" was held at our Institute on 13 February 1998. This meeting, coordinated by Dr Sundar Sarukkai, was an attempt to initiate a dialogue between different groups working in the area of social sciences, both in the Institute and outside. This first such meeting focussed on the idea of theory in the social sciences. The colloquium was chaired by Prof M.N. Srinivas. The speakers were Dr Sundar Sarukkai on "What is a

Theory?"; Dr A.R. Vasavi on "Theory in Social Anthropology"; Prof Vijay Chandru, IISc, on "Theory in Economics"; Dr Deepa Ollapally on "Theory in International Relations"; Dr Shantha Mohan on "Theory in Gender Studies" and Dr Prabhakar Vaidya, NAL, on "Adam Smith and the Invisible Hand". This half-a-day meeting was well attended and generated a lot of interest. More such collaborative meetings which are inter-disciplinary in nature are envisioned for the future.

RESEARCH WORK AT NIAS

Prof Roddam Narasimha, Director

Prof Narasimha's main research interest is the dynamics of fluids, in nature and in technology.

His major publications (largely describing research carried out at IISc and JNCASR) include:

1. Boundary layer transition in turbomachines. *Current Science*, 74: 274-279, 1998.
2. Visualization studies of cloud-like flows. *Current Science*, 74:597-606, 1998 (co-authored with L. Venkatakrishnan, G.S. Bhat and A. Prabhu).

Prof Narasimha's numerous lectures include:

1. "Some Problems in the Fluid Dynamics of Clouds", TIFR, Bangalore, February 11.
2. "Monsoons and Clouds", Institute Lecture, Indian Institute of Technology, Kharagpur, 17 March.
3. "Personal Reminiscences from Four Decades of Turbulence Research", Indian Institute of Technology, Chennai, and Indian National Science Academy, Chennai Chapter, 24 March.
4. "The Fluid Dynamics of Clouds", National Geophysical Research Institute, Hyderabad, 25 March.
5. "The Science of Flight: From Birds and Bees to Airplanes", Mahajana Education Society, Mysore, 18 May.

6. "Tipu's Rockets", Indian Institute of Astrophysics, Bangalore, 28 May.
7. "Bird Flight", Refresher Course in Zoology for College Teachers of Bangalore University, National Institute of Advanced Studies, Bangalore, 1 June.

Prof Narasimha was recently awarded the Srinivasa Ramanujan Birth Centenary Award for 1997 1998 at the Indian Science Congress, held at Hyderabad in January 1998.

**Prof C.V. Sundaram,
Honorary Visiting Professor and
Senior Associate**

Prof Sundaram's research interests lie in the areas of energy options for India, advanced materials development issues especially as related to environmental conservation, and the history of metallurgy in India. He is also working on a project on 'Writing a history of the Department of Atomic Energy' for which he has been travelling widely in search of archival material.

Prof Sundaram continues to be the Chairman, Extractive Metallurgy Committee, for the project on Ocean Nodules, Department of Ocean Development, Government of India, and is also the Chief Editor of the quarterly journal 'Metals, Materials and Processes', published from Bombay (since 1989).

A monograph entitled 'Where gods come alive - A study on the bronze icons of South India', with Dr Baldev Raj (Director, Materials Group, IGCAR, Kalpakkam) as the principal author, and C. Rajagopalan (IGCAR) and Prof Sundaram as co-authors has been accepted for publication by Vigyan Prasar (C-24, Institutional Area, ASCI Building, New Delhi 110 016) in their Monograph Series on India's Scientific Heritage.

Some of the important lectures delivered by Prof Sundaram this year include:

1. "Technology, Culture and Society", XII NIAS Course for Executives, National Institute of Advanced Studies, Bangalore, 12 January.
2. "Electrochemical, Processes in Nuclear Materials Engineering", Prof K.S.G. Doss Memorial Lecture, CECRI, Karaikudi, Tamil Nadu, 28 January.

3. Convocation Address at the 20th Convocation of the Institute of Technology, Banaras Hindu University, Varanasi, 4 April.
4. "The Power of the Atom", Department of Metallurgical Engineering, Banaras Hindu University, Varanasi, 6 April.
5. "Light Elements, Light Metals, Light Materials and Light Components - In pursuit of Lightness", Department of Metallurgical Engineering, Banaras Hindu University, 7 April.

The Honorary Degree of Doctor of Science (Honoris Causa) was conferred on Prof Sundaram by the Banaras Hindu University at its Convocation on 4 April 1998.

**Prof K Ramachandra,
Honorary Visiting Professor**

Prof Ramchandra's research interests are currently centred on the theory of the Riemann Zeta-Function and its applications to the theory of numbers. He is writing a book on "Analytic Theory of Numbers", and continues to be involved with the publication of the Hardy-Ramanujan Journal with Dr R. Balasubramanian of Institute of Mathematical Sciences, Chennai, as co-editor.

