



President's Note

Dear Colleagues,

The year witnessed the entry of 42 new students, taking our current student strength to 290. Twenty Ph D, 2 M S (Eng.), and 15 M S of Int Ph D degrees have been recommended to the Council of Management for the award of degrees.

Continuing the spade of awards, Prof C N R Rao has received Japan Government's Highest Civilian Award, the Order of the Rising Sun, Gold and Silver Star as well as elected as Corresponding Member of the Australian Academy of Sciences. Prof K S Valdiya has received Padma Bhushan. Prof Tapas Kumar Kundu became the first recipient of the JNCASR Silver Jubilee Professorship.

It's a matter of great pride that JNCASR received the IPO Special Mention Award instituted by the Intellectual Property Office (IPO), Department of Industrial Policy and Promotion (DIPP), Government of India, and Confederation of Indian Industry (CII), in recognition of contributions in harnessing the country's intellectual capital and creating an ecosystem that boosts creativity and innovation.

The year 2015 began with the Closing Ceremony of JNCASR Silver Jubilee Programme graced by Hon'ble Vice-President of India, Dr Hamid Ansari.

I'm glad to share that several significant discoveries have been published in high-impact international journals by our faculty members. Some of them were reported in the media as well.

Moving forward in a collective manner, I look forward for many more accolades for the Centre and Science in general.

Prof KS Narayan

In-Charge President



A coffee-table book to celebrate 25-year long journey of JNCASR was released by Hon'ble Vice-President of India, Dr. Hamd Ansari at the Closing Ceremony of JNCASR Silver Jubilee Celebrations on January 5, 2015.



Felicitation of Hon'ble Vice-President by Prof C N R Rao at the Closing Ceremony of JNCASR Silver Jubilee Celebrations

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FROM THE EDITOR'S DESK

The beginning of 2015 marked the closing of the year-long celebration of JNCASR's Silver Jubilee. The Hon'ble Vice-President of India, Dr. Hamid Ansari, graced the ceremony on January 05, 2015. This was coupled with an In-house Symposium where faculty, students and alumni participated with enthusiasm. A coffee-table book to celebrate 25-year long journey of JNCASR was released by the Hon'ble Vice-President, Hon'ble Governor of Karnataka, Shri Vajubhai Vala, Hon'ble Chief Minister Mr. Siddaramaiah, Secretary DBT Prof K VijayRaghavan, Bharat Ratna Prof C N R Rao, Chairman, Council of Management Dr P Rama Rao, and In-Charge President, JNCASR Prof K S Narayan.

Several research contributions of faculty colleagues have garnered attention of the print and electronic media including those by Prof C P Rajendran, Dr Jayanta Haldar and Dr Subi J George.

Science Outreach Programmes have reached out to hundreds of school and college students and teachers across the country since the start of 2015. We are happy to note that the number of admissions to our academic programmes are at a steady high. As has been the trend, a large number of applications have been received for our fellowships and extension programmes, which shows the popularity of these programmes both within the country and also internationally.

In our discussion-meetings, conferences and other scientific events, eminent speakers have delivered talks at the Centre.

Two international patents have been granted this year. Several patent applications have been filed.

Significant national and international awards have been conferred upon several of our faculty members. Our students have also marked their presence at International forums and received recognition for their excellent research contributions.

JNC IN THE NEWS

Three weapons to slow down bacteria spread in hospitals

When you go to battle against bacteria, you need to take with you a big bag full of tricks. And then find some more as a backup. Being a scientist, Jayant Halder has just three kinds of weapons: a new drug, a method to tweak old drugs, and a paint that can slow down the infection spread in hospitals. They work well in Halder's lab at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) in Bangalore, but his team has to take them to the clinic.

Source: Economic Times, 4 Apr, 2015.

Supramolecular sensing: Enzyme activity with a twist

Monitoring the activity of chemical processes in biological systems can lead to a greater understanding of how they function and also provides an opportunity to find out when they go wrong. Particularly interesting targets are the adenosine phosphates (APs) because of the integral part they play in various processes in living cells. A great number of chemical-sensing approaches relevant to APs have been demonstrated with small-molecule probes but genetically encoded indicators composed of fluorescent proteins have also been used to measure their levels inside single cells.

