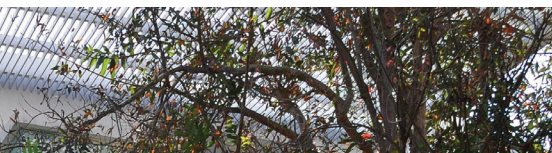




# JAWAHARLAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH



Bi-annual Newsletter



## JNC News

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### Message from the President

Dear All,

I would like to first extend my gratitude on all our behalf to Prof. V. Nagaraja, who completed his presidential tenure in May. He has always been a great source of encouragement to all of us, and under his tenure, our institute has achieved several milestones.

These past few months have been exciting times at JNCASR, with progress and achievements on many fronts. Several of our faculty received either national or international recognition on different platforms. Prof. C.N.R. Rao received the first Sheikh Saud International Prize for Materials Research while Prof MRS Rao received SERB-Year of Science Chair Professorship and Prof Maneesha Inamdar has been chosen as a member, Advisory Committee of WHO on developing global standards for governance and oversight of human genome editing. Then, we had our share of Academy fellowships, Swarnajayanti Fellowship and other recognitions listed elsewhere in this forum. Congratulations to all the achievers.



We have had many recent research highlights and excellent publications, also making progress in terms of patents granted, workshops conducted, and other academic activities. As a lead off initiative, a 200 kW solar power plant has been installed and operational which will augment our efforts towards a green campus. This pilot effort will be expanded further in our go green initiative. It also gives me immense pleasure to let the student community know that finally we have started the construction of the new hostel block leading to a total capacity to accommodate more than 350 students.

Other achievements, progress and highlights will be found in the following pages. With all your energy and enthusiasm I am sure JNC will accomplish more in the coming days.

With best wishes,

*K.S. Narayan*

I/c President

### What's Inside ?

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**New 200 kW roof-top Solar Power Plant inaugurated by Prof. V. Nagaraja, President, JNCASR on April 25, 2019.**

The plant installed on rooftops of 4 buildings at JNCASR (ICMS, CCMS, New Auditorium, and Men's Hostel) includes 615 PV panels along with 2 inverters, data collection systems, pyranometer and temperature sensors. Annual electricity generation from the solar plant is 3,00,000kW, thus saving Rs.24,00,000. CO<sub>2</sub> emissions mitigated through this plant is estimated to be approximately 6150 tonnes.

**The Ground Breaking Ceremony of the New Hostel Block V was held on April 25, 2019.**

The estimated project duration is 15 months to construct G+4 floors and will house 118 students.



# Leading News



## From the Editor

Perhaps as a reflection of the high level of academic activity, as we grow in size and number, our campus has hosted many exciting academic events during the course of the last semester. In addition to the many international and national level meetings, conferences and workshops, individual Units have held seminars and talks attended by students and other researchers across disciplines. In addition, we have had many a young school student visitor getting their first glimpse of research-in-action while also being able to chat informally with her/his graduate student buddy. With the coming of summer, we welcome undergraduate and master's students to short internships and hopefully kindle in them a life-long thirst for scientific adventure. For an institution of its size, we take pride in the high level of scientific discourse. JNCASR looks forward to its younger faculty members and students to maintain this momentum in the years to come.

**Sheeba Vasu**, Ph.D.

*Associate Professor*, Neuroscience Unit  
JNCASR

**Prof. C.N.R. Rao** received the *First Sheikh Saud International Prize for Materials Research* given by the Centre for Advanced Materials of the UAE.

**Prof. Maneesha Inamdar**, MBGU selected as a *member in an expert advisory committee* formed by World Health Organization (WHO) on developing global standards for governance and oversight of human genome editing.

Team Breathe (**Dr. Rakshith R. Belur, Prof. Umesh V. Waghmare and Dr. Sebastian C. Peter**) has been selected as the *first runner up in 12<sup>th</sup> Clean Equity forum, Monaco* in the category of "Excellence in the field Environmental Technology Research".

JNCASR has entered into an agreement with The Bengaluru International Airport Ltd (BIAL) to conduct a collaborative study on atmospheric conditions in the vicinity of the airport. The study will develop a Numerical Simulation Tool capable of predicting onset, intensity and dissipation of fog, enabling airport traffic and material management.