Some of Prof Ramachandran's publications include:

1. Some local-convexity theorems for the zeta-function-like analytic functions. *Contemporary Mathematics* 210: 243-256, 1998 (co-authored with R. Balasubramanian).
2. Vinogradou's Three Primes Theorem. *The Mathematics Student*, 66: 27-72, 1997 (co-authored with A Sankaranarayanan).
3. Some remarks on a Lemma of Ingham. *Publ. Math. Debrecen*, Hungary (in press) (co-authored with R Balasubramanian).
4. Notes on the Prime Number Theorem I. *INSA Publications: 50 years of Indian Independence* (in press).
5. A review of "Resonance of Ramanujan's mathematics", Vol I and III, by R.P. Agarwal. *Journal of the Indian Institute of Science*, 77: 492-494, 1997.

Prof Ramachandran was recently honoured with the Sir M Vishveshwaraiah Award of the

Karnataka State Government at a function held on 13 February 1998, at the Vidhana Soudha, Bangalore. He has also been made Senior (Research) Scientist of the Indian National Science Academy with effect from 1 January 1998.

**Dr Susmita Subramanyam,
Research Associate**

Dr Subramanyam has completed her Ph.D thesis: "A Psychosocial Study of Creativity Among Indian Scientists" earlier this year. The study involves detailed interviews with 20 scientists of the Indian Institute of Science, 10 of whom were nominated as creative by their peers. Findings suggest important differences between the two groups of scientists along several parameters including their personality profile and motivation for scientific research. This work, primarily guided by Prof R.L. Kapur, is the third and final stage of the Creativity Project at NIAS.

There are six research units at NIAS. A brief review of their activities during the period from January to June 1998 are described below.

ENVIRONMENT

Dr P.K. Shetty, Research Fellow
Ms K.N. Savitha, Research Associate
Mr Dinesh Babu, Project Assistant

A collaborative research programme was being conducted with Prof K M Madhyasta of the department of Organic Chemistry, Indian Institute of Science, Bangalore, and with Dr N B K Murthy and Dr K Raghu of the Nuclear Agriculture and Biotechnology Division, Bhabha Atomic Research Centre, Mumbai, on "Bioremediation of Pesticide-contaminated Soils and Effluents".

During the last six months, a few fungal strains isolated from atrazine- and endosulfan-enriched soils were screened for their ability to bring about transformation of atrazine and endosulfan molecules. Further experiments were also conducted on percent disappearance of these pesticide molecules by using a *Mucor sp*; the analysis of these samples by GLC with ECD detector is being carried out. During this period, large-scale fermentation of atrazine was carried out using the above fungal strain. The isolation and identification of these metabolites

as also their spectral and chemical analysis are in progress.

Some of the major publications and articles this year include:

1. *In vitro* effect of pesticides on carbon dioxide evolution and dehydrogenase activities in soil. *Journal of Environmental Biology*, 19: 141-144, 1998.
2. Save the environment. *Deccan Herald*, 31 March.
3. Effect of Metalaxyl on soil microbial population and nitrogen transformation in a sandy loam soil. *Journal of Tropical Agriculture* (in press).

EPIGRAPHY

Dr H.K. Anasuya Devi, Fellow
Mr V.R. Vignesh, Technical Assistant
Mr Anand, Technical Assistant
Mr Anjanish Pandey, Technical Assistant

Research activities of the Unit include the development of software techniques for deciphering epigraphy texts, currently those in Brahmi of the 4th and 3rd century BC. Individual extraction of the script characters has been carried out using high-performance computing technology; this will help in the recognition of these characters and in the building up of databases. Scale-, rotation-, and translation-invariant moments have also been calculated for each character to further enable their recognition. Attempts have also been made to remove noise in the epigraphic data using region-growing techniques.

Some of the important publications include:

1. Image enhancement techniques for epigraphy texts. Epigraphical Society of India, vol 25 (in press).
2. Role of segmentation techniques for epigraphy texts; a case study -presented. Epigraphical Society of India, vol 25 (in press).
3. Computers to assist archaeologists decipher scripts. *Times of India*, 5 December.

Dr Anasuya Devi's work has also been recognised in the media, including radio and television. Most notably, a documentary film on her work was telecast by NBC Television on 22 April under its Infotrek programme.

During this year, Dr Anasuya Devi has completed the IETE Course on UCC++'98, the TULEC Advanced Course on UCO'98, and has been awarded the CIC Certificate in Computing from the Indira Gandhi National Open University.

Dr S. Ritti, Retired Professor of Ancient Indian History and Epigraphy visited the Unit on 13 June to discuss the research activities being carried out by the group.

International and Strategic Studies

Prof S. Rajagopal, Homi Bhabha Visting Professor
Dr Deepa M. Ollapally, Fellow
Mr Arvind Kumar, Research Associate

Main research areas of the Unit include nuclear cooperation and technology transfer; techno-political aspects of international agreement; gender security; and energy issues. A new project under Prof S. Rajagopal was launched relating to Indo-U.S. collaboration on electric power technology assessment. Funded by Carnegie Mellon University, the project's main aim is to assess and recommend different technology options for India by a number of working groups.

