UM-DAE CBS
CENTRE FOR EXCELLENCE IN BASIC SCIENCES
Health Centre Building, University of Mumbai,
Kalina Campus, Mumbai -400 098
Phone: 91-22-26524983 | Fax: 91-22-26524982

Annual Report
(April 2013 - March 2014)

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(April 2013- March 2014)

UM-DAE CEBS

University of Mumbai (UM) – Department of Atomic Energy (DAE)

Centre for Excellence in Basic Sciences (CEBS)

Preface

CEBS has now completed 7 years of its existence. The Centre now offers all streams of Basic Sciences, namely, Mathematics, Physics, Chemistry and Biology. The first three batches of students of CEBS have graduated in April 2012, 2013 and 2014 with excellent grades, and have since joined for pursuing higher studies in reputed institutions, which include DAE aided institutions like TIFR, NCBS, NCRA, HRI, CEBS, CMI, BARC etc., and top universities in US, UK etc. The CEBS students have been performing extremely well in national competitive examinations in Physics and Mathematics and have won several laurels. The Centre has established excellent organic linkages with the University Departments and constituent Colleges.

CEBS has established modest research facilities for the core faculty. Research labs in Physics, Chemistry and Biology departments are now fully functional. In addition to carrying out research at CEBS, the faculty also collaborate with scientists in other well established research institutions with access to major equipments. The faculty members at CEBS have been able to produce excellent research publications in reputed international journals. The productivity has been increasing steadily and during the last year alone **52** papers have been published in reputed International Journals.

The construction work of the permanent buildings of CEBS is now complete and awaiting water and electricity supplies to be turned on. The activities will soon be shifted there.

One of the hall marks of CEBS is its Visitors' programme. Visiting and Adjunct faculty coming from proximate research institutions, colleges and departments contribute immensely to the teaching and research programmes at the Centre. There have been foreign nationals as well who have come and taught courses of lectures to the students. Distinguished scientists, who include several Nobel Laureates, have delivered Colloquia and Public Lectures at CEBS.

This document lists all the activities and accomplishments of the Centre during the last one year and it is satisfying to note that CEBS has lived up to the dreams of its creators; it has successfully established itself as a brand institution for teaching and research in the area of 'Basic Sciences' and set an example for other Universities in the country to follow, which when accomplished would contribute immensely to the growth and improvement of higher education in the country.

R. V. Hosur

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1. Preamble

The Centre for Excellence in Basic Sciences (CEBS) has been created with the objective of sustaining a brand institution in the field of Basic Sciences on the campus of a University. The principal thrust is to impart high quality undergraduate and post graduate education in the midst of a vibrant research environment with emphasis on the experimental component within a multi-disciplinary framework. The undergraduate training is structured in such a manner so as to facilitate and attract young students to the frontiers of exciting research in the physical, mathematical, chemical and life sciences, with special emphasis on programmes related to energy science.

2. Governing Council and Academic Board of the Centre

Governing Council of the Centre:

CEBS is managed by a Governing Council consisting of the following members:

Dr. R. K. Sinha — Chairperson
Secretary to the Government of India
Department of Atomic Energy
Chairman, Atomic Energy Commission
Anushakti Bhavan, C. S. M. Marg
Mumbai – 400 001

Dr. Rajan Welukar — Co-Chairperson
Vice-Chancellor
University of Mumbai
Fort Campus, Mumbai – 400 032

Shri. Sekhar Basu — Member
Director
Bhabha Atomic Research Centre
Trombay, Mumbai – 400 085

Dr. M. Barma — Member
Director
Tata Institute of Fundamental Research
Homi Bhabha Road
Mumbai – 400 005

Dr. Devang Khakhar — Member
Director
Indian Institute of Technology, Bombay
Powai, Mumbai – 400 076

Dr. Naresh Chandra — Member
Pro Vice Chancellor
University of Mumbai
Fort Campus, Mumbai – 400 032

Shri. Pradeep R Baviskar — Member
Joint Secretary (R&D)
Department of Atomic Energy
Anushakti Bhavan, C.S.M. Marg
Mumbai – 400 001

Prof. S. K. Joshi — Member
Room No. 250
National Physical Laboratory
Dr. K.S. Krishnan Road
New Delhi - 110 012

Prof. R. V. Hosur — Member Secretary
Director
UM-DAE CEBS
University of Mumbai
Kalina Campus, Mumbai – 400 098

Academic Board of the Centre

The academic activities of the Centre are designed and overseen by the Academic Board of the Centre whose current members are:

Prof. S. M. Chitre — Chairperson
Emeritus Professor
UM-DAE CEBS
University of Mumbai
Kalina Campus, Mumbai – 400 098

Prof. J. V. Narlikar — Member
The Inter-University Centre for
Astronomy and Astrophysics (IUCAA)
Post Bag 4, Ganeshkhind
Pune University Campus
Pune - 411 007

Prof. Arvind Kumar — Member
Homi Bhabha Centre for Science Education
V. N. Purav Marg, Mankhurd
Mumbai – 400 088

Prof. M. S. Raghunathan — Member
National Centre for Mathematics
Indian Institute of Technology – Bombay
Powai, Mumbai – 400 076

Prof. J. Maharana — Member
Institute of Physics
Sachivalaya Marg
Bhubaneshwar, Orissa - 751 005

Dr. Swapan Ghosh — Member
Head
Theoretical Chemistry Section, Chemistry Group
Bhabha Atomic Research Centre
Trombay, Mumbai – 400 085

Prof. Dipan Kumar Ghosh — Member
Professor
Indian Institute of Technology – Bombay
Powai, Mumbai – 400 076

Prof. N. Mukunda — Member
Senior Professor
Centre for High Energy Physics
Indian Institute of Science
Bangalore – 560 012

Prof. K. N. Ganesh — Member
Indian Institute of Science
Education and Research (IISER)
Dr. Homi Bhabha Road
Pashan, Pune – 411 008

Prof. R. R. Puri — Member
Visiting Professor
Indian Institute of Technology – Gandhinagar
B103, Sukun Chandkedha
S. G. Road
Ahmedabad – 382 424

Prof. G. D. Yadav — Member
Vice Chancellor
Chemical Engineering Department
Institute of Chemical Technology
Mumbai – 400 019

Prof. N. Sathyamurthy — Member
Director
Indian Institute of Science Education and
Research (IISER) Mohali,
MGSIPA Complex, Sector 26
Chandigarh – 160 019

Prof. A. M. Narsale — Member
UM-DAE CEBS
University of Mumbai
Kalina Campus
Mumbai – 400 098

Prof. Deepak Dhar — Member
Department of Theoretical Physics
Tata Institute of Fundamental Research
Homi Bhabha Road, Colaba
Mumbai - 400 005

Dr. S. K. Apte — Member
Bio-Medical Group and Head
Molecular Biology Division
Bhabha Atomic Research Centre
Trombay, Mumbai - 400 085

Prof. R. V. Hosur — Member
Director
UM-DAE CEBS
University of Mumbai
Kalina Campus
Mumbai – 400 098

3. Faculty

3.1 Core Faculty

PHYSICS		
Name of the faculty	**Designation**	**Courses taught in the Academic Year (2013-2014)**
Prof. S. M. Chitre *(Rotation and magnetic field in solar interior and solar activity cycle)*	Chairperson Academic Board & Emeritus Professor	Physics II (P 201) Fluid Mechanics (P 702) Astronomy and Astrophysics (P 803)
Prof. R. Nagarajan *(Superconductivity, Magnetism, Instrumentation)*	Emeritus Professor	Physics Laboratory (PL101, PL201, PL501,PL401) Electronics and Instrumentations (G201) Electronics and Instrumentation Laboratory (GL 201) Experimental Techniques (PE 1002)
Dr. Sujit Tandel *(Nuclear Structure Physics: Spectroscopic studies of heaviest elements, isomeric states and exotic shapes in nuclei)*	Reader 'F'	Statistical Techniques and Applications (G 401) Nuclear Physics- I (P 603) Advanced Physics Laboratory (PL 701)

Dr. Ameeya Bhagwat *(Theoretical Nuclear Physics)*	Reader 'F'	Numerical Methods for Analysis (G 501) Laboratory for Numerical Methods for Analysis (GL 501)
Dr. Gargi Shaw *(Astrophysics (Numerical simulations))*	Reader 'F'	Physics Laboratory (PL 301, PL 401)
Dr. Ananda Hota *(Multi-wavelength observational investigation of black hole-galaxy co-evolution in the Cosmic web)*	Reader 'F'	Astronomy and Astrophysics (P 803)
Dr. Sangita Bose *(Experimental Condensed Matter Physics, Mesoscopic Superconductivity, Thin films and organic electronic devices)*	Reader 'F'	Solid State Physics –I (P 703) Advance Condensed Matter Physics (P 804) Chemistry of Materials (C 801) Advance Physics Laboratory (PL 701)
Dr. M. Hemalatha *(Laser Spectroscopy for Nuclear Physics, Reaction with weakly bound nuclei)*	Assistant Professor	Optics (P 303) Physics Laboratory (PL 501, 601) Nuclear Physics- I (P 603) Advance Physics Laboratory (PL 701)
Dr. Bhaskar Khubchandani *(Nonlinear Dynamics, Chaos, Nonlinear Optics)*	Assistant Professor	Optics (P 303) Computational Laboratory (GL 401)
Dr. Manojendu Chaudhury *(Multi-wavelength (X-rays, gamma-rays, radio, optical) astronomical data analysis, interpretation and simulation)*	Visiting Scientist - II	Statistical Techniques and Applications (G 401) Computer Basics (G 101) Computer Laboratory (GL 101) Experimental Advanced Astronomy and Astrophysics (P 805) Advanced Physics Laboratory (PL 801) Numerical Methods for Analysis (G 501) Laboratory for Numerical Methods for Analysis (GL 501)
Dr. Alkendra Pratap Singh *(Solar and Plasma Astrophysics, Magnetohydrodynamics (MHD))*	Visiting Scientist - II	Nil

Dr. Kaushik Sengupta *(Experimental Condensed Matter Physics (High Pressure Physics))*	Visiting Scientist - II	Physics Laboratory (PL 601)
Dr. Sanjeev Kumar *(Superconductivity & Magnetism)*	Visiting Scientist - I	Physics Laboratory (PL 401, PL 601)
Dr. Tapan Naskar *(Theoretical Physics)*	Visiting Scientist - I	Classical Mechanics & Special Relativity (P 302) General Relativity and Cosmology (PE 1004)
Dr. Bharat K. Sharma *(Inner Crust of Neutron Star in Thomas-Fermi Approach)*	Research Associate – II	Nil
Dr. Jayashree Roy *(X-ray astronomy : X-ray binaries (Black hole and neutron star binaries) and Gamma Ray Astronomy (Blazars, AGNs) and X-ray instrumentation)*	Research Associate – I	Nil

CHEMISTRY		
Name of the faculty	**Designation**	**Courses taught in the Academic Year (2013-2014)**
Dr. Neeraj Agrawal *(Synthesis of Organic Materials for Opto-electronic Applications)*	Reader 'F'	Chemistry Laboratory (CL 101, CL 601) Chemistry-Biology Laboratory (CBL 301) Advanced Chemistry Laboratory (CL 701, CL 801) Analytical Chemistry (CB 503) Introductorily Spectroscopy (CB 401)
Dr. Basir Ahmad *(Molecular Biophysics & Protein Biotechnology)*	Reader 'F'	Biochemistry (CB 301) Biophysical Chemistry (CB 601) Chemistry Laboratory (CL 201, CL 501) Chemistry-Biology Laboratory (CBL 301) Advanced Chemistry Laboratory (CL 701, CL 801) Advanced Chemical Biology (CE 1001)

Dr. Avinash Kale *(Molecular Biophysics and Structural Biology)*	Visiting Scientist - II	Biophysical Chemistry (CB 601) Chemistry Laboratory (CL 201, CL 501) Chemistry-Biology Laboratory (CBL 301) Advanced Chemistry Laboratory (CL 701, CL 801)
Dr. Mahendra Patil *(Chemical Catalysis: Organocatalysis, Transition metal catalysis and Enzyme catalysis)*	Visiting Scientist - I	Organic Chemistry I – (CB 303) Organic Chemistry III – (C 801) Chemistry Laboratory (CL 101) Chemistry-Biology Laboratory (CBL 401) Advanced Chemistry Laboratory (CL 701, CL 801)
Dr. Subhradip Paul *(Structural Characterization and Methodology development in Solid-state Nuclear Magnetic Resonance)*	Research Associate - II	Nil
Dr. Sinjan Choudhury *(Biophysical investigation of protein recognition, fibrillization and it's inhibition)*	Research Associate - I	Chemistry Laboratory (CL 501) Biophysical Chemistry (CB 601) Chemistry-Biology Laboratory (CBL 402)

MATHEMATICS		
Name of the faculty	**Designation**	**Courses taught in the Academic Year (2013-2014)**
Dr. Shameek Paul *(Topology and Algebraic Geometry)*	Research Associate - I	Mathematics II (M 201) Foundations (M 301) Partial Differential Equations (M 704) Algebraic Number Theory (M 802)
Dr. Akshay Rane *(Broadly Numerical Functional Analysis and specifically asymptotic expansions for approximate solutions of operator equations and eigenvalue problems)*	Research Associate - I	Mathematics II (M 201) Analysis II (M 401)

