

CeNS News

Issue 2

August 2017



Bharat Ratna Prof. C. N. R. Rao performing Bhoomi Pooja at the Shivanapura Campus

Director's Note

Centre for Nano and Soft Matter Sciences (CeNS) in the present form, has entered into its fourth year. The in-house inventions in Nanotechnology interlaced with soft matter principles are aiming translation towards flexible, ergonomic futuristic technology. Nanotechnology being the focus, the diversity in research borne out of interdisciplinarity will be but natural; Nano can connect and percolate seamlessly into the diverse areas of science and technology. In short, CeNS exercises an open-minded approach to R&D in Nanotechnology with high emphasis on IP generation and technology realisation. The Centre has embarked on collaborative activity with well-known industries. It will be growing to newer heights in the coming years serving the society at large.

Outreach programmes of the Centre launched last year, विज्ञानि - विद्यार्थि विचार विनिमय (V4) for popularization of science among school children and Research Outreach Initiative (ROI), an internship programme for the benefit of students in their post graduate degree in science or in engineering, are being continued with all vigour. A "Learn it Experimentally (LitE)"

Gallery, which houses several hands-on science experiments designed for school and college going students has added another dimension to Centre's outreach activity. Increasingly higher number of students are being enrolled for research programmes leading to PhD, in the area of nanoscience and technology. During the year 2016-17, several lab facilities related to fabrication and device characterization have been commissioned. Prototype Gallery, which displays prototypes based on in-house inventions, and a Gas Sensor Testing Laboratory have been set up during the year under report. These facilities are attracting a large number of academic and industry visitors to the campus. Extramural and industrial projects and also mission mode projects were undertaken during the year. Several workshops held jointly with neighbouring institutions and national organisations have enhanced research interactions and networking.

The Centre is being constantly mentored by eminent scientists, administrators as well as policy makers, in particular by the Nano Mission of Government of India.

News

Opening of healthcare facility

A medical clinic was opened at CeNS campus on 19 July 2016 for the benefit of staff members and other personnel. An authorised medical officer is available for consultation twice a week.

Freshers' Day

To welcome the new students, Freshers' Day was held on 5 August 2016.

Hindi Diwas

On the occasion of Hindi Diwas, a week long programme was organized at the Centre during 12-17 September 2016. Various activities like essay writing, speeches, drama, debate etc were organized.

Prototype Gallery

A new gallery housing prototypes developed by CeNS faculty and students based on their research activities was inaugurated by Mr. Anand Sen, President, Total Quality Management and Steel Business, Tata Steel Limited, on 3 October 2016. The objective of having such a space is to set meaningful dialogue with Industry. (For a list of inventions displayed in the gallery, see page 4)

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News

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Vigilance Awareness Week

CeNS observed the Vigilance Awareness Week during 31 October to 5 November 2016. The faculty and administrative staff took a pledge on vigilance while they were told about the importance of maintaining the same.

Kannada Rajyotsava celebration



Mrs. Indira Kulkarni (right), Chief Guest, delivering a talk on the occasion of "Kannada Rajyotsava" celebration. Ms. Adithi H. M. (left) performed Bharathanatyam at the event.

CeNS celebrated Kannada Rajyotsava on 4th November 2016. Mrs. Indira Kulkarni, an enthusiastic Kannada educationist, was the Chief Guest. A variety of programmes, including singing Kannada songs, poetry recital, skit, quiz, etc. marked the event.

CeNS at IISF-2016



Young visitors to CeNS stall at the IISF-2016, New Delhi

The Centre participated in the India International Science Festival (IISF) - 2016 at NPL, New Delhi, held during 7-11 December 2016. IISF is India's biggest science fest with active participation from academia, industry and schools. CeNS showcased the research highlights through posters and demonstrative models in the Mega Science Expo stall under DST pavilion.

LiTE gallery



The "Learn it Experimentally" or "LiTE" Gallery, a hall hosting exhibits and hands-on experiments designed for school and college going students, was inaugurated on 28 February 2017.