## Visiting Scientists

Prof. Geetha Balakrishnan

Dr. Avneesh Kumar

Prof. Garry Brown

Dr. Suvadip Das

## Visiting Students

Mr. Niket Suresh Powar

Mr. Kshitij Karajekar

Ms. Himani Medhi

Mr. Anish D'Silva

Ms. Doha Berraaouan

Ms. Awani Bapat

# Research Highlights



## A leap toward cure from Spinal Cord Injuries

Spinal cord injuries (SCIs) can be devastating, particularly because the spinal cord rarely repairs itself upon damage. The team led by Prof. Kundu at JNCASR, in collaboration with Prof. Di Giovanni from Imperial College London, recently found a means to promote regeneration and induce sprouting of sensory and motor neurons using glucose-derived carbon nanosphere (originally developed by Prof. M. Eswaramoorthy, CPMU and Prof. Kundu's team) conjugated to a small molecule activator (discovered by Prof. Kundu's group) of histone acetyltransferase. This strategy holds great therapeutic potential for SCIs and neurodegenerative conditions. The research work was published in *Science Translational Medicine*.

## In the fight against cancer

The team led by Prof. Maneesha Inamdar at JNCASR, discovered a stem cell protein, *asrij*, which plays a critical role in preventing myeloproliferative diseases (bone marrow and blood disorders leading to excess production of cells). Their study provided insights into the molecular mechanisms underlying the disease condition. Importantly, they developed a new mouse model, which will be highly beneficial to identify therapeutic strategies against blood cancer. This work was published in *'Blood'*, a journal of the American Society of Haematology.

## One step closer to cure from neurodegenerative diseases (ND)

Two years back, the team led by Dr. Ravi Manjithaya reported a large number of novel molecules that could potentially enhance the autophagy process, which essentially clears up unnecessary or dysfunctional components of the body. Disruption of autophagy is associated with neurodegenerative disorders such as Parkinson's and Alzheimer's diseases. Thus, these molecules are promising neuroprotective agents. Recently, Vipragen Biosciences, a Mysuru-based biotech company, partnered with JNCASR to take the research forward and identify potential drug candidates against neurodegenerative diseases.

## Mimicking nature's chemistry

Biological processes are stringently regulated chemical reaction networks, and scientists have been attempting to create synthetic systems mimicking nature's efficient machinery for long. Recently, reported in *Nature Communications*, Dr. Subi J. George's team from JNCASR, in collaboration with a team from InStem, designed a chemical fuel-driven self-assembly system that can be grown or disassembled in a controlled manner. Additionally, the system is responsive to multiple molecular cues,

leading to inherent growth and decay characteristics, which is suggestive of the "life-like" nature of the system. This is a key step in the development of programmable supramolecular materials.

## Way to recover electricity from 'wasted' heat

Heat dissipation is inevitable in any form of energy use. Considering the impending worldwide energy crisis, it would be extremely productive to convert the wasted heat into electricity. Dr. Kanishka Biswas and his team at JNCASR, recently found a way to make this happen! Although the idea has been around for long, the perfect material to bring about such conversion has evaded scientists. The desirable properties include high electrical conductivity, ultra-low thermal conductivity, and the capacity to generate high electrical voltage from given temperature gradient. Dr. Biswas' team achieved these necessary conditions using a novel concept called the ferroelectric instability. This work was published in *Energy & Environmental Science*.

## Tackling mercury pollution in water

Mercury pollution is a serious threat to our environment and health. In India, mercury contamination in water bodies has reached alarming levels that are above the permissible WHO standards (0.001 mg/L) for drinking water. Therefore, it is critical to assess mercury levels accurately. Dr. Govindraju's group at JNCASR, along with collaborators at RMIT, Australia, developed a novel sensor that can detect very low quantities of mercury. The sensor works on the principle of Surface Enhanced Raman Spectroscopy, and allows measurements of 0.01 parts per quadrillion of mercury in water. This strategy will be important for determination of mercury contamination. The research was published in *Biosensors and Bioelectronics*.

## Cation ordering

Perovskite oxides have interesting and valuable properties such as superconductivity, magnetoresistance, ionic conductivity, and dielectric features. Double perovskite oxides have intriguing cation arrangements, which impact several of the above-mentioned properties. Recently, Prof. A. Sundaresan from JNCASR described the unusual ordering of isovalent cations  $\text{Fe}^{3+}$  and  $\text{Al}^{3+}$  in the double perovskite  $\text{Bi}_2\text{FeAlO}_6$ . Previous attempts by researchers to stabilize such structures have been unsuccessful. The high pressure and high temperature method described by Sundaresan and team might make many polar materials of the type  $\text{Bi}_2\text{B}'\text{B}''\text{O}_6$  accessible. This commendable work was recently published in *Angew. Chem. Int. Ed.* 2018, 57, 1-6 and highlighted in *Nature Reviews Chemistry*.

