



# अणुविद्या

## HBNI NEWSLETTER

*Issue No: 09 | June 2023*



होमी भाभा राष्ट्रीय संस्थान

**Homi Bhabha National Institute**

( परमाणु ऊर्जा विभाग की एक सहायता प्राप्त संस्था और यूजीसी 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



**HRI, Allahabad**



**IPR, Gandhinagar**



**RRCAT, Indore**



**BARC, Mumbai**



**TMC, Mumbai**



**HBNI Central Office**



**VECC, Kolkata**



**SINP, Kolkata**



**IoP, Bhubaneswar**



**NISER, Bhubaneswar**



**IISc, Chennai**



**IGCAR, Kalpakkam**

# *HBNI Newsletter*



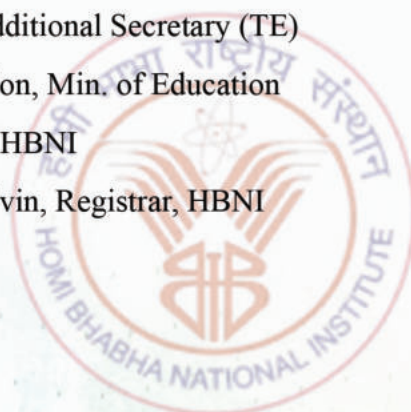
## **Homi Bhabha National Institute**

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



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◆ Shri K. N. Vyas/Prof. A. K. Mohanty, Secretary DAE & Chairman, AEC	Chairman
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◆ Prof. Gautam Bhattacharyya, Director, SINP	Member
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◆ Prof. Shishir Deshpande, Director, ITER- IPR,	Member
◆ Prof. Vivekanand Kain, BARC	Member
◆ Prof. P. D. Naik, Dean, HBNI	Member
◆ Prof. R. B. Grover, Convenor, BoS (Applied Systems Analysis)	Member
◆ Prof. S. M. Yusuf, Convenor, BoS (Physical Sciences)	Member
◆ Prof. A. P. Tiwari, Convenor, BoS (Engineering Sciences)	Member
◆ Prof. Prasanna Venkatraman, Convenor, BoS (Life Sciences)	Member
◆ Prof. Meena Mahajan, Convenor, BoS (Mathematical Sciences)	Member
◆ Prof. S. D. Banavali, Convenor, BoS (Medical & Health Sciences)	Member
◆ Prof. S. Kannan, Convenor, BoS (Chemical Sciences)	Member
◆ Prof. Bedangadas Mohanty, Convenor, BoS (Integrated Masters Programme)	Member
◆ Prof. P. Christopher Selvin, Registrar, HBNI	Secretary

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- ◆ Prof. A. K. Mohanty, Director, BARC Member
- ◆ Prof. P. D. Naik, Dean, HBNI Member
- ◆ Prof. R. B. Grover, Professor Emeritus, HBNI Member
- ◆ Prof. B. Venkatraman, Director, IGCAR Member
- ◆ Prof. S. Chaturvedi, Director, IPR Member
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- ◆ Prof. P. Christopher Selvin, Registrar, HBNI Secretary



## From the Vice Chancellor's Desk



It gives me immense pleasure to present the June 2023 issue of the HBNI Newsletter highlighting the major developments and achievements of HBNI during the first half of this year. After taking over as Vice Chancellor of this prestigious University of excellence this is the first issue of Newsletter which I am proud to forward to HBNI community and others.

HBNI organized two online Courses, Course on “Research and Publication Ethics” and “Advanced NMR Spectroscopy-Part I”. The courses benefitted not only the students and faculty members from its CIs/OCC but also students/faculty members from educational institutes all over India. A course on “Nuclear and Radiochemistry” curated by Prof. B. S. Tomar, Ex-Institute Chair Professor, HBNI is available on the Swayam-NPTEL platform.

Towards the efforts to accelerate the academic collaborations among the CIs/OCC of HBNI, HBNI continued to organize theme-based discipline-specific meetings in association with its CIs/OCC. During January to June 2023, HBNI organised interaction meeting in Chemical Sciences at NISER, Bhubaneswar and in Life Sciences (second in series) at SINP, Kolkata.

The eighteenth Foundation Day of HBNI saw excellent participation from Faculty and students. Prof. A.K. Mohanty, Chairman CoM, Prof. Subhasis Chaudhuri, Director IIT Bombay and Dr. Ajit Sapre, Reliance Industries, graced the event and inspired and enlightened the gathering with their words of wisdom and knowledge.

National Institute Ranking Framework (NIRF) India Rankings 2023 have been declared and HBNI has secured 15th rank in the Research Institution category, 17th rank in the university category and 30th rank among 1657 institutions in the overall category. Based on the high-quality publications in the Nature Group of journals (June 2022 to May 2023), the Nature Index 2023 placed HBNI in the second position among all academic institutions in India, and in the first position with regard to publications in Physical Sciences. This has primarily been possible due to the excellent contributions of the faculty and the students of HBNI from all CIs/OCC.

I am sure that in the near future, HBNI will scale new heights and will secure a unique position among world-class universities/Institutes in the country and abroad.