Phase-I of the project on assessing the linkages between selected nuclear treaties and agreements and their technical and security aspects is being completed for the Department of Atomic Energy. This undertaking which will allow for better policy integration by Indian decisionmakers, has been a major area of research for Mr Arvind Kumar.

Dr Deepa M. Ollapally's project on gender and security funded by the Ford Foundation is working toward establishing a regional network of women security experts with a number of aims including professional development, scholarly collaboration, and second track diplomacy. A key research focus is on transnational issues with a gender component which have received little attention to date. This is a highly innovative approach and is expected to serve as a pilot project for other regions of the world.

The Unit also has an ongoing project to deepen India's contribution to global efforts at disarmament. Through a Rockefeller Foundation grant, the Unit is building a strong

communication interlink with critical international experts and groups in this regard.

The recent nuclear testing by India led to a spate of media and public events involving members of the Unit. On 12 May, Prof S. Rajagopal appeared on Star Plus TV, TV Today Aaj Tak (DD Metro), DD-I, National Network and Regional Network. He was again interviewed by Star Plus on 17 May. Mr Arvind Kumar was interviewed by Times of India, Press Trust of India and United News of India on 12 May, and Dr Deepa Ollapally who was in the U.S. at the time was interviewed by Fox TV News on 13 May and ABC TV News on 14 May. Dr Ollapally was an invited panelist for discussions on nuclear testing at TIFR on 3 June, IISc on 18 June and the Mythic Society on 21 June. Prof Rajagopal likewise spoke at IISc on 21 June.

Prof S. Rajagopal's publications included:

1. We Should Continue with the Moratorium on Nuclear Tests: The Only Viable Option for Us. Deccan Herald, 5 June.

Dr Deepa Ollapally's publications include:

1. India and the new Asian balance of power. *Strategic Analysis* (in press).
2. Arms politics and the Asian balance of power. *Asian Affairs*, Summer 1998.
3. Behind the Bamboo Curtain. *Indian Review of Books* 7 (9), 16 June - 15 July.
4. Articles published in the Deccan Herald include:
 - (i) The currency crunch and militarisation: S E Asia still groping ahead. 31 January.
 - (ii) US brinkmanship and lessons from Iraq: High stakes game with no risk?. 14 March.
 - (iii) BJP politics and Indo-Pak relations: Derailment or engagement?. 13 April.

Mr Arvind Kumar published a number of pieces in the Deccan Herald on the following topics:

1. Reviving the CTBT debate: Should India sign? 16 January.
2. Future of START-II: Why is the Duma procrastinating? 30 January.

3. Harrison's model and India's nuclear posture: Will it serve India's interests? 28 February.
4. UN peace-keeping operations: Identity with India's agenda. 10 April.
5. China, South Asia and nuclear testing: Reassessing mutual concerns. 26 June

Prof Rajagopal's key lectures included:

1. "Energy for Growth and Sustainability", International Workshop at the Indira Gandhi Centre for Atomic Research, Kalpakkam, 24-25 June.
2. Series of lectures on "Quality of Assurance for Nuclear Power Plants", Bushehr Nuclear Power Plant, Iran, 28 February - 4 March.

In addition to **Dr Ollapally's** lectures at NIAS, others included:

1. Inaugural speaker for the Workshop on "Globalisation and Liberalisation", Indian Institute of Management, 23 March.

Among the important meetings organised by the Unit were:

1. A one-day meeting between the National Academy of Sciences, USA, and NIAS on 22 January. The former delegation was represented by a number of distinguished experts including Dr F. Sherwood Rowland (Foreign Secretary, US National Academy of Sciences), Dr Harold Forsen (US National Academy of Engineering), Dr John Holdren (Director, Program on Science, Technology and Public Policy, John F. Kennedy School of Government) and Dr John Steinbruner (Senior Fellow, Brookings Institution).
2. A round table meeting of noted experts on "Energy for the Future" was held under the aegis of the Energy Project on 10 March.

Philosophy of Science

Prof B.V. Sreekantan,

Dr S Radhakrishnan Visiting Professor

Dr Sundar Sarukkai, Research Fellow and

Homi Bhabha Fellow

Dr Sangeetha Menon, Research Fellow

Dr Anindya Sinha, Research Fellow

Dr M.G. Narasimhan, Research Fellow

Prof Anindita Balslev, Sir Ashutosh Mukherjee Chair (January - February, 1998)

Prof George M. Williams, Sir Ashutosh Mukherjee Chair (June - August, 1998)

One major area of research in the Unit is in the **History and Philosophy of Science**. **Dr Sundar Sarukkai** has been working in the areas of philosophy of science and mathematics, phenomenology and postmodernism. **Dr M.G. Narasimhan** is interested in the history and philosophy of science, with particular reference to (i) the history of science in India and (ii) the history and philosophy of biology. In this connection, he is supervising a doctoral thesis on the "History of Physics in Pre-Independence India - 1900-1930" by a student registered with the Kannada University, Hampi. Finally, he is involved in comparative studies in cultural and literary studies including translation from English to Kannada and vice versa.