# Academic Activities

During the academic year 2018-19, 57 students joined various degree programs at the Centre in the August 2018 session, followed by 7 students in the January session of 2019. This took the number of students at JNCASR to 325. In May 2019, 19 Ph.D, 2 M.S. (Engg.) and 16 M.S. (Int. Ph.D) degrees were awarded.

The advertisement for admissions to the Integrated Ph.D, Ph.D and M.S. programmes starting in August 2019 was released in the prominent national and regional newspapers, and announced on our website. The last date for applications was 16 April 2019.



## Intellectual Property

### Patents Granted

#### Indian Patent Office issued:

- ◆ Patent (No. 311070) for 'A Nanosphere-Histone Acetyltransferase (HAT) Activator Composition And Process Thereof' developed by Profs. Tapas Kumar Kundu and Muthusamy Eswaramoorthy et al.
- ◆ Patent (No. 307423) for 'Nanoparticle Compositions Of Antibacterial Compounds And Other Uses Thereof' developed by Prof. Jayanta Haldar et al.
- ◆ Patent (No. 309617) for 'Monoclonal Antibodies Against NPM1 and Acetylated NPM1, and Process Thereof' developed by Prof. Tapas Kumar Kundu et al.

### Technical Research Centre

Keeping with the spirit of moving valuable discoveries to market, JNCASR continues to make strides through its translational wing, the Technical Research Center (TRC). Supported by Department of Science and Technology (DST) of GoI, TRC has supported about 14 projects with potential for commercialization. TRC supports scientists to freeze collaborations with industries and entrepreneurs, and to forge partnerships of mutual interests. In the last 6 months, TRC facilitated three collaborative R&D projects, licensing of five technologies, and two start-ups.

Recently, numerical simulation tool developed by Prof. K R Sreenivas to predict the onset, intensity and dissipation of fog caught the interest of the "Namma airport" authorities of Bangalore International Airport (BIA). The powerful prediction of occurrence of fog 4-5 hours in advance, inspired the BIA to enter into an agreement with JNCASR. The BIA authorities feel that such prediction ahead of scheduled flight time will eventually help in better air space and on ground flight management that will benefit the passengers, and avoid huge financial burden arising due to extended flying in the holding pattern or diversion to a nearby airport.

#### South Africa Patent Office issued:

- ◆ Patent (No. 2016/07051) for 'Small Molecular Probes, Processes and Use Thereof' developed by Prof. Govindaraju Thimmaiah et al.
- ◆ Patent (No. 2018/01948) for 'Compounds As Stimuli-Responsive Probes, Methods And Applications Thereof' developed by Prof. Govindaraju Thimmaiah et al.

### Patents Filed

#### Three Indian Provisional Patent Applications filed for the inventions developed by:

- ◆ Prof. Sebastian Chirambatte Peter et al. (Patent Appl. No. 201841045187, filed on 29-11-2018)
- ◆ Prof. Ranga Udaykumar. (Patent Appl. No. 201941005934, filed on 14-02-2019)
- ◆ Prof. Jayanta Haldar et al. (Patent Appl. No. 201941015155, filed on 15-04-2019)

#### One International Patent Application filed under PCT:

- ◆ 'Enhancing Photocatalytic Water Splitting Efficiency Of Weyl Semimetals By A Magnetic Field' developed by Prof. Chintamani Nagesa Ramachandra Rao et al.

#### Two National Phase Patent Applications filed for:

- ◆ 'A Polymer Network, Method For Production, And Uses Thereof', developed by Prof. Jayanta Haldar et al., filed in USA and Canada.

# Outreach Activities



Participants of Salters Chemistry Camp conducting an experiment at a lab in JNCASR

## Education Technology Unit

**November to December:** Four workshops were conducted on experiments using college chemistry kit in which 99 students and 9 teachers from 4 Pre-University college participated.