*U. Kamachi Mudali*

**U. Kamachi Mudali**  
Vice Chancellor, HBNI

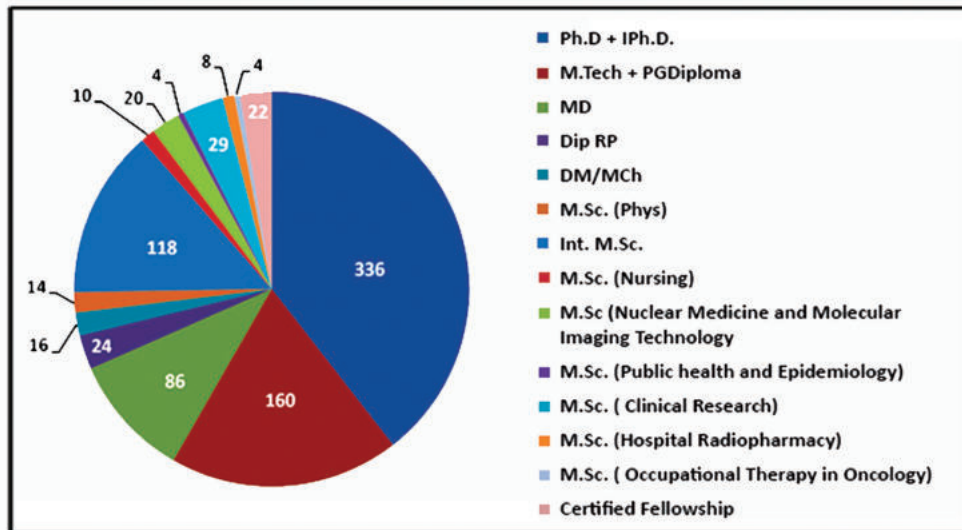


## *In This Issue.....*

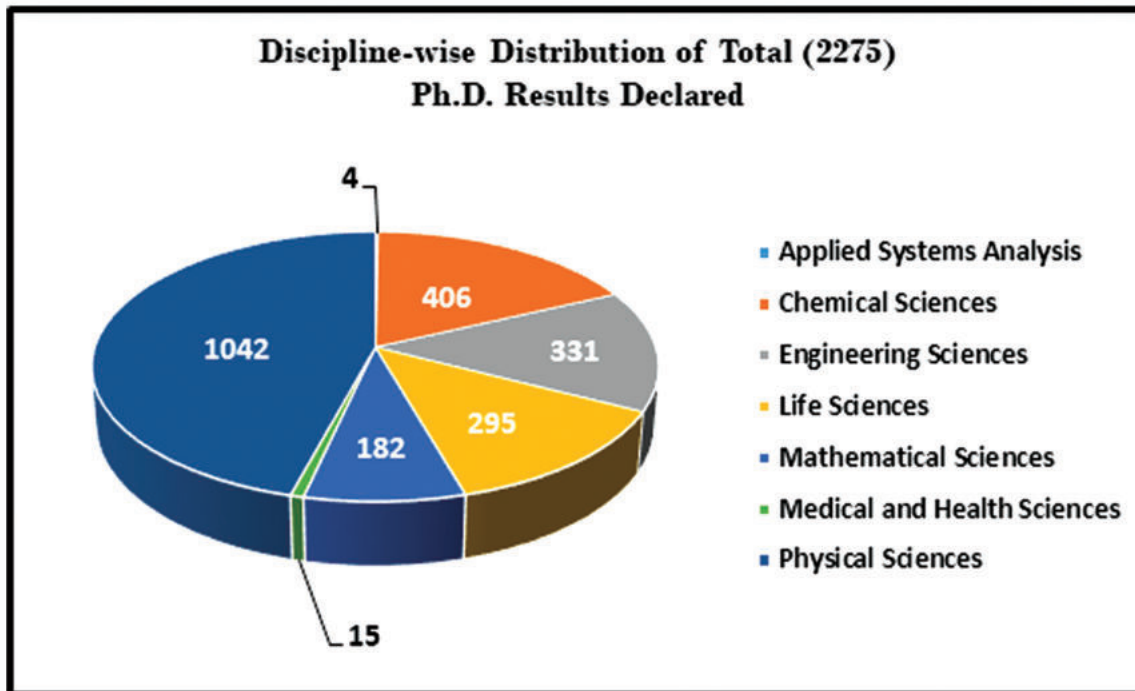
- ◆ Academic data of HBNI at a glance.....1
- ◆ News Updates.....5
- ◆ Events at the HBNI Central Office ..... 6
- ◆ Courses Conducted by HBNI.....24
- ◆ NPTEL Courses by HBNI.....26
- ◆ Events at the Constituent Institutions (CIs)/Off  
Campus Centre (OCC).....26
- ◆ Scientific Outreach Activities Conducted by  
CIs/OCC.....29
- ◆ Awards and Academic Honors Received  
by HBNI Faculty..... 31
- ◆ Awards Received by HBNI Students..... 34



## Academic Data of HBNI at a Glance



Academic Programme	BARC	IGCAR	RRCAT	VECC	SINP	IPR	TMC	IoP	IMSc	HRI	NISER	Total
Ph.D. + Integrated Ph.D	36	44	16	6	30		25	61	19	12	87	336
M.Tech + PG Diploma	115	29	7			9						160
MD	....	....	....	....	....	....	86	....	....	....	....	86
Dip RP	24	....	....	....	....	....	....	....	....	....	....	24
DM/MCh	....	....	....	....	....	....	16	....	....	....	....	16
M.Sc. (Physics)	....	....	....	....	....	....	....	....	....	14	....	14
Integrated M.Sc.											118	118
M.Sc. (Nursing)	....	....	....	....	....	....	10	....	....	....	....	10
M.Sc (Nuclear Medicine and Molecular Imaging Technology)	10	....	....	....	....	....	10	....	....	....	....	20
M.Sc. (Public Health and Epidemiology)	....	....	....	....	....	....	4	....	....	....	....	4
M.Sc. Clinical Research							20				9	29
M.Sc. (Hospital Radiopharmacy)	8	....	....	....	....	....	....	....	....	....	....	8
M.Sc. (Occupational Therapy in Oncology)	....	....	....	....	....	....	4	....	....	....	....	4
Certified fellowship	....	....	....	....	....	....	22	....	....	....	....	22
<b>Total</b>	<b>193</b>	<b>73</b>	<b>23</b>	<b>6</b>	<b>30</b>	<b>9</b>	<b>197</b>	<b>61</b>	<b>19</b>	<b>26</b>	<b>214</b>	<b>851</b>



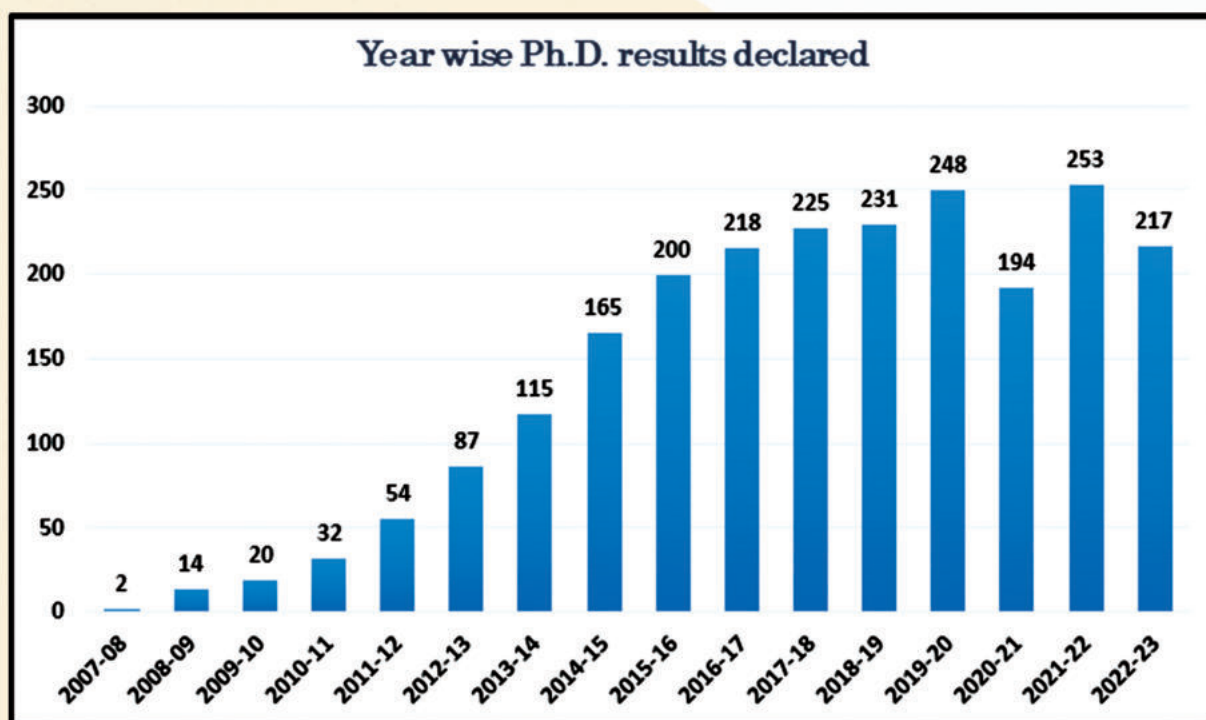
### CI/OCC wise declared total Ph.D. results since inception