Prof. Prashant Kamat,
Editor-in-Chief, ACS Energy Letters visits CeNS



Prof. Prashant Kamat, Editor-in-Chief, ACS Energy Letters interacting with young researchers from CeNS, JNCASR and IISc

On 12 March 2017, an interaction session between Prof. Prashant Kamat, Editor-in-Chief, ACS Energy Letters, and young researchers of CeNS, JNCASR and IISc was held at the Lecture Hall, CeNS. Prof. Kamat, a Zahm Professor of Science at the University of Notre Dame, USA, spoke to the researchers about the art of publishing scientific research. The interaction was filled with very useful tips from Prof. Kamat about different aspects of writing a good manuscript and to publish in reputed journals. The highlight of the programme was an hour long question and answer session found extremely fruitful by the research student community. After the session, the festival of colors, Holi, was played both by the students and professors alike with lot of fervour and gaiety.

Sports Day



Sports day, Shivanapura Campus

On 1 April 2017, "CeNS Sports Day" was organized at the Shivanapura campus. The entire CeNS community including admin staff, faculty and students along with their family and friends participated in the event. Various games and sports were conducted under the guidance of Mr. C.P. Poonacha, Chief Sports Officer, Indian Institute of Science.

Admin Day

"Admin Day" was held on 21 April 2017 to discuss various aspects administrative matters with active participation from the admin staff and faculty. During the meeting, a booklet titled "Purchase Procedure" was released. Also a file tracking module was introduced for the benefit of the CeNS faculty and admin.

Tweet from Hon'ble Union Minister



Honorable Union Minister for Science & Technology & Earth Sciences Dr. Harsh Vardhan tweeted about the achievement of the Centre on 3 May 2017 during the DST-Conclave meeting held at S.N. Bose National Centre for Sciences, Kolkata during 2-4 May 2017.

more news on P3

News

...contd. from P2

Bhoomi Pooja



Shivanapura Campus: Construction in progress

Bhoomi Pooja for the construction of Laboratories at the Shivanapura campus was conducted on 19 May 2017. Bharat Ratna Prof. C. N. R. Rao, F.R.S., Chairman, Governing Council and dignitaries including the members of Governing Council and Research Advisory Board graced the occasion.

International Yoga day

The 3rd International Yoga Day was celebrated in our Centre on 21 June 2017. Shri H. N. Gopalakrishna, of Yoga Sannidhi, Bengaluru was invited to deliver a Lecture-Demonstration highlighting the benefits of Yoga.

Gas Sensor Testing Lab



The Gas Sensor Testing Laboratory was inaugurated by Prof. D. D. Sarma, Chairman, Research Advisory Board on 10 July 2017. The sensing of helium gas by the Pd based gas sensor was demonstrated during the inauguration. Over all, the Lab has the potential to control and monitor supply of gases such as O₂, H₂, NH₃, CH₄, CO, NO etc. down to ppm level for testing of sensor devices.

Academic & Research Activities

Ph D admission

During August and January sessions (2016-2017) 12 students joined the PhD programme.

Ph D Degree awardees

Rajalakshmi R., thesis titled "Synthesis, characterization and device applications of ZnO and transition metal doped ZnO thin films", 9 November 2016

Gayathri H. N., thesis titled "Studies on the monolayer and multilayer films of liquid crystalline amphiphilic molecules at interfaces", 23 February 2017

Nagaiah Kambhala, thesis titled "Synthesis, Electrical and magnetic properties of some multiferroic and colossal magnetoresistance materials", 4 May 2017

Shilpa Harish T., thesis titled "Condensation and structural transitions in thin films at interfaces", 22 May 2017

New Projects

Two SERB-DST Extramural projects titled "Molecular design directed synthesis and characterization of inexpensive, functional organic materials exhibiting technologically relevant liquid crystal phases" and "Magnetic nanoparticles for memory applications" and a WOS-A, DST project, "Synthesis of chiral liquid crystals and their composites with nanoparticles: Development of functional mesophases for applied science" are approved.

The thematic project in frontiers of Nano S&T (TPF-Nano, SR/NM/TP-25/2016) titled "Chemical Physics of Functional Nanostructures and Interfaces" jointly with JNCASR, Bengaluru, has commenced from 9 November 2016.