Important lectures delivered include:

Dr Sundar Sarukkai

1. "Possibility of Indian Postmodernism", a paper presented at the UGC-National Seminar on "Postmodernism, Marxism and Gandhism", Department of Philosophy, University of Calicut, 16 January.
2. "Beyond Belief: Trust, Deception and Knowledge", a paper presented at the Indo-French Seminar on "Norms, Reliability and Science/Knowledge", Indian Institute of Advanced Study, Simla, 27 May.
3. "Retrieving Philosophy from Science", Indian Institute of Advanced Study, Simla, 4 June.

Dr M G Narasimhan

"Embryology before and after Darwin", Discussion Meeting on Concepts and Models in Developmental Biology, Nainital, Uttar Pradesh, 8 April.

"On the History of Developmental Biology", Refresher Course in Zoology for College Teachers of Bangalore University, National Institute of Advanced Studies, Bangalore, 1 June.

Dr Narasimhan also chaired the inaugural session at a seminar on Crises in English Studies at the Regional Institute of English, Bangalore, on 5 March.

The other major area of research actively being pursued in the Unit is in **Consciousness Studies**. In addition to his continuing work on extensive air showers of cosmic rays in collaboration with the Cosmic Ray Group of the Tata Institute of Fundamental Research, Mumbai, **Prof B.V. Sreekantan** is interested in exploring certain scientific aspects of human consciousness. **Dr Sangeetha Menon** is specifically interested in the problem of 'intentionality' of consciousness as discussed in the Vedanta. She is also working on 'the harder problem' of consciousness with particular reference to the Chalmersian 'hard problem'. **Dr Anindya Sinha** has been exploring the complex nature of social relationships in free-ranging groups of the bonnet macaque (*Macaca radiata*), a common cercopithecine primate widely distributed in peninsular India. In contrast to other studies on primate sociality, his emphasis has primarily been on the analysis of the communication skills and cognitive abilities of individuals which enable them to develop and maintain each and every unique social relationship.

Dr Sangeetha Menon and **Prof George M. Williams** (Senior Professor of Asian Religion, Department of Religious Studies, California State University, Chico, USA) are conducting a project to preserve the oldest manuscripts of the Bhagavad Gita digitally. They are testing new copying technology and a digitisation process which will make possible new and economical ways of archiving, publishing, and distributing graphic copies and translations of the originals. **Prof B.V. Sreekantan** is the Chief Advisor for this project.

Prof George M. Williams, who currently holds the Sir Ashutosh Mukherjee Chair of the Institute, is a member of the Electronic Publishing Committee of the American Academy of Religion and was the project manager for their first digital publication on CD ROM. He is also an advisor to the Shinto Shrine Association of Japan for building a database of their sacred scriptures and texts.

Some of the important publications in this area are:

1. B.V. Sreekantan et al., 1998. "Cosmic ray composition from multiple muon data with KGF underground detector". *Physical*

Review D, 57: 2653 (co-authored with H.R. Adarker et al. of TIFR and Y. Hayashi et al. of Osaka City University, Japan).

2. S. Menon, 1998. "The ontological pragmaticity of karma in Bhagavad Gita". *Journal of Indian Psychology*, 16: 44-52.
3. S. Menon, 1998. "Towards an Advaitic approach to consciousness". *Consciousness Research Abstracts of the meeting on 'Toward a Science of Consciousness' Tucson III*: 361.
4. A. Sinha, 1998. Another brick in the Tower of Babel: The search for an universal language. *Current Science*, 74: 653-656.
5. A. Sinha, 1998. The evolving female: A life-history perspective. A review of the book edited by M.E. Morbeck, A. Galloway and A.L. Zihlman, Princeton University Press, 1997. *Current Science*, 74: 81-82.

Important lectures delivered in this area include:

Prof B.V. Sreekantan

1. "Science and Consciousness", Indian Institute of Astrophysics, Bangalore, 27 January.
2. "Physics of Neural Mechanisms", Interactive Session on "Vision for Neurosciences in the Next Millenium", Department of Biotechnology, Government of India, New Delhi, 20 March.
3. "Ancient Indian Insights and Modern Science", Advaita Samsodhana Pratisthana, Bangalore, 19 May.

Dr Sangeetha Menon

1. "Looking into the Myth and Meaning of 'Panchakanya' or the Hindu Notion of Ideal Women", a paper presented at the meeting of the American Academy of Religion, Claremont, California, USA, 15 March.
2. "The Bhagavad Gita Project at NIAS", University of Berkeley, California, USA, 21 April.
3. "Towards an Advaitic Approach to Consciousness", a paper presented at the conference on 'Toward a Science of Consciousness', Tucson, Arizona, USA, 27 April.

Dr Anindya Sinha

1. "Social Knowledge in Wild Bonnet Macaques", National Centre for Biological Sciences, Bangalore, 28 March.
2. "Observing Behaviour: Studying Cognition in Non-human Primates", Refresher Course in Zoology for College Teachers of Bangalore University, National Institute of advanced Studies, Bangalore, 1 June.