BIOLOGY		
Name of the faculty	**Designation**	**Courses taught in the Academic Year (2013-2014)**
Dr. Jacinta D'Souza *(Building up the flagellar and the stress-induced protein-protein interactome in the green chlorophyte Chlamydomonas reinhardtii)*	Reader 'F'	Biology I (B 101) Advanced Molecular Biology (CB 403) Biology Laboratory (BL 501) Chemistry-Biology Laboratory (CBL 401)
Dr. Uma Ladiwala *(Immune mechanisms of damage to neural cells including stem cells and biophysics of cell behavior and dynamics)*	Assistant Professor	Biology I (B 101) Immunology (B 602) Biology Laboratory (BL 601)
Dr. Bhaskar Saha *(Neural Stem Cells)*	Visiting Scientist - II	Advanced Molecular Biology (CB 403) Animal Physiology (B 603) Chemistry-Biology Laboratory(CBL 401)
Dr. Manu Lopus *(Experimental cancer therapuetics and chemical biology)*	Visiting Scientist - II	Genetics (B 501) Advanced Cell biology (B 502) Biodiversity of Microbes, Animals and Plants (B 601) Animal Physiology (B 603)
Dr. V. L. Sirisha *(Plant Molecular Biology and Stress physiology)*	Research Associate – II	Biology Laboratory (BL 101, BL 201)
Dr. Mahuya Sinha *(Biophysics, Molecular Biology & Genetics)*	Research Associate - I	Biology Laboratory (BL 101, BL 201)
Dr. Madhura Pradhan *(Cell Biology (Oncology))*	Research Associate - I	Nil

3.2 Senior Scientist

Name of the faculty	**Stream**	**Courses taught in the Academic Year (2013-2014)**
Prof. S. B. Patel (Till October 31, 2013)	Physics	Mathematical Physics (PCB 301) Atoms, Molecules and Radiations (P 403)
Prof. S. C. Phatak *(Theoretical Nuclear and Particle Physics)*	Physics	Computer Basics (G101) Computer Laboratory (GL 101) Special Relativity (P 403) Classical Mechanics (P 502)
Prof. H. C. Pradhan *(Physics Education Research)* Raja Ramanna Fellow	Physics	Communication Skills (H 101) History and Philosophy of Science (H 201)

Prof. A. K. Raina *(Mathematical Physics in general, with special emphasis on algebraic and geometric aspects of QFT on a Riemann surface)*	Physics	Mathematical Physics II (P 401) Classical Electrodynamics (P 701)
Prof. S. Kailas *(Experimental Nuclear Physics, Accelerator based Multidisciplinary Research)*	Physics	Experimental Techniques (PE 1002)
Prof. Balwant Singh *(Algebraic Geometry and Commutative Algebra)*	Mathematics	Commutative Algebra (M 702) Advanced Commutative Algebra and Applications (ME 1006)
Prof. A. M. Narsale *(Semiconductor, Electronics Instrumentation, Material Science)*	Physics	Electronics and Instrumentation (G 201)

3.3 DST, UGC Scientist

Name of the faculty	Affiliation	Stream	Courses taught in the Academic Year (2013-2014)
Prof. B. K. Jain *(Intermediate Energy Nuclear Physics, Theory)*	DST Ramanna Fellow	Physics	Nil
Dr. Subhojit Sen *(Epigenetic mechanisms of environmental responses leading to Cancer)*	Ramalingaswami Fellow	Biology	Genetics (B 501) Biology Laboratory (BL 101, BL 201, BL 601)
Dr. Prachi Chandrachud *(Computational Condensed Matter)*	Dr. D. C. Kothari Fellow	Physics	Advanced Condensed Matter Physics (P 804)
Dr. Tripti Bameta *(Biophysics)*	DST Inspire Faculty	Biology	Physics II (P 201)
Dr. Ishita Mehta *(Cellular and Chromosome Biology)*	DST Inspire Faculty	Biology	Chemistry Biology Laboratory(CBL 401) Biodiversity of Microbes, Animals and Plants (B 601)

3.4 Adjunct Faculty

Name of the faculty	Affiliation	Courses taught in the Academic Year (2013-2014)
Dr. Swapan Ghosh	Bhabha Atomic Research Centre (BARC), Mumbai	Chemical Kinetics and Reaction Dynamics (CBP 401) Quantum Chemistry I (C 501) Properties of Matter (C 605) Quantum Chemistry and Group Theory (C 604)
Dr. Srinivas Krishnagopal	Bhabha Atomic Research Centre (BARC), Mumbai	Electromagnetism (P 503) Accelerator Physics (P 803)
Prof. Vijay Singh	Homi Bhabha Centre for Science Education (HBCSE), Mumbai	Statistical Mechanics (P 602)
Prof. H. M. Antia	Tata Institute of Fundamental Research (TIFR) Mumbai	Nil

3.5 Distinguished Guest Faculty

Name of the faculty	Affiliation	Stream	Courses taught in the Academic Year (2013-2014)
Prof. S. S. Jha	*Formerly* Tata Institute of Fundamental Research (TIFR) Mumbai	Physics	Classical Mechanics (P 502)
Prof. P.C. Agrawal	*Formerly* Tata Institute of Fundamental Research (TIFR) Mumbai	Physics	Experimental Advanced Astronomy and Astrophysics (P 805) Advanced Physics Laboratory (PL 801)
Prof. Chandrashekhar Khare	University of California (Los Angeles)	Mathematics	Nil
Prof. Shrinivas Kulkarni	California Institute of Technology (Caltech)	Physics	Nil

3.6 Visiting Faculty

PHYSICS		
Name of the faculty	**Affiliation**	**Courses taught in CEBS**
Dr. Sudhir Jain	Bhabha Atomic Research Centre (BARC), Mumbai	Physics I (P 101) Physics II (P 201) Fluid Mechanics (P 702)
Dr. Radha Srinivasan	University of Mumbai	Physics Laboratory (PL 101, PL 201)
Prof. Dipan Ghosh	Indian Institute of Technology (IIT-B), Mumbai	Quantum Information and Quantum Computing (PE 1005)
Prof. G. Ravindra Kumar	Tata Institute of Fundamental Research (TIFR), Mumbai	Lasers and Quantum Optics (PE 1003)
Dr. P. K. Dasgupta	Siddharth College	Physics Laboratory (PL 101, PL 201)
Prof. Ajay Patwardhan	*Formerly* St. Xavier College	Mathematical Physics – I (PCB 301)
Prof. Jyoti Rao	Ruia College	Classical Mechanics & Special Relativity (P 302)
Prof. P. Shashidhran	Vertak College	Applied Electronics Laboratory (GL 301) Electronics and Instrumentations (G 201) Electronics Laboratory (GL 201)
Prof. Arvind Kumar	*Formerly* Homi Bhabha Centre for Science Education (HBCSE), Mumbai	Thermal and Statistics Physics (P304) Relativistic Quantum Mechanics (P 802) General Relativity and Cosmology (PE 1004)
Dr. Sandhya Ullal	*Formerly* Mithibhai College	Physics Laboratory (PL 101, PL 201, PL 501)
Dr. Manohar Nyayate	B. N. Bandodkar college, Thane	Physics Laboratory (PL 501) Physics Laboratory (PL 601)
Dr. Pratap Raychauduri	Tata Institute of Fundamental Research (TIFR), Mumbai	Advanced Condensed Matter Physics (P 804)
Dr. S. K. Singh	Bhabha Atomic Research Centre (BARC), Mumbai	Reactor Physics (P 704)

Prof. Sreerup Raychaudhuri	Tata Institute of Fundamental Research (TIFR), Mumbai	Quantum Field Theory (PE 1001)
Dr. V. Sudarsan	Bhabha Atomic Research Centre (BARC), Mumbai	Nanomaterial and Soft Condensed Matters (PE 1008)
Dr. Kartik Patel	Bhabha Atomic Research Centre (BARC), Mumbai	Computational Electrodynamics (PE 1006)
Prof. Wendrich Soars	Vikash College	Physics Laboratory (PL 101, PL 201) Electronics Laboratory (GL 201) Applied Electronics Laboratory (GL 301)
Dr. Tushima Basak	Mithibai College, Vile Parle	Physics Laboratory (PL 301, PL 401)
Prof. S. H. Patil	Indian Institute of Technology (IIT-B), Mumbai	Quantum Mechanics II (P 601)
Dr. Praveen Pathak	Homi Bhabha Centre for Science Education (HBCSE), Mumbai	Statistical Mechanics (P 602)
Prof. Lakshmi Natarajan	*Formerly* University of Mumbai	Atomic and Molecular Spectroscopy (P 604)
Prof. Rajan Chitalay	Mithibai College, Vile Parle	Electronics and Instrumentations (G 201) Electronics Laboratory (GL 201) Applied Electronics Laboratory (GL 301)

MATHEMATICS		
Name of the faculty	**Affiliation**	**Courses taught in CEBS**
Dr. Joseph Amalnathan	Bhabha Atomic Research Centre (BARC), Mumbai	Mathematics I (M 101)
Dr. Prithwijit De	Homi Bhabha Centre for Science Education (HBCSE), Mumbai	Mathematics I (M 101)

Dr. Supriya Pisolkar	Tata Institute of Fundamental Research (TIFR), Mumbai	Algebra I (M 303)
Prof. Kapil Joshi	Indian Institute of Technology (IIT-B), Mumbai	Discrete Mathematics (M 304) Topology I (M 404/PE1007)
Prof. Rekha Kulkarni	Indian Institute of Technology (IIT-B), Mumbai	Functional Analysis (M 701)
Prof. Jyotsa Dani	*Formerly,* St. Xavier College	Elementary Number Theory M 403
Dr. Kiran Kolwankar	R. J. College, Ghatkopar	Differential Equations and Dynamical Systems (M 605)
Dr. Ajit Kumar	Institute of Chemical Technology (ICT), Mumbai	Computational Mathematics - I (M 305) Computational Mathematics - II (M 606)
Prof. Mahadeo Bakare	*Formerly,* University of Mumbai	Differential Geometry (M 604)
Prof. Inder K. Rana	Indian Institute of Technology (IIT-B), Mumbai	Analysis I- (M 302)
Prof. Monoj Keshari	Indian Institute of Technology (IIT-B), Mumbai	Algebraic Topology (M 803)
Prof. A. J. Parmeswaran	Tata Institute of Fundamental Research (TIFR), Mumbai	Topics in Algebraic Geometry (ME 1001)
Prof. Neela Natraj	Indian Institute of Technology (IIT-B), Mumbai	Advanced Numerical Techniques (ME 1004)
Prof. Alladi Subramanyam	Indian Institute of Technology (IIT-B), Mumbai	Stochastic Analysis (M 705) Probability Theory (M 603)
Prof. C. S. Rajan	Tata Institute of Fundamental Research (TIFR), Mumbai	Lie Group and Geometry (ME 1002)
Prof. Amitava Bhattachryya	Tata Institute of Fundamental Research (TIFR), Mumbai	Combinatory and Enumeration (ME 1003)

Prof. S. Krishnan	Indian Institute of Technology (IIT-B), Mumbai	Computational Mathematics III (M 804)
Prof. R. R. Simha	*Formerly* Tata Institute of Fundamental Research (TIFR), Mumbai	Fourier Analysis (M 801)
Prof. M. G. Nadkarni	University of Mumbai	Mathematics II (M201) Analysis III (M 501)
Prof. R. C. Cowsik	University of Mumbai	Differential Topology (M 703) Algebra II (M 402)
Prof. Narsimhan Chari	Sanghvi College	Topology II (M 503) Analysis IV (M601)
Prof. Ananth Hariharan	Indian Institute of Technology (IIT-B), Mumbai	Algebra III (M 502) Algebra IV (M 602)
Prof. Indranil Biswas	Tata Institute of Fundamental Research (TIFR), Mumbai	Advanced Differential Topology (ME 1006)

CHEMISTRY		
Name of the faculty	**Affiliation**	**Courses taught in CEBS**
Dr. Evans Coutinho	Bombay College of Pharmacy, Mumbai	Chemistry I (C 101)
Dr. Raghuvir Pissurlenkar	Bombay College of Pharmacy, Mumbai	Chemistry I (C 101)
Dr. Padmakar Sathe	Ramnarain Ruia College	Inorganic Chemistry (CB 302) Chemistry II (C 201)
Prof. M. Sudarsanam	University of Mumbai	Chemistry Laboratory (CL 101, CL 501, CL 701, CL 201) Chemistry-Biology Laboratory (CBL 301, CBL 401, CBL 601) Analytical Chemistry (CB 503)
Dr. R.K. Vatsa	Bhabha Atomic Research Centre (BARC), Mumbai	Chemical Kinetics and Reaction Dynamics (PCB 401)
Dr. B. S. Tomar	Bhabha Atomic Research Centre (BARC), Mumbai	Nuclear Chemistry (C 702)
Dr. Rahul Tripathi	Bhabha Atomic Research Centre (BARC), Mumbai	Nuclear Chemistry (C 702)

Dr. Sunil K. Ghosh	Bhabha Atomic Research Centre (BARC), Mumbai	Physical Organic Chemistry (C 704)
Dr. Dipak Palit	Bhabha Atomic Research Centre (BARC), Mumbai	Introductory Spectroscopy (CB 401) Photochemistry (C 701)
Dr. Sudha Srivastava	Tata Institute of Fundamental Research (TIFR), Mumbai	Introductory Spectroscopy (CB 401)
Dr. R. P. Patel	Bhabha Atomic Research Centre (BARC), Mumbai	Chemistry of Inorganic Molecules II (C 502)
Dr. S. Kannan	Bhabha Atomic Research Centre (BARC), Mumbai	Chemistry of Inorganic Molecules II (C 502) Inorganic Chemistry III (C 603)
Dr. Lakshamy Ravishankar	V.G.Vaze College of Arts, Science & Commerce	Organic Chemistry (C 602)
Prof. N. V. Thakkar	*Formerly* I. Sc Mumbai	Organometallics and Bio-inorganic Chemistry (C 703)
Dr. Gail Carneiro	Sophia College	Organic Chemistry (C 602)
Dr. C G S Pillai	*Formerly* Bhabha Atomic Research Centre (BARC), Mumbai	Chemistry of Materials (C 801)
Dr. P. A. Hassan	Bhabha Atomic Research Centre (BARC), Mumbai	Macro and Supra-molecular Chemistry (C 802) Nano Materials and Soft Condensed Matter (CE 1002)
Dr. KRS Chandrakumar	Bhabha Atomic Research Centre (BARC), Mumbai	Macro and Supra-molecular Chemistry (C 802)
Dr. Nihar Chaudhary	Bhabha Atomic Research Centre (BARC), Mumbai	Computational Chemistry (C 804)