- 1. November 2-4, 2018:** The Salters Chemistry Camp in association with Royal Society chemistry was conducted where 60 students from rural Govt. Schools participated along with their coordinators.
- 2. November 19, 2018:** two lectures were delivered by Prof. Chandrabhas Narayana and Dr. T. Govindaraju from JNCASR followed by an interactive Q & A Session. Around 200 students and teachers participated in the program.
- 3. December 10, 2018:** 200 students participated from Government High School, JNV Yelahanka and School Chandan Laxmeshwar etc. A lecture demonstration was carried out by Mr. Ashok Rupner, from IISER Pune. Lectures were delivered by faculty members from JNCASR followed by an interactive Q & A Session
- 4. December 13-15, 2019:** in association with Sagar Science Forum, an enrichment residential workshop for High School Teachers was organized at Sagar in Shimoga, Karnataka. The lectures and experimental sessions were given by Prof. N.S. Vidhyadhiraja and Mr. Vinayak Pattar from JNCASR.

**January 17-18, 2019:** in association with an NGO, Parikrma Parikrma Festival of Science' was organised. The theme of the science festival this year was 'WILDLIFE'. Prof. C.N.R. Rao inaugurated the festival and addressed the students. Prof. V. Nagaraja, Mrs. Indumati Rao were among the distinguished invitees. Over 200 students, teachers, guests, and volunteers participated in the event.

**January 22-24, 2019:** A 3-day workshop was conducted with school Chandan, Laxmeshwar, Gadag district, The workshop was inaugurated by Prof. C.N.R. Rao, who addressed the students followed by an interactive Q & A Session. Prof. K.S. Valdiya also presented two lectures on the geodynamics of the Himalayas. This program was supported by CNR Rao Education foundation where lectures and experiments on physics and chemistry were presented by faculty from JNCASR.

**March 31 - April 4, 2019:** In collaboration with Sagar Science Forum at Sagar, Shivamogga District, workshop on physics experiments, where lectures on making low cost physics model (from NCERT VIII-X) as well as demonstrations were presented by Mr. Vinayak Pattar of JNCASR. In this workshop, 8 high school teachers and 4 students had participated, and 20 physics kits had been prepared, each kit was containing around 25 experiments.

**April 08 - May 18 2019:** Under Student Mentoring Program (SMP), twelve students from Class X participated. The participants attended regular classes, worked in laboratory and library. Assignments and tests were conducted and evaluated along with recreational activities during their stay at the Centre.

## Fellowships and Extension Programmes

**Enhancement in Fellowships:** For the fellowship programmes including Summer Research Fellowship Programme (SRFP), Project Oriented Chemistry Education (POCE) and Project Oriented Biology Education (POBE), fellowships were increased to Rs.10,000 per month w.e.f. 2019 session.

### Summer Research Fellowship Programme (SRFP)

The number of Fellowships offered this year was increased to up to 150. The advertisement for SRFP 2019 was released in two newspapers and on the JNCASR website. The notification and application form were emailed to around 200 colleges in the country. Of 2020 applications received, 147 candidates under different disciplines were shortlisted and offered the fellowship.

### Project Oriented Chemistry Education (POCE)

Nine students of POCE-2016-18 batch were awarded Diploma in Chemistry. The advertisement for POCE 2019 was announced on our web site and newspapers. The last date to receive applications was March 8, 2019. 10 candidates from 7 states were shortlisted from 385 applications.

### Project Oriented Biology Education (POBE)

Six students of POCE-2016-18 completed the program successfully and were awarded the Diploma in Biology. The advertisement for POBE 2019 was announced on our website and newspapers. The last date to receive applications was March 8, 2019. Eleven candidates from 10 states were shortlisted out of 453 applications.

### Visiting Fellowship Programme

The Centre received 21 applications for the Visiting Fellowships Programme 2018-19 for different categories. A committee was set up to shortlist the candidates for the programme and 16 were selected. Twelve have been selected under the Physical Sciences category and the rest under the Biological Sciences category.

### Student Buddy Programme

A total of 108 students and 10 teachers visited JNCASR under the Student Buddy Programme in 2018. The Student Buddy programme has been highly successful and the students and teachers of JNV and KV have expressed their desire to come to JNCASR frequently. Student buddies from JNC have also given feedback that they would like to participate again and interact with a larger number of school students. So far 374 students have visited JNCASR under this programme since its inception in 2015.