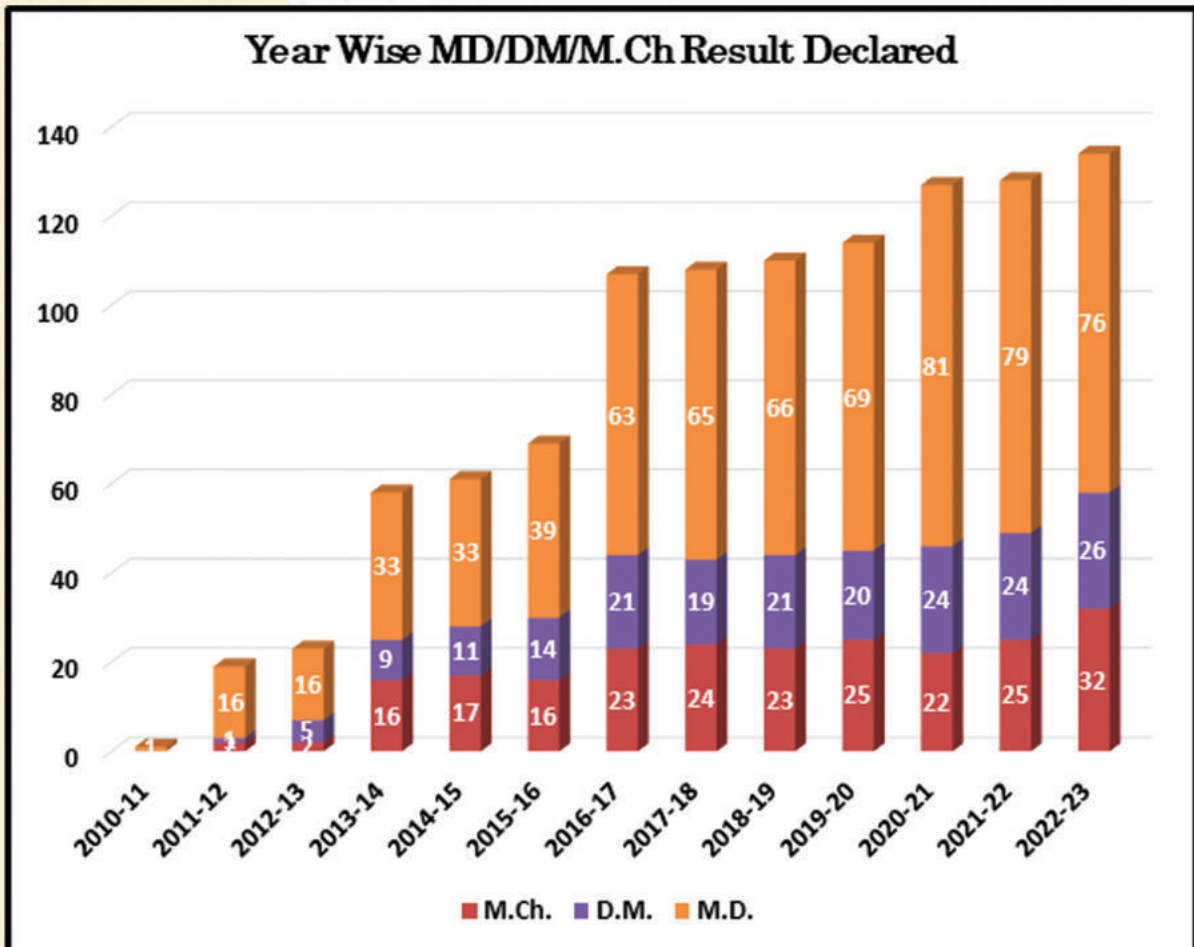
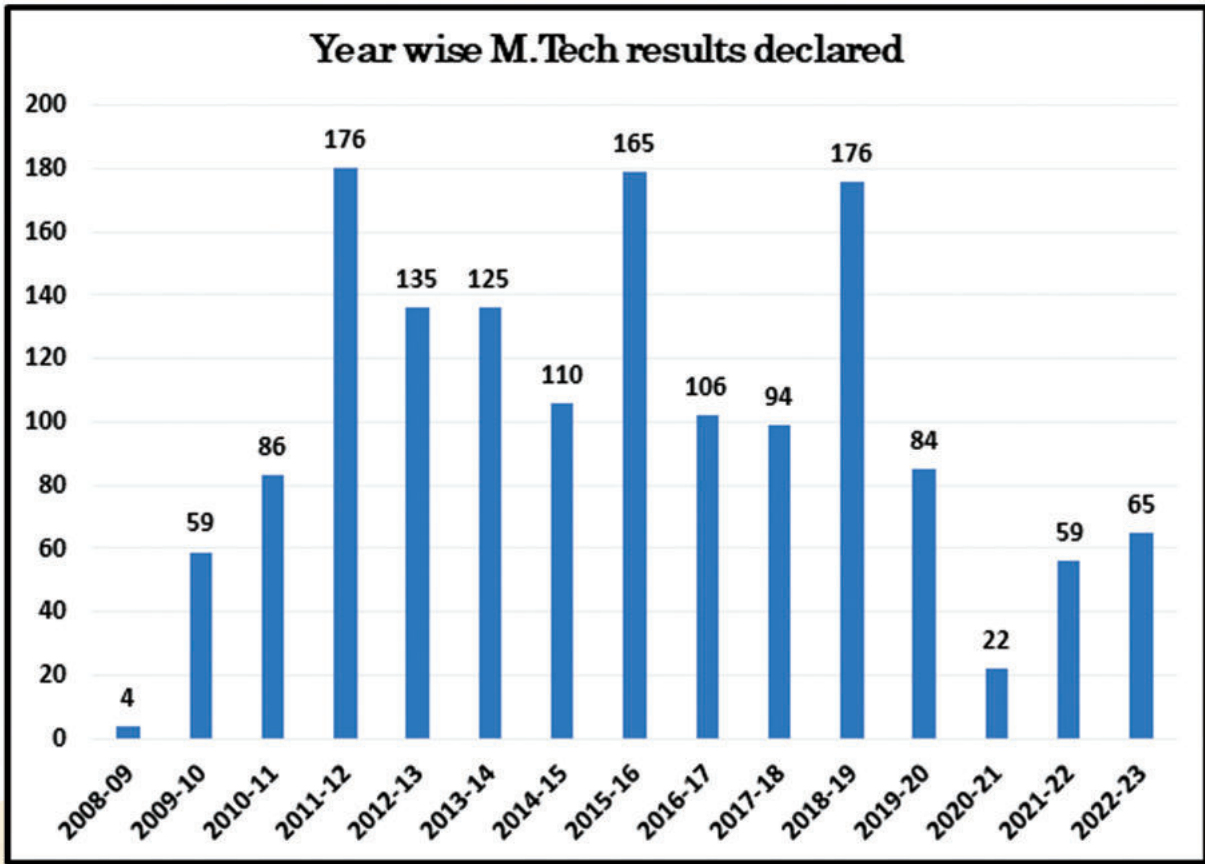
YEAR	BARC	IGCAR	RRCAT	VECC	SINP	NISER	IPR	IOP <sup>#</sup>	HRI	TMC	IMSc	TOTAL
2007-08								2				2
2008-09					1			4	2		7	14
2009-10					1			2	7		10	20
2010-11	5				2			6	9		10	32
2011-12	15	2	2		1		5	3	9		17	54
2012-13	45	7	4	8	2		3	4	5	4	5	87
2013-14	34	23	2	7	6		8	9	4	6	16	115
2014-15	62	33	15	6	8		1	8	5	14	13	165
2015-16	86	29	13	7	13		5	10	11	18	8	200
2016-17	71	33	5	10	11	16	7	5	14	23	23	218
2017-18	71	27	10	11	18	16	13	8	16	15	20	225
2018-19	75	30	16	10	13	27	8	10	15	11	16	231
2019-20	68	39	14	16	15	22	12	8	21	13	20	248
2020-21	57	24	12	3	21	23	9	4	10	14	17	194
2021-22	75	42	13	9	25	30	7	3	10	15	24	253
2022-23	50	33	10	7	21	47	7	4	11	11	16	217
<b>TOTAL</b>	<b>714</b>	<b>322</b>	<b>116</b>	<b>94</b>	<b>158</b>	<b>181</b>	<b>85</b>	<b>90</b>	<b>149</b>	<b>144</b>	<b>222</b>	<b>2275</b>