Mission Mode Programme

Based on the recommendation of the Chairman, Governing Council and the Research Advisory Board, a Mission Mode Programme is initiated by a group of researchers including the faculty and students. The first interactive meeting of the programme was held on 30 May 2017. Under this programme, the researchers will strive to develop non-invasive point-of-care device termed as "Nano-nose" or "Electronic-nose" that can detect chronic diseases such as diabetes, cancer, hyper tension etc at early stages. Such a device works on the basis of sensing the molecular entities that are present in human breath, each unique to a particular type of illness.

Publications

Journal Publications: 45

Books: 1

Outreach

Since its inception in 2015, the CeNS outreach programmes have become very popular with the student community. During the last year, under the V4 (विज्ञान - विद्यार्थि विचार विनिमय) programme that includes lab tours, scientific talks and experimental demonstrations, more than 2000 students from high schools and colleges within and outside Karnataka have benefited. The Research Outreach Initiative (ROI) which caters to highly motivated post-graduate (science) students saw an upsurge in the number, with 15 students from all over India enrolling for the programme in the last one year alone.

Inventions @ Prototype Gallery



Research Advisory Board members visit the Prototype Gallery

The gallery housing prototypes based on in-house inventions is a platform to showcase Centre's research activities and to set a meaningful dialogue with Industry.

- Graphene coated quartz plates
- Corrosion Protective Coating for Copper
- Fast Responding Anisotropic Organogels
- Fog-on Demand : Electrically Switchable Transparency
- Triboelectric Nano Generator
- Ultrafast supramolecular humidity sensor
- Self-heated Cover slip
- Flexi Touch Display
- Defrosting Panels
- Defogging Panels
- Light Modulating Smart Window
- Invisible Switches
- Instant hot packs
- Invisible EMI shield
- Luminescence based Lead Sensor

New Research Facilities

Some of the important facilities commissioned in the past one year are

- Contact angle Meter
- ITO/AZO Sputtering System
- Solar Simulator
- Glancing Angle Deposition (GLAD) system
- 3D printer
- Environmental testing Chamber

Industry Interaction



Launching Tata Steel Advanced Materials Research Centre (TSAMRC) at CeNS. Mr. Anand Sen, Chairman, Total Quality Management and Steel Business, Tata Steel Limited, and Prof. G. U. Kulkarni, Director, CeNS are seen exchanging the MOU documents.

Tata Steel signed a MOU with CeNS on 3 October 2016, to set up the Tata Steel Advanced Materials Research Center (TSAMRC) at CeNS. This programme spread over five years enables the researchers to directly explore their work for commercialization aspects under the supervision of an industrial partner.

CeNS signed an MoU with Hindustan Petroleum Corporation Ltd (HPCL) on 27 February 2017 to find value addition to industrial carbon waste under the "Swachh Bharath" programme.

An industrial project (funded by DST Nanomission) with Hind High Vacuum, Bengaluru to prototype manufacturing of oxide coated metal mesh based transparent conducting plates, is in principle approved.

A technology knowhow transfer agreement was signed with Lab Engineers (India) on 22 May 2017 to manufacture and commercialize Projection Lithography system.

Forthcoming Events

- Indo-German Workshop - September 2017
- DST Nanoschool - October 2017
- International Conference on Nano S&T (ICONSAT 2018) - March 2018

Honours



G. U. Kulkarni

Adjunct Member of the Faculty for Science and Technology, Gulbarga University, Gulbarga

Chief Editor of Bulletin of Materials Science, Indian Academy of Sciences, Bengaluru



S. Krishna Prasad

Associate Editor for Bulletin of Materials Science, Indian Academy of Sciences, Bengaluru



Neena S. John

Member of the Royal society of Chemistry, London, UK



K. A. Suresh

Adjunct Professor, Department of Materials Science, Mangalore University

Workshops

• An interaction meeting of a Indo-US R&D networked Joint Centre on **'Nanomaterials for Clean Energy and Environmental Sensors'**, under the aegis of Indo-US Science & Technology Forum (IUSSTF) was held on 11 & 13, March 2017. The meeting began with the inspiring opening remarks by Bharat Ratna Professor C. N. R. Rao. Scientists and students from the participating institutes, viz., CeNS, IISc and JNCASR from India and Purdue University, North-western University, University of Notre Dame and the University of Akron from the US presented their work at the meeting. The scientific content of the presentations covered a wide variety of topics such as perovskites, helical nanomaterials, block