BIOLOGY		
Name of the faculty	**Affiliation**	**Courses taught in CEBS**
Prof. G.K. Rao	Central Institute of Fisheries Education, Versova	Genetics (B 501)
Dr. Rajani Bhisey	*Formerly* Advanced Centre for Treatment, Research and Education in Cancer (ACTREC) , Mumbai	Genetics (B 501)

Dr. Avinash Bhisey	*Formerly* Advanced Centre for Treatment, Research and Education in Cancer (ACTREC) , Mumbai	Advanced Cell Biology (B 502)
Dr. Champakali Ayyub	Tata Institute of Fundamental Research (TIFR), Mumbai	Biology Laboratory (BL 501)
Dr. Tara Hariharan	D. Y. Patil International School	Biodiversity of Microbes, Animals and Plants (B 601)
Dr. Sudha Gangal	INSA Member	Immunology (B 602)
Dr. B. J. Rao	Tata Institute of Fundamental Research (TIFR), Mumbai	Advanced Molecular Biology (CB 403)
Prof. S. Sivakami	*Formerly* University of Mumbai	Biochemistry (CB 301) Biology II (B 201)
Dr. Surekha Zingade	Advanced Centre for Treatment, Research and Education in Cancer (ACTREC) , Mumbai	Biology II (B 201)

Earth Science, Energy & Environment etc.		
Name of the faculty	**Affiliation**	**Courses taught in CEBS**
Prof. Nilufer Bharucha	*Formerly* University of Mumbai	World Literature (H 301)
Dr. R. K. Awasia	The Indian Institute of Gems & Jewellery (IIGJ), Mumbai	Earth Science (G 502)
Prof. S. Viladakar	Indian Institute of Gems & Jewellery (*IIGJ*), Mumbai	Earth Science (G 502)
Prof. M. C. Arunan	Homi Bhabha Centre for Science Education (HBCSE), Mumbai	Ethics in Science and IPR (G 601)

4. Students

4.1 National Entrance Screening Test -2013

Year wise statistical data of NEST is given below

Year	Students enrolled for the Test	Students appeared for the Test
2007	~5600	~3300
2008	~8200	~7000
2009	14105	12036
2010	16686	9453
2011	~14500	9691
2012	15099	10775
2013	24543	19436

4.2 Admitted students for the academic Year 2013-2014

Sr.No.	M/F	Name of the student	NEST Rank	State
1.	M	Adarsh S	284	Kerala
2.	M	Akshaykumar Prakash Hotkar	2731	Maharashtra
3.	M	Aniruddha Tamma Venkata	111	Karnataka
4.	M	Aron G	2784	Kerala
5.	F	Bhavya Venkatesh	235	Tamilnadu
6.	M	Chetan N	2652	Karnataka
7.	M	Dhanpal Siddharth	145	Andrapradesh

8.	M	Ikshul J	181	Uttarpradesh
9.	M	Kartikeya Sharma	172	Rajshtan
10.	M	Malothu Venkatram	1290	Andrapradesh
11.	M	Maradana Siva Kumar	393	Andrapradesh
12.	M	Pawan Kumar Gupta	738	Uttarpradesh
13.	F	Pinki	419	New Delhi
14.	M	Praphull Kumar	646	Bihar
15.	F	Prathyusha Sukumar	293	Andra Pradesh
16.	M	Rohit Solanki	462	Rajshtan
17.	M	Samvit Mahapatra	9	Orissa
18.	F	Sanwardhini Krishna Pantawane	1496	Maharashtra
19.	F	Shraddha Agrawal	440	Uttarpradesh
20.	M	Somasundaram S	55	Tamilnadu
21.	M	Soumek Pattnaik	4105	Orissa
22.	F	Swati Guddolian	2525	Uttarpradesh
23.	M	T Sundupalli Sathish	2262	Andrapradesh
24.	M	Upnishad Sharma	75	Madyapradesh
25.	M	Vijay Kumar Sharma	452	Rajshtan
26.	M	Vikas Shridhar Bothe	76	Maharashtra
27.	M	Viswajith.E. S	87	Kerala

4.3 Current status of students graduated in the year 2013

Sr. No.	M/F	Name of the Students	Currently at
1	M	Abhishekh Mohapatra	Ph.D. at Ohio State University, USA
2	M	Alkesh Yadav	Ph.D. at Raman Research Institute (RRI), Bangalore
3	M	Chandan Kumar	Ph.D. at Indian Institute of Science (IISc.), Bangalore
4	M	Dhruv Ringe	Ph.D. at Michigan State University, USA
5	F	Neha Singh	Project Assistant at UM-DAE Centre for Excellence in Basic Sciences (CEBS), Mumbai
6	M	S. Niranjan	Scientific Officer at Bhabha Atomic Research Centre (BARC), Mumbai
7	M	Sandeep Kumar Sehrawat	Ph.D. at Harish-Chandra Research Institute (HRI), Allahabad
8	F	Pooja Vijay Moundekar	Radiologist at Bhabha Atomic Research Centre (BARC), Mumbai
9	M	Praneet Prakash	Ph.D. at Indian Institute of Science (IISc.), Bangalore
10	M	Sarath Sankar	Ph.D. at Tata Institute of Fundamental Research (TIFR), Mumbai
11	M	Saurabh Jadhav	Information not available

4.4 Achievements of the students

- **Asian Science Camp 2013**

  Mr. Sanchit Sablok 2nd year student has been selected for the Asian Science Camp 2013 at Tsukuba, Japan

- **Madhava Mathematics Competition – 2014**

  i. Mr. Deepak Kamlesh 2nd year student – First Prize, Winner of the competition
  ii. Mr. Siddharth Dhanpal 1st year student – Cheer Prize

- **S. N. Bose Scholars Programme**

Mr. Prateek Garg 3rd year student has been selected from the Science & Engineering Board (SERB), Department of Science and Technology (DST), Govt. of India, the Indo – U. S. Science and Technology Forum (IUSSTF) and the University of Wisconsin-Madison (UM) for S. N. Bose Scholar for the year 2013.

- **National Initiatives on Undergraduate Science (NIUS) 2013**

Students selected for **NIUS Physics Camp**
Mr. Sachit Sablok
Ms. Lamia Varawala

- **National Creative Aptitude Test (NCAT-2013)**

i. Mr. Jamshed Ali K. : AIR-3 (Category 5)
ii. Mr. Harsh Bhatt : AIR-3 (Category 3
iii. Mr. Saket Sumar : AIR-6 (Category 2)

- **National Graduate Physics Examination 2013**

Mr. Jyotirmoy Roy 4th year student has been awarded Gold Medal

- **Joint Entrance Screening Test (JEST -2014)**

The following CEBS students have qualified in the Joint Entrance Screening Test (JEST-2014) for pursuing Ph.D. Programme:

Name	Year	Rank
i. Mr. Saranyo Moitra	5th	8
ii. Mr. Aklant Kr. Bhowmick	5th	60
iii. Mr. Shashank G. Markande	5th	69
iv. Mr. Amit Seta	5th	81
v. Ms. Angana Mondal	5th	530

- **Kishore Vaigyanik Protsahan Yojana (KVPY) 2013**

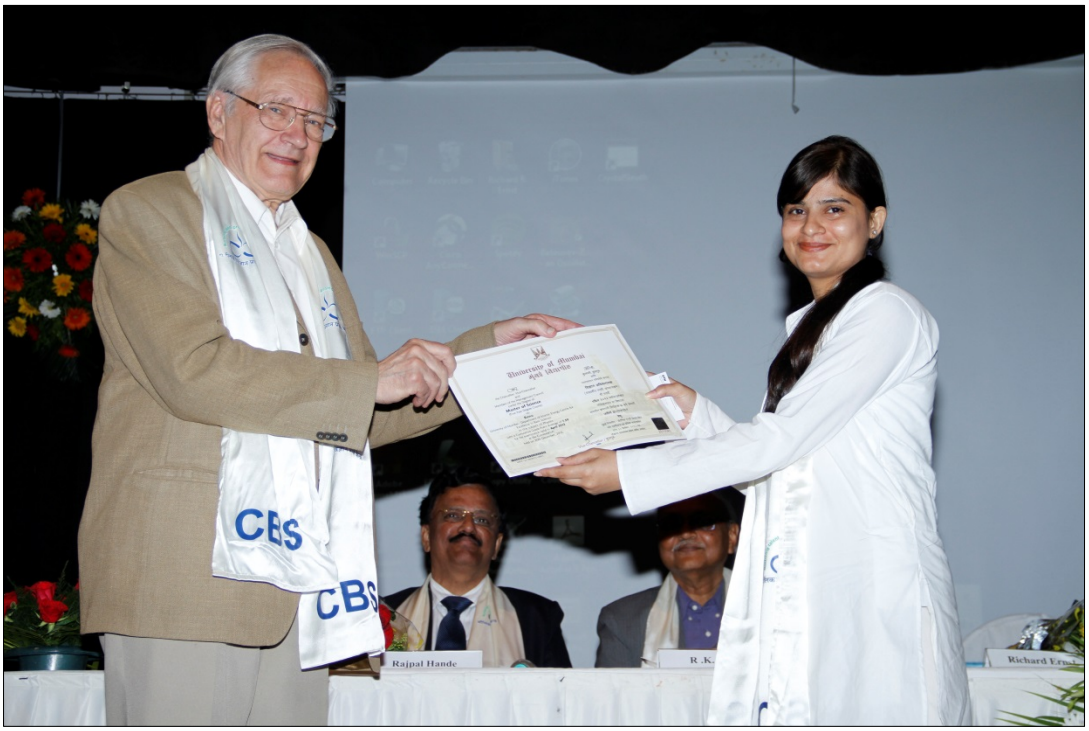
  The following students have been selected for the Kishore Vaigyanik Protsahan Yojana (KVPY) fellowship 2013

  i. Ms. Shraddha Agrawal 1st
  ii. Mr. Vishwajith E. S. 1st
  iii. Mr. Upnishad Sharma 1st

4.5 Projects done by final year students

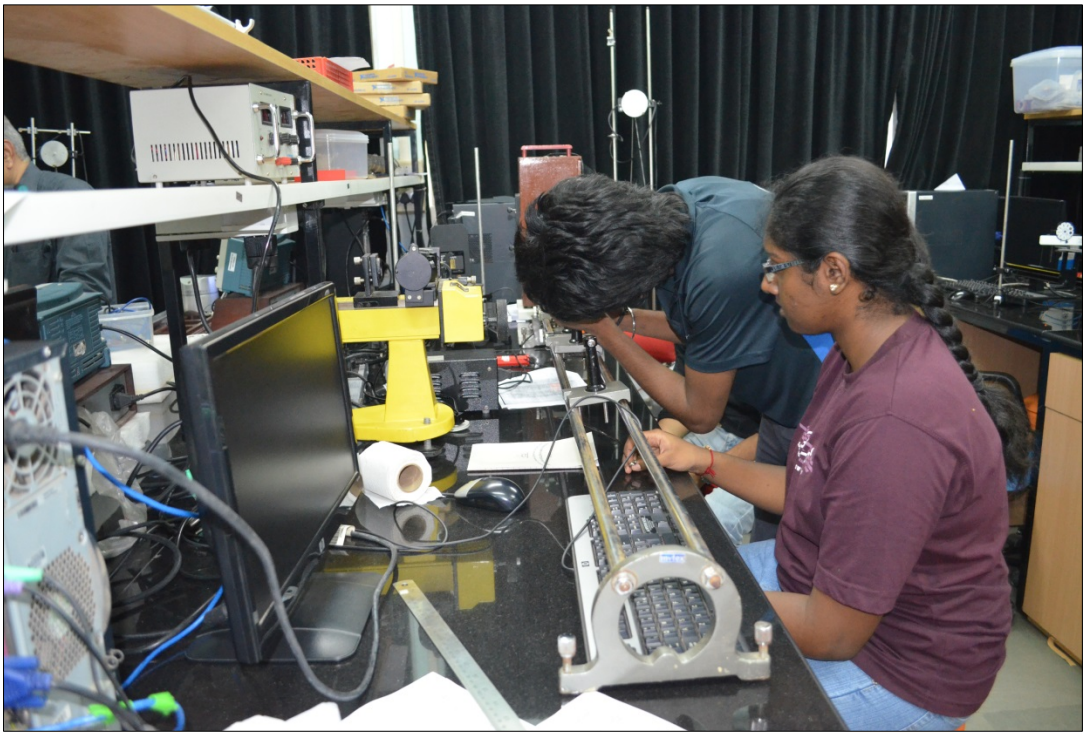
Sr. No.	Name of the Student	Guide	Brief Title
Mathematics			
1.	Ms. Smita Prahraj	Prof. R. V. Gurjar (TIFR)	Polynomial Derivations
2.	Mr. Naveen Kumar	Prof. Nitin Nitsure (TIFR)	Riemann Surfaces
3.	Ms. Pious Padmakar	Prof. Amitava Bhattacharya (TIFR)	Matching Theory
4.	Mr. Ram Shila	Prof. Ravi Rao (TIFR)	The Whietehead Group
5.	Mr. Plawan Das	Dr. Supriya Pisolkar (TIFR)	Class Field Theory
Physics			
6.	Ms. Shubhangi Gupta	Prof. Y. Sasidhar (IIT-B)	Turn Propensity and the role of turn residues in the formation of the beta-hairpin in staphylococcal nuclease: A Comparative study
7.	Mr. Saranyo Moitra	Prof. D. Dhar (TIFR)	Existence of Phase Transitions in ID Ising Models with long Range Interactions
8.	Mr. Shanshank Markande	Prof. V. Tripathi (TIFR)	Study of Phase of the Kitaev Heisenberg model in the presence of magnetic field
9.	Ms Santwana Dubey	Prof. R. Palit (TIFR)	Pulse shape analysis for particle identification using radiation detectors