Sociology and Social Anthropology

Prof M.N. Srinivas, J.R.D. Tata Visiting Professor
Dr A.R. Vasavi, Fellow

Major areas of research of the Unit include changing cultures in societies in South Asia with emphasis on India, the role of media and consumersim, primary education issues, and the cultural bases of agriculture.

For approximately five years, Prof M.N. Srinivas has been engaged in writing about his life and professional encounters with a view to understanding changes in the cultural and social life of Indian society. So far, his publications on this theme alone has included:

1. The Introduction to the book, *Bangalore*, Gangarams, Bangalore.
2. Sociology in Delhi. In: D School (eds. Kumar and Mukherjee), Oxford University Press, New Delhi.
3. Professor Ghurye and I: A troubled relationship. In: *The Legacy of Ghurye* (ed. A.R. Momin), Popular Prakashan, Bombay, 1996.
4. Practicing social anthropology in India. *Annual Review of Anthropology*, 1997.

Most recently, his other publications have included:

5. Franz Steiner, a memoir. In: *F.B. Steiner's Selected Papers*, Vol II (eds. J. Adler and R. Fardon), Bergahahn Books, London.
6. Caste: A systemic change? In: Rethinking Equality in the Global Society, *Washington University Law Quarterly* 75: 1561, 1998.
7. Divide and rule, counting on caste in census. *Times of India*, 7 May.

Prof Srinivas received the honour of delivering the H. Raja Rao Lecture on "Anthropology and Literature" at Dharmyaloka, Mysore, on 23 June. He also received the M.V. Pylee Award for Best Academic of 1996-1997 from Cochin University of Science and Technology at Cochin on March 6.

Dr A.R. Vasavi's project on "Community and Primary Education: Experiences from Karnataka" is focusing on a community-agency-institution perspective and attempts to provide sociological insights into issues relating to the promotion primary education. A preliminary study will gather details of a range of communities to highlight and understand regional and community variations in educational conditions and levels.

In addition, she is working on "The Inner Mirror: Kannada Writings on Society and Culture", which is a compilation, translation and publication project. Fourteen Kannada essays that address issues relating to culture and society have been identified and compiled. They are currently being translated and will be published with an introductory essay that will contextualise the contribution of these essays to the development of sociology and social anthropology in India.

Dr Vasavi's publications include:

1. Blueprint for rural primary education: How viable? *Economic and Political Weekly*, 32 (50), 1997 (co-author).
2. Youth and identities: Public symbols of affluence, private experiences of deprivation. *Voices*, June 1998.
3. Provisioning transactions and the reproduction of agrarian social orders. *Contributions to Indian Sociology*, January - June 1998.
4. Excellence in technical education: The results of autonomy in an engineering institute. *Kayakalp* (Newsletter for Innovations in Higher Education), 4, 1998.

Lectures delivered by Dr A.R. Vasavi include:

"Narratives in the Re-constitution of Communities", a paper delivered at the National Seminar on "Interrogating Community: Discourses in Contemporary India", Central University Hyderabad, 19 March.

Women's Policy Research and Advocacy (WOPRA)

Dr N. Shantha Mohan, Fellow

Dr Anitha, B.K., Research Fellow

Mr Krishna Chandran, Project Assistant

Ms V. Gayathri, Research Associate

The main focus of the Unit is towards an understanding of gender and gender relations and evolving strategies to work towards empowering the overall status of women. The Unit's work has emphasised the situation in Karnataka so far but is broadening its purview. Further research aims include a deeper understanding of the role of women in decentralised governance and attempts to evolve mechanisms to strengthen their role in political participation. The Unit also aims to explore the real factors underlying the failure of both the literacy programmes and primary education in the country, with special reference to the interplay of socio-economic and political factors that appear to be directly responsible.

A major research effort of the group has been the generation of a gender-sensitive data base on the status of rural women in Karnataka. The preliminary analysis of the data has been disseminated and discussed in various fora, both in India and abroad. The conceptual framework and the questionnaire developed for the study, through a project from the Ford Foundation, have been in high demand in the country.

To widen the advocacy activities of the Unit, efforts are being made to network with both governmental as well as non-governmental organisations. In an important new development, WOPRA has been made the focal point for International Women's Rights Action Watch - Asia Pacific (IWRAW) for "Facilitating the Fulfillment of State Obligations to Women's Equality". The Unit will be coordinating the generation of information on three important issues identified through consensus for the country. These are (i) political governance, (ii) rights of women in marriage/family, and (iii) women in armed conflict in Kashmir and the Northeast. The intention of WOPRA is to generate a baseline report in coordination with Women's Voice and Initiatives: Women in Development (IWID).

Some of the important publications of the Unit include:

Dr N. Shantha Mohan

The story of every Banjara woman. In: *Education of Women from Socially Backward Communities* (ed. Indira Kulshreshtha 'Noopur'), Vikas Publishing House, New Delhi, 1998.