copolymers/nanoparticles assemblies, advanced electron microscopy, nanostructured GaN, quantum dots, thermal interfaces, transparent conducting electrodes, liquid crystal-nanoparticle hybrids, nanofabrication under the theme of clean energy and environmental sensors. In all there were 17 invited talks and 25 poster presentations covering various topics such as "Advanced Electron Microscopy of Energy Materials", "Engineering Nanomaterials for Energy efficient applications", "Nanostructured GaN", "Mixed Halide Lead Perovskites" etc. The sessions took place in three places, viz., CeNS, JNCASR and CeNSE-IISc with a view to include a wider student audience of the respective institutes.



(Top left) Bharat Ratna Prof. C. N. R. Rao delivering the inaugural speech at the Meeting. (Top right) ACS Energy Letters covered the proceedings of the meeting in the April 2017 issue. (Bottom) Participants at the Indo-US interaction meeting.

- A Science Academies' Lecture Workshop on **"Nano-Science and Nanotechnology"** was held at the Department of Physics, Alva Institute of Engineering and Technology on 11 - 12 March 2016 at Moodbidri, Mangalore.
- The first joint workshop involving CeNS and Manipal University on the topic of **"Nano- Science & Technology"** was held at Manipal University, Manipal on 17 August 2016.



Participants of CeNS-Manipal University Workshop

- Indian Science Academies' (INSA, IASc, NASI) Lecture Workshop on **"Condensed**

and Soft Matter Physics" was held at Mangalore University during 22 - 24 February 2017.

- The second CeNS - Manipal University Workshop based on the theme **"Advances in Nano and Soft Materials"** was held at CeNS, Bengaluru on 27 - 28 June 2017.
- A joint workshop between CeNS, DRDO and JNCASR on **"Frontiers in Nanoscience and Technology"** was held on 4 - 5 July 2017 at JNCASR, Bengaluru.

Colloquia /Seminars: Visitors

Speaker of the Month

1. "Coupling of Elementary Excitations: Drawing Parallels Between Excitons and Plasmons", Prof. K. George Thomas, IISER-TVM, Thiruvananthapuram, 11 July 2017
2. "High Performance Thermoelectric based on SnTe", Dr. Kanishka Biswas, JNCASR, Bengaluru, 13 January 2017.
3. "Plasmonic interactions via small gaps and in three dimensions", Dr. Ambarish Ghosh, IISc, Bengaluru, 24 March 2017.
4. "Liquid Crystal in optoelectronic and biosensor applications", Dr. Santanu Kumar Pal, IISER, Mohali, 23 June 2017.

Colloquia/Seminars

1. "50mV Nano-electromechanical (NEM) Switch", Dr. Bisvas Saha, University of California, USA, 07 July 2017
2. "Atomic Scale Capillaries", Dr. Radha Boya, University of Manchester, UK, 16 June 2017
3. "Advancements in Field of Transmission Electron Microscopy", T. Oikawa, Senior Product Manager, JEOL, Singapore, 5 May 2017
4. "Photo-induced Force Microscopy", Dr. Sung Park, Molecular Vista, San Jose, USA, 04 April 2017
5. "Subpicosecond Exciton and Bi-exciton Dynamics in Quantum Dot Materials: Implication in Solar Cell", Prof. H. N. Ghosh, INST, Mohali, Colloquium, March 8, 2017
6. "Frontier molecular orbitals of CO₂ on ZnO surfaces: Time-resolved photoelectron spectroscopy", Dr. Sesha Vempati, Institute of Max Planck Society, Germany, 23 February 2017
7. "Recycle or Perish - Emerging Challenges in MSW Management", Dr. H. N. Chanakya, Center for Sustainable Technologies, IISc, 17 February 2017
8. "Continuous and large scale gas phase synthesis of size selected metal, alloy and core-shell nanoparticles", Prof. B.R. Mehta, IIT Delhi, New Delhi, 10 February 2017