10.	Ms. Shilpi Singh	Prof. S. Ghosh (TIFR)	Building of a low temperature Hall effect and resistivity measurement setup and study of temperature dependence of mobility and carrier concentration in semiconductors
11.	Mr. S. Gholam Wahid	Dr. Sujit Tandel (CEBS)	Study of neutron rich nuclei through transfer reactions using large gamma detector arrays
12.	Mr. Shashank Pathak	Prof. Deepak Mathur (TIFR)	Laser assisted, absorber-induced nucleation and crystal growth
13.	Ms. Angana Model	Prof. S. Basu (BARC)	Deposition and Characterization of Ni-Ge thin films
14.	Mr. Amit Seta	Prof. Anwesh Mazumdar (TIFR)	Seismic Characterization of the red giant branch
15.	Mr. Navneeta Katyan	Prof. Pushan Ayyub (TIFR)	Size dependent melting point variation of silver nanoparticles
16.	Mr. Aklant Kr Bhowmick	Prof. Sreerup Rauchaudhuri (TIFR)	Determination of higgs boson properties through rare processes using large hadron collider
17.	Ms. Kriti Gupta	Prof. S. Ghosh (TIFR)	Non-Equilibrium reactive processes in the condensed phase: Effect of Initial state
18.	Mr. Amar Deo Chandra	Prof. P. C. Agrawal (CEBS)	Spectral studies of X-ray pulsar Vela X-1 using Rossi X-ray timing explorer (RXTE)
19.	Mr. Jamshed Ali K. A.	Prof. P. C Agrawal (CEBS)	X-Ray Binaries
Chemistry			
20.	Ms. Preeti Sheokand	Dr. Samrat Ghosh (IISER Mohali)	Green, Efficient and Closed cycle synthesis of Palm oil Bio-Diesel using Ethanol, Palm Oil and Sodium
21.	Mr. Mohanish Borana	Dr. Basir Ahmad (CEBS)	Studies of Guanidine hydrochloride induced aggregation and its inhibition by polyphenols



CEBS first Graduation Ceremony held on April 22, 2013

Students' magazine launched by Dr. Srikumar Banerjee during Foundation day programme of CEBS



Physics Undergraduate Laboratory

Chemistry Undergraduate Laboratory

Biology Undergraduate Laboratory

5. Administration

Name of Staff	Designation
Mr. K. P. Balakrishnan	Registrar
Mr. Kishore Menon	Advisor
Mr. B. L. Bhargava	Consultant (Building & Construction)
Mr. Milind Ashrit	Consultant (Finance)
Mr. Deepak P Hate	Consultant (Purchase)
Ms. Swati V. Kolekar	Office Superintendent (Admin)
Ms. Vaishali M. Kedar	Office Superintendent (Admin)
Ms. Rupali Shringare	Office Superintendent (Finance)
Ms. Neha Dandekar	Office Superintendent (Finance)
Mr. Prashant Gurav	Systems Assistant
Mr. Amit Shetkar	Library Attendant
Ms. Veena Naik	Office Assistant (Purchase & Store)
Mr. Nitesh Kadam	Hostel Assistant
Ms. Divya Sukumaran	Office Assistant (Multi Skill)
Ms. Vaibhavi Nerurkar	Office Assistant (Finance)
Mr. Maruti Khot	Office Attendant

Laboratory Attendants

Mr. Ram M. Soure	Lab Attendant (Physics)
Mr. Dinesh B. Desai	Lab Attendant (Physics)
Mr. Santosh Sood	Lab Attendant (Biology)
Ms. Rupesh Kamtekar	Lab Attendant (Chemistry)
Mr. Abhay Bakalkar	Lab Attendant (Nuclear Physics & Computer)
Mr. Harish Hira Singh	Lab Attendant (Biology)
Mr. Rahul Shinde	Lab Attendant (Biology)

Scientific Assistants

Mr. Kanak Gawde	Scientific Assistant (Biology)
Ms. Nayana Kamtekar	Scientific Assistant (Chemistry)
Ms. Sonali Shiriskar	Scientific Assistant (Chemistry)
Mr. Harish Bharambe	Scientific Assistant (Biology)

Senior Research Fellow (SRF)

Ms. Dolly Khona	Biology
Mr. Venkataramana G. Rao	Biology
Ms. M. Shalini	Physics
Mr. Sushil Samant	Physics

Senior Project Assistant (SPA)/Junior Project Assistant (JPA)/Junior Research Fellow (JRF)

Ms. Merilyn Sequeira	(SPA)	Biology
Ms. Katherine Rawlins	(JRF)	Physics
Ms. Pradnya G. Parab	(JPA)	Physics
Ms. Shivani Muthu	(JPA)	Chemistry
Mr. Domnic Colvin	(JPA)	Chemistry
Ms. Samridhi Phatak	(JPA)	Chemistry
Ms. Neha	(JPA)	Physics
Ms. Namrata Maladkar	(JRF)	Physics
Mr. Saim Mulla	(JPA)	Biology
Ms. Tejashree Mahaddalkar	(JPA)	Biology

6. Research at the Centre

6.1 Awards and Honors

Prof. R. V. Hosur

- Elected to the Council of International Society of Magnetic Resonance (ISMAR).
- Honored with the Padma Shri award by the Government of India.

Dr. S. Kailas

- Received the Life Time Achievement Award from Indian Society of Analytical Scientists (ISAS), August 2013
- Invited to deliver Dr. P. K. Iyengar Memorial Lecture at the Kerala Science Congress, January 2014

Prof. B. K. Jain

- Appointed as Chair, Institute of Physics, U.K., Mumbai Branch

Dr. Ameeya Bhagwat

- Admitted as member (Physical Sciences) of the National Academy of Sciences, India.

Dr. Sujit Tandel

- Awarded Faculty position: UGC Associate Professor under the "UGC Faculty Recharge Programme".

Dr. Basir Ahmad

- Awarded Faculty position: UGC Assistant Professor under the "UGC Faculty Recharge Programme".

Dr. Ananda Hota

- Awarded Faculty position: UGC Assistant Professor under the "UGC Faculty Recharge Programme".

Dr. Sangita Bose

- Awarded Women's Excellence Award from Science and Engineering Research Board (SERB), DST.

Dr. Manojendu Choudhury

- Team Leader (Observer) of the Indian Contingent to the International Olympiad on Astronomy and Astrophysics held at Volos, Greece, July 27 – August 05, 2013.

Dr. Sinjan Choudhary

- Awarded "DST Young Scientist Scheme" in May 2013 for a period of 3 years

6.2 Publications

- Jithendra G. Reddy and **Ramakrishna V. Hosur**
  "Parallel acquisition of 3D-HA(CA)NH and 3D-HACACO spectra"
  J. Biomol. NMR 56:77-84 (2013).

- Pushpa Mishra, Shobona Sharma and **Ramakrishna V. Hosur**
  "Residue level description of In-vivo-self-association of *Plasmodium falciparum* P2"
  J Biomol. Struct. Dyn. 32, 602-612 (2014).

- **Mohanish Borana**, Pushpa Mishra, Raghuvir R. S. Pissurlenkar, **R. V. Hosur** and **Basir Ahmad**
  "Curcumin and Kaempferol Prevent Lysozyme Fibril Formation by Modulating Aggregation Kinetic Parameters"
  BBA –Proteins and Proteomics, 1844(3):670-80 (2014).

- Jithender G. Reddy and **Ramakrishna V. Hosur**
  "Complete Backbone and DENQ Side chain NMR Assignments in Proteins from a Single Experiment: Implications to Structure - Function studies"
  J. Struct. Funct. Genom. 15(1):25-32 (2014).

- Jithender G. Reddy and **Ramakrishna V. Hosur**
  "A reduced dimensionality NMR pulse sequence and an efficient protocol for unambiguous assignment in intrinsically disordered proteins"
  J. Biomol. NMR, 59, 199-210 (2014).

- Pierre Lesaffre, **Shashikumar M. Chitre**, Adrian T. Potter and Christopher A. Tout
  "A two-dimensional mixing length theory of convective transport"
  Monthly Notices of the Royal Astronomical Society 431, 2200-2208 (2013).

- H. M. Antia, **S. M. Chitre** and D.O. Dough
  "On the magnetic field required for driving the observed angular-veloim variation in the solar convection zone"
  Monthly Notices of the Royal Astronomical Society 428, 470-475 (2013).

- R.T. Gangadhara, V. Krishan, **A. K. Bhowmick** and **S. M. Chitre**
  "Generation of Magnetic Structures on the Solar Photosphere"
  Astro 788, 135 (2014).

- V. Jha , V. V. Parkar and **S. Kailas**
  "Understanding fusion and its suppression for the ^{9} Be projectile with different targets"
  Phys. Rev. C 89 034605 (2014).

- Varinderjit Singh, B. R. Behera, Maninder Kaur, A. Kumar, K. P. Singh, N. Madhavan, S. Nath, J. Gehlot, G. Mohanto, A. Jhingan, Ish Mukul, T. Varughese, Jhilam Sadhukhan, Santanu Pal, S. Goyal, A. Saxena, S. Santra, and **S. Kailas**
  "Measurement of the evaporation residue excitation functions for the ^{19} F + ^{194,196,198} Pt reactions"
  Phys. Rev. C89,024609 (2014).

- P. K. Rath, S. Santra, N. L. Singh, B. K. Nayak, K. Mahata, R. Palit, K. Ramachandran, S. K. Pandit, A. Parihari, A. Pal, S. Appannababu, Sushil K. Sharma, D. Patel, and **S. Kailas**
  "Complete fusion in ^{7} Li + ^{144,152} Sm reactions"
  Phys. Rev. C 88, 044617 (2013).

- Ray, A. De, A. Chatterjee, **S. Kailas**, S. R. Banerjee, K. Banerjee, and S. Saha
  "Nuclear temperature from the fragment spectra and observed anomalies"
  Phys. Rev. C 87 064604 (2013).

- Varinderjit Singh, B. R. Behera, Maninder Kaur, A. Kumar, P. Sugathan, K. S. Golda, A. Thingan, M. B. Chatterjee, R. K. Bhowmick, Davinder Siwal, S. Goyal, Jhilam Sadhukhan, Santanu Pal, A. Saxena, S. Santra, and **S. Kailas**
  "Neutron multiplicity measurements for systems ^{19}F + ^{194,196,198}Pt to investigate the Nuclear shell effect on nuclear dissipation"
  Phys. Rev. C 87 064601 (2013).

- K.S. Golda, A. Saxena, V.K. Mittal, K. Mahata, P. Sugathan, A. Jhingan, V. Singh, R. Sandal, S. Goyal, J. Gehlot, A. Dhal, B.R. Behera, R.K. Bhowmik, **S. Kailas**
  "Determination of shell correction energies at saddle point using pre –scission neutron multiplicities"
  Nucl. Phys. A 913 157 (2013).

- A.K. Mody and **H. C. Pradhan**
  "Problem Based Learning in Basic Physics –IV, V,VI"
  School Science 51(1)March 2013, 51(2)June 2013, and 51(3)Sept 2013 respectively (ISBN 0972-5060).

- A.K.Mody and **H. C. Pradhan**
  "Achieving Core Values in Higher Education: A Design Experiment"
  University News, 51 (14) (2013) (ISSN: 0566-2257).

- Vivek Sadhu and **Balwant Singh**
  "Subintegrality, invertible modules and polynomial extensions"
  J. Algebra 393 (2013) 16-23.

- N G Kelkar, K P Khemchandani, N J Upadhyay and **B K Jain**
  "Interaction of eta mesons with nuclei"
  Reports on Prog. in Physics, 76(2013)066301.

- **S.K. Tandel**, **M. Hemalatha**, A.Y. Deo, and **S.B. Patel**, R. Palit, T. Trivedi, J. Sethi, and S. Saha, D.C. Biswas and S. Mukhopadhyay,
  "Evolution of octupole collectivity in 221Th,"
  Phys. Rev. C 87, 034319 (2013).

- P. Chowdhury, **S.K. Tandel** et al
  "Search for Collective Oblate Structures in 186W"
  Bulletin of the American Physical Society 58 (2013).

- Y. Qiu, **S.K. Tandel** et al.,
  "High-Spin Structures in the N=153 Nucleus 251Cf",
  Bulletin of the American Physical Society 58 (2013).

- S. Mukhopadhyay, **S.K. Tandel** et al.
  "High-K structure in the shape-coexistent nucleus 188Pt,
  Proceedings of the DAE Symposium on Nuclear Physics 58, 190 (2013).

- D Choudhury, **S.K. Tandel** et al
  "Study of high spin states and magnetic dipole band structure in odd-A 107Cd",.,
  Proceedings of the DAE Symposium on Nuclear Physics 58, 222 (2013).

- L.S. Danu, **S.K. Tandel** et al.
  "Spectroscopy of 128Te using fusion-fission 238U (32S, f) reaction",
  Proceedings of the DAE Symposium on Nuclear Physics 58, 182 (2013).

- S. Biswas, **S.K. Tandel** et al
  "Structure of high-spin states in 132Xe from fusion-evaporation and fusion-fission experiments",
  Proceedings of the DAE Symposium on Nuclear Physics 58, 280 (2013).