# Awards and Achievements

## Awards received by Faculty

### Prof. C.N.R. Rao

- COSINE Award 2017
- First Sheikh Saud International Prize for Materials Research given by the Centre for Advanced Materials of the UAE

### Prof. M.R.S. Rao

- SERB-Year of Science Chair Professorship

### Prof. G.U. Kulkarni

- MRSI-Distinguished Lectureship Award (2019-20)

### Prof. Namita Surolia

- DBT Distinguished Biotechnology Research Professorship Award

### Prof. Chandrabhas Narayana

- Fellowship of Indian Academy of Sciences, Bangalore
- Mizushima-Raman Lecture 2018

### Prof. Umesh V. Waghmare

- Member, Council of the National Academy of Sciences, Allahabad
- Fellow, Asia Pacific Academy of Materials

### Prof. Maneesha Inamdar

- Prof. C.N.R. Rao Oration Award, 2019
- Member, World Health Organization (WHO) expert advisory committee on Developing global standards for governance and oversight of Human Genome editing

### Prof. Swapan K. Pati

- Fellowship of Indian National Science Academy, New Delhi

### Prof. Kaustuv Sanyal

- Fellow of American Academy of Microbiology

### Prof. Tapas Kumar Maji

- Fellowship of Indian Academy of Sciences, Bangalore

### Dr. T. Govindaraju

- CDRI Award 2019 for Excellence in Drug Research in chemical sciences category

### Dr. Subi J. George

- Fellowship of Indian Academy of Sciences, Bengaluru

### Dr. Jayanta Haldar

- 8th National Award for Technology Innovation, Ministry of Chemicals and Fertilizers, Government of India in 2018
- CRSI Bronze Medal in 2018
- Sheikh Saqr Career Award Fellowship in 2018

### Dr. Sebastian C. Peter

- Swarnajayanti Fellowship (Chemical Sciences) (2018)

### Dr. Ranjani Viswanatha

- MRSI Medal 2018 from Material Research Society of India (MRSI)

### Dr. Kaniska Biswas

- CRSI Bronze Medal 2019 from Chemical Research Society of India (CRSI)

### Dr. Kushagra Bansal

- Ramalingaswami Re-entry Fellowship by Dept. of Biotechnology



## Appointment

### Faculty Fellow

Dr. Kushagra Bansal

## Promotions

### Professor

Prof. N.S. Vidhyadhiraja

## Deans, Chairperson & In-charge of Units

### President In-charge

Prof. K.S. Narayana

### Dean, Fellowships and Extension Programmes

Prof. N.S. Vidhyadhiraja

### Dean, Research and Development

Prof. Chandrabhas Narayana

### Chair, Molecular Biology and Genetics Unit

Prof. Maneesha Inamdar

### Chair, Chemistry and Physics of Materials Unit

Prof. A. Sundaresan

### Associate Director, International Centre Materials Science

Prof. M. Eswaramoorthy

### Representing Chair, Education Technology Unit

Dr. T. Govindaraju

### Associate Chair, New Chemistry Unit

Dr. Subi J. George

## Awards received by Students

### Ph. D. Students

**Ms. Ananya Banik**, Solid State Chemistry Laboratory, NCU received "BEST THESIS AWARD" for KPIT Shodh Awards in Energy & Mobility Conference at IISER, Pune

**Mr. Gaurav Barve**, Autophagy Lab, MBGU as a lead author in one of his journal publication in Journal of Cell Science, his interview was also published in the journal (titled: First person – Gaurav Barve).

**Ms. Somya Vats**, Autophagy Lab, MBGU wins the Newton-Bhabha fellowship and her research in collaboration with Dr. Sovan Sarkar, University of Birmingham, UK opens new possibilities for treating neurodegenerative disorders.

**Ms. Srimayee Mukherji**, ICMS. Her recent publication with Prof. Rajesh Ganapathy in Physical Review Letters, selected as "Editor's suggestion" and appeared as coverpage of the journal issue.

**Mr. Subhajit Roychowdhury**, Solid State Chemistry Laboratory, NCU received "Graduate Student Silver Award" in 2019 MRS Spring Meeting, Phoenix, Arizona, USA.

**Ms. Neha Varshney**, Molecular Mycology Lab, MBGU received PLoS Genetics Best Poster award in the Chromosome Stability meeting 2018.