9. "De Novo Approaches to Organic Materials Based on Sterically-Engineered Molecular Systems", Prof. J.N. Moorthy, IIT Kanpur, Kanpur, 5 January 2017
10. "Design of nano-catalysts for various applications", Prof. A. K. Tyagi, BARC, Mumbai, 2 December 2016
11. "Self-Assembled Photoresponsive Materials", Prof. Suresh Das, Kerala State Council for Science technology and Environment, Thiruvananthapuram, 22 December 2016
12. "Effect of Electric Fields on Desiccation Crack Patterns", Prof. Sujata Tarafdar, Jadavpur University, Kolkata, 14 September 2016
13. "The Role of Oxides in Materials Chemistry: Select Examples", Prof. Srinivasan Natarajan, IISc, Bengaluru, 8 July 2016
14. "Tuning tribological and mechanical properties of surfaces by gradient and graded fabrication", Prof. Shivaprakash Ramakrishna, ETH - Swiss Federal Institute of Technology, Switzerland, 13 February 2017
15. "Chemistry Underlying Functional Materials", Prof. R. Vijayaraghavan, School of Advanced Sciences, VIT University, Vellore, 21 November 2016
16. "Metal-Nucleotides with Different Modes of Coordination", Dr. Nethaji, Chief Research Scientist, IPC, IISc, Bengaluru, 15 September 2016
17. "Switchable Plasmonic Nanostructures", Dr. S. R. C. Vivek Chand, Founder CEO, Sensal Technologies, 07 October 2016
18. "COMSOL Multiphysics® & Application Builder", Dr. Ashwin S. Mecheri, COMSOL, 23 August 2016
19. "Interaction between moisture and graphene: permeation encapsulation FOR the graphene and FROM the grapheme", Dr. Abhay A. Sagade, University of Cambridge, UK, 31 August 2016
20. "Designing Defects in ZnO: A few curiosities", Dr. Joy Mitra, IISER - TVM, Thiruvananthapuram, 19 August 2016

21. "Self - Assembly of Small Building Blocks: From Molecules to Functional Materials", Dr. Bhimalendu Adhikari, Chiba University, Japan, 23 May 2016
22. "Development of smart molecular systems and their applications in molecular recognition, self-assembly and optical upconversion", Dr. Prasenjit Mahato, Kyushu University, Japan, 14 June 2016
23. "Fluorescence quenching studies of some important NACs employing conducting polymers as fluorophores", Prof. A. Venkataraman, Gulbarga University, Kalaburgi, 14 June 2016
24. "Trends in Advanced Manufacturing and University - Industry Collaboration", Prof. Peter Hodgson, Deakin University, Australia, 15 June 2016
25. "Theoretical approaches to understand various bio-inspired soft condensed matter systems", Dr. Debarati Chatterjee, IISc, Bengaluru, 06 April 2016
26. "Advanced measurement techniques with the CSI Nano Observer scanning probe microscope", Dr. Kunal Bose, APAC, CS Instruments, France, 07 April 2016
27. "Thermal probe SPM based high speed 3D Nano lithography & Different Hyphenated Characterization tools for Nanotechnology based on SPM", Dr. Samik Pal, Labindia Instruments Pvt Ltd, Bengaluru, 15 April 2016
28. "Semiconductor oxides and 2-D Materials Based Electronic Devices in Flexible and Printed Format", Dr. Bhupendra K Sharma, IISc, Bengaluru, 27 April 2016

Seminars: Faculty

1. "Passive Light Harvesting Window using texture film", S. Angappane, 20 February 2017
2. "Self cleaning glass based on photovoltaics", Neena S. John, 20 February 2017
3. "Metamaterial airconditioner", Geetha G. Nair, 20 February 2017

Intellectual Property and Patents

Orientation programme

- Dr. Geetha G. Nair, Coordinator - R&D, participated in "Advanced Workshop on IP management", jointly organized by TIFAC and DRDO, 12-14 January 2017, New Delhi.
- Dr. D. S. Shankar Rao, faculty, attended the technology exposition "ARCI-TechEx-2017" at ARCI, Hyderabad during February 27-28, 2017.

Patents filed

1. A Process For Producing Graphene Based Transparent Conductive Electrode and The Product Thereof, S.K. Choudhary, Sumitesh Das, G. U. Kulkarni and Rajashekhar N. Pujar,

Indian Patent Application Number: IN201721021005.