Now, writing in Nature Communications, a team led by Subi George has shown

that entirely synthetic supramolecular polymers — a series of monomeric molecular units held together by non-covalent bonds — can also act as useful reporter groups for enzyme activity through their interaction with adenosine triphosphate (ATP).

Source: Nature Chemistry: News & Views, 24 March 2015.

Prof C P Rajendran's work on Himalayas in Science Magazine and on Rajya Sabha TV

Prof C P Rajendran's work on Himalayas has been reported in February issue of the Science Magazine (Science, 27 February 2015: Vol. 347 no. 6225 pp. 933-934). His work was broadcast on Rajya Sabha TV under Science Monitor series on February 21, 2015.



ACADEMIC AND EXTENSION PROGRAMMES

City-based scientists develop compounds that may make Ebola curable

Even as the world looks for potential treatment option against the deadly Ebola virus, two compounds developed by scientists at the city-based Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) is among the 20 identified to undergo clinical trials.

This patented research is the only chosen compound from any developing country, said Jayanta Haldar, from JNCASR's New Chemistry Department.

Source: The Hindu, December 20, 2014.

Academic Activities

Degree Programmes

During the August admissions of 2014-15, 42 students joined. With the mid year admissions, 10 students joined JNCASR in the month of January 2015 under different degree programmes. The current student strength at JNCASR is 290. For the year 2015, 17 Ph D and 2 M S (Engg) degrees were awarded.

The advertisement for admissions to the Ph D and Integrated Ph D programmes for the August session of 2015 has been released in the newspapers and on the Centre's website.

The Centre has hiked the research fellowships for the students registered under various degree programmes with effect from October 2014. To the best of our knowledge, JNCASR is the only institution in the country which has implemented the research hike as per the DST/UGC guidelines.

Diploma Programmes

Three students are presently undergoing their course work in the Postgraduate Diploma in Materials Science (PGDMS) programme and one student is undergoing course work in the Postgraduate Science Education (PGDSE) programme. They will be completing their course requirements by July 2015. On successful completion of their course requirements they will be awarded a Postgraduate Diploma of the Centre.

Fellowships & Extension Programmes

Visiting Fellowship Programme

For the Visiting Fellowships 2014-15 eleven scientists from different institutions across the country were selected. They are placed in MBGU, CPMU or TSU for a period of three months tenable between October 2014 - September 2015.

Summer Research Fellowship Programme

The SRFP 2015 was announced on JNCASR website and advertised by email to about 150 colleges across the country. 1300 applications were received and 69 scholarships were offered for the year 2015. Under this programme, the students will receive a scholarship of Rs 6000 per month for two months along with admissible travel incidentals.

Project Oriented Biological Education (POBE) and Project Oriented Chemical Education (POCE)

The POBE-POCE 2015 programme was announced in January 2015 on JNCASR website and advertised by email to over 200 colleges across the country for students enrolled in B.Sc. first year. Ten students were selected for each programme from over 500 applications received. The programme of 2015 commenced on 11 May 2015. The POBE/POCE batches of 2013 and 2014 have returned for their second and third year training.

Nine students of POCE-2012-14, who had completed the programme successfully, are doing M Sc in different institutions in India and abroad. One student of POCE-2013-15 had worked with a faculty member during her winter vacation (December 2014-January 2015).

JNCASR-CICS (Centre for International Cooperation in Science) Fellowship Programme

Six scientists from the following countries were shortlisted under the JNCASR-CICS Fellowship Programme 2015-16: Nigeria, Uzbekistan, Ethiopia, Sri Lanka, Zambia and Cameroon. Guides have been identified and scientists are expected to join them during the next one year.