- Kamtekar N, Pandey A, Agrawal N, Pissurlenkar RR, Borana M, **Ahmad B**
  "Interaction of multimicrobial synthetic inhibitor 1,2-bis(2-benzimidazolyl)-1,2-ethanediol with serum albumin: spectroscopic andcomputational studies"
  PLoS One. 2013;8(1):e53499.

- Aditya K. Dharmadhikari, Harish Bharambe, Jayashree A. Dharmadhikari, **Jacinta S. D'Souza** and Deepak Mathur
  "Ultrafast laser induces both single stranded and double stranded breaks in plasmid DNA".
  Physics Review Letters (2014) Apr 4;112(13):138105. Epub 2014 Apr 2. IF:6.875.

- Sirisha V. L., Mahuya Sinha and **Jacinta S. D'Souza**
  "Menadione-induced caspase-dependent programmed cell death in the green alga *Chlamydomonas reinhardtii*."
  Journal of Phycology (2014) 50(3): 587-601. IF:2.34.

- Mustafa J. Motiwalla, Marilyn P. Sequeira and **Jacinta S. D'Souza**
  "Two Calcium-Dependent Protein Kinases from *Chlamydomonas reinhardtii* are transcriptionally regulated by nutrient starvation."
  Plant Signaling and Behaviour (2014) 9 (1), e27969-1 to e27969-8. IF:2.02.

- Rakesh C. Chandarana, Vikrant, Ashok Verma, Anil Saran, Evans C. Coutinho, **Jacinta S. D'Souza**,
  "Expression of ^{15}N-labelled recombinant glucose dependent insulinotropic polypeptide for probing biomolecular interaction of the gut peptide."
  3Biotech, (2013) DOI 10.1007/s13205-013-0181-x.

- **A. Bhagwat**, X. Viñas, M. Centelles, P. Schuck and R. Wyss
  "Recent Developments in the Wigener – Kirkwood Mass Formula"
  AIP Conf. Proc. 1524, 20-24 (2013).

- **A. Bhagwat**, R. Wyss, W. Satula, J. Meng and Y. K. Gambhir
  "Investigation of Band Termination in the Lower fp Shell within the Cranked Relativistic Mean Field Model"
  AIP Conf. Proc. 1524, 105-108 (2013).

- Syed Rafi, **A. Bhagwat**, W. Haider and Y. K. Gambhir
  "Systematic Analysis of Microscopic Nucleon - Nucleus Optical Potential for p - Ni Scattering"
  J. Phys. G: Nucl. Part. Phys. 40, 065101 (2013).

- Y. K. Gambhir, M. Gupta, **A. Bhagwat**, W. Haider, Sayed Rafi, M. Sharma, D. Pachouri
  "Microscopic Optical Potential with Two and Three Body Forces for Nucleon–Nucleus Scattering"
  EPJ Web of Conferences 66, 02038 (2014).

- Youichi Ohyama and **Ananda Hota**
  "Discovery of a Possibly Single Blue Supergiant Star in the Intra-cluster Region of Virgo Cluster of Galaxies"
  The Astrophysical Journal Letters, Volume 767, Issue 2, article id. L29, 6 pp. (2013).

- Volkar Heesen, Judith H Croston, Jeremy J. Harwood, Martin J. Hardcastle, **Ananda Hota**
  "The impact of a young radio galaxy: clues from the cosmic ray electron population"
  Monthly Notices of the Royal Astronomical Society, Volume 439, Issue 2, p.1364-1380.

- **Tamanna K. Khan, Preeti Sheokand and Neeraj Agarwal**
  "Synthesis and Studies of Aza-BODIPY-Based π-Conjugates for Organic Electronic Applications"
  European Journal of Organic Chemistry (Dec 2013).

- Ferland, G. J., Porter, R. L., van Hoof, P. A. M., Williams, R. J. R., Abel, N. P., Lykins, M. L., **Shaw, G**., Henney, W. J., Stancil, P.C.
  "The 2013 Release of Cloudy"
  Revista Mexicana de Astronomía y Astrofísica Vol. 49, pp. 137-163 (2013).

- **Sanjeev Kumar,** Chandan Kumar, John Jesudasan, Vivas Bagwe, Pratap Raychaudhuri and **Sangita Bose**
  "A two-coil mutual inductance technique to study matching effect in disordered NbN thin films"
  Applied Physics Letters 103, 262601 (2013).

- Puthucode, A. Devaraj, S. Nag, **S. Bose**, P. Ayyub, M.J. Kaufman and R. Banerjee
  "De-vitrification of nanoscale phase-separated amorphous thin films in the immiscible copper–niobium system"
  Philosophical Magazine 94, 15, (2014).

- Sajan D George, **Uma Ladiwala**, John Thomas, Assefhali Bankapur, Santhosh Chidangil, and Deepak Mathur
  "Deposition and alignment of cells on laser-patterned quartz"
  Applied Surface Science.

- Risinger AL, Riffle SM, **Lopus M**, Jordan MA, Wilson L, Mooberry, SL
  "The taccalonolides and paclitaxel cause distinct effects on microtubule dynamics and aster formation"
  Mol Cancer 13 (1): 41.

- Manchukonda NK, Naik PK, Santoshi S, **Lopus M**, Joseph S, Sridhar B, and Kantevari S
  "Rational Design, Synthesis, and Biological Evaluation of Third Generation α-Noscapine Analogues as Potent Tubulin Binding Anti-cancer Agents"
  PLoS One, 8(10):e77970.

- **Lopus M**
  "Mechanism of mitotic arrest induced by dolastatin 15 involves loss of tension across kinetochore pairs"
  Mol Cell Biochem, 382, 93-102.

- **M. Hemalatha**
  "Elastic scattering of the halo nucleus 11Be on 64Zn,"
  European Physical Journal, 66 (2014).

- **M. Hemalatha**
  "Double folding model analysis of elastic scattering of halo nucleus 11Be from 64Zn around Coulomb barrier"
  Pramana, 82 (2014) 789.

- **M. Hemalatha**
  "Design of fluorescence cell for isotope shift measurements by atomic-beam laser spectroscopy"
  Proc. International DAE Symp Nuc. Phy. 58, 978 (2013).

- **M. Hemalatha**
  "Elastic scattering of halo nucleus ^{11}Li with near-barrier energies"
  Proc. International DAE Symp Nuc. Phy. 58, 546 (2013).

- R.G Mane, P. Surendran, **M. Hemalatha**, K. Mahata, J.P. Nair, R.M. Kale, and A.K.Gupta
  "Identification of Polyatomic Anions by Accelerator based Mass Spectrometry at Pelletron- LINAC Facility"
  Proc. SPARC, (2014).

- Arikkala Raghurama Rao, Rupal Basak, Jishnu Bhattacharya, Sarthak Chandra, Nikunj Maheswari, **Manojendu Choudhury**, Ranjeev Misra
  "Time-resolved spectral analysis of prompt emission from long gamma-ray bursts with GeV emission"
  Research in Astronomy and Astrophysics, Volume 14, 35-46 (2014).

- Karasulu, B.; **Patil M.,** Thiel W.
  "Amine Oxidation Mediated by Lysine-Specific-Demethylase 1 (LSD1): QM/MM Insights into Mechanism and Role of Lysine 661"
  J. Am. Chem. Soc. (2013).

- **Sinjan Choudhary**, Nand Kishore
  "Drug-protein interactions in micellar media: Thermodynamic aspects"
  J. Coll. Interface Sci. 413 (2014) 118-126.

6.3 Conference, Invited talks and Lecture given outside

- **Prof. R. V. Hosur**

  - Gave invited talk on "Academic opportunities: Breaking New Grounds" at Institute of Chemical Technology, Matunga, October 21, 2013.

  - Symposium on Protein structure, function and dynamics at IISER, Pune, January 30, 2014.

  - Gave invited talk on "Understanding Protein Folding Landscape by NMR; Symposium on Protein Structure, Function and Dynamics" at IISER Pune, January 30, 2014.

  - Delivered a lecture 'Recent Developments in Protein NMR' at National University of Singapore, March 17, 2014.

  - Delivered a lecture 'Pushing the Frontiers in Protein NMR' at Stanford University, March 21, 2014.

  - Experimental NMR Conference at Boston, USA, March 23-28, 2014.

- **Prof. S. M. Chitre**

  - Invited to give a talk on "Outstanding problems in Astrophysics and Cosmology" in the Inspire workshop at Pt. Ravishankar Shukla University, Raipur, December 2013.

  - Invited to give a talk on "Is there Intelligent Life elsewhere in the Universe!" in the Nuclear Physics Symposium, BARC, Mumbai, December 2013.

- **Prof. S. Kailas**

  - Invited to give a talk on "Frontiers in Nuclear Physics: Progress and Prospects Indian Scenario" at the Conference on Particle Accelerators: Technology and Applications in Science, April 2013 IUAC, New Delhi.

  - Invited to give a talk on "Mass Spectroscopy using Accelerators" at the Conference organized at Mumbai University regarding upcoming AMS facility, April 2013, Mumbai university, Mumbai.

  - Following Conference Papers in the "DAE Symposium on Nuclear Physics" Vol 58 (December 2103):
    1. Fission barrier of 210 Po K. Mahata and S. Kailas p. 516
    2. Exclusive measurement direct and transfer break up reactions for 7 Li + 89 Y, 93 Nb systems S. K. Pandit, A. Shrivastava …..S. Kailas p. 518
    3. Searching the effect of N = 126 in hot fusion in mass around 200 region E. Prasad, ..S. Kailas p 532
    4. Investigation of fission barriers for compound nucleus with neutron number N = 126 V. Singh, B. R. Behera…….S. Kailas p 536
    5. Determination of $<l^2>$ from fission fragment anisotropy for reactions involving weakly bound 6,7Li A. Parihari, S. Santra, N. L. Singh, S. Kailas,……..p.582

- **Prof. R. Nagarajan**

  - Invited to give a talk at the Inaugural Plenary Session on Honoring India's Pioneers: More than a century of Fundamental Research legacy, "Raman and his contributions to Science - Honoring Sir CV Raman at his 125th Birth anniversary", International Microwave & RF Conference – 2013, (IMaRC – 2013), New Delhi.

  - Demonstrations and introductions to some physics experiments at the 48th Refresher Course for college teachers on Experimental Physics, organized by Prof. R. Srinivasan sponsored by the three science academies (IAS, Bangalore, INSA, New Delhi, and NASI, Allahabad) at Vidya Pratishthan, Baramathi, Maharashtra. May 14-29, 2013.

- Invited to give a lecture on Superconductivity and Demonstrations with Liquid Nitrogen (in association with Vijay Arolkar, TIFR, Mumbai) September 03, 2013, Mithibai College, Vile Parle, Mumbai.

- Invited to give a lecture Demonstration of physics experiments at high school level (in association with Prof. Chakradeo, formerly CHM College, Ulhas Nagar), at Grannoti Mandal's Arts, Commerce and Science College, Narayangaon, Maharashtra, 8th March 2014, Sponsored by Indian National Science Academy, in connection with Centenary of hundredth year of Indian Science Congress.

- **Prof. B. K. Jain**

  - Gave a lecture on "Near Threshold Resonances and their Role in Nuclear Physics" at University of Surrey, Guildford, U.K.

  - Invited to give a talk on "Role of near threshold resonances in intermediate energy nuclear physics" at International Symposium on Nuclear Physics, BARC, Mumbai December 2013.

  - Invited to give summary talk of the Symposium at International Symposium on Nuclear Physics, BARC, Mumbai December 2013.

- **Prof. Balwant Singh**

  - Participated in the ATM Work on Computational Algebraic Geometry held at the Indian Institute of Space Science and Technology, Thiruvananthapuram, from February 9 to 13, 2014.

- **Prof. H. C. Pradhan**

  - Gave Keynote address on " Fostering creativity in children, Road ahead for National Children's Science Congress" at the meeting of NCSC State Coordinators organized by National Council of Science and Technology Communication, DST, Gov of India, at Nashik , June 26, 2013.

  - Invited to give a talk on "The new paradigm in teaching-learning and NCF 2005", Seminar on New Maharashtra – Education, organized by the Matathi Daily Loksatta, Mumbai, August 2, 2013.

- Invited to give a talk on "New directions in educational research", at the Seminar for beginning researchers, School of Education and Social Sciences, Nav-rachana University, Vadodara , September 12, 2013.

- Gave welcome and valedictory addresses as President of the Association and chaired a technical session in the National Convention of the Indian Association of Physics Teachers at Kolkata, October 27-29, 2013.

- Invited to give a talk on "Handling misconceptions in sciences at school", at the Workshop for Teachers, National Children's Science Congress, Bhopal, December 28, 2013.

- Invited to give a talk on "History of the sciences – Lessons and excitement: Evolution of the concepts of inertia and gravity up to the Newtonian era", Workshop for students of higher secondary schools under the INSPIRE programme of DST, Gov of India at Indian Academy College, Bangaluru, January 09, 2014; Also at the National Symposium of Students of Physics (NSSP 2014) organized by Punjab Regional Council of Indian Association of Physics Teachers and Department of Physics, University of Punjab, Chandigarh, January 17, 2014.

- Invited to a give a talk on "Evolution of scientific rationality as seen through the history of the sciences, UGC sponsored Refresher Course for Teachers of Political Science and Philosophy", at Academic Staff College, University of Mumbai, February 24, 2014.

- Invited to give a talk on "What is research in behavioural and Social Sciences?" at the Seminar for students newly registered for Ph.D., SNDT University, Mumbai, March 4, 2014.

- Invited to give a talk on "Constructivism – the theoretical underpinning of NCF 2005, Learnet 2", Workshop for Resource Persons of NGOs working in various Tiger Reserves in the country supported by Wildlife Conservation Fund of India, Bandipur, Karnataka, March 19, 2014.