2. A process for producing graphene, and application thereof, S.K. Choudhary, Sumitesh Das, G.U. Kulkarni and Rajashekhar N. Pujar, Indian Patent Application no is IN201621041721. Filing PCT application is under process.

3. Solar Cell and method thereof, G.U.Kulkarni, Nikita Gupta, K.D.M. Rao., Indian Patent Application no is 201741003497.

4. Photoactive gel exhibiting optical memory states, Vimala S., Geetha G. Nair, S. Krishna Prasad, Sathya S., C. V. Yelamaggad, Indian Patent Application Number: 201641033449.

5. Polymer stabilized liquid crystal device, composition and method thereof, S. Krishna Prasad, Marlin Baral and S.N. Jaisankar, Indian Patent Application Number: 201741002313.

6. Supramolecular nanofiber as electrolyte, G.U.Kulkarni, Subi J. George, Murali Gedda and Umesha Mogera, Indian Patent Application Number: 5285/CHE/2015.

7. Turbostratic graphene dispersions, coatings and process thereof, G.U.Kulkarni, Nikita Gupta and Umesh Mogera, Indian Patent Application Number: 201741004449.

4. "Super-hydrophobic transparent substrates", P. Viswanath, 20 February 2017

5. "Flexible, semi/full transparent organic solar cells", H.S.S.R. Matte, 20 February 2017

6. "Non-invasive point-of-care devices", G.U. Kulkarni, 20 February 2017

7. "Interference Coating on Glasses", Pralay K Santra, 20 February 2017

8. "TENG to harvest energy from rain drops on the windshield", D. S. Shankar Rao, 20 February 2017

9. "Windshield/ Head-up Transparent Displays", S. K. Prasad, 20 February 2017

10. "Hot packs and fruit juices as sensors for metals", C. V. Yelamaggad, 20 February 2017

11. "Nano nose: Concept to Applications", G. U. Kulkarni, Mission Mode Meeting, 30 May 2017

Seminars: Students

General

1. "Workshop on projection lithography", Bharath B, 2 April 2016 & 18 May 2016

2. "Transparent Conducting Glasses made of Metal Nanomesh Coated with Metal Oxide Overlayer", Ashutosh K. Singh, 24 August 2016

3. "Improving the electrical conductivity of the grown rGO film", Rajashekhar Pujar, 9 January 2017

Thematic

1. "War against cancer: Role of nano and soft matter sciences", Arup Sarkar, 26 August, 2016

2. "Energy Harvesting Devices", Chandan Kumar, 21 October 2016

3. "Soft electronics for healthcare applications", Priya Madhuri K., 17 July 2017

Journal Article based Seminar

1. "Metal Organic Frameworks (MOFs): Advanced Materials for Thermoelectric Devices", Sachin Ashok Bhat, 26 March 2017

2. "H-bonded donor-acceptor units: towards high mobility ambipolar organic semiconductors", Madhu Babu Kanakala, 12 May 2017

3. "A Flexible Integrated System Containing a Micro supercapacitor, a Photodetector, and a Wireless Charging Coil", Suman Kundu, 11 May 2017

4. "Flexible and Highly Sensitive Pressure Sensors Based on Bionic Hierarchical Structures", Indrajit Mondal, 23 May 2017

5. "A Molecular nematic liquid crystalline material for high -performance organic photovoltaics", Marlin Baral, 25 May 2017

6. "Helical Nano-crystallite (HNC) Phases: A new type of Dark Conglomerates", Rekha S. Hegde, 29 May 2017

7. "Photo Driven Soft Robotics", Vaisakh V. M., 16 June 2017

Thesis Colloquia

1. "Synthesis and Properties of Graphene-based Hybrid Materials Employing Chemical Routes", Bramhaiah K., 19 October 2016

2. "Experimental studies on anisotropic soft matter at atmospheric and elevated pressures", Srividhya Parthasarathi, 20 March 2017

3. "Electrical and Viscoelastic Studies on Liquid Crystal Gels and Composites", S. Vimala, 28 March 2017

4. "Synthesis and Characterization of Liquid Crystalline Compounds", Mr. Veerabhadraswamy B. N., 03 July 2017

5. "New Fabrication Strategies for Smart Window Prototype Devices Using Invisible Metal Mesh Electrodes", S. Kiruthika, 12 April 2017



... in pursuit of
Global excellence in
Science and
to nurture Indigenous
Technology for the
betterment of Our Country.