SCIENCE OUTREACH & INTELLECTUAL PROPERTY

Science Outreach & Education Technology

Programme in Chemistry with NCU was organised where short film titled *Getting to know the scientists*, a chemistry quiz and experiments in chemistry was organised for the students. Similar programme was organised at a later date where Prof Bert Meijer and Prof C N R Rao gave lectures followed by a multimedia presentation. A Programme in Biology for students was also organized.

An INSPIRE PROGRAMME for participants of the INSPIRE-2014 Science Nurture Camp was organized.

A programme for students and teachers was organized at Trivandrum where 300 students and teachers participated. The book and CD-ROM titled 'NANOWORLD: an introduction to nanoscience and technology' was

distributed to the participating schools.

A workshop on experiments using "College Chemistry Kit" was organized by Science Outreach Programme under Project Oriented Chemistry Education (SOP-POCE). The participants visited the Chemistry of Materials Exposition and Prof C N R Rao Archives.

Programme for students and teachers at the Vivekananda Global University, Jaipur was organized. In another event, Prof C N R Rao delivered lecture 'A Celebration of Chemistry' to students and teachers at the Ras Al Khaimah Center for Advanced Materials.

Mrs. Indumati Rao introduced the multimedia presentation of excerpts from the CD-ROM 'Nanoworld' to students and teachers at a function organized in Jorhat. Prof C N R Rao delivered the lecture in chemistry.

Intellectual Property

Patents Granted

Out of two international patents granted, one was Japanese Patent (No. 5658248) titled 'Optimal wing platforms for reducing the induced or total drag of the wing of an aircraft driven by wing-mounted tractor propellers/rotors' was invented by Prof R Narasimha and others. The next granted patent was from US (No. 8957255 B2) for 'A method of oxidizing an organic compound' invented by Prof C N R Rao and others.

Patent Applications Filed

One US Patent application (No. 12/681,596) was filed which received notice of allowance for patent grant. The invention is titled "Intrinsically Fluorescent Carbon Nanospheres and a process thereof" and inventors being Prof Tapas Kundu, Prof M Eswaramoorthy et al.

Two Indian Provisional Patent Applications were filed for the inventions of Prof K R Sreenivas et al. and Dr Jayanta Haldar et al.

International PCT Applications were filed for two inventions by Dr Jayanta Haldar et al. for inventions titled 'Chitin derivatives, method for production and uses thereof', and 'Antimicrobial conjugates, method for production and uses thereof.

US and European Patent Applications



Fig.: INSPIRE Programme for participants of INSPIRE 2014 Science Nurture Camp, December 26, 2014.



APPOINTMENTS AND AWARDS

filed for invention titled 'A nanosphere-histone acetyltransferase (hat) activator composition and process thereof' invented by Prof Tapas Kumar Kundu et al.

US, European and South Korean Patent Applications filed for invention titled 'Nanoparticle compositions of antibacterial compounds and other uses thereof' invented by Dr Jayanta Haldar et al.

New Appointments

Faculty Fellow

Dr Sarit S Agasti (CPMU and NCU)

Visiting Scientists

Dr Ronojoy Adhikari

Dr Ibrahim M Nassar

Prof Gopinathan Sankar

Dr Santu Baidya

Dr Ranber Singh

Dr Soumik Siddhanta

Visiting Scholars

Ms Surabhi Jirapure

Ms Gugu Florence Msane

Mr Soumen Ash

Ms Silvia Illa Tuset

Mr B Havish

Mr Santosh Konangi

Mr Yuki Kitamura

Research Associates (Provisional)

Mr Sanjeev Kumar

Mr Sourav Roy

Mr K D Mallikharjuna Rao

Mr Ritesh Haldar

Mr Leishangthem Premkumar

Mr Vijaykumar S Marakatti

Research Associates

Mr Murali Gedda

Dr Chandra S Voshavar

Dr Suresh Perumal

Dr Satish Shetty

Dr Somesh Kumar Bhattacharya

Dr Rachana Tewari

Dr Tirthankar Sengupta

Awards & Recognitions

Prof C N R Rao

Elected Corresponding Member of the Australian Academy of Sciences.