# Includes NISER Results till 2015

## CI/OCC & Discipline wise Ph.D. results declared during 2022-23

Academic Program	BARC	IGCAR	RRCAT	VECC	SINP	NISER	IPR	IOP	HRI	TMC	IMSc	Total
Chemical Sciences	9	8				30						47
Engineering Sciences	19	14	1	1			1					36
Medical & Health Sciences												
Life Sciences	9				7	6				11	4	37
Mathematics						1			7		7	15
Physical Sciences	12	11	9	6	14	10	6	4	4		5	81
Applied System Analysis	1											1
<b>Total</b>	<b>50</b>	<b>33</b>	<b>10</b>	<b>7</b>	<b>21</b>	<b>47</b>	<b>7</b>	<b>4</b>	<b>11</b>	<b>11</b>	<b>16</b>	<b>217</b>





## News Updates

Prof. U. Kamachi Mudali has assumed the charge of Vice Chancellor, Homi Bhabha National Institute (HBNI), Mumbai in the forenoon of May 11, 2023. Prof. U. Kamachi Mudali is Distinguished Alumni of IIT, Bombay and joined IGCAR, Kalpakkam in 1984 and served the organization till 2017. During his tenure at IGCAR, he was Senior Professor of HBNI and guided 12 Ph.D. & 13 M.Tech students and was honoured with “Distinguished Faculty Award” of HBNI during 2015. He has also served HBNI since its inception in various capacities and committees.

During 2017-2020 he was Distinguished Scientist, Chairman & Chief Executive of Heavy Water Board. After superannuation in Sept. 2020 from DAE, Prof. U. Kamachi Mudali served as Honorary Professor of Practice at IIT Madras during 2021-22, and the Vice Chancellor, Vellore Institute of Technology University at Bhopal campus during March 2021- May 2023. He has acquired rich experience in academic processes, activities, and programs before taking over as Vice Chancellor of HBNI on May 11, 2023.



*Prof. P. D. Naik, Officiating VC and Dean HBNI handing over charge to Prof. U. Kamachi Mudali on May 11, 2023*

HBNI conducted a faculty induction program in hybrid mode on June 14, 2023 for the benefit of newly inducted faculty members to brief them about the structure of academic processes and ordinances of HBNI. A total of forty-two new faculty members from different CIs/OCC of HBNI attended the program .

## Events at the HBNI Central Office

### Republic Day Celebration

The 74<sup>th</sup> Republic Day was celebrated at HBNI on January 26, 2022. Prof. P. D. Naik, Officiating Vice Chancellor and Dean, HBNI unfurled the National Flag followed by singing of National Anthem by HBNI functionaries and staff members present on the occasion. Prof. Naik then addressed the gathering of the HBNI functionaries and staff members. In his address, Prof. P. D. Naik gave a brief account of the recent achievements of HBNI, new academic programmes started, outreach activities undertaken and value-added courses conducted on NPTEL platform. This was followed by soulful performances of patriotic songs and poems by staff and students of HBNI. It was a momentous occasion with the spirit of patriotism at the centre of it all.



*Prof. P. D. Naik, Officiating VC and Dean HBNI saluting the National Flag after unfurling it*

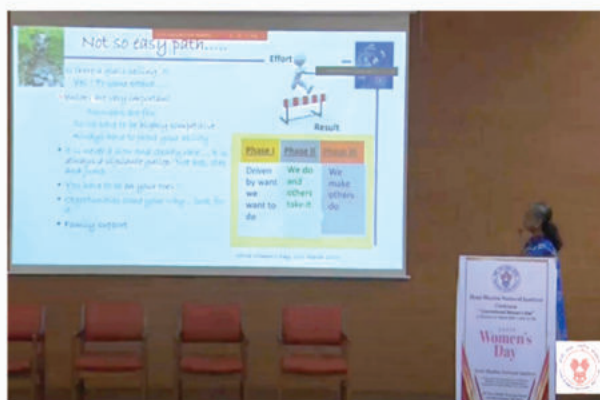
## International Women's Day Celebration