Special Lectures

• **National Science Day Celebration:** As per the theme "Science and Technology for specially abled persons", the Centre celebrated National Science Day on 22 and 28 February 2017. Prior to this, visits to schools which cater to specially abled students was organised and the researchers interacted with the students as well as the teaching staff to learn about the functioning of these schools and to explore ways where the Centre can contribute in providing additional academic interaction. On 22 February children from Spastics Society of Karnataka, Asha Kiran, Deepika Special School and ASHA were invited to participate in a specifically designed science demonstration tour. The programme on 28th included a lecture on "Science of Colour", a science-based skit, a video show on specially abled achievers, science quiz and inauguration of Lite Gallery. Students from B.E.L. high school participated in this event.



- **Prof. S. Chandrasekhar Memorial Lecture:** The 13th Professor S. Chandrasekhar Memorial Lecture was delivered on 11 August 2016 by Prof. Krishna N. Ganesh, Director, Indian Institute of Science Education and Research, Pune. The talk titled "Supramolecular mimics of DNA base pairs: Potpourri of H-bonds" was attended by, among other invited guests, Members of the Governing Council and the Research Advisory Board of CeNS, the family of Prof. S. Chandrasekhar, faculty and research scholars.
- **Dr. Abdul Kalam's Birthday:** A special lecture on the occasion of Dr. Abdul Kalam's Birthday was organized by the Centre on 18 October 2016. Padma Shri Dr. Prahlada Ramarao, Former Distinguished Scientist and Chief Controller, DRDO and Former Vice Chancellor, DIAT, Pune, gave a lecture titled 'My Years with Kalam'.

Awards

Dr. Neena S John: Springer award for best paper at 'International Conference for NextGen Technologies: Silicon to Software', organized at VIT University, Chennai in March 2017

Sunil Walia, SRF, received Best Poster award at the CeNS-Manipal Joint Workshop, held at Manipal University, Manipal, 16-17 August 2016.

Sunil Walia, SRF, received Best Poster award at the IUSSTF Workshop, held at CeNS, IISc and JNCASR, Bengaluru, 11 & 13 March 2017.

Vimala S., SRF received IUCr Young Scientist Award by International Union of Crystallography, September 2016.

Monika M., SRF received Best Paper presentation at 'International Conference on Advanced Materials (SCICON-2016)', 12-16 December, 2016, Coimbatore.

Sachin Ashok Bhat, SRF, received Best Poster award at 'National Conference on Liquid Crystals', Dhanbad, December 07-09, 2016.

Outstanding award for Best Ornamental Garden was received by the Centre from Mysore Horticultural Society, Lalbagh, Bengaluru on January 2017

Visiting Faculty

Dr. C. Kavitha, DST-Scientist, BMSIT,
Yelahanka, Bengaluru

Dr. Gurumurthy S.C., Assistant Professor,
Manipal Institute of Technology, Manipal

Promotions

Scientist G

S. Krishna Prasad

Assistant

Jayaram M

New Appointments

Scientists

Dr. Pralay K. Santra, Scientist D (Contract)

Dr. H.S.S.Ramakrishna Matte, Scientist C
(Contract)

Research Associates

Dr. Umesha Mogera (Project)

Dr. Vivek Ramakrishnan

Dr. Jitendra Kumar

Dr. Sujeet Dutta

Dr. Remya K. Govind (Project)

Dr. P. Chithaiah

Dr. C. Sathiskumar (Project)

Dr. Bhagwati Sharma

R&D Assistants

Mr. S. Madhanmohanraju

Ms. Pallavi V.

Ms. Amrutha Thomas

Mr. Aman Anand

Mr. Shivam Trivedi

Ms. S. Kiruthika (Project)

Mr. Abhishek Shibu (Project)

Mr. Kaushalendra Kumar Singh (Project)

Mr. Dharmendra Kumar Singh (Safety
Management)

Others

Dr. M.L.V. Archana, Authorised Medical
Officer

Dr. Rajalakshmi R., Consultant –
Publications (Project)

Mr. Tharakanath K., Site Engineer
Ms. Bindu S., Office Assistant