Elected honorary member of the Nepal Academy of Science and Technology.

Received Doctor of Science honoris causa from Australian National University.

Japan Government's Highest Civilian Award, 'the Order of the Rising Sun, Gold and Silver Star', for his outstanding contributions to Science and Indo-Japan science co-operation.

Prof Roddam Narasimha

Senior Guru award by Alumni Association of IISc.

Prof M R S Rao

Received Goyal Prize in Life Sciences for 2012-2013.

Prof K S Valdiya

Received the prestigious Padma Bhushan award.

Prof K S Narayan

J C Bose Fellowship.

Prof Maneesha Inamdar

Invited to be a Member (Steering Group) of International Stem Cell Banking Initiative.

Selected as Editorial Board Member of Scientific Reports, a journal from Nature Group Publications.

Prof Tapas K Kundu

Elected as Vice-President of The Society of Biological Chemists (India).

Awarded the first 'Silver Jubilee Professorship donated by the C N R Rao Education Foundation.

Prof Srikanth Sastry

J C Bose Fellowship 2015.

IIT Bombay Distinguished Alumnus Award 2015.

Dr Kaustuv Sanyal

Elected Fellow of the National Academy of Sciences.

Faculty of the prestigious Faculty of 1000 (F1000Prime), UK.

Invited Member of the Advisory Board of the 21st International Chromosome Conference, Brazil.

Mrs Indumati Rao

Conferred with the Honorary Doctorate in Literature by the Karnataka State Women's University, Bijapur in recognition of her contributions for the cause of popularizing science education.

Prof Amitabh Joshi

Member, Sectional Committee on Animal Sciences, Indian National Science Academy, New Delhi.

Member, Research Advisory Committee, Indian Institute of Science Education and Research, Thiruvananthapuram (IISER-TVM).

Prof Meheboob Alam

Editorial Board Member of Proceedings of Mathematical Sciences (Indian Academy of Science; co-published with Springer) and Scientific Reports (Nature Publishing Group, London).

Dr Kavita Jain

Co-editor of the international journal EPL (EuroPhysics Letters).

Prof Umesh V Waghmare

Editor of Pramana-The Journal of Physics,



AWARDS AND LECTURES

published by Indian Academy of Science, Bangalore.

Awards Received by Students

Mr Chandradhish Ghosh received GYTI Appreciation Award

Mr Venkateswarlu Yarlagadda bagged BIRAC-GYTI Award

Best Poster Prize to Mr Satya Narayan Guin

Nanoscale Poster Prize to Mr Umesh Mogera

Awards to the Centre

IPO Special Mention Award 2015

IPO Special Mention Award constituted by Indian Patent Office, Department of Industrial Policy and Promotion (DIPP), Government of India, and the Confederation of Indian Industry (CII),

has been conferred upon Jawaharlal Nehru Centre for Advanced Scientific Research in the National IP Awards 2015 function on the eve of World Intellectual Property Day at New Delhi.

Best Ornamental/Vegetable Garden Award

NDTV Design and Architecture Award under the Institutional Architecture Design of the Year for Education category for designing the CCMS Laboratory of the Centre.

Lectures & Meetings

Endowment Lecture

What Can Be Learnt From The Fluorescence Behaviour Of Molecular Systems In Room Temperature Ionic Liquids?, Prof Anunay Samanta, School of Chemistry, University of Hyderabad, Hyderabad; Prize Lecture: *Functional*

Organic Molecules for Biological Application, Dr D Ramaiah, Director, CSIR-North East Institute of Science & Technology, Jorhat, Assam, May 21, 2015.

Materials Lecture

Seventh International Materials Lecture delivered by Prof R J M Nolte, Royal Netherlands Academy of Science, Radboud University Nijmegen, Netherlands, December 01, 2014.

Special Lecture

Exposing layers of transcriptome complexity and its use in dissecting complex trait, Dr Lars Steinmetz, V Ramalingaswami Chair, INSA Professor of Genetics, Stanford University, Co-Director, Stanford Genome Technology Center, Associate Head of Genome Biology & Senior Scientist, EMBL, Germany, January 20, 2015.