### Post-doctoral Fellow

**Dr. Sreedevi Padmanabhan** bagged the DST AWSAR award in the Post-doctoral Fellow category.

# Lectures, Meetings and Events



## Discussion Meetings & Conferences

- ◆ 7<sup>th</sup> Meeting of the Asian Forum of Chromosome and Chromatin Biology, Prof. Tapas K. Kundu, JNCASR, Nov. 15-17, 2018.
- ◆ 87<sup>th</sup> Annual Meeting of Society of Biological Chemists (SBC-1), Dr. K. Satyamoorthy, MAHE, Manipal, November 25-27, 2018.
- ◆ International Symposium on Solid State Chemistry of Transition Metal Oxides, Prof. A. Sundaresan, JNCASR, November 30 - December 1, 2018.
- ◆ INDO-UK Workshop on Electrochemical Routes to Energy Storage, Energy Conversion and Fuel Production, Prof. Sebastian C. Peter, JNCASR, December 10-13, 2018.
- ◆ Winter School on Modelling and Simulations of Materials for Energy and the Environment, Prof. Umesh Waghmare, JNCASR, December 12-14, 2018.
- ◆ Conference on Chromosome Stability, Prof. Kaustuv Sanyal, JNCASR, December 14-18, 2018.
- ◆ Fluids Days 2019, held on January 24-25, 2019.
- ◆ First Indian Materials Conclave and the 30<sup>th</sup> Annual General Meeting of Materials Research Society of India, Profs. P.S. Anil Kumar and S.B. Krupanidhi, IISc, February 12-15, 2019.
- ◆ Conference on Dynamics at Interface of Chemistry and Biology, Prof. Aninda Jiban Bhattacharyya, February 18-20, 2019.
- ◆ International Conference on Chemistry and Physics of Materials: Glorious Past and Exciting Future, Profs. Subi J. George, Umesh V. Waghmare and Chandrabhas N, JNCASR, February 20-22, 2019.
- ◆ Life Science Fest 2019, MBGU, JNCASR, March 8, 2019.
- ◆ SERB Sponsored School in Evolutionary Biology 2019, convenor: Dr. TNC Vidya held on March 12–26, 2019.

### InSearch2019 by Neuroscience Unit

InSearch 2019 - a one-day symposium aimed at inspiring undergraduate and postgraduate students to a future in research was organised on January 18, 2019. Scintillating talks on a range of topics were followed by opportunities to interact with the scientists, and pointers on how to approach a future in science were discussed.

## Endowment Lectures

### Prof. V. Ramalingaswami Memorial Lecture

(16<sup>th</sup> in the series) by Dr. Shekhar C. Mande, Secretary, DSIR and Director General, Council of Scientific & Industrial Research, New Delhi, on "*Networks and Tuberculosis*" held on April 29, 2019.



### A.V. Rama Rao Foundation Lectures in Chemistry

Foundation Lecture by Prof. S. Sampath, Dept. of Inorganic and Physical Chemistry, Indian Institute of Science, Bangalore on "*Role of Modified Surfaces and Multifunctional Catalysts in Electrochemistry*"; Prize Lecture by Prof. Ashok Kumar Ganguli, Dept. of Chemistry, Institute of Technology, New Delhi on "*Design of nanostructures for energy and environmental applications*" held on May 10, 2019.

Events contd...

## NCU Conference

The School of Advanced Materials (SAMat) hosted an International Conference, "Chemistry and Physics of Materials: Glorious Past and Exciting Future" from February 20-22, 2019 at JNCASR. The International Conference aimed to carve out a vision for future directions of research in Materials Science.



## Annual Faculty Meeting and In-house Symposium

The Annual Faculty Meeting and In-House Symposium was organised on November 13 and 14, 2018. Talks were delivered by scientists from the Centre and other scientific institutions during the two-day event.

## Visit of Nobel Laureate

**Prof. Ben L. Feringa**, Jacobus Van't Hoff Distinguished Professor of Molecular Sciences, Stratingh Institute, University of Groningen, the Netherlands, and the recipient of the Nobel Prize (2016) for his contributions in the field of Molecular Machines, visited the Centre on March 11, 2019. A brief interaction with SAMat Faculty and discussion session with students was also arranged.



## Upcoming Events

- ◆ 28<sup>th</sup> Discrete Simulations of Fluid Dynamics (DSFD) International Conference to be held from July 22 to 26, 2019.
- ◆ Chemical Frontiers Goa-CFG 2019, convenor: Prof. R. Murugavel to be held from August 22 to 25, 2019.
- ◆ Annual Faculty Meeting and In-house Symposium to be held from November 13 to 14, 2019.
- ◆ Bangalore Science Habba (BaSH), convenor: Prof. Rajesh Gopakumar, ICTS to be held on January 2020.
- ◆ MLK@80 Symposium, convenors: Prof. S. Balasubramanian and Prof. Umesh V. Waghmare, JNCASR to be held from February 18 to 20, 2020.



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