Dr B.K. Anitha

Being true to feminism. In: *Reflections about Feminist Research* (ed. Ranjani K. Murthy) (in press) (co-authored with Anita Gurumurthy).

Lectures delivered in this year have included:

Dr N. Shantha Mohan

1. "Status of Women", Block Education Officers' Training, DSERT, Bangalore, 26 February.
2. "Women's Rights - Role of Government - Non-governmental Organisations", Dr O'Grady Health Centre, Bangalore, 8 March.
3. "Reservation for Women in Centre and State Legislature", Terre Des Hommes, Bangalore, 23 March.
4. "Theoretical Discussion on the Concepts of Gender and Gender Relations", Advanced Gender Training Programme, Bangalore, 27 May.

Dr B.K. Anitha

1. "Gender and Education", Sutradhar, Bishop Cotton Girls High School, Bangalore, 7 March.
2. "Globalisation and Labour Market - its Implication on Gender", Advanced Gender Training Programme for Master Trainers in Gender, Karnataka Education Department, NIPCCID, Bangalore, 6 June.

Dr Anitha also attended the final module of the course for NGOs on "Globalisation and the Challenges facing NGOs" at the Indian Institute of Management, Bangalore, in March 1998.

Ms V. Gayatri recently joined the Unit as a Research Associate. Her doctoral thesis, currently under progress, is on 'Women, Decentralisation and Development in the context of Gram Panchayats in Karnataka'. She has had prior experience in training women representatives of the Gram panchayats and master trainers chosen by the Karnataka government to train Panchayat members.

The Unit has been very active in organising a number of meetings and workshops. In May, a one-day workshop on "Women and Decentralised Governance" was organised, as was a national planning workshop on "Facilitating the Fulfillment of State Obligations to Women's Equality", sponsored by International Women's Rights Action Watch - Asia Pacific.

The Unit also conducted a 15-day Advanced Gender Training Programme for Master Trainers in the Education Department of the Karnataka government, sponsored by the DSERT, during 25 May - 8 June 1998, at the National Institute for Public Cooperation and Child Development (NIPCCD). These participants form the core group whose main responsibility is to provide gender training to teachers, teacher educators and administrative staff of the Education Department in Karnataka. A total of 22 trainers underwent the residential training for 15 days. The programme had 8 sub-themes and covered a range of topics including Women's Movement, Feminism, Gender and Gender Relations, Violence against Women and Children, Mental Health in Relation to Women and Children, and Education and Gender. A participatory methodology was adopted to conduct transactions through experts from different fields of specialisation.

In collaboration with the Singamma Sreenivasan Foundation, the Unit organised a roundtable conference on "Strengthening Women's Participation in Governance at the District Level" in March 1998. The preliminary report of the WOPRA study on the status of rural women was shared with the participants. The participants included persons representing the government, non-governmental bodies, research institutions, academicians and the press.

ASSOCIATES PROGRAMME

The Institute maintains a strong outreach with its Associates Programme. The Associates of the Institute include prominent personalities from widely different backgrounds in the media, arts, policy-making and academia. Associates are invited to a monthly evening lecture series and other important events, and constitute a strong base of ongoing outside support and interactions.

The Associates Programmes during the earlier part of this year included:

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| 10 January | A lecture on "Ethics in Democratic Society" by Mr Soli J Sorabjee, Senior Advocate, Delhi. |
| 28 February | NIAS, in collaboration with "Sursagar", organised a unique Hindustani music programme, "Chatur - Sujaan - Dinarang: Ek Parampara". |

This programme, directed by Sm. Aditi Upadhyaya, involved choral compositions and solo 'bandishes' of three great composers of this century - Pandit Vishnu Narayan Bhatkhande (Chatur), Dr S.N. Ratanjankar Sujaan) and Pandit Dinakar Kaikini (Dinarang).

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| 27 March | A lecture on "Einstein and India" by Prof C.V. Vishveshwara, Indian Institute of Astrophysics, Bangalore. This was followed by screening of a short film on Einstein. |
| 24 April | A lecture on "Literatures in India" by Prof U.R. Ananthamurthy, former President, Sahitya Akademi. |
| 6 May | A lecture on "Negotiating Disarmament" by Ms Arundhati Ghose (formerly India's Permanent Representative to Conference on Disarmament, Geneva). |
| 26 June | A lecture on "Good Governance and Judicial Activism" by Justice M.F. Saldana, High Court of Karnataka. |

WEDNESDAY DISCUSSION MEETINGS

The members of the Institute meet every Wednesday morning for informal academic discussions after a talk delivered by a member of the faculty. Wednesday meetings also serve as a forum for invited guest speakers to deliver a lecture on a subject of their choice. Another highlight of the Wednesday talks is the high tea that follows them!