The Women's Cell of HBNI organized International Women's Day on March 21, 2023 at the central office by organizing a webinar titled "Reflections of a Nuclear Reactor Scientist," by Prof. Umasankari Kannan, Head, Reactor Physics Design Division, BARC, and Senior Professor, HBNI. The webinar was organized in hybrid mode and attended by a large number of students, staff and faculty of HBNI. In her talk, Prof. Kannan first talked about the challenges and barriers faced by women in the field of science and technology and how to address these. She then gave glimpses of her professional journey as a physicist in BARC, dwelling upon the challenges and hurdles faced and how she overcame them all to build a successful career as a nuclear reactor scientist. The talk was followed by a cultural program by HBNI students and staff members showcasing the rich cultural heritage of India through dance and music



*Prof. P. D. Naik, Officiating VC and Dean, HBNI (left) and Prof. D. K. Maity, Associate Dean, HBNI (right) addressing the gathering on International Women's Day celebration at HBNI*





*Prof. Umasankari Kannan delivering her talk*



*Cultural program presented by HBNI students and staff members*

## Theme/Interaction Meetings Conducted by HBNI

### (a) HBNI Interaction Meeting on Chemical Sciences at NISER, Bhubaneswar

The first HBNI interaction meeting on Chemical Sciences was organized by the School of Chemical Sciences, NISER, Bhubaneswar during 18-20th January 2023 in hybrid mode. The three-day meeting had lectures by expert faculties invited from different CIs of the HBNI, viz., BARC, IGCAR, SINP and Off-Campus Centre (OCC), NISER. The talks covered nearly all research areas in Chemical Sciences, including Inorganic Chemistry, Organic Chemistry, Bioinorganic Chemistry, Nuclear Chemistry, Materials Chemistry, Photochemistry, Environmental & Analytical Chemistry, etc. In addition, there were about 50 posters presented by young research scholars on the topic of their research in Chemical Sciences.



*Participants of the interaction meeting on Chemical Sciences held at NISER*

## (b) HBNI Theme Meeting on Life Sciences at SINP, Kolkata

The second Theme meeting on Life Sciences was organized by SINP, Kolkata, during February 16-17, 2023 in hybrid mode. The meeting was attended by faculty members and research scholars from BARC, ACTREC, IMSc, NISER, RRCAT and SINP along with the distinguished members from HBNI central office.

Prof. Gautam Bhattacharyya, Director, SINP welcomed the participants and emphasized the significance of such meetings to develop a common goal for the thematically connected topics in a time-bound manner. Prof, P. D. Naik, Vice-Chancellor (Officiating) and Dean, HBNI, pointed out the importance of collaborative efforts to take up challenging research projects. Prof. Naik and Prof. D. K. Maity, Associated Dean of HBNI, mentioned the usefulness of such discussion meetings for Ph.D. scholars as they get opportunities to interact and share their research findings with scholars and faculty members from other CIs/OCC of HBNI.

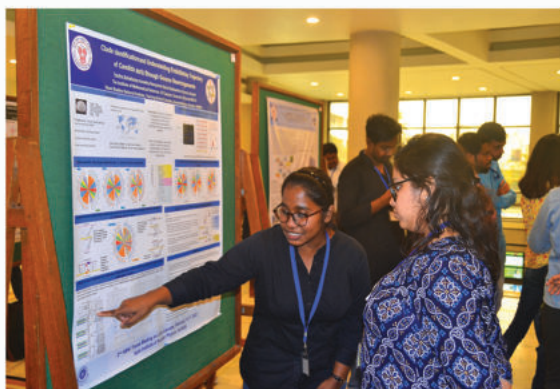
During scientific sessions over two days, twelve faculty members from different CIs and OCC of HBNI delivered talks and twenty eight Ph.D. scholars presented posters on diverse topics including disease biology, stress biology, metabolomics, wastewater treatment, agriculture, and theoretical biology. In a special session on Intellectual Property Rights, Prof. Prabuddha Ganguli, Honorary Professor of HBNI, delivered a very insightful lecture on “IPR-related strategic R&D for monetisation.” Prof. Ganguli pointed out the importance of patent literature containing advanced information on diverse research fields. In the concluding session, Prof. D. K. Maity mentioned about the excellent performance of the life sciences Ph.D. scholars with good overall publication records. It was noted that as a consequence of the two discussion meetings on Life Sciences held so far, several collaborations among faculty members of different CIs/OCC are evolving.



*Prof. Gautam Bhattacharyya,  
Director, SINP welcoming the gathering*



*Prof. Prabuddha Ganguli delivering  
lecture on IPR*



*Poster Session in progress*

## National Technology Day

National Technology Day is held every year on 11th May to celebrate the achievements & contributions of scientists. The day was established by the Prime Minister Atal Bihari Vajpayee, in honor of the tenth anniversary of the Pokhran Nuclear Test on May 11, 1999. HBNI celebrated National Technology Day on May 11, 2023 in hybrid mode. Shri D. K. Shukla, Chairman, Atomic Energy Regulatory Board (AERB) was the Chief Guest on the occasion and gave a talk on the topic “Nuclear Regulation in India: Evolution to Maturity”.

The program began by Prof. P. C. Selvin, Registrar, HBNI welcoming the gathering. In his introductory remarks, Prof. P. D. Naik, Dean, HBNI emphasized on the importance of converting high impact knowledge to technology and pointed out how HBNI is taking efforts to facilitate knowledge sharing among its CIs/OCC. Prof. U. Kamachi Mudali, VC, HBNI talked about the model of circular economy in which products are designed for durability, reuse and recyclability, and whereby materials for new products would come from old products. He also talked about adopting circular economy principles and practices for India’s nuclear power plants for the maximum use and indicated how safety regulations will play an important role in it.