- Invited to give two talks on "Measurement and Evaluation and Effective Science Communication", at the Workshop for University/College Teachers, Department of Chemistry, Institute of Chemical Technology, Mumbai, March 29, 2014.

- **Dr. Sujit Tandel**

  - Delivered a lecture on "Octupole correlations in neutron-deficient Th-Pa isotopes", INGA User Workshop at Tata Institute of Fundamental Research, March 9-11, 2013, Mumbai, India.

  - Delivered a lecture on "Nuclear Spectroscopy at the limits of Coulomb stability: A journey towards the highest shells", Physics Colloquium at Bhabha Atomic Research Centre, May 17, 2013, Mumbai, India.

  - Invited to deliver a talk on "Evolution of octupole collectivity in ^{221}Th", in the International Nuclear Physics Conference 2013, June 2-7, 2013, Florence, Italy.

  - Invited to deliver a talk on "Configurations and decay hindrances of high-K states in ^{180}Hf" in the conference on Nuclear Structure Physics with Advanced Gamma-Detector Arrays, June 10-12 2013, Padua, Italy.

- **Dr. Jacinta D'Souza**

  - Invited to deliver a lecture for MSc-Part II (Biophysics) students at the Department of Physics, K. J. Somaiya College of Science and Commerce, Vidyavihar (East) on January 30, 2014 on the topic titled, 'Flagella: Cellular sensors and movers'.

  - Invited to deliver a plenary talk at the National Conference on Science, Biotechnology and Sustainability, Elphinstone College of Science and Commerce, Fort on February 14, 2014 on the topic titled, "'Studying Flagella, the Cellular watchtowers using molecular biology tools".

  - Invited to deliver a talk at the Thadomal Shahani Engineering College, Bandra on February 21, 2014 on the topic titled, "Flagella: An Engineering Enigma".

- **Dr. Neeraj Agarwal**

  - **Agarwal, N.;** Khan, T. K.; Sheokand, P.
    Poster presentation on "Synthesis and studies of Aza-BODIPY for organic electronic applications" at the Conference on Organic Devices: the future Ahead, BARC Mumbai 2014.

- **Dr. Gargi Shaw**

  - Invited to give lectures on the "Galactic and Extra galactic astronomy" courses (MSc II) at University of Mumbai (July- November 2013).

- **Dr. Ameeya Bhagwat**

  - **Bhagwat**, M. Gupta and Y. K. Gambhir
    Poster presentation on "Microscopic - Macroscopic Description of Ground State Nuclear Masses" at the DAE – BRNS Symposium on Nuclear Physics, BARC, Mumbai.

  - Syed Rafi,W. Haider, **A. Bhagwat**, Y. K. Gambhir
    Poster presentation on "Proton Skin in 9C" at the DAE – BRNS Symposium on Nuclear Physics, BARC, Mumbai.

  - Invited to deliver talk on "Wigner – Kirkwood Method for Nuclear Masses" at the "6th Asian Nuclear Physics Association Symposium" (ANPhAS-2014) Organized at VECC Kolkata and Asian Nuclear Physics Association, February 2014.

- **Dr. Basir Ahmad**

  - Gave oral presentation on "Effects of small molecule inhibitors on the dynamics, conformations and kinetics parameters of aggregation prone proteins" in the National Conference on Frontiers in Biotechnology and Bioinformatics (NCFIBB2014) "Macromolecular Interactions in Biology**.** January 30-31, 2014 at the Padmashree Dr. D. Y. Patil University

  - Sonali M. Shiriskar, Neeraj Agarwal, Raghuvir R. S. Pissurlenkar, **Basir Ahmad**
    Poster presentation on "The Effect of Interaction of 2-Amino-8-Hydroxyquinoline on the Conformation and Unfolding Pathway of Physiological Isomers of Human Serum Albumin" in the National Conference on Frontiers in Biotechnology and Bioinformatics (NCFIBB2014) "Macromolecular Interactions in Biology. January 30-31, 2014 at the Padmashree Dr. D. Y. Patil University.

- Shivani Muthu, Sonali M. Shiriskar, **Basir Ahmad**
  Poster presentation on "Ofloxacin Induced Acceleration of Fibrillar Aggregation of Hen Egg White Lysozyme" in the National Conference on Frontiers in Biotechnology and Bioinformatics (NCFIBB2014) "Macromolecular Interactions in Biology on January 30-31, 2014 at the Padmashree Dr. D. Y. Patil University.

- Mohanish S. Borana, Pushpa Mishra, Raghuvir R. S. Pissurlenkar, Ramakrishna V. Hosur, **Basir Ahmad**
  Poster presentation on " Curcumin and Kaempferol Prevent Lysozyme fibril Formation by Modulating Aggregation Kinetic Parameters" in the National Conference on Frontiers in Biotechnology and Bioinformatics (NCFIBB2014) "Macromolecular Interactions in Biology**.** on January 30-31, 2014 at the Padmashree Dr. D. Y. Patil University.

➢ **Dr. Ananda Hota**

- Invited to give a Special talk, titled "Networking ProAm through planetaria", during the Plenary Session of the 'National Meet on Role of Planetaria in Science Communication' at Research Centre in Astronomy at Ujjain, June 10-12, 2013.

- Invited to give a talk titled "Three Discoveries in Galaxy Evolution and Prospect of joining RAD@home" in the Nehru Planetarium, Mumbai, July 26, 2013.

- Invited to give a talk titled "RAD@home: A Pro-Am-Student Collaboratory", during the Panel Discussion on "Citizen Science and Virtual Observatory" in the national conference "Pro-Am-3: Fostering Collaboration Between Amateurs and Professionals in India" held at HBCSE and organized by Astronomical Society of India and HBCSE October 26-27 , 2013.

- Contributed oral-talk titled "New results on the exotic galaxy `Speca' and discovering many more Specas with RAD@home network" in the international conference "The Metrewavelenght Sky" at NCRA-TIFR, Pune. This was a celebration of 50 years of radio astronomy at TIFR and 10 years of operation of the Giant Metrewave Radio Telescope (GMRT) as an international observatory December 9-13 2013.

- Invited to give a talk titled "The First Indian Citizen-Science Social-Network Collaboratory for rapid Astronomy Discovery RAD@home" in the Regional Conference on radio Science, organized by the Indian National Committee of URSI (International Union of Radio Sciences) and hosted by Symbiosis Institute of Technology at Pune, January 2-5, 2014.

- Invited to give a talk titled "Jet-induced star formation in galaxies: Evidence for and against" in the workshop "Radio Studies of Galaxies and Galaxy Systems" at the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, March 4-6, 2014.

- Invited by the Scientific Organizing Committee to participate in a special session "Astronomers for Tomorrow" with posters and talks on RAD@home at the annual meeting of the Astronomical Society of India at Indian Institute of Science Education and Research, Mohali, March 20-22, 2014.

- **Dr. Sangita Bose**

- Invited to give a lecture on "Origin of Matching Effects in Anti-dot Array of Superconducting Thin Films" at Departamento de Física, Instituto Superior Técnico, Lisbon , 2014.

- Invited to give a talk on "Quantum in Complex Matter: Superconductivity, Magnetism and Ferroelectricity SUPERSTRIPES 2013" at Ischia, ITALY.

- Invited to give a talk on "'Multi-Condensate Superconductivity and Superfluidity in Solids and Ultracold Gases" 2014 at Camerino, ITALY.

- **Dr. M. Hemalatha**

- Invited to deliver a talk on "Double folding model analysis of elastic scattering of halo nucleus ^{11}Be from ^{64}Zn around Coulomb barrier", National Conference on Nuclear Physics (NCNP2013), Sambalpur University, Odisha, March 2, 2013.

- Invited to deliver a talk on "Archaeology with Pelletron", Workshop on Carbon Tuned AMS (CMAS), April 9- 10, 2013.

- Presented a paper on Elastic Scattering of the halo nucleus 11Be on 64Zn" in the International Nuclear Physics Conference (INPC2013), Firenze, Italy, June 2-7, 2013.

- Attended Nuclear Structure with Advanced Gamma-detector Arrays (NSP13), Padova, Italy, June 10-12, 2013.

➢ **Dr. Uma Ladiwala**

- Delivered a lecture on "Assembling Neurospheres: Dynamics of Neural Progenitor/Stem Cell Aggregation Probed Using an Optical Trap" at Manipal University, SPIE Student Chapter – May 13, 2013.

- Invited to give talk on "No – touch physical methods to study cell behavior and dynamics"- for the ASET Colloquium, Tata Institute of Fundamental Research, September 2013.

- John Thomas, **Uma Ladiwala**, Aseefhali Bankapur, Sajan D George, Santhosh Chidangil and Deepak Mathur
  Poster presentation at National Conference on Cell Mechanics and Interactions at the Physics - Biology interface, NCCMI-2013, Bangalore University, Bangalore on "Directed growth of 3T3 fibroblasts on femtosecond laser patterned quartz coverslips".

- John Thomas, **U Ladiwala**, S D George, D Mathur and C Santhosh
  Poster presentation at 22nd National Laser Symposium (NLS) – January 2014 , Manipal University, Manipal on "Spatial confinement of biological cells using femtosecond laser patterned surface" .

- **Uma Ladiwala**, Assehali Bankapur, Himanish Basu, Bhushan Thakur, Santhosh Chidangil, Deepak Mathur
  Poster presented at the international conference on Adult Neurogenesis: From Stem Cells to Therapies, Feb 2014, TIFR, Mumbai on " No-touch physical methods to study neural stem/progenitor cell behavior and dynamics.

➢ **Dr. Manojendu Chaudhury**

- Invited to give a talk on "The Low Frequency QPO and the spectral states of Galactic Black Hole Binary 4U1630-47" in the International Conference on ``Accretion onto Black Holes" at Goa, September 04-06, 2013.

- Participated in MIT-IUCAA workshop on "X-ray studies of Transient Astronomical Sources", at IUCAA, Pune, India, January 13-24, 2014. Provided a general script to the participants for timing analysis from the RXTE satellite observatory in this workshop.

- Invited to give Lectures at the Dept. of Physics, University of Mumbai, for the M. Sc. final year students, on the "Units of high energy astronomy and astrophysics".

- Invited to give Lectures on various topics of physics, astronomy and astrophysics at the Orientation and selection camp for the Astronomy Olympiads at the HBCSE, April-May 2013.

- Invited to give Lectures on various topics of physics, astronomy and astrophysics at the Astronomy Olympiad Exposure Camp to the school and college teachers, November 2013.

➢ **Dr. Avinash Kale**

- Invited to give a guest lecture at Thakur College, Kandivali (E) in the workshop on "Genomics and Proteomics" on December 06, 2013.

➢ **Dr. Mahendra Patil**

- Attended DAE BRNS Symposium on "Current Trends in Theoretical Chemistry" September 26, 2013, Bhaba Atomic Research Centre, Mumbai.

➢ **Dr. Alkendra Pratap Singh**

- Invited to give lectures on the course "Astrophysics and Space Science" to the M. Sc. students of Mumbai University.

- Participated in COMPHY 2014@National Workshop on computational Physics, Participation organized by K. J. Somaiya College of Science and Commerce, Vidhyavihar, Mumbai during January 2014.

- Gave Invited Talk in National Symposium on Nonlinear and Complex Phenomenon organized by Advanced Centre for Nonlinear and Complex Phenomena (ACNCP), Survey park, Kolkata, and Centre for Plasma Studies , Jadavpur University, Kolkata at Jadavpur University, Kolkata during January 7-9, 2014.

- **Dr. Subhojit Sen**

  - Delivered a talk on "Mechanisms of Epigenetic responses to oxidative stress" at ACTREC.

  - Delivered a talk on "Dynamics of Histone Exchange in vivo: H2A.Z variant (*Htz1*)" at TIFR.

  - Participated in Annual Meeting of Indian Society of Developmental Biologists.

- **Dr. Shameek Paul**

  - Invited to give remedial lectures in Institute of Chemical Technology, Mumbai.

  - Invited to give lectures on a on a course "Topology" in the Mathematics Training and Talent Search (MTTS) camp held in RIE, Mysore From 19th May to 14th June 2013.

  - Attended a conference on "Educational Interfaces Between Mathematics and Industry (EIMI)" which was held during January 23-24, 2014 at the Institute of Chemical Technology, Mumbai.

  - Participated ICTS Program on "Knot Theory and its Applications - Advanced School and Discussion Meeting" from 10th - 20th December, 2013 at IISER Mohali.

- **Dr. Subhradip Paul**

  - Invited to give a talk on "Solid-state NMR structural studies of an amphiphilic n-type nanotube" NMR Meets Biology: An Interaction Week, February 21-27, 2014, Goa, India.