The Wednesday Discussion Meetings this year have included:

28 January	Psychosocial Study of Creativity among Indian Scientists Dr Susmita Subramanyam
11 February	The Harder Problem of Consciousness and the Self : Some Insights from the Bhagavad Gita Dr Sangeetha Menon
18 February	The Ramdas Paradoxes Prof R. Narasimha
4 March	Fact/Fiction Dr Sundar Sarukkai
11 March	Reconstituting Communities Dr A.R. Vasavi
1 April	The April Fools Day Talk: Do Bonnet Monkeys Deceive Each Other? Dr Anindya Sinha
15 April	Scientific Explanations and Consciousness Prof B.V. Sreekantan
22 April	Language and Mind: An Introduction to the Contributions of Noam Chomsky Dr M.G. Narasimhan
6 May	Counting Objects and Measuring Lengths Prof K. Ramachandra
13 May	Noise Cleaning for Epigraphy Texts Mr Anand
20 May	Economic Sanctions and its Implications for India Mr Arvind Kumar

10 June

Pokhran II: The Blasts that Rocked the US
Dr Deepa Ollapally

Guest speakers at the Institute during this period were:

7 January	A lecture on "Literature, Culture and Society" by Dr Gita Rajan, Associate Professor, Department of English, Fairfield University, USA.
3, 4 February	Two lectures by Dr Anindita Balslev, Department of Philosophy, Aalborg University, Denmark, and Sir Ashutosh Mukherjee Chair, NIAS, on "Cross-cultural Conversations" and "I-Consciousness: Perspectives from Indian Thought", respectively.
19 February	A lecture on "Biodiversity, Sustainability and Our Common Future" by Dr Peter H. Raven, Director, Missouri Botanical Garden, USA.
18 March	A lecture on "Role of Institutions in Economic Development" by Mr J.N. Chaubey, Principal Secretary, Department of Energy, Government of Karnataka.
1 April	A lecture on "Some Important Highlights of the History of Mathematics in the Twentieth Century" by Prof M. Walschmidt, University of Paris, France.
29 April	Screening of a documentary "After the Gold" by Dr Janaki Nair, Visiting Fellow, Centre for the Study of Culture and Society, Bangalore.
27 May	A lecture on "Sources of Civil-military Relations in India and Pakistan" by Ms Chitra Sudarshan.

- 3 June A lecture on "From Ethics to Metaethics" by Prof Sudha Gopinath, Dept. of Philosophy, Bangalore University.
- 17 June A lecture on "Unravelling the Social Life of the Dhole - the Asiatic Wild Dog" by Dr Arun B. Venkataraman, Asian Elephant Conservation Centre, Centre for Ecological Sciences, Indian Institute of Science, Bangalore.

OTHER EVENTS AT NIAS

- 10 March A one-day Round Table Discussion on "Energy for the Future".
- 17-18 April A two-day Round Table Discussion on "The Indian Software Industry in 2010".
- 1 June A one-day orientation course for the Bangalore University Zoology Lecturers' Forum.
- 5 June Special lecture on "Anthropology and Literature" by Prof M.N. Srinivas, J.R.D. Tata Visiting Professor, NIAS.

UPCOMING EVENTS

The Philosophy of Science Unit is organising a one-week lecture course on "Some Landmarks in the History of Physical and Chemical Sciences and Technology" on 3 - 8 October 1998. The course is primarily aimed at university and college teachers from different parts of the country. The total number of expected participants is about 30. The contact person for this meeting is Dr M.G. Narasimhan.

PLANNED EVENTS

The Sociology and Social Anthropology Unit plans to hold a one-day consultation on Universalising Primary Education: Situation and Strategies in November, 1998. The contact person for this event is Dr A.R. Vasavi.

The Epigraphy Unit is organising a Round-table Conference on Archaeology and Epigraphy in late 1998 to discuss the progress and future

scope of computer-based epigraphical studies. Contact person: Dr. H.K. Anasuya Devi.

The Philosophy of Science Unit is proposing to hold a National Meeting on Scientific and Philosophical Studies in Consciousness in January 1999. This meeting, the first of its kind, will be interactive in nature and will involve both experienced and young researchers in this area. The contact person for this event is Prof B.V. Sreekantan.

AN APPEAL FOR FUNDS

Building and sustaining the intellectual and social foundations of a transforming civilisation

About NIAS

India has several fine institutions, in the natural sciences, in engineering and technology, and in the social sciences. But these institutions harbour different cultures, and, indeed, are often worlds unto themselves. And there are too few bridges between and among them. The most interesting and challenging problems of the coming century probably lie in the interfaces between these cultures and disciplines - interfaces that are studied far too little in our country. It is in these no-man's lands that I believe the future of NIAS lies - in subjects that do not belong to the tidy little pigeon-holes that the current knowledge system of the world has created - artificially, and for technical or bureaucratic convenience, not because that is the way the world operates. How to build these bridges, how to bring different intellectual and social communities together, and how to look at the future of our nation and the world with the greatest possible intellectual integrity as well as public and social confidence - it is the pursuit of these aims that NIAS is taking up as its mission.

If we have to achieve these goals it is necessary for us to bring together the best in the natural and social sciences. The late JRD Tata, who conceived of this institution, saw the great need in India to form a new kind of leader - he envisioned an institution that could harness creativity and commitment, mathematics and management. With my distinguished colleagues on the faculty of NIAS, and the eminent

persons we count among our Associates, I am hopeful that we can carve a unique niche for ourselves in the public and intellectual life of this country and the world, moving in the direction that our founders so clearly saw as essential for the future health of our nation.