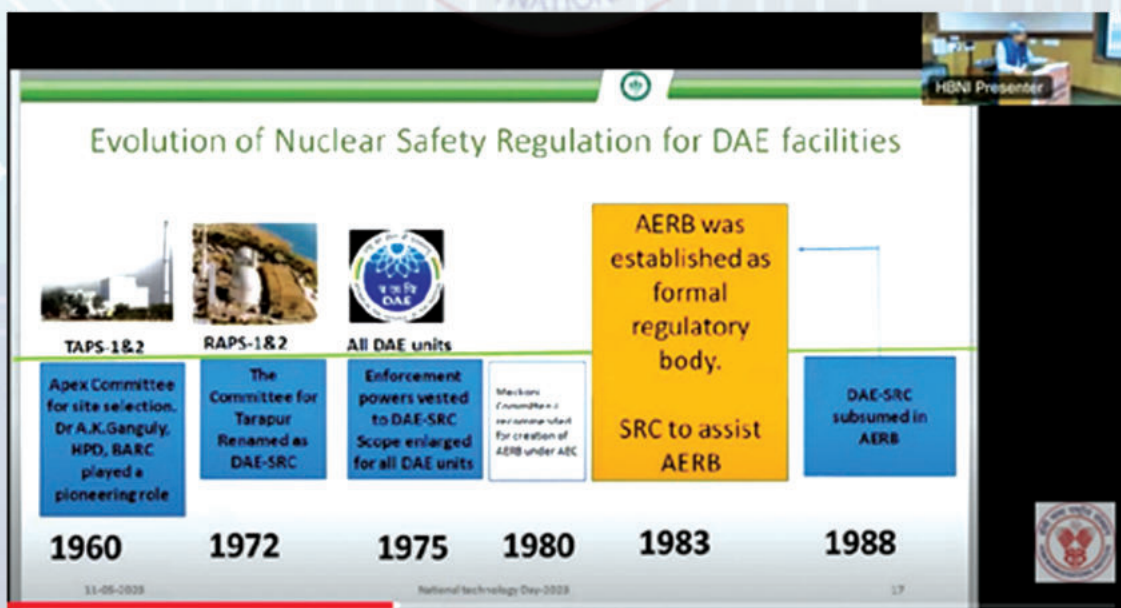


*Prof. U. Kamachi Mudali, VC, HBNI welcoming Shri D. K. Shukla, Chief Guest on the occasion of National Technology Day celebration at HBNI*



*Prof. P. D. Naik, Dean HBNI welcoming the gathering (left) and Prof. U. Kamachi Mudali VC, HBNI addressing the gathering on the occasion of National Technology Day celebration at HBNI*

In his talk, Shri D. K. Shukla gave a detailed account how since its inception in 1983 AERB has grown into an effective and vibrant regulatory body of international repute and followed procedures for the purpose of safety review and surveillance of the nuclear facilities including Nuclear Power Plants and fuel cycle facilities in DAE and non-DAE organizations. He concluded his talk by stating that AERB is completely geared up to face the future regulatory challenges for regulating diverse design of nuclear power plants and wide spread applications of high energy radiation.



*Shri D. K. Shukla delivering his talk on the occasion of National Technology Day celebration at HBNI*

## Prof. Srikumar Banerjee Memorial Programme

A second memorial programme in the honour of Prof. Srikumar Banerjee, Former Chancellor, HBNI, who was a great metallurgical scientist, academician par excellence, outstanding mentor and an institution builder, was organised on May 19, 2023 by HBNI. Prof. G. K. Dey, Former Director, Materials Group, BARC was the chief guest on the occasion. He gave an interesting and informative talk on the topic, “Role of Basic Research in Development of Materials,” where in he elaborated the role of basic research in alloy development and product making, understanding the unresolved structure of very common materials, and the manufacturing process development.



*Prof. U. Kamachi Mudali, VC, HBNI welcoming Prof. G. K. Dey, Chief Guest on the occasion of Prof. Srikumar Banerjee memorial programme at HBNI*



*Prof. U. Kamachi Mudali, VC, HBNI addressing the gathering*



*Prof. G. K. Dey delivering his talk on the occasion of Prof. Srikumar Banerjee Memorial programme at HBNI*

## Eighteenth Foundation Day Celebration of HBNI

The 18th Foundation Day of the Homi Bhabha National Institute (HBNI) was celebrated in hybrid mode at the DAE Convention Centre in Anushaktinagar, Mumbai on June 3, 2023. Prof. Subhasis Chaudhary, Director, Indian Institute of Technology (IIT), Bombay was the chief guest on the occasion. Dr. Ajit Sapre, Group President, Reliance Technology Group, Reliance Industries Pvt. Ltd., Mumbai was invited to deliver Prof. J. B. Joshi Research Foundation Endowment Lecture. Prof. A. K. Mohanty, Secretary DAE and Chairman, Council of Management, HBNI presided over the function. Prof. Anil Kakodkar, Chancellor, HBNI, Prof. Vasudeva Rao, Former Vice Chancellor, HBNI, Directors and Functionaries of HBNI at various CIs/OCC and Central Office, and a large number of faculty, alumni and students of HBNI participated in function, both online and offline modes. Outstanding students of the institute in various academic programmes and students selected for J.B.Joshi Research Foundation Innovation awards for the year 2022 were also honoured on the occasion.

The event began with the welcome address by Prof. P. D. Naik, Dean, HBNI, Prof. U. Kamachi Mudali, Vice chancellor, HBNI presented the annual report of HBNI for the period 2022-23. He gave a comprehensive overview of the progress of HBNI in various domains and informed the gathering about the new academic programmes of HBNI, value added courses and high value webinars and other events conducted by HBNI in the past year.



*Dignitaries on the dais during HBNI Foundation Day Celebration on June 3, 2023*



*Prof. P. D. Naik (left), Prof. U. Kamachi Mudali (center) and Prof. A. K. Mohanty (right) addressing the gathering on the occasion of HBNI Foundation Day*

Prof. A. K. Mohanty began his presidential address by congratulating all the award winners and degree holders and remarked that he is very certain that the educational journey of the students with HBNI has given them the skill and knowledge to fulfil the societal needs, innovative research, and entrepreneurship. He emphasized that HBNI is a confluence of different centres of excellence which have their own academic freedom but at the same time they all are bound together with a common cause of creating excellence in the field of nuclear science and technology. He expressed his happiness to know about the high quality of research work being carried out at CIs/OCC of HBNI which has led to not only a steady rise in high quality publications in peer reviewed international journals but also promoted translational research by converting the latest research into new technologies. He also released two books titled, “Nuclear Reactor Thermal Hydraulics” edited by A. K. Nayak, G. Vaidyanathan, K. Velusamy, A.K. Dureja, Naveen Kumar, A.M. Vaidya, Mukesh Dhiman and A. J. Gaikwad and “Nuclear Fuel Cycle” edited by B. S. Tomar, P. R. Vasudeva Rao, S. B. Roy, Jose P. Panakkal, Kanwar Raj, A. N. Nandakumar.



*A book titled, “Nuclear Reactor Thermal Hydraulics,” being released by Prof. A.K. Mohanty, Secretary, DAE and Chairman, Council of Management, HBNI*

Prof. Subhasis Chaudhary distributed the degree certificates and also presented the awards to outstanding students of Ph.D., M.Tech, M.D., D.M. and M.Ch programmes. He congratulated the award winners and students who received their degrees on the occasion and shared his nuggets of wisdom with them. He remarked that today's Indian youth is highly aspirational and it is the responsibility of people who are a part of education sector to create educational institutes which not only provide quality education but also empower them with the skills which not only help them prosper but also ensures growth and prosperity of the nation.