Silver Jubilee Celebration Lectures

Spintronic and Ionitronic Computing Technologies, Stuart S.P. Parkin, Max Planck Institute for Microstructure Physics, Halle, Germany and IBM Research – Almaden, California, USA, December 2, 2014

Silver Jubilee Annual Faculty Meet and In-House Symposium, January 5-6, 2015.

Fluid Dynamics Colloquia

1. *Philosophies and Fallacies in Turbulence Modeling*, Dr Philippe Spalart, Senior Technical Fellow, The Boeing Company, Seattle, USA, December 19, 2014.

2. *Microfluidics: A versatile platform for biomedical applications*, Dr M K S Verma,



Smt. Nirmala Sitharaman, Minister of State for Commerce & Industry conferring IPO Special Mention Award to Prof K S Narayan, President In-Charge, and Dean (R&D), JNCASR



PAST EVENTS

Harvard Medical School, Cambridge, USA, December 26, 2014.

3. *Semiflexible polymers confined in nanochannels: Equilibrium properties and implications to DNA barcoding*, Abhiram Muralidhar, Graduate Student Department of Chemical Engineering and Materials Science University of Minnesota, Minneapolis, USA, December 31, 2014.

4. *Effect of Interfacial Mass Transfer on the Dispersion in Segmented Flow in Straight Capillaries*, Dr. Amol A. Kulkarni, Chemical Engineering Division, National Chemical Laboratory, Pune, January 7, 2015.

5. *Direct numerical simulation of turbulence, transition and flow instabilities*, Dr Vagesh Murthy, Senior Research Engineer, Norway, February 11, 2015.

7. *Active evolvable matter: A perspective from experiments with bacteria, worms, drops and clocks*, Dr Shashi Thutupalli, HFSP Cross Disciplinary Fellow, Depts. of Physics, Mechanical Engineering and Integrative Genomics, Princeton University, USA, February 13, 2015.

8. *Mesoscopic Methods in Physics & Biology*, Dr Anuj Chaudhri, Computational Research Division, Lawrence Berkeley National Lab, USA, April 15, 2015.

Symposia / Workshops / Conferences / Winter School

1. Winter School on "Frontiers of Materials Science 2014" during December 01-05, 2014

2. International Conference on *Chromosome Stability*, December 14-18, 2014.

3. *13th Eurasia conference on Chemical Sciences*, December 14 - 18, 2014.

4. *International Workshop and Conference on Operator Theory and Applications*, Prof K B Sinha, December 19-20, 2014.

5. *National Symposium on Complex Fluids - CompFlu*, Dr Santosh Ansumali and Dr Ganesh Subramanian, December 22 - 24, 2014.

6. *Gene networks in chromatin / chromosome function*, 5th Meeting of the Asian Forum of Chromosome and Chromatin Biology, JNCASR, January 15-18, 2015.

7. *Winter-School on "Materials and Processes for Energy and Environment"*, January 15-17, 2015.

8. *TWAS Regional Conference of Young Scientists on "Nanoscience and Nanomaterials"*, February 18-20, 2015.

9. *International Conference on Magnetic and Optical Molecular Materials*

(ICMOMM), March 2-3, 2015.

10. *Flow Cytometry Workshop*, March 11-12, 2015.

Seminars

1. *Nanoscale Quantum Transport-Paradigms and Possibilities*, Prof Bhaskaran Muralidharan, Dept of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, December 02, 2014.

2. *The Ser/Thr kinase BUB1 and its kinase activity are required for signaling mediated by transforming growth factor*, Dr Shyam Nyati, Dept of Radiation Oncology, University of Michigan, December 08, 2014.

3. *Molecular Mechanism of Post-transcriptional Gene Regulation by the HIV-1 Gene Product Rev*, Dr L K Venkatesh, Saint Louis University, School of Medicine, Saint Louis, USA, January 9, 2015.