The Appeal

The pursuit of our goals demands a measure of autonomy. We need financial support from diverse sources to ensure and sustain that autonomy. The early generosity of the House of Tatas and the Government of Karnataka has given us some splendid facilities. We now need to build on this foundation, diversify our sources of income and carry out programmes that are sensitive, at one and the same time, to public and national needs as well as to the demands of uncompromising intellectual rigour.

We solicit your contributions to help us to realise our goals. Bequests can be made to the NIAS Endowment Fund in the manner described below.

R Narasimha
Director, NIAS
and Chairman, NIAS Endowment Committee

HOW TO MAKE CONTRIBUTIONS TO THE NIAS ENDOWMENT FUND

All contributions made to NIAS or its Endowment Fund are tax-deductible under Section (i) and (ii) of the Indian Income Tax Act of 1961.

NIAS is registered under the Foreign Contributions (Regulation) Act, 1976, and is entitled to receive contributions from abroad directly (Register number 094420614, Account No. 0100005000200, State Bank of India, Indian Institute of Science, Bangalore 560 012). Contributions must be made by cheques drawn in favour of the National Institute of Advanced Studies; the cheques may be sent directly to NIAS, or credited to the State Bank of India account mentioned above with independent intimation to NIAS.

The Institute welcomes contributions of any amount. Typical sums and the purposes for

which they can be used and the forms in which acknowledgements can be made are shown below.

1. *Books*
Can be donated as books or as funds to be utilised for purchase of books. Every book donated or purchased out of donation funds will carry a label indicating the name of the donor.
2. *Objects of art* (paintings, sculpture etc.)
Rs.10,000/- and above. Will carry a small plaque indicating the name of the donor.
3. *Annual Endowed Lecture* (speaker residing in India) Rs.2.5 lakhs or US \$ 6,000. May be named with concurrence of donor.
4. *New Office Space*
Rs.5 lakhs per room.
Room will carry a plaque indicating the name of the donor.
5. *Visiting Professor* (from India or abroad)
Rs.10 lakhs or US \$ 25,000.
May be named with concurrence of donor.
6. *Library Hall*
Rs.20 lakhs or US \$ 50,000.
May be named with concurrence of donor.
7. *Lecture Hall*
Rs.20 lakhs or US \$ 50,000.
May be named with concurrence of donor.
8. *East Wing, Main Building*
Rs.40 lakhs or US \$ 100,000.
May be named with concurrence of donor.
9. *West Wing, Main Building*
Rs.50 lakhs or US \$ 125,000.
May be named with concurrence of donor.
10. *Endowed Fellowship*
Rs.20 lakhs or US \$ 50,000.
May be named with concurrence of donor.
11. *Endowed Professorship*
Rs.30 lakhs or US \$ 75,000.
May be named with concurrence of donor.
12. *Endowed Research Unit*
Rs.75 lakhs or US \$ 187,500.
May be named with concurrence of donor.

THE NIAS FACULTY

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Homi Bhabha Chair, International and
Strategic Studies

Prof B V Sreekantan (Ph.D. TIFR/Bombay)
S Radhakrishnan Chair, Philosophy of Science

Prof M N Srinivas (Ph.D. Oxford)
J R D Tata Chair, Sociology and Social
Anthropology

Dr R L Kapur (Ph.D. Edinburgh)
Honorary Visiting Professor

Prof C V Sundaram (D. IISc)
Honorary Visiting Professor

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Fellow, Epigraphy

Dr Shantha Mohan (Ph.D. ISEC/Bangalore)
Fellow, Women's Policy Research
and Advocacy

Dr Deepa Ollapally (Ph.D. Columbia)
Fellow, International and Strategic Studies

Dr A R Vasavi (Ph.D. Michigan State)
Fellow, Sociology and Social Anthropology

Dr B K Anita (Ph.D. ISEC/Bangalore)
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Research and Advocacy

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Research Fellow, Philosophy of Science

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Research Associate, Women's Policy
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Mr Arvind Kumar (M.Phil. JNU)
Research Associate, International and
Strategic Studies

Dr Susmita Subramanyam (Ph.D NLSUI)
Research Associate

ADMINISTRATION

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The National Institute of Advanced Studies (NIAS) was conceived and initiated by the late Mr. J R D Tata, who sought to create an institution which would conduct advanced research in multidisciplinary areas, and also serve as a forum that will bring together administrators and managers from industry and government, leaders in public affairs, eminent individuals in different walks of life, and the academic community in the natural and social sciences. The intention is to nurture a broad base of scholars, managers and leaders who may contribute to tackling the complex problems facing contemporary India in a more informed and effective manner.

The philosophy underlying NIAS is given shape by its research teams, which are drawn from a variety of disciplines in the natural and social sciences. The Institute is unique in its integrated approach to the study of intersections between science and technology and social issues.



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