*Prof. Subhasis Chaudhary delivering his address on the occasion of HBNI Foundation Day*



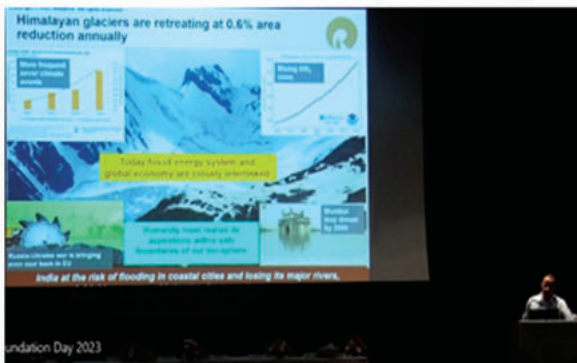


*Outstanding Student Award winners receiving their awards from Prof. Subhasis Chaudhary*

Followed by this, Dr. Ajit Sapre presented the J B Joshi Research Foundation Innovation awards and delivered an inspiring and thought-provoking lecture titled, “Climate Change, Sustainability, and Energy transition: One perspective.” He said that Global energy demand is expected to rise about 25% by 2040, mainly driven by developing countries, and thus there is a greater need of clean energy sources that can take care of the rising energy demand as well as emit less/zero CO<sub>2</sub> emissions in the atmosphere. He also elaborated on the technologies which are being developed and implemented by Reliance Industries (RIL) to help and meet RIL’s net zero goals. These technologies include advances in the areas of biofuels, chemicals, synthetic biology, advanced materials, novel catalysts, and reactors.



*J B Joshi Research Foundation Innovation Awardees receiving their awards from Dr. Ajit Sapre*



*Dr. Ajit Spare delivering the talk*



*Prof. Selvin proposing vote of thanks*



*Glimpses of the cultural program presented by HBNI students, staff, and faculty members*

Prof. Christopher Selvin, Registrar proposed the vote of the thanks which was followed by National Anthem. The Foundation Day celebration concluded with a colourful cultural programme presented by enthusiastic HBNI students, staff, and faculty members.

## Outstanding Student Awards for the Year 2022

**Pranav Utpalla**

CHEM01201704012

**Thesis Title:***Investigation of the Molecular Packing in Polymer Nanocomposites and its Role on the Bulk Physical Properties*

Ph.D (Chemical Sciences)

**Sudip Sau**

CHEM11201704027

**Thesis Title:***Sustainable Approaches towards C-X (-N, -C, -O) Bond Formation Reactions in Organic Synthesis***Punit Arora**

ENGG01201604012

**Thesis Title:***A Modified Cyclic Plasticity Model for C-Mn Steel and a New Critical Plane Model to Predict Crack Initiation Under Multiaxial Cyclic Loading*

Ph.D (Engineering Sciences)

**Sagar Chandra**

ENGG01201704002

**Thesis Title:***A Multiscale Model for Simulation of Plastic Deformation Behavior of Ni-based Alloys with Explicit Consideration of the effect of Grain Boundries***Prafful Kumar Sinha**

ENGG01201804018

**Thesis Title:***Oxidation and Electrochemical Behaviour of an Alpha-phase Titanium Alloy in Different Environments*

## Outstanding Student Awards for the Year 2022



**Amiya Agrawal**

HLTH09201909053

*MD in Radiation Oncology*



Medical & Health Sciences



**Shubham Suryavanshi**

HLTH09201909038

*MD in Radiodiagnosis*



**Shubham Kumar**

ENGG01201901058

Thesis Title:

*Development of Alumina/Aluminide Coating on P91 Steel by Pack Cementation and Thermal Oxidation*



M. Tech



**Pranshu Pareek**

ENGG01201901071

Thesis Title:

*Studies on Purification of <sup>90</sup>Sr from Simulated High Level Radioactive Liquid Waste using Liquid Membranes in Hollow Fiber Membrane Contactor*



## Outstanding Student Awards for the Year 2022



**Janani R**

LIFE10201604004

**Thesis Title:**

*Exposome and Health: Characterization and Network-based Exploration of Diverse Environmental Chemical Spaces*



Ph.D (Life Sciences)



**Reema Chaudhary**

LIFE01201504013

**Thesis Title:**

*Molecular Studies on Cell Division Regulation in *Deinococcus radiodurans* R1*



Medical & Health Sciences



**Minit Jalan Shah**

HLTH09201910043

*DM in Medical Oncology*



**Devesh Sanjeev Ballal**

HLTH09201910016

*M.Ch. in Surgical Oncology*



## Outstanding Student Awards for the Year 2022



**Ritesh Ghosh**

PHYS05201704023

**Thesis Title:**

*A Study on some Aspects of Hot and Dense QCD Matter*



**Avik Das**

PHYS01201604001

**Thesis Title:**

*Formation of Hierarchical Nanostructured Micro-granule by Self-assembly and its Characterization by Small-angle Scattering*



**Saptarshi Roy**

PHYS08201405005

**Thesis Title:**

*Implementation of Quantum Information Protocols in Physical Systems*



**Rabindra Nath Juine**

PHYS02201604004

**Thesis Title:**

*ZnS Nanoparticles for Photocatalysis, Optical Detector and Environmental Remediation*



Ph.D (Physical Sciences)

## J B Joshi Research Foundation Innovation Awards for the Year 2022



**Shrinkhla Ghidiyal**

ENGG01201404005

Thesis Title:

*Modeling and Analysis of Fabry Perot Interferometer for Pressure Sensors with Metallic Diaphragms*



**Kathakali Sarkar**

LIFE05201504002

Thesis Title:

*Synthetic Genetic Devices for Higher Order Information Processing in Living Cells*



**Sandeep K C**

ENGG01201504021

Thesis Title:

*Studies on the Recovery and Separation of Hydrogen Isotopes from Inert Gas*



**Madhura Bellippady**

ENGG02201505013

Thesis Title:

*Development of Interlayer Coatings on High-density Graphite for Yttria Coating for Pyrochemical Reprocessing Application*



## International Yoga Day

International Yoga Day is observed every year on June 21 to raise awareness about this ancient practice and to celebrate the physical and spiritual prowess that yoga has brought to the world. HBNI celebrated 9th International Yoga Day on June 21, 2023. with great enthusiasm. It was attended by functionaries, staff members of HBNI and Human Resource Development Division (HRDD), BARC, as well as Trainee Scientific Officers, Training School, BARC and students of HBNI.

The event began with Smt. Bharati Suvarna, Administrative Officer-III, HBNI welcoming the guest of honors, Dr. Vijay Kumar, Shri P. K. Pillai, and Smt. Bindu Jayprakash, eminent yoga instructors from Yoga Circle, BARC Staff Club, Anushaktinagar and the gathering. Prof. A. K. Dureja, Head, HRDD and Associate Dean, HBNI then addressed the gathering and gave a brief introduction about the Yoga Day and the importance of incorporating yoga into daily life.

Warm up exercises were taken and all the participants practiced and performed sitting and standing Asanas and Pranayama. Importance of these were explained simultaneously by yoga instructors. The yoga instructors also provided detailed explanations of each pose and offered guidance on precautions to be taken. The session lasted for over an hour witnessing active participation and engagement from all the participants.