4. *Transcription Regulatory Mechanisms in Animal Cells*, Robert G. Roeder,





PAST AND FORTHCOMING EVENTS

Rockefeller University, January 15, 2015.

5. *FLU Pandemics, Past, Present, Future*, Dr Gyan Bhanot, Rutgers University, January 16, 2015.

6. *Measuring Molecules: Mass Spectrometers in Science, Medicine, and Business*, Prof. R. Graham Cooks, Department of Chemistry, Purdue University, USA, January 27, 2015.

7. *Building a Neuron for its Function: Deciphering the cellular mechanisms regulating neural patterning*, Dr Ramakrishnan Kannan, NINDS/NIH, Maryland, USA, January 28, 2015.

8. *Nanoscale interface formation and charge transfer in graphene/silicon and semiconductor nanorod based solar cells*, Prof B R Mehta, Department of Physics, Indian Institute of Technology Delhi, January 28, 2015.

9. *Mechanism of Chaperonin-Assisted Protein Folding: Investigation at Single Molecular Resolution*, Dr Shubhasis Haldar, Department of Cellular Biochemistry, Max Planck Institute of Biochemistry, Germany, February 10, 2015.

10. *Origin of Magnetism - 85 years of misunderstanding*, Prof Yoshiyuki Kawazoe, Professor Emeritus, New Industry Creation Hatchery Center, Tohoku University, Miyagi, Japan, February 11, 2015.

11. *Microscopic calculation of conformational thermodynamics in bio-macromolecular complexes*, Prof J Chakrabarti, S. N. Bose National Centre for

Basic Sciences, Kolkata, February 12, 2015.

12. *Adaptive constraints and their natural rescuers: insights from Drosophila aldehyde dehydrogenase*, Dr Mahul Chakraborty, University of California, Irvine, February 20, 2015.

13. *Development of chemical tools for target protein modification*, Prof. Hiroyuki Nakamura, Chemical Resources Laboratory, Tokyo Institute of Technology, Yokohama, Japan, March 9, 2015.

14. *Anisotropic particles in turbulence*, Dr Dario Vincenzi, Laboratoire Jean Alexandre Dieudonné, Université Nice Sophia Antipolis, Nice, France, March 19, 2015.

15. *Process Control for Inkjet Printing of Functional Materials*, Prof George T C Chiu, Birck Nanotechnology Center School of Mechanical Engineering, Purdue University, March 19, 2015.

16. *Chemical Tools for Drug Discovery Research in Cancer and Alzheimer's Disease*, Prof Kavita Shah, Purdue University, March 23, 2015.

17. *Experimental investigations on instability in suspension flow*, Prof Anuragh Singh, Department of Chemical Engineering, Indian Institute of Technology, Guwahati, April 6, 2015.

18. *Properties simulation and results of perovskite materials at finite temperatures*, Dr Brajesh Kumar Mani, University of South Florida, USA, April 13, 2015.

19. *Information processing at multiple levels in cellular systems*, Dr J Krishnan, Imperial College, London, April 21, 2015.

Hindi Workshop

Hindi Workshop on "The Art of Letter Writing", Shri M G Savadatti, December 22, 2014.

Discussion Meetings

European Union and Indo-Italy Meeting, March 10-14, 2015.

JNCASR-Purdue Meeting, March 20-21, 2015.

Forthcoming Events

1. Prof V Ramalingaswami Memorial Lecture, speaker: Satyajit Mayor, Director, NCBS, July 2015.

2. C N R Rao Oration Award Lecture, speaker: Prof Umesh V Waghmare, August, 2015.

3. DAE-Raja Ramanna Lecture in Physics, September, 2015.

4. ISRO Satish Dhawan Lecture, Dr S Ayyappa, Director-General, ICAR, October 2015.

5. International Conference on Large Length Scale Phenomena in Condensed Matter Physics, October 8-10, 2015.

Annual Faculty Meeting

The Annual Faculty Meeting and In-House Symposium of the Centre is scheduled to be held in November 2015.