6.4 Collaboration of CEBS Faculty with other departments, organizations and countries

National

- Tata Institute of Fundamental Research (TIFR), Mumbai
- Bhabha Atomic Research Centre (BARC), Mumbai
- Indian Institute of Technology (IIT-B)
- Department of Biotechnology, University of Mumbai
- Inter-University Accelerator Centre, New Delhi
- Department of Atomic and Molecular Physics, Tata Institute of Fundamental Research (TIFR), Mumbai
- Department of Atomic and Molecular Physics, Manipal University, Manipal
- Andhra University, Vishakapatnam
- Department of Physics, University of Mumbai
- Manipal University, Manipal
- Department of Physics, Aligarh Muslim University, Aligarh
- Department of Physics, IIT-Bombay
- The Inter-University Centre for Astronomy and Astrophysics (IUCAA) Pune
- Bombay College of Pharmacy, Mumbai
- Haffkine Institute, Mumbai
- National Physics Laboratory, New Delhi
- Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), Mumbai
- Department of Biotechnology, Guru Ghasidas Vishwavidyalaya (Central University), Chattisgarh

International

- Argonne National Laboratory, USA
- University of Massachusetts Lowell, USA

- Departament d'Estructura i Constituents de la Materia and Institut de Ciencies del Cosmos, Facultat de Fısica, Universitat de Barcelona, Diagonal 647, E-08028 Barcelona, Spain.
- Royal Institute of Technology (KTH), Alba Nova University Centre, S-10691 Stockholm, Sweden.
- University of Kentucky, USA
- University of Georgia, USA
- John Hopkins University, USA
- Michigan State University, USA
- University of Ulm, Germany
- University of Cambridge , UK
- Instituto Superior Tecnico, Lisbon
- Antwerp University, Belgium
- Marquette University, USA
- Harvard Medical School, Boston
- Institut De Physique Nucleaire, Orsay, France
- Department of Physics, University of Zagrab,
- University of Alberta, Canada
- Weizmann Institute of Science, Israel

6.5. Ongoing Projects

Name of the Principal Investigator	Title of the Project	Funding Agency	Duration	Total Project Amount
Dr. Brajesh Kumar Jain	Hadron Interaction near Threshold	Department of Science and Technology (DST)	3 years from August, 2010	30,65,000/-
Dr. Ameeya Bhagwat	Microscopic global nuclear mass formula	Department of Science and Technology (DST)	3 years from June, 2011	21,50,000/-

Dr. Neeraj Agarwal	New Bodipy derivatives and their anthracene-fused-porphyrin composites for the up-conversion of energy	Department of Science and Technology (DST)	3 years from January, 2012	21,00,000/-
Dr. Sangita Bose	Tunneling studies in novel supercoductors and nanocomposites	Science and Engineering Research Board (SERB)	3 years from July, 2012	26,00,000/-
Dr. Gargi Shaw	Numerical simulations of molecular astrophysics and their spectra applications to star forming regions from local high redshift universe	Science and Engineering Research Board (SERB)	3 years from July, 2012	12,84,000/-
Dr. Jacinta D'Souza	Spectroscopic analyses of flagellar proteins from chlamydomonas reinhardti and homologous ciliary proteins from human	Ministry of Science & Technology, Department of Biotechnology (DBT)	3 years from August, 2012	61,61,600/-
Dr. M. Hemalatha	Laser Spectroscopy of nuclei away from stability	Board of Research in Nuclear Sciences (BRNS) for Yong Scientist Research Award-2012	3 years from October, 2012	17,00,000/-
Dr. Sangita Bose	Superconductivity in Engineered Granular Thin Films	Indian National Science Academy (INSA)	3 years from January, 2013	5,00,000/-

Dr. Subhojit Sen (Ramalingaswami Fellowship)	Epigenetic Study of Environmental influence of Quality of Life	Ministry of Science & Technology, Department of Biotechnology (DBT)	5 years from September, 2013	82,00,000/-
Dr. Tripti Bameta	INSPIRE Faculty Award	Department of Science and Technology (DST)	Maximum 5 years from August, 2013	19,00,000/- (For First Year)
Dr. Prachi Chandrachud	Dr. D.S. Kothari Postdoctoral Fellowship	University Grant Commission (UGC)	Maximum 3 years from September, 2013	3,93,000/-
Dr. Ishita Mehta	INSPIRE Faculty Award	Department of Science and Technology (DST)	Maximum 5 years from September, 2013	19,00,000/- (For First Year)
Dr. Mahendra Patil	Computational Studies of Synergistic Catalysis: Reactivity, Mechanism, Stereoselectivity and Catalyst Screening. (DST-Fast Track Project for Young Scientist)	Department of Science and Technology (DST)	3 years from March, 2014	23,00,000/-

6.6 New Laboratories

- **Laser Spectroscopy Laboratory**

Laser Spectroscopy of Nuclei Laboratory has been setup with mainly funding received as part of the BRNS Young Scientist Research Award (2012). The focus is on laser spectroscopic studies of nuclei away from the line of stability. The studies undertaken here will have a considerable impact in the understanding of ground state properties of nuclei away from stability. Under this project, instrumentation

will be developed to perform in-beam laser spectroscopic measurements for the first time in India. This work is interdisciplinary and involves nuclear physics, atomic spectroscopy, lasers, accelerators and reactors. Techniques that have high sensitivity and resolution would be required in the near future as new nuclei are being produced in increasing numbers at accelerated radioactive ion beam facilities. A high-sensitive fluorescence cell is being developed that enables online measurement of short-lived nuclei produced in small amounts at accelerators using laser spectroscopy and is an important step.

Information on nuclear structure through hyperfine structure (hfs) and isotope shift (IS) studies has been immensely successful in evaluating the ground state properties of nuclei away from stability primarily due to the availability of tunable lasers. The nuclear physics interest in such studies lies in understanding the size and shape evolution as a function of proton and neutron number and in describing or predicting properties of unstable nuclei on the basis of an effective nucleon-nucleon interaction.

- **Biophysical Chemistry & Structural Biology Laboratory**

The Biophysical Chemistry and Structural Biology Laboratory was developed during the year 2013. The Biophysical Chemistry & Structural Biology applies fundamental principles from physics, chemistry, biology and medicine to gain molecular and structural insights into the mechanisms of medically relevant biological processes. The Lab aims to promote multidisciplinary research of excellence at the interface between biology, chemistry, physics and medicine, to foster collaborations with local organizations and international research institutes, to provide high-level training in the biochemical and biomedical sciences to staff, students and visitors, and to promote innovation and technology transfer. Researchers of the Lab and CEBS work together to solve problems that have direct biomedical applications, such as the design of new therapeutic agents against infectious and late life diseases, and drug delivery.

In addition to basic molecular biology and protein purification for manipulation/mutation of genes and purification of their resulting proteins, the experimental work involves the utilization of biophysical techniques for characterization, folding, aggregation and target oriented ligand recognition processes of biomacromolecules. These include NMR, X-ray crystallography, light scattering, fluorescence, circular dichroism and Fourier-transform infrared spectroscopies, and high sensitivity micro calorimetry. Projects involving nuclear

magnetic resonance (NMR), X-ray crystallography, atomic force microscopy (AFM), transmission electron microscopy (TEM), mass spectrometry (MS) and micro calorimetry are feasible through collaborations at TIFR, BARC, Haffkine Institute, and IIT Bombay.

- **Laboratory of Epigenetics - of behaviour and diseases**

This lab's interests lie in unraveling basic molecular mechanisms of how the environment shapes us as genetic beings either within our lifetime or over short transgenerational periods, a phenomenon that seems to play a central role in dictating our eventual evolutionary path. They study molecular mechanisms of how environmental insults modulate heritable gene expression, a hallmark of epigenetic change. The lab characterizes these changes, both at single (candidate) gene resolution or by studying the global epigenome (chromatin remodelors, histone modifications and their effectors/modulators/readers, DNA methylation). Their current focus lies in understanding how environmental insults in the early life of an individual (be it foetal or during its infancy/adolescence/young adult) translates to an early onset of an array genetic diseases/disorders (eg. diabetes, obesity, neurological disorders, degenerative diseases). They do this by using model systems to assay for the very first epigenetic changes that can be detected, where gene expression in normal cells get altered to a heritable mis-regulated state, cumulatively leading to a cancer specific epigenome which becomes the precursor to what eventually manifests as a genetic disease that we can histologically detect as cancer (ranging from stage I to IV).

In the past year, in collaboration with Dr. Stephen Baylin at Johns Hopkins they have been studying these changes in a stem cell paradigm in mammalian systems, using molecular analysis of "bivalent chromatin", an epigenetic signature unique to 'stemness'. Using a specialised sequential ChIP protocol developed in our laboratory and combining it with whole genome analysis (with Dr. H. Easwaran) it can be surmised that these early changes in bivalent 'stem-cell' chromatin can possibly act precursor modules towards a cancer specific epigenome. In parallel, they are applying our understanding of these molecular mechanisms to develop *Chlamydomonas reinhardtii* as a novel model system to study the same. Several projects in the lab aim at designing epigenetic assays and using them for drugs discovery that can interfere with these processes. In the bigger picture, they aim not only to understand the basic mechanisms of cancer epigenetics but also discover molecules that can modulate these processes and possibly rectify diseases that have epigenetic roots.

- **Experimental Cancer Therapeutics and Chemical Biology Laboratory**

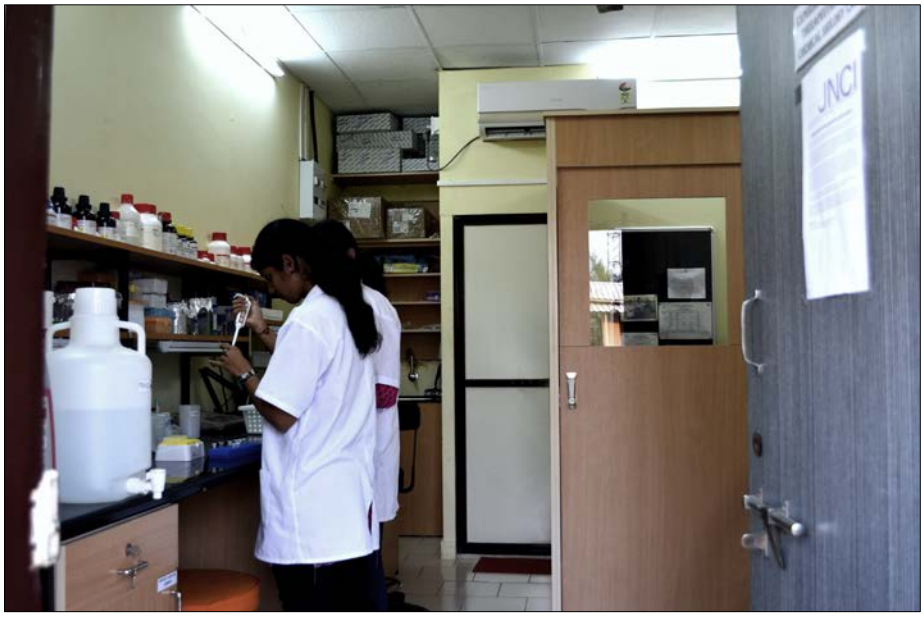
There are three major difficulties to effectively treat cancer. 1) Drug resistance, i.e., the cancer cells in the patient blocking or neutralizing the given drug. 2) "Peripheral neuropathy" is a side effect of several anticancer drugs and it creates severe pain and burning sensation in patients, and results in loss of different body functions. 3) Spreading of the cancer to different parts of the body (a process called "metastasis").

Current research in the laboratory is focused on addressing these challenges. For drug resistance, we study one type of resistance called, "tubulin isotype-mediated drug resistance". This resistance occurs when a protein (tubulin) that helps the cells to divide shows large amount of one of its variant called beta III tubulin; this variant inhibits the effective working of the drug inside the cancer cell. We investigate the mechanisms employed by tubulin variants to resist drugs so that potential drugs that can overcome this resistance can be developed. For addressing the drug-induced peripheral neuropathy, we are investigating molecular mechanisms of potential cancer drugs that can effectively destroy cancer cells while leaving nerve cells intact. We have recently identified, and elucidated the mechanisms of few effective compounds. Preclinical evaluation of these compounds on cancel cell types has started. As for cancer metastasis, our research focuses on the mechanisms with which cancer spreads from its original location, and effectiveness of few potential antimetastatic drugs. The laboratory employs techniques ranging from biochemical, biophysical, and cellular analyses to molecular docking and molecular dynamic simulations. The laboratory has several ongoing collaborations with research labs in India and abroad.

Laser Spectroscopy Laboratory

Biophysical Chemistry & Structural Biology Laboratory

Laboratory of Epigenetics - of behaviour and diseases



Experimental Cancer Therapeutics and Chemical Biology Laboratory

7. Colloquia

CEBS organises colloquia on Tuesdays at 3.45p.m. on topics of academic interest by reputed speakers, researchers, scientist etc. to facilitate exchange of ideas. The list of such colloquia held during 2013-14 is reproduced below:

- April 23, 2013: **Mr. Alan Rosling**, Chairman at Griffin Growth Partners Limited "India's solar future".

- September 10, 2013 **Dr. Pratap Raychaudhuri**, Tata Institute of Fundamental Research, Mumbai "Electron Tunneling".

- October 08, 2013: **Prof. Dulal Panda**, Department of Biosciences & Bioengineering, Indian Institute of Technology Bombay, Mumbai., TIFR "Regulation of microtubule dynamics by MAPs and small molecule inhibitors: Implication in cancer chemotherapy".

- October 29, 2013: **Prof. Raghunathan Srianand**, Inter-University Centre for Astronomy and Astrophysics, Pune "Probing the Universe with QSO absorption lines".

- November 05, 2013: **Dr. Sri Rama Koti Ainavarapu**, Tata Institute of Fundamental Research, Mumbai "Pulling and Stretching of Single Molecules: Mechano-Chemistry and Mechano-Biology".

- November 12, 2013: **Dr. Shekhar Mande**, Director. National Center for Cell Sciences (NCCS), Pune "Genomic approach for understanding Tuberculosis".

- January 14, 2014: **Prof. Vijay A. Singh**, Homi Bhbha Centre for Science Education, Mumbai "Glimpses of Physics Education Research".

- January 21, 2014: **Dr. Sandeepan Mukharjee**, Haffkine Institute, Mumbai "Vaccines: The Arts, The Science, and The Commerce".

- February 04, 2014: **Prof. Sreerup Raychaudhuri**, Tata Institute of Fundamental Research, Mumbai "Particle Physics –the best of times; the worst of times".

- February 11, 2014: **Prof. Vinod Krishan**, Indian Institute of Astrophysics, Bangalore "Plasma --- The First State of Matter".

- February 18, 2014: **Prof. Devendra Ojha**, Tata Institute of Fundamental Research, Mumbai "Star Formation in the Milky Way Galaxy".

- March 04, 2014: **Dr. Pitamber Singh**, Bhabha Atomic Research Centre, Mumbai "Accelerators: Physics, Technology and Applications".

- March 11, 2014: **Dr. Sushil Mujumdar**, Tata Institute of Fundamental Research, Mumbai "Optical resonators: From lasers to quantum electrodynamics".

- March 25, 2014: **Prof. Jayashree Ramadas**, Homi Bhbha Centre for Science Education, Mumbai "Science Education Research at HBCSE".

8. Events: 2013-2014

8.1 Meetings held at the Centre

During the year 2013-2014, the following meetings were conducted:

Total eight Faculty Meetings were held during 2013-2014

19th Meeting of the Governing Council : August 20, 2013

9th Meeting of the Academic Board : August 02, 2013

8.2 Academic Events:

- **First Graduation Ceremony**

The first batch of 19 students of CEBS graduated the Five Year Integrated M.Sc. degree (Physics Stream) in July 2012. The first graduation ceremony of the UM-DAE Centre for Excellence in Basics Sciences (CEBS) was held on April 22, 2013. The students received the degree certificates from the hands of Nobel Laureate Prof. Richard Ernst, who was the Chief Guest of the ceremony. Dr. R. K. Sinha, Chairman of the Atomic Energy Commission and Chairperson, Governing Council of CEBS, Dr. Rajan Welukar, Vice Chancellor of the University of Mumbai and Co-Chairperson of CEBS, Dr. Naresh Chandra, Pro Vice Chancellor of University of Mumbai, Dr. Rajpal Hande, Director Board of College and University Development

(BCUD), Prof R. V. Hosur, Director CEBS and Prof. S.M. Chitre, Chairman Academic Board of CEBS graced the occasion.

The Gold Medal and Silver Medal were awarded to Mr. Lavish Pabbi and Ms. Rashi Verma respectively for topping in the batch of 2012.

- **Life Science Day Celebrations**

UM-DAE CEBS, in association with GE HEALTHCARE, organized a seminar on "Trends in Protein Purification and Characterization" to celebrate Life Science Day on August 27, 2013. On this occasion, "Molecular Biophysics and Structural Biology" Laboratory was inaugurated.

The seminar talks were given by the following speakers:

- Dr. Shubhendu Seal : "Introduction to label free interaction analysis :Surface plasmon resonance and microcalorimentry".
- Mr. Prateek Joshi and Mr. Manjunath Dudhanikar: "Protein purification strategies and approach".
- Dr. Shubhendu Seal : "Proteomics: Spot The Real Difference with Dige".
- Dr. Sachin Mangle : "Microscopy -The art and science of image quality".

- **Foundation Day Celebrations**

The seventh Foundation Day of UM-DAE CEBS was celebrated on September 23, 2013. **Dr. Srikumar Banerjee** gave the foundation day lecture on "Energy, Environment & Sustainability".

This lecture was followed by musical programme where CEBS students and faculty performed classical music and played musical instruments like basuri, piano etc. and concluded with rendition of Bengali Rabindra Sangeet (Songs by Tagore) and Hindi Geet/Ghazals by Dr. Subhojit Sen.

- **Public lecture**

UM-DAE CEBS organized a public lecture on January 11, 2014. The lecture was delivered by **Prof. V. Ramakrishnan**, Nobel Laureate, Cambridge, England on "How antibiotics illuminate ribosome function and vice varsa". Following this, a special interaction session with Prof. V. Ramakrishnan was also arranged exclusively for the students of both CEBS and University of Mumbai.

- **Seminar/Workshop/Informal Talks organized**

- A one-day Seminar on "Importance of Basic Sciences in Higher Education" was organized by UM-DAE CEBS on April 23, 2013. The following eminent speakers gave seminar talks:
  Prof. B. V. Sreekantan : "Role of Basic Sciences in Human Culture and Philosophy".

  Prof. Anil Kakodkar : "Role of Basic Sciences in Energy".

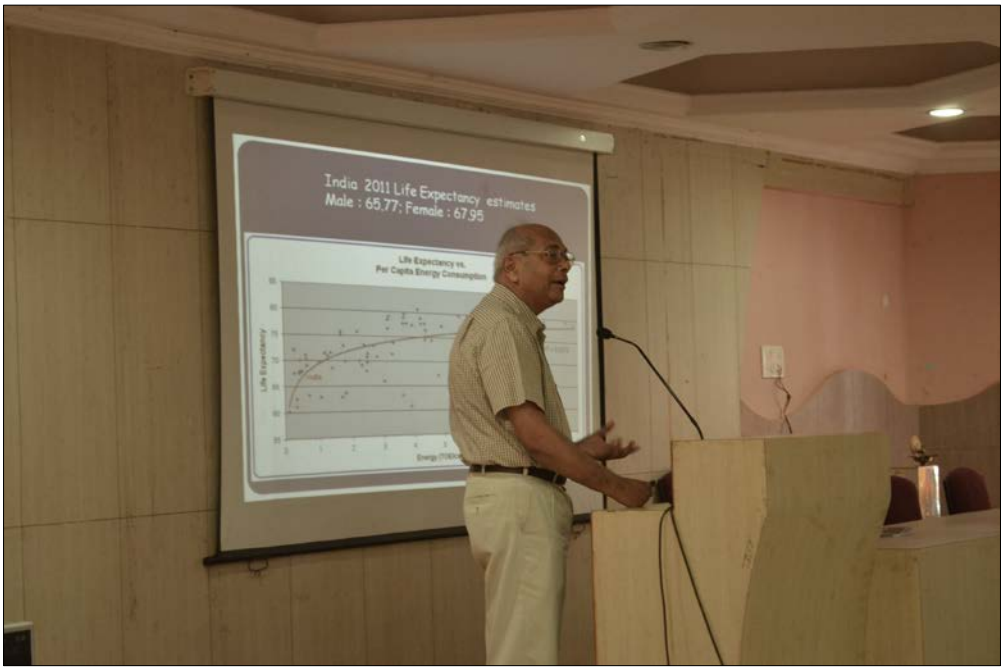
  Prof. Richard Ernst, NL : "Role of Basic Sciences in Promoting Excellence in University System".

- UM-DAE CEBS in collaboration with Nehru Science Centre, Worli organized a special lecture by **Prof. Richard Ernst**, Nobel Laureate on April 24, 2013 on the topic "Science and Society".

- A one-day **workshop on comet ISON:** UM-DAE Centre for Excellence in Basic Sciences initiated as a science outreach program. On this occasion, a one-day workshop was organized on October 06, 2013 for teachers and science educators of Mumbai district (approx. 70 participants) to spread the message about science education to the public and students. It was a part of a national campaign (initiated by Vigyan Prasar, NCSTC, HBCSE, IUCAA, NCRA) to use the excitement surrounding the comet ISON to promote science and scientific temper among the people, and to encourage hands-on experiments on the day and night sky amongst school students, as well as to enable public science activities in as many schools as possible around the country. Besides talks and experiments, a poster presentation session was also organized by the Centre. Students from CEBS, Mumbai University, and other nearby colleges took part and made this workshop a grand success. At the end of the workshop each participant received a certificate at the hands of eminent solar astrophysicist Prof. S. M. Chitre.

- **Prof. Jocelyn Bell Burnell**, Oxford University gave an informal talk on "Pulsars and Extreme Physics".

- As part of science day celebration, **Prof. Alec Booksenberg,** FRS gave an informal talk on "The Evolving Universe" on February 27, 2014.



Dr. Srikumar Banerjee delivered the Foundation Day Lecture
on September 23, 2013.

Prof. V. Ramakrishnan, NL delivered the
Public Lecture on January 11, 2014

Prof. Richard Ernst, NL, Prof. B. V. Sreekantan and Prof. Anil Kakodkar during Seminar on "Importance on Basic Sciences in Higher Education" held on April 23, 2013

8.3 Social Events

- **Dhwani Programme**

Dhwani is the annual musical concert where eminent artists are invited to perform. Faculty and students of CEBS also perform in the event. The aim of this musical event is to enrich the academic ambience of CEBS with a classical vocal rendition.

This year Dhwani programme was held on April 17, 2014 in the D. N. Marshall Hall, J N. Library, University of Mumbai. Mr. Soumyadeep Sikdar was invited as the main artist on this event. He is a Hindusthani classical singer from Kolkata, India. He is the top 10 finalist of # SUR KSHETRA @ Sahara One. He has performed "Bada Khayal", "Dadra", "Bhajan" in CEBS musical concert. Mr. Sammy Gonsalves and Mr. Karthik Rao played guitar and Mr. Ajit Nishad played percussion on this event. It was followed by performance by CEBS students.

- **Blood Donation Camp**

The first blood donation camp was organized by CEBS Health Club on August 27, 2013 from 5 pm to 8 pm, conducted by Lokmanyatilak Municipal General Hospital (Sion Hospital). 40-50 Cebscients including staff members participated in this camp. The bold donors were given certificates and voluntary blood donation cards.

- **International Women's Day Celebration**

The Women's Cell of CEBS was formally constituted on October 29, 2013, with the following members - Dr. (Mrs.) Jacinta S. D'Souza (Co-ordinator), Warden-Dr. Ameeya Bhagwat, Dr. Basir Ahmed, Dr. (Mrs.) Sinjan Choudhary and Mrs. Rupali Shringare. March 8th being the International Women's Day, a short programme was organized. In our own small way, we started by spreading awareness on women's role and power in today's rapidly changing society. All girl students and women staff of CEBS expressed their thoughts in writing interesting poetry, pictures and posters. These were displayed on 7th and 8th March, 2014 and appreciated by all the viewers.

- **ORIS – 2014**

ORIS is an open art festival held every year as part of the CEBS Art Club activity. This year ORIS was celebrated with great enthusiasm and vigor, on March 15-16, 2014. It provided Cebsceint creative freedom to come up with ideas of their own.

First day was an open painting session on paper. It was followed by Origami session by Prof. R. Nagarajan. Second day came with its own twist. It started with a warm discussion on art and its importance. Later, students were provided with canvas and painting materials. This was followed by flower bouquet making, face painting and Origami sessions.

In addition to these activities, exhibitions were also organized comprising painting exhibition by students and alumini, photography exhibition and handy craft. University of Mumbai students also participated in this exhibition.

Prior to the ORIS, Art-Club members made a promotional video **'Art in motion'.** This video can be viewed on YouTube.

The above artworks are displayed in the CEBS library and can also be viewed on our official Facebook Page, https://www.facebook.com/CEBSArtClub.

- **Ragnarok 2014**

This is an annual sports fest of CEBS where different types of sporting events are organized including both indoor and outdoor games. Students have created website for Ragnarok 2014 so that students, faculty and staff can register online for different sports. Ragnarok comprised of 7 games with 15 events in entirety. There were 3 indoor games: Carrom, Chess and Table Tennis, and 4 outdoor games: Cricket, Volleyball, Basketball and Football. This was held between January 11-18, 2014. Prize distribution was organized on January 28, 2014.

- **Social Upliftment Programme**

The Social Upliftment Programme was aimed at improving the socio-economic status of the target population comprising mostly of migrant labourers from different parts of the country who have settled in Mumbai and a small population of permanent residents belonging to the lowest economic classes.

The main motive of the programme was to educate people on:
1. The need for education.
2. The need to become a socially aware, well-informed and active citizen.
3. Rights and government schemes that are applicable to the target group.
4. Education of girls and their safety.

The programme was held in Kurla (near railway station) on October 19, 2013. A few students from 1st, 2nd and 3rd years participated in this programme. The first stage

of the programme included door to door distribution of pamphlets, containing information on relevant government schemes and rights like the RTE, to all the residents of the area. This was followed by an audio visual presentation in the late evening, with due permission from local authorities. The major part of the audience were children below the age of 12 and many inspiring videos on the need to attend schools were presented and received quite well. The presentation also included topics like education of girls, prevention of child marriage etc.

9. Students Science Blog

CEBS students have started Science blog for creating a platform where everybody can put his or her ideas, experiences about his/her research projects or any educational matter. This will help in creating awareness about opportunities available for everybody. By sharing personal experiences, readers can get information normally not available on any web page. This way a lot of possibilities will be open to everyone.

The blog also covers various other information such as details of Wednesday Sciences talks, important events, interesting posts, comments etc. The address of blog is philomaths.blogspot.in.

10.Infrastructure Development

Prefab structure PF-B and PF-C were constructed to fulfill the requirement of accommodation for students, faculty rooms and their research laboratories. All these were completed with interior design and furnished in 2013. The last year saw construction of more hostel rooms as an extension to PF-C and 17 single and 11 double occupancy rooms were made available. All these rooms were furnished and kept ready for students' use. Also, three research laboratories were completed in the past one year. In addition, the first and second floors of the new hostel building got ready with furniture. Students occupied the same from the academic year 2014-15. The permanent arrangement of various services such as water supply, electrical supply, and lifts are being pursued vigorously.

Celebration of International Women's Day on March 07, 2014

Musical Event on CEBS Foundation Day held on September 23, 2013

CEBS first blood donation camp held on August 27, 2013

Social upliftment programme: CEBS students giving audio visual presentation to laborers' children

Dhwani Programme held on April 17, 2014

ORIS Art Festival held on March 15-16, 2014

Nurturing talent...promoting excellence

मौलिक विज्ञान प्रकर्ष केन्द्र

UM-DAE CBS
CENTRE FOR EXCELLENCE IN BASIC SCIENCES
Health Centre Building, University of Mumbai,
Kalina Campus, Mumbai -400 098
Phone: 91-22-26524983 | Fax: 91-22-26524982
Web: www.cbs.ac.in