The celebration concluded with a vote of thanks by Prof. P. C. Selvin, Registrar, HBNI



*VC, HBNI with the participants present on the occasion of International Yoga Day celebration at HBNI*





*Yoga session in progress during International Yoga Day celebration at HBNI*

## Courses conducted by HBNI

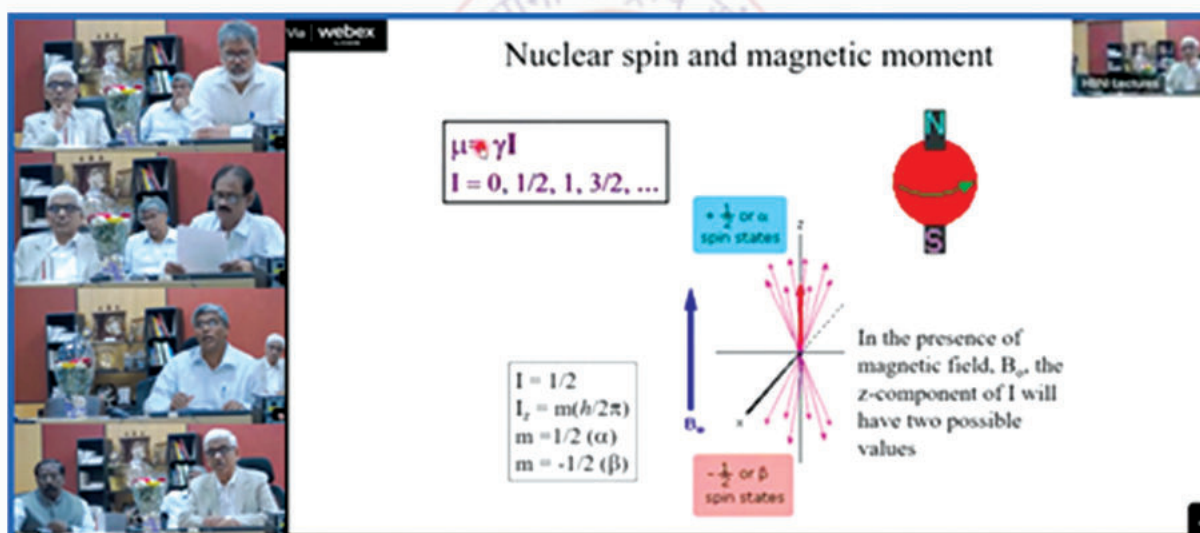
During the period January 2023 to June 2023, two online courses were organized by HBNI. The details about the courses are given below.

### **Online Course on “Research Methodology, Research and Publication Ethics” for HBNI Students**

As per University Grants Commission guidelines applicable from December 2019, two credit Course for awareness about publication ethics and publication misconducts entitled “Research and Publication Ethics” (RPE) is mandatory for all Ph.D. students for pre-registration course work. Accordingly, a 40-lecture course on Research Methodology, encompassing the RPE course, was conducted in all CIs/OCC of HBNI during January-March 2023. The course had three modules, namely, (i) Module A: Research design and methods (15 lectures), (ii) Module B: Research and Publication ethics (10 lectures) and (iii) Module C: Computational and experimental methods (minimum 15 lectures). Lectures on Module A and B were conducted by HBNI Central Office, while Module C was conducted by CIs/OCC. The lectures on Module A and B were delivered by Prof. B. S. Tomar, Prof. Prabuddha Ganguli, Prof. B. K. Nayak (Module A), and Prof. V. Siruguri (Module B). The course was attended by 389 Ph.D. students from different CIs/OCC of HBNI and was well received.

## Online Course on “Advanced NMR Spectroscopy”

An online interactive course on “Advanced NMR Spectroscopy” is being conducted by HBNI presently. The course is formulated into Part-I and Part-II. The Part-I of the course was conducted during January to May 2023. The course is coordinated by Prof. Haridas Pal, Associate Dean HBNI and Raja Ramanna Fellow. The course was formally inaugurated by Padma Shri Prof. R. V. Hosur, Former Director, Centre for Excellence in Basic Sciences (CEBS), Mumbai, on January 23, 2023. In his inaugural address, Prof. Hosur gave an overview of NMR spectroscopy and its applications.



*Screenshot of the inaugural function of Advanced NMR Spectroscopy Course*

The major topics covered in the Part-I of the “Advanced NMR Spectroscopy” course included basic understanding of NMR spectroscopy and NMR instrumentation, heteronuclear NMR, multi-dimensional NMR, NMR for chiral and spin decoupled systems, NMR for diffusive systems, and solving of molecular structures using NMR. Research scholars and scientists from a variety of academic institutes and industrial establishments across the country participated in the Part-I of the course and got the benefit thereof. The Part-II of the course will cover the advanced aspects of NMR spectroscopy and will be conducted during July to September 2023.

## NPTEL Courses by HBNI

### Course on Nuclear and Radiochemistry

The NPTEL course on Nuclear and Radiochemistry has been curated by Prof. B. S. Tomar, Former Institution Chair Professor, HBNI and aims to benefit M.Sc. and Ph.D. students in the subject area. The course deals with the study of nuclear properties of elements using chemistry as a tool. The topics covered in the course include the fundamentals of radioactivity, nuclear decay, nuclear structure and stability, nuclear models, nuclear reactions including fission, radiochemical practices and chemistry of actinides. A total of 767 learners enrolled for the course and benefitted from it.

## Events at the CIs/Off-Campus Centre (OCC)

### Diamond Jubilee Celebration of Institute of Mathematical Sciences - IMSc 60

The Institute of Mathematical Sciences (IMSc) a constituent institution of HBNI, is celebrating its 60th foundation year in 2022-2023. To commemorate this momentous occasion, a virtual event, “IMSc 60 celebration” was organized by IMSc. during Jan 2-5, 2023 with an aim to celebrate all areas of science and to bring together the scientific community encompassing scientists, nation-builders, policy-makers and research scholars not only to honor and recognize the remarkable scientific contributions made in past but also to strengthen India’s scientific vision for the next decade and help India to lead the global research landscape. The event was inaugurated by Prof. V. Ravindran, Director of the Institute, on January 2, 2023. The four day event included lectures by eminent scientists on wide variety of topics encompassing mathematics, theoretical physics, theoretical computer science and computational biology, the event also included other conferences and academic programs across all research groups. A poster session, release of special stamp to commemorate IMSc 60, release of special volumes of the Tamil Nadu Science Forum (TNSF) science outreach magazines, “Thulir” and “Jantar Mantar”, featuring the contributions of IMSc members over the years, panel discussions and a cultural dance event were also part of the celebrations.

### **National Science Day Celebrations at RRCAT**

RRCAT celebrated the National Science Day on 25th and 26th February by holding an open house for the school and college students, teachers, family members and guests of