

Issue No. 04 | December 2020

अणुविद्या

HBNI NEWSLETTER



होमी भाभा राष्ट्रीय संस्थान
Homi Bhabha National Institute

(परमाणु ऊर्जा विभाग की एक सहायक संस्था और युजीसी
अधिनियम 1956 की धारा 3 के तहत विश्वविद्यालय माना जाता है)

(An aided institution of the Department of Atomic Energy and
a Deemed-to-be university under section 3 of the UGC Act.1956)

Location of HBNI Central Office, Constituent Institutions & Off Campus Centre





अणुविद्या

HBNI NEWSLETTER

DECEMBER 2020

होमी भाभा राष्ट्रीय संस्थान

Homi Bhabha National Institute

(An aided institution of the Department of Atomic Energy and a Deemed-to-be university under section 3 of the UGC Act.1956)

Council of Management

Shri K.N. Vyas, Secretary DAE & Chairman, AEC	Chairman
Prof. P. R. Vasudeva Rao, Vice Chancellor	Member
Smt. Sudha Krishnan, Member (Finance), AEC	Member
Prof. A.K. Mohanty, Director, BARC	Member
Prof. R.A. Badwe, Director, TMC, Mumbai	Member
Prof. Sudhakar Panda, Director, NISER	Member
Prof. Surendra Prasad, Former Chairman NBA & Former Director, IIT Delhi	Member
Prof. Mustansir Barma, Professor Emeritus, TIFR Centre for Inter-Disciplinary Sciences, Hyderabad	Member
Sri S.S. Sandhu, IAS, Additional Secretary, Department of Higher Education, MHRD, New Delhi	Member
Prof. P.D. Naik, Dean, HBNI	Member
Dr. B. Chandrasekar, Registrar	Secretary

Planning & Monitoring Board

Prof. P.R. Vasudeva Rao, Vice Chancellor	Chairperson
Prof. A.K. Mohanty, Director, BARC	Member
Prof. P.D. Naik, Dean, HBNI	Member
Prof. R.B. Grover, Professor Emeritus HBNI	Member
Prof. A. K. Bhaduri, Director, IGCAR	Member
Prof. S. Chaturvedi, Director, IPR	Member
Prof. G. Bhattacharyya, Director, SINP	Member
Prof. Devang Khakhar, Department of Chemical Engg., IIT Bombay	Member
Dr. Praveen Chaddah, Former Director, UGC-DAE, Consortium for Scientific Research	Member
Prof. S. Ramakrishnan, Director, TIFR	Member
Dr. B. Chandrasekar, Registrar	Secretary

Academic Council

Prof. P.R. Vasudeva Rao, Vice Chancellor	Chairperson
Prof. A. K. Mohanty, Director, BARC	Member
Prof. A. K. Bhaduri, Director, IGCAR	Member
Dr. R.A. Badwe, Director, TMC	Member
Prof. Sudhakar Panda, Director, NISER	Member
Prof. S.M. Yusuf, Director, IoP	Member
Prof. D. Das, Director, RRCAT	Member
Prof. SumitSom, Director, VECC	Member
Prof. Shashank Chaturvedi, Director, IPR	Member
Prof. Gautam Bhattacharyya, Director, SINP	Member
Prof. Pinaki Majumdar, Director, HRI	Member
Prof. V. Arvind, Director, IMSc	Member
Prof. Indranil Manna, IIT Kharagpur	Member
Prof. Kannan N. Iyer, IIT Bombay	Member
Prof. E.D. Jemmis, IISc, Bangalore	Member
Prof. Shishir Deshpande, Director, ITER-IPR	Member
Prof. B. Venkatraman, IGCAR	Member
Prof. P.K. Pujari, BARC	Member
Prof. P.D. Naik, Dean, HBNI	Member
Prof. R. B. Grover, Convenor, BoS (Applied Systems Analysis)	Member
Prof. G. Amarendra/Prof. S.M. Yusuf, Convenor, BoS (Physical Sciences)	Member
Prof. A. P. Tiwari, Convenor, BoS (Engineering Sciences)	Member
Prof. S. V. Chiplunkar/ Prof. Prasanna Venkatraman, Convenor, BoS (Life Sciences)	Member
Prof. B. Ramakrishnan / Prof. Meena Mahajan, Convenor, BoS (Mathematical Sciences)	Member
Prof. B.S. Banavali, Convenor, BoS (Medical & Health Sciences)	Member
Prof. H. Pal / Prof. S. Kannan, Convenor, BoS (Chemical Sciences)	Member
Prof. S. Panda/ Prof. Bedanga Das Mohanty, Convenor, BoS (Integrated Masters Programme)	Member
Dr. B. Chandrasekar, Registrar	Secretary



होमी भाभा राष्ट्रीय संस्थान

Homi Bhabha National Institute

प्रशिक्षण विद्यालय परिसर, अणुशक्तिनगर, मुंबई-400 094, भारत Training School Complex, Anushaktinagar, Mumbai – 400 094, India
Tel. No. 91-22-25503385 • Fax : 91-22-25503384 • Email : vasudeva@hbni.ac.in

Prof. P.R. Vasudeva Rao, FNAE, FNASc
Vice-Chancellor

प्रो. पी.आर. वासुदेव राव, एफएनएई, एफएनएससी
कुलपति

FROM THE VICE CHANCELLOR'S DESK



The year 2020, and particularly the second half, has been a challenge to all Universities. They had to devise processes for completing on-going programs, and plan for examinations and declaration of results, at the same time adhering to guidelines for the prevention of spread of COVID-19. The additional challenge was to plan for the next batch of students. Research students faced the challenge of pursuing laboratory based research work. HBNI was no exception. It is a matter of great satisfaction that it was possible to handle these issues, mainly through enhanced reliance on on-line processes, with active co-operation and support from all its CIs/OCC. It was this support that also enabled HBNI to prepare and submit its Self-study report for second cycle of NAAC accreditation on time and also address all related queries.

The last six months have indeed seen a flurry of online activities and improvements in online processes, which will stand us in good stead. For example, after the onset of the pandemic and until 31st December 2020, around 150 Ph.D theses were submitted online by the students and processed for result declaration. In addition to webinars, an online course on “neutrons as probes for condensed matter” has also been started, reaching students across the country, giving ideas for more such unique courses. The Awards Function was also organized online, and it was a pleasure to find active participation from the awardees, some of whom are already pursuing their career abroad.

Our students and faculty have continued to receive accolades and honors, and we hope that the coming year will see a fading away of the pandemic and lead to further spurt in our academic activities and achievements.

(P. R. Vasudeva Rao)

In this Issue...

§ Events at Central Office	1
§ Events at CI/OCC	10
§ Awards and Honors	14
§ HBNI Publications	15
§ Students Corner	20

Events at Central Office

Independence Day Celebration

The 74th Independence Day was celebrated with great fervor by HBNI on August 15 2020. The function was attended by HBNI functionaries and office staff. Prof. Vasudeva Rao, VC, HBNI hoisted the National Flag and addressed the gathering. Prof. Grover, Emeritus Professor, HBNI, and Prof. P.D. Naik, Dean, HBNI also addressed the gathering. Patriotic songs were sung by office staff of HBNI on the occasion.

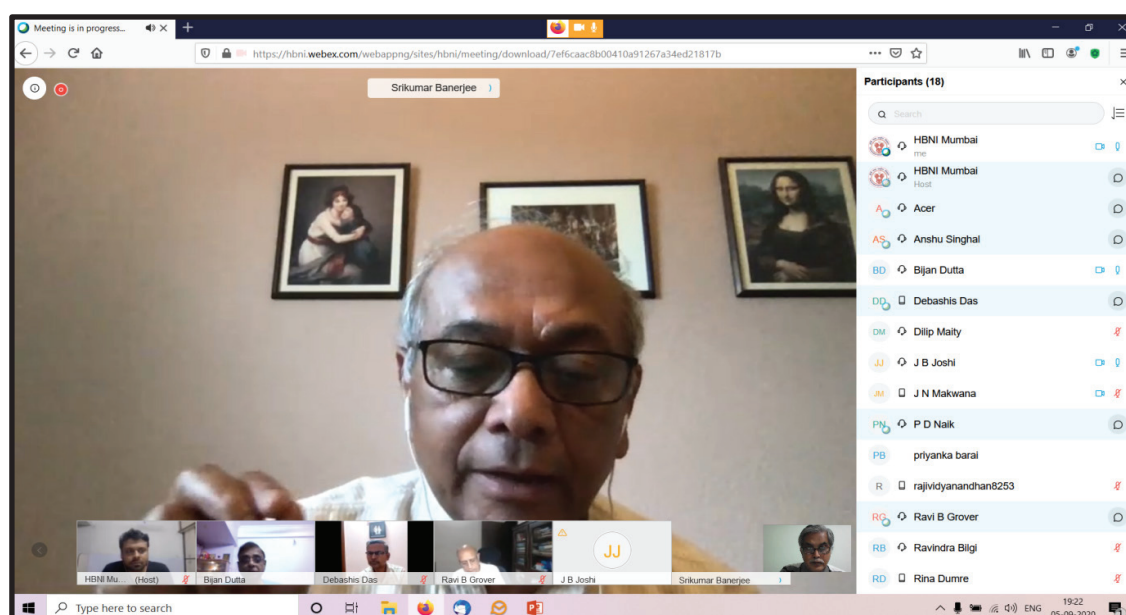


**Prof. P.R. Vasudeva Rao, VC, HBNI, hoisting National Flag
On the occasion of 74th Independence Day**

Teachers' Day Celebration

Teachers' day at HBNI was celebrated on 5th September, 2020 over a WebEx meeting, in view of existing situation at that time due to COVID-19 pandemic. The online meeting was coordinated by Prof. P.R. Vasudeva Rao, Vice Chancellor, HBNI and participants on the occasion included, Prof. S. Banerjee, Chancellor, HBNI, Prof. R.B. Grover, Prof. J.B. Joshi, Emeritus Professors, HBNI, Prof. D. Das, Director RRCAT and other HBNI functionaries.

Prof. Rao welcomed the participants. Prof. S. Banerjee and Prof. R.B. Grover reminisced about their days in Training School as students and discussed about the teacher who had influenced them the most at that time. In response to the question asked by Prof. Rao on the challenges faced by teachers in modern times, Prof. Banerjee responded that it is challenging for a teacher to capture the interest and attention of students in present times as a lot of information on every topic is available to them just at the tap of a finger. Prof. Banerjee and Prof. Joshi both emphasized the need to adapt innovative ideas of teaching to capture the attention and interest of students. On the topic of online learning/teaching, particularly in view of existing conditions due to COVID-19 pandemic, Prof. Banerjee stated that this cannot be avoided in present times but teachers must ensure continuous interaction with students. Prof. Banerjee also stressed on the need for further promoting the academic and research collaboration among various CIs of HBNI and discussed the steps which need to be taken in this direction. All the distinguished participants agreed that there is an urgent need to steer academic researches carried out in the institutes of DAE towards the direction which can assist industry and bring out technological products in the public domain for the benefit of society. They also discussed about strategies which will help bridge the gap between academia and industry and also ways to better equip HBNI students if they want to make a transition from a researcher to an entrepreneur.



Prof. S. Banerjee, Chancellor, HBNI, interacting with participants on Teacher's day, September 5, 2020

हिन्दी दिवस समारोह

हिन्दी दिवस के अवसर पर होमी भाभा परिषद कक्ष में दिनांक 14 सितम्बर 2020 को प्रातः 11:00 बजे एक समारोह का आयोजन किया गया। इस समारोह के पूर्व हिन्दी दिवस पर ऑनलाइन वार्ता प्रतियोगिता आयोजित की गई जिसमें संस्थान के 7 कर्मचारियों ने भाग लिया।

हिन्दी दिवस समारोह में प्रो. भूपेन्द्र तोमर, संस्थान चेअर प्रोफेसर ने स्वागत भाषण दिया व अतिथियों का स्वागत किया। तत्पश्चात श्री एम जी केलकर, एसोसिएट डायरेक्टर मानव संसाधन, एनपीसीआईएल, ने "परमाणु ऊर्जा के लिए नये विकास - कुछ नये आयाम" पर वार्ता प्रस्तुत की। नई दिल्ली स्थित मानव संसाधन विकास मंत्रालय के वैज्ञानिक एवम् तकनीकी शब्दावली आयोग के सह निदेशक श्री शिवकुमार चौधरी ने "वैज्ञानिक आविष्कारों एवं अन्वेषणों के हिन्दी में प्रचार एवं प्रसार के लिए शब्दावली के महत्त्व" पर अपनी वार्ता प्रस्तुत की। संस्थान के कुलपति महोदय ने समारोह में हिन्दी दिवस प्रतियोगिता में सर्वाधिक अंक प्राप्त करने वाले कर्मचारियों को पुरस्कार वितरण किये। कुलपति ने अपने भाषण में हिन्दी भाषा के प्रचार एवम् प्रसार के महत्त्व पर जोर दिया तथा होमी भाभा राष्ट्रीय संस्थान की हिन्दी वेबसाइट भी प्रस्तुत की। डॉ. तोमर ने अन्त में धन्यवाद प्रस्ताव प्रस्तुत किया। कार्यक्रम में संस्थान के सभी कर्मचारियों ने भाग लिया।



परिषद कक्ष में हिन्दी दिवस समारोह में भाग लेते एचबीएनआई के सदस्य।



श्री शिवकुमार चौधरी अपनी वार्ता प्रस्तुत करते हुये।



श्री एम जी केलकर अपनी वार्ता प्रस्तुत करते हुये।

Awards Function

The award function of the HBNI to honour outstanding students of the institute in various academic programs was held online over WebEx platform and streamed live on YouTube on December 2, 2020. Prof. R.A. Mashelkar, Former DG, CSIR and Former Chairman, NIF, was the Chief Guest for the function. Secretary, Department of Atomic Energy (DAE), Chairman, Atomic Energy Commission and Chairman, Council of Management, Shri K.N. Vyas presided over the function. Apart from participation of functionaries of HBNI at various CIs/OCC and Central Office, faculty, alumni, students of HBNI, vice-chancellors, directors and students of prestigious institutions across India also participated in the function online.



Prof. P.D. Naik, Dean HBNI giving welcome address



Prof. Vasudeva Rao, VC, HBNI addressing the gathering

Prof. P.D. Naik, Dean, HBNI welcomed the participants. Prof. Vasudeva Rao, Vice-Chancellor, HBNI, in his address spoke about the recent achievements of HBNI and awards and honors won by HBNI students and faculty. He also mentioned about the measures taken by central office to smoothly run the academic processes in aftermath of COVID-19 pandemic and various online events conducted by HBNI during July-December 2020 to benefit its students and faculty. Shri K.N. Vyas, in his presidential address, congratulated all the award winners and their mentors on their achievement. He lauded the efforts of HBNI to bring India at the forefront in research and innovation and remarked that through its academic programmes HBNI has imbibed the spirit of DAE with regards to excellence, relevance and multi-disciplinary collaborations. He further informed that on the occasion of 111th birth anniversary of Dr. Bhabha, DAE has established incubation centres at BARC, IGCAR, RRCAT, and IPR and urged HBNI students to advance their research further to develop indigenous technologies as part of the “Aatmanirbhar Bharat” campaign of the Government of India.



Prof. J.B. Joshi, Emeritus Professor, HBNI introducing Prof. R.A. Mashelkar



Prof. Mashelkar delivering J.B. Joshi Research Foundation Endowment Lecture



Shri K.N. Vyas, Chairman, CoM giving his Presidential Address



Prof. R.A. Mashelkar, Chief Guest interacting live with one of the award winner

Prof. B.K. Dutta, Institute Chair Professor and Convenor, Awards, Committee, gave a briefing on awards. The awards to the 16 outstanding students of Ph.D, M.Tech, M.Sc (Engg.), MD, DM and MCh programs were presented online and the awardees also interacted with Prof. Mashelkar live. Prof. Mashelkar delivered the J.B. Joshi Research Foundation Endowment Lecture on the topic "Inclusive Innovation: Learnings from a Personal Journey." The essence of his talk was that science must make not only an economic sense but a sense from a societal perspective. In his talk, he highlighted how one can achieve a system of development aligned with sustainability principles to create more useful goods and services for more people using fewer resources.

Celebration of Dr. Sarabhai 101st Birth Anniversary

The birth centenary year of the founding father of Indian Space programme, Dr Vikram Sarabhai, who also succeeded Dr. Bhabha as Chairman of Atomic Energy Commission was celebrated during 2019-20. Beginning in August 2019, ISRO and Department of Atomic Energy jointly organized the year-long Vikram Sarabhai Centenary Programme, wherein several events such as memorial lectures, student competitions, exhibitions, etc. were conducted across the country at more than 100 locations.

The 101st Birth anniversary of Dr. Sarabhai was celebrated by HBNI in virtual mode on August 12, 2020. To mark the occasion, HBNI arranged scientific talks by eminent nuclear scientists and physicists on the topic "Dr. Vikram Sarabhai and his legacy: A tribute to Dr. Sarabhai" over WebEx platform. Prof. R.B. Grover, Emeritus Professor, HBNI in his talk outlined the contributions of Dr. Sarabhai for the development of atomic energy in India. Prof. Bikash Sinha, INSA Senior Scientist, VECC, spoke about Dr. Sarabhai's contribution to cyclotron program and Prof. Abhijit Sen, IPR, talked in detail about how Dr. Sarabhai established the program for plasma physics and fusion program at Physics Research Laboratory, Ahmedabad.

Founder's Day Celeration

The 111th Birth anniversary of Dr. Homi Jehangir Bhabha was celebrated by HBNI on October 30, 2020. On this occasion, Prof. Sreerup Raychaudhuri, Dean (Administration) and Professor, Department of Theoretical Physics, Tata Institute of Fundamental Research, delivered a special lecture on the topic “Homi Bhabha and the Early Days of Particle Physics in India.” The lecture was conducted online on a Webex platform and streamed live on YouTube. In his talk, Prof. Raychaudhuri, described about the history of nuclear physics, cosmic physics and particle physics research in India and highlighted the contributions made by Dr. Homi Jehangir Bhabha and various other Indian physicists/scientists.

Course on Neutrons as probes for condensed matter

An online course on “Neutron as Probe of Condensed Matter” is being conducted by HBNI presently. The course program was inaugurated by Dr. R. Chidambaram on October 5, 2020. The course is coordinated by Prof. Saibal Basu, Associate Dean, HBNI and the lectures are streamed live on HBNI YouTube channel. The course has attempted to introduce neutron scattering techniques to the researchers for probing structure and dynamics in condensed matter. Owing to neutron’s unique properties (no charge and inherent magnetic moment), the short-range strong interaction of neutron with matter and the inherent magnetic moment of neutron makes neutron scattering a unique probe in condensed matter research. The course has seen good participation from a variety of educational institutes across the country as well as abroad.



Dr. R. Chidambaram (L) and Prof. Saibal Basu (R) during the inaugural program of the course on Neutrons as probes for condensed matter

Webinars Conducted by HBNI

Webinars conducted using online platforms have become an excellent way of dissemination of knowledge to a wide range of students, particularly in view of existing situation due to COVID-19 pandemic. HBNI has conducted several webinars by eminent scientists over WebEx platform for the benefits of its research scholars and students across all CIs/OCC during this period. The list of the webinars conducted by HBNI is given below:

Sr. No.	Webinar Topic	Speaker	Date
1.	Challenges and Rewards of Experimental Cosmic Ray Physics	Dr. Sunil Gupta, Department of High Energy Physics, TIFR, Mumbai.	08.07.2020
2.	A Few tips on Scientific Literature Search and Writing Skills : Do's & Don'ts	Dr. Ramesh L. Gardas, Indian Institute of Technology, Madras	15.07.2020
3.	Dr. Vikram Sarabhai and his legacy : A tribute to Dr. Sarabhai on his 101st Birth Anniversary	Prof. R.B.Grover, Emeritus Professor, HBNI, Mumbai	12.08.2020
		Prof. Abhijit Sen, Institute of Plasma Research, Gandhinagar, Gujrat	
		Prof. Bikash Sinha, INSA Senior Scientist, VECC, Kolkata	
4.	Positrons for probing matter and antimatter	Dr. G. Amarendra, Former Director, aterials Science Group, Metallurgy & Materials Group, IGCAR, Kalpakkam, Tamil Nadu	16.09.2020
5.	Chemical Safety	Dr. A.V.R. Reddy, Former Head, Analytical Chemistry Division, BARC, Mumbai	23.09.2020
6.	Prosperity of India through Science & Technology: Opportunity for Innovations & Entrepreneurship - 1	Prof. J. B. Joshi, Emeritus Professor, HBNI, Mumbai	14.10.2020
7.	Prosperity of India through Science & Technology: Opportunity for Innovations & Entrepreneurship - 2	Prof. J. B. Joshi, Emeritus Professor, HBNI, Mumbai	23.10.2020

Sr. No.	Webinar Topic	Speaker	Date
8.	Convergence of arts and science	Dr. J.V. Yakhmi, Former Director, Physics Group, BARC, Mumbai	28.10.2020
9.	Homi Bhabha and the Early Days of Particle Physics in India	Prof. Sreerup Raychaudhuri, Department of Theoretical Physics, TIFR, Mumbai	30.10.2020
10.	Swarm Intelligence Systems for detection of Cyber Attacks on IoT clusters	Dr. Kaushik Saha, CTO, Samsung R & D Institute, New Delhi	06.11.2020
11.	Additive manufacturing	Dr. C. P. Paul, Head, Laser Additive Manufacturing Lab, RRCAT, Indore	11.11.2020
12.	The Universe, Elementary Particles, and Dark Energy	Prof. Ajit Srivastava, Institute of Physics, Bhubaneswar	20.11.2020
13.	Cancer and the immune system- a clash of the Titans	Dr. S. V. Chiplunkar, Ex-director, ACTREC, Kharghar, Navi Mumbai	16.12.2020
14.	Ramaujan, Number theory and the Pandemic	Prof. M. Ram Murty, Department of Mathematics, Queen's University, Ontario, Canada	24.12.2020

The power point presentations of the listed webinars are available on website, www.anuvidhya.in. HBNI webinars are also streamed live on its YouTube channel, (HBNI Webinar) and recordings of webinars are available on the channel for the benefit of students/faculty across all educational institutions in India and abroad.

Forthcoming Courses

HBNI is set to organize two new online courses in the coming months. The details are given below:

1. The online course on “Design of Multiphase reactors/contactors” co-ordinated by Prof. J.B. Joshi, Emeritus Professor, HBNI, will start on January 21, 2021. Researchers, Masters/Doctoral Students, Operating Plant Practitioners can participate in the course.
2. The online course on “Nuclear Science and Technology” coordinated by Prof. B.S. Tomar, Institute Chair Professor, HBNI will start from February 5, 2021. The course is for post graduate students and research scholars.

It is to be noted that, the students successfully completing either of the course (meeting attendance and assignment requirements and passing the examination to be conducted at the end) can avail course credits. All participants meeting attendance requirements will be given participation certificates. Details of the courses and registration procedures are available in the website <http://www.anuvidhya.in>.

Events at CIs/OCC

Founder's Day Celebration at BARC

The 111th birth anniversary of Dr. Homi Jehangir Bhabha was celebrated as Founder's Day on October 30, 2020 at BARC.

Dr. A.K. Mohanty, Director, BARC welcomed the gathering. In his address, he highlighted the recent achievements of the Centre related to nuclear science and technology, nuclear medicine, and food security. In his address, Shri K.N. Vyas, Chairman, Atomic Energy Commission and Secretary, DAE spoke about the major achievements of the Department in nuclear energy sector, agriculture sector, health care sector and mega science projects. He informed the gathering about the initiatives taken by DAE to contain the spread of COVID-19. On this occasion, Shri Vyas also remotely inaugurated technology Incubation centres at BARC, IGCAR, RRCAT and IPR. This move is in line with the government's decision regarding opening up technologies developed by DAE institutions to private partners as part of the "Aatmanirbhar Bharat" campaign of the Government of India. A logo and a short film as a visual identity for the activity, was also released on the occasion to give fitting tribute to Dr. Bhabha.



Shri K.N. Vyas inaugurating Technology Incubation Centre at BARC on Founder's day



Technology Incubation Centre at RRCAT inaugurated on Founder's Day





परमाणु ऊर्जा का सामर्थ्य
आत्मनिर्भर भारत



इन्क्यूबेशन सेंटर - आईपीआर
का उद्घाटन
श्री के. एन. व्यास
सचिव, परमाणु ऊर्जा विभाग एवं
अध्यक्ष, परमाणु ऊर्जा आयोग
द्वारा दिनांक 30 अक्टूबर 2020 को किया गया

Incubation Centre - IPR
Inaugurated by
Shri K. N. Vyas
Secretary, Department of Atomic Energy &
Chairman, Atomic Energy Commission
on 30th October 2020

Images from the virtual inauguration of IPR incubation Centre

Independence Day 2020 Celebrations at RRCAT

On the occasion of 74th Independence Day 2020, Shri Debashis Das, Director RRCAT, hoisted the National Flag in the Central Lawn near Administration Building, RRCAT. Shri Debashis Das also delivered speech on the occasion. Shri Das in his address spoke about recent scientific, technical and other achievements of the centre. He also specifically mentioned about the efforts made to contain the spread of COVID-19 in the centre.



Shri Debashis Das, Director, RRCAT hoisting National Flag
On the occasion of 74th Independence Day

Measures adapted by Central Office HBNI for smooth conduct of Academic Processes in aftermath of COVID-19 Pandemic

In order to run academic processes smoothly in the time of pandemic, several measures were taken by Central Office, HBNI. A new website, <http://www.anuvidhya.in> was launched by HBNI in the month of May 2020. The website allows for online submission of fee and all the documents required for issue of PDC viz., soft copy of the thesis, alumni form and feedback form by the students. A general relaxation of 6 months was approved by HBNI for submission of thesis by Ph.D students in their final year of tenure, across all CIs. Processing of all the documents for result declaration is being done through online approvals, i.e. by e-mail transactions.

Measures taken at CIs/OCC

In order to have a timely completion of academic requirements for the PhD students, the Annual progress reviews, OGCE, pre-synopsis presentation and even the PhD Viva voce have been conducted using on-line platforms such as google meet, zoom and WebEx during and after lockdowns. The review reports were signed by examiners either by email consent or digitally wherever possible in order to fulfil the procedural requirements. In some cases, the Yearly Progress review meetings and Reading Course Evaluations for the scholars were conducted through conventional modes also depending on the convenience of the respective Doctoral Committees. The course curriculum for Ph. D. and M. Tech. programmes were completed through live and interactive online classes. Some CIs also conducted selection interviews for PhD research scholars online. Admission to PhD programs in all CIs/OCC were postponed to January, 2021.

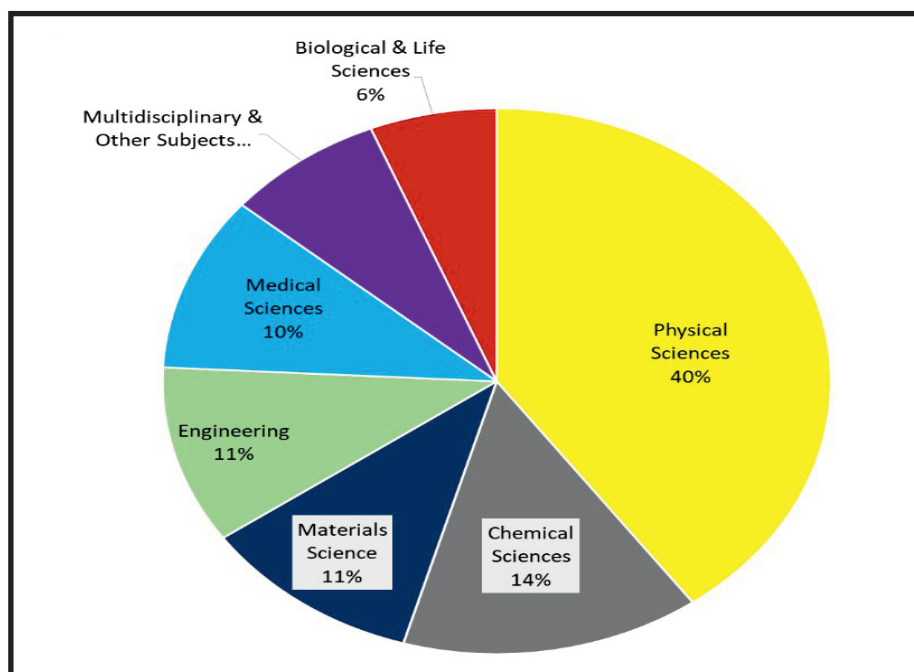
Awards and Honors

1. **Dr. Kinshuk Das Gupta, BARC** has been awarded Shanti Swarup Bhatnagar award in Engineering Sciences for 2020.
2. **Prof Bedangadas Mohanty, NISER** has been elected Fellow of American Physical Society (APS) for the year 2020 for his outstanding contributions to Physics.
3. **Dr. Sanjib Kumar Agarwalla, IOP, Bhubaneswar** has been awarded DST Swarnajayanti Fellowship 2019-2020 for his contributions in the field of neutrino physics. He has also been selected for the prestigious N. S. Satya Murthy Award 2020 by the Indian Physics Association.
4. **Dr. Sutanu Roy** from the School of Mathematical Sciences, **NISER** has been selected for INSA Medal for Young Scientists for the year 2020.
5. **Prof. P.R. Vasudeva Rao, Vice Chancellor, HBNI** has been presented with Dr. M.V. Ramaniah memorial award -2019 for Lifetime contributions to the field of Nuclear and Radiochemistry, by Indian Association of Nuclear Chemists and Allied Scientists (IANCAS).
6. **Dr. A.K. Debnath, BARC** has become Fellow, Maharashtra Academy of Sciences.
7. **Prof. S. Dhara, IGCAR** has co-edited a book titled “Chemical Solution Synthesis for Materials Design and Thin Film Device Applications”, Publisher: Elsevier. Print Edition will be available in February 2021.
8. The work of **Prof. A.K. Pati, HRI** on the topic Quantum Information and Quantum Computing has featured in the book titled, “Nobel Dreams of India: Inspiring Budding Scientists.” The book is free to read and the link is <https://www.juggernaut.in/books/nobel-dreams-india-inspiring-budding-scientists-1>
9. **Dr. Archana Mishra, BARC** has been awarded Prof. Sabu Thomas Best Ph.D Thesis Award for 2020.
10. **Mr. Joy Mukherjee, HBNI Ph.D student at VECC**, has received best poster presentation award for his poster “Spatially oscillating dissimilar chemical phase formation by mixed ion beam irradiation” at the 6th International Conference on “Ion Beams in Materials Engineering and Characterizations (IBMEC 2020)”, organized by Inter University Accelerator Centre, New Delhi during 8th to 11th December 2020 in virtual mode. He has also received best oral presentation award in “National Conference of Physics and Chemistry of Materials (NCPCM-2020)” conducted by Holkar Science college in association with American Institute of Physics from 14th to 16th December 2020 via virtual online mode.

HBNI Publications

Subject wise Publications for the year 2020 by Students/Faculty in CIs/OCC of HBNI as per Web of Science Database

<u>Subject</u>	<u>No. of. papers</u>
Physical Sciences	710
Chemical Sciences	257
Materials Sciences	191
Engineering	187
Medical Sciences	184
Multidisciplinary & Other Subjects	136
Biological & Life Sciences	109
<u>Total</u>	1774




Selected HBNI Publications in High Impact Factor Journals (2020)


CI: TMC

[Journal of Clinical Oncology](#) > [List of Issues](#) > [Volume 38, Issue 2](#) >

ORIGINAL REPORTS | Lung Cancer

Gefitinib Versus Gefitinib Plus Pemetrexed and Carboplatin Chemotherapy in *EGFR*-Mutated Lung Cancer




[Vanita Noronha](#), MBBS, MD, DM¹; [Vijay Maruti Patil](#), MBBS, MD, DM¹; [Amit Joshi](#), MBBS, MD, DM¹; [Nandini Menon](#), MBBS, MD, DNB¹; [Anuradha Chougule](#), PhD¹; [Abhishek Mahajan](#), MBBS, MD, MRes¹; [Amit Janu](#), MBBS, DMRD, DNB¹; [Nilendu Purandare](#), MBBS, DNB¹; [Rajiv Kumar](#), MBBS, MD¹; [Sucheta More](#), BAMS, MSc¹; [Supriya Goud](#), BAMS¹; [Nandkumar Kadam](#), BSc²; [Nilesh Daware](#), HSc²; [Atanu Bhattacharjee](#), MSc, PhD¹; [Srushti Shah](#), BHMS, PDCR¹; [Akanksha Yadav](#), MSc¹; [Vaishakhi Trivedi](#), MSc¹; [Vichitra Behel](#), MTech¹; [Amit Dutt](#), PhD³; [Shripad Dinanath Banavali](#), MBBS, MD¹; and [Kumar Prabhash](#), MBBS, MD, DM¹ 


¹Tata Memorial Center, Mumbai, India
²Gunvati J. Kapoor Medical Relief Charitable Foundation, Mumbai, India
³Advanced Centre for Treatment, Research and Education in Cancer, Navi Mumbai, India

CI: NISER

The Prodigious Hydrogen Bonds with Sulfur and Selenium in Molecular Assemblies, Structural Biology, and Functional Materials

Apramita Chand, Dipak Kumar Sahoo, Abhijit Rana, Subhrakant Jena, and Himansu S. Biswal*

 **Cite this:** *Acc. Chem. Res.* 2020, 53, 8, 1580–1592 | Article Views | Altmetric | Citations

Publication Date: July 17, 2020 

<https://doi.org/10.1021/acs.accounts.0c00289>




Copyright © 2020 American Chemical Society

[RIGHTS & PERMISSIONS](#)

1283 | 4 | 5

LEARN ABOUT THESE METRICS



Share | Add to | Export

HBNI


Chemical Engineering Journal 386 (2020) 121447

Contents lists available at [ScienceDirect](#)

 **Chemical Engineering Journal** 

journal homepage: www.elsevier.com/locate/cej

Scale-up of a downflow bubble column: Experimental investigations



Dinesh V. Kalaga^a, Manizheh Ansari^a, Damon E. Turney^a, Freddy Hernandez-Alvarado^a, Simon Kleinbart^a, K.E. ArunKumar^d, Jyeshtharaj B. Joshi^{b,c,*}, Sanjoy Banerjee^a, Masahiro Kawaji^a

^aCity College of New York, New York, NY 10031, USA
^bHomi Bhabha National Institute, Anushaktinagar, Mumbai 400094, India
^cDepartment of Chemical Engineering, Institute of Chemical Technology, Mumbai 400019, India
^dSouth Dakota School of Mines & Technology, Rapid City, SD 57701, USA


CI: BARC

Chemical Engineering Journal 389 (2020) 124112

Contents lists available at ScienceDirect

Chemical Engineering Journal


journal homepage: www.elsevier.com/locate/cej




Enhanced electromechanics of morphology-immobilized co-continuous polymer blend/carbon nanotube high-range piezoresistive sensor

K.A. Dubey^{a,b,*}, R.K. Mondal^{a,b}, Jitendra Kumar^{a,c}, J.S. Melo^{a,c}, Y.K. Bhardwaj^{a,b}

^a Homi Bhabha National Institute, Mumbai 400094, India
^b Radiation Technology Development Division, Bhabha Atomic Research Centre, Trombay, Mumbai 400085, India
^c Nuclear Agriculture and Biotechnology Division, Bhabha Atomic Research Centre, Trombay, Mumbai 400085, India


CI: IGCAR

Water Research 184 (2020) 116181

Contents lists available at ScienceDirect

Water Research

journal homepage: www.elsevier.com/locate/watres





Making waves: Wastewater surveillance of SARS-CoV-2 for population-based health management



Janelle R Thompson^{a,b,c,*}, Yarlagadda V Nancharaiiah^{d,e}, Xiaoqiong Gu^{c,f}, Wei Lin Lee^{c,f}, Verónica B Rajal^{a,g,h}, Monamie B Haines^{c,i}, Rosina Girones^j, Lee Ching Ng^k, Eric J Alm^{c,f,l,m}, Stefan Wuertz^{a,c,n,*}

^a Singapore Centre for Environmental Life Sciences Engineering, Nanyang Technological University (NTU), Singapore
^b Asian School of the Environment, NTU, Singapore
^c Campus for Research Excellence and Technological Enterprise (CREATE), Singapore
^d Biofouling and Biofilm Processes, Water and Steam Chemistry Division, Chemistry Group, Bhabha Atomic Research Centre, Kalpakkam 603102, India
^e Homi Bhabha National Institute, BARC Training School Complex, Anushakti Nagar, Trombay, Mumbai 400 094, India


CI: IMSc

 eLIFE
elifesciences.org

RESEARCH ARTICLE

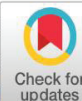
Loss of centromere function drives karyotype evolution in closely related *Malassezia* species

Sundar Ram Sankaranarayanan¹, Giuseppe Ianiri^{2†}, Marco A Coelho², Md Hashim Reza¹, Bhagya C Thimmappa^{1‡}, Promit Ganguly¹, Rakesh Netha Vadnala³, Sheng Sun², Rahul Siddharthan³, Christian Tellgren-Roth⁴, Thomas L Dawson Jnr^{5,6}, Joseph Heitman^{2*}, Kaustuv Sanyal^{1*}

¹Molecular Mycology Laboratory, Molecular Biology and Genetics Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru, India; ²Department of Molecular Genetics and Microbiology, Duke University Medical Center, Durham, United States; ³The Institute of Mathematical Sciences/IBN, Chennai, India;

CI: SINP**FULL PAPER**ADVANCED
ENERGY
MATERIALS

www.advenergymat.d

**Highly Air-Stable Single-Crystalline β -CsPbI₃ Nanorods: A Platform for Inverted Perovskite Solar Cells***Somnath Mahato, Arup Ghorai, Sanjeev Kumar Srivastava, Mantu Modak, Sudarshan Singh, and Samit K. Ray****CI: IOP**

Applied Surface Science 507 (2020) 144958

Contents lists available at ScienceDirect



Applied Surface Science

journal homepage: www.elsevier.com/locate/apsusc

Full Length Article

Growth angle-dependent tunable work function and optoelectronic properties of MoO_x thin filmsRanveer Singh^{a,b}, R. Sivakumar^c, S.K. Srivastava^d, Tapobrata Som^{a,b,*}^a SUNAG Laboratory, Institute of Physics, Bhubaneswar 751 005, Odisha, India^b Homi Bhabha National Institute, Training School Complex, Anushakti Nagar, Mumbai 400 085, India**CI: HRI**

CERN-LPCC-2020-001, FERMILAB-FN-1098-CMS-T, Imperial/HEP/2020/RIF/01

**Reinterpretation of LHC Results for New Physics:
Status and Recommendations after Run 2**

We report on the status of efforts to improve the reinterpretation of searches and measurements at the LHC in terms of models for new physics, in the context of the LHC Reinterpretation Forum. We detail current experimental offerings in direct searches for new particles, measurements, technical implementations and Open Data, and provide a set of recommendations for further improving the presentation of LHC results in order to better enable reinterpretation in the future. We also provide a brief description of existing software reinterpretation frameworks and recent global analyses of new physics that make use of the current data.

Waleed Abdallah,^{1,2} Shehu AbdusSalam,³ Azar Ahmadov,⁴ Amine Ahriche,^{5,6} Gaël Alguero,⁷

CI: NISER

ChemComm



COMMUNICATION
View Article Online
View Journal | View Issue

Check for updates

(Z)-Selective anti-Markovnikov or Markovnikov thiol–yne-click reactions of an internal alkyne by amide hydrogen bond control†

Milan Pramanik, Khokan Choudhuri, Subhayan Chakraborty,
Arindam Ghosh and Prasenjit Mal *



Cite this: *Chem. Commun.*, 2020, 56, 2991

Received 27th January 2020,
Accepted 29th January 2020

DOI: 10.1039/d0cc00702a

CI: BARC

American Journal of
Transplantation

ORIGINAL ARTICLE

Xenogeneic transplantation of human WJ-MSCs rescues mice from acute radiation syndrome via Nrf-2-dependent regeneration of damaged tissues

Mayuri Bandekar, Dharmendra K. Maurya , Deepak Sharma, Rahul Checker, Vikram Gota, Nigamananda Mishra, Santosh K. Sandur

Students Corner

Effects of Radiations on Birds

Jeevan Nayak and Anshuman Sahoo

School of Biological Sciences, National Institute of Science Education and Research,
Bhubaneswar, Odisha- 752050

Abstract

‘Safest distance from a cell phone tower to avoid radiation is about 50 meters’ is quite a general thought among science enthusiasts. Undoubtedly, humans are affected but birds are more prone to these radiations. These electronic radiations and AM radio signals disrupt the magnetic orientation of birds which may harshly affect the migratory birds. Also, the electromagnetic radiation (EMR) produces heat which causes a burning sensation in birds by damaging their tissues, in particular, excessive heat is lethal for cold adaptation birds. The eggs of the birds are getting thinner and deformed because of the emissions coming from the nearby mobile towers. Though scientists, time and again have emphasized over the thermal effect of the microwave radiation, not much information is available regarding athermal effect of such radiation. Henry Mouritsen, a professor of neurosensory science, University of Oldenburg, Germany has shown the effect of radiation on birds through a series of experiments.

Main

Microwaves are non-ionizing radiations whose frequency lies between 300 MHz to 300 GHz. This frequency range allows broadband width to pass through and the data transmission rates are high, hence they are extensively used in the point to point communication. Although these are non-ionizing radiations they affect the bird’s muscles, nervous system, skin and breeding capacity.

It’s an invisible threat on the bird population imposed mainly by the cell phone and its tower’s radiations. The advent of wireless technology and its widespread use amplifies the spreading of this invisible pollution. The natural homeostasis of a bird is imbalanced by such radiations. The surface area of birds is large in comparison to humans; hence they tend to absorb more radiations. As a result the body fluids of birds evaporates which produces heat causing a burning sensation and damaging tissues (Dermographism). These radiations can also cause polarisations in the tissues which inhibit or slow down the normal wound healing capacity of birds. Organs like eyes and testes are more affected as there is a lesser circulation of blood in comparison to other parts of the body to carry away the heat produced by radiations. That’s why the cold adaptation birds are more affected than the summer adapted birds by EMR¹.

Eggs of birds are getting deformed and thinner due to these radiations. Microwaves in the range of (30 MHz - 300 MHz) damage the eggs and embryos of sparrows. A case study in the UK showed that the bird population of sparrows declined from 24 million to 14 million in 30 years due to extensive use of cell phones and the establishment of cell phone towers².

Radiations also cause side effects such as insomnia, concentration dysfunction, nausea, dizziness, loss of appetite, headache, fatigue, which collectively impact the birds a lot, in particular, the migratory birds. The most important harm caused by radiation is disabling the bird's internal magnetic compass. Birds can sense their directions in the air by their internal setup but the excessive radiation disrupts the earth's natural magnetic align, thereby preventing the birds to determine their directions. As a result, the migratory birds are facing problems in reaching their destinations in the stipulated time and are dying. A case study in Valladolid, Spain showed that over a period of 10 years (1997-2007) out of 14 species; 3 species have been completely wiped out.

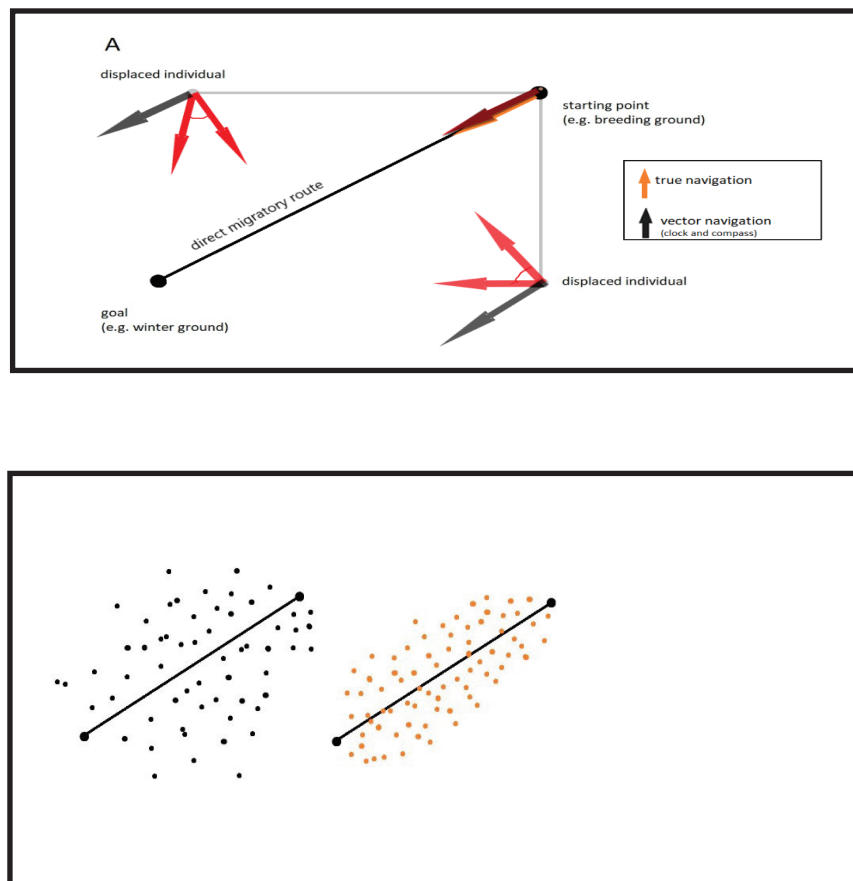


Figure 1: Bird's deviation from destination.

Experimental Proof

After several years of research, this phenomenon was discovered by Henrik Mouritsen, a professor of neurosensory sciences, University of Oldenburg, Germany and his colleagues. He gave experimental proof for the effect of microwave radiation on birds. Prof. Mouritsen observed that birds weren't flying over the University for a long time. To discover the reason, he did experiments on robins which were inside a Faraday cage. A Faraday cage is a grounded metal box, which doesn't screen out the earth's powerful, static magnetic field, but shields the weaker magnetic fields, viz., those generated by the common electronic appliances such as cell-phones and microwave ovens. In the presence of an electric field, the positively and negatively charged particles align themselves accordingly such that no external magnetic field can hamper the cage. The external electric field outside the cage is cut out to neutralize the outside magnetic field. On keeping birds inside the cage it was observed that they could still navigate their way and hence their magnetic compass worked properly. But after the birds were released from the cage, they moved in random directions. They might have lost their internal mechanism to detect north after being released from the cage. However, when the same birds were taken away and then released, they were able to determine the direction i.e north. So, Prof. Mouritsen concluded that the radiations emitted by electronic devices deviate birds from their destination by manipulating their internal magnetic mechanism³.

Concluding Remarks

The use of electronic gadgets is an essential part of life, be it writing a mail for educational purposes on a computer, watching television for entertainment purposes, or using cell phone. With the passage of time, we have got enslaved by electronic gadgets and extensive use of these has proven fatal. They pose a life-threatening risk to a wide range of bird species. The biological balance needs to be maintained in nature. Since it is not plausible to completely eradicate the use of several gadgets like mobile phones, it is important to find a technology that would fulfil our purposes without disturbing the natural life of birds and other species.

References

1. Effect of microwave radiation on birds.
J.A. Tanner
Nature, 210, 1966, 636.
2. The electromagnetic radiations and its impacts on bird diversity in India
K. K. Dhama
Int. J. Avian & Wildlife Biol., 5, 2020, 5-7.
3. Anthropogenic electromagnetic noise disrupts magnetic compass orientation in a migratory bird.
S. Engels, N.-L. Schneider, N. Lefeldt, C.M. Hein, M. Zapka, A. Michalik, D. Elbers, A. Kittel,
P.J. Hore and H. Mouritsen
Nature, 509, 2014, 353-356.

Core Values of Homi Bhabha National Institute

Student-Centric Approach

Keep in mind the good of the student in designing processes and programs

Ethical Conduct

Adhere to code of ethics in teaching, research and service

Resist and relegate dishonesty

Science for Society

Encourage application of advanced knowledge in sciences including medical and health sciences, to address needs of society



World Class Education and Research

Nurture human resources in sciences (including Engineering sciences) and Mathematics

Provide access to world class experimental facilities and research problems in frontier areas

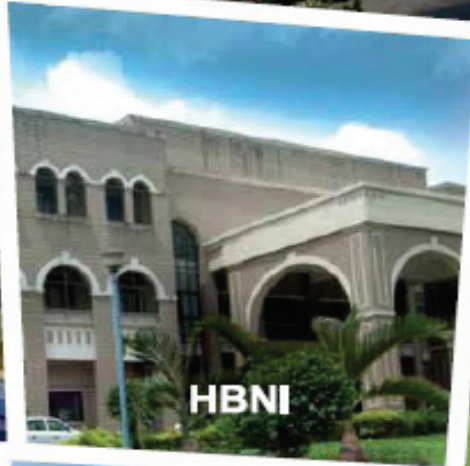
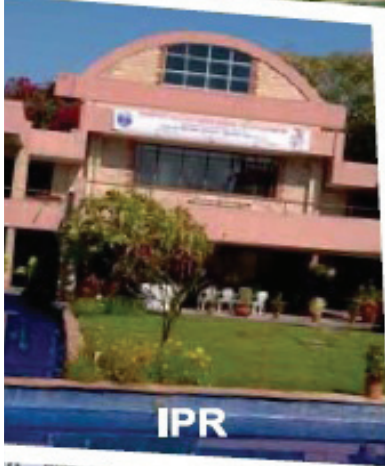
Promote Excellence

Devise mechanisms to recognize, encourage and reward Excellence

Use merit as the only consideration in every process

Focus on National Mission

Use education and research as tools to meet the needs of the nation in various domains and particularly nuclear science and technology



Layout & Design by : HBNI Central Office, Mumbai

Published by:

होमी भाभा राष्ट्रीय संस्थान
Homi Bhabha National Institute
पशिक्षण विद्यालय परिसर
Training School Complex
अणुशक्तिनगर, मुंबई, भारत
Anushaktinagar, Mumbai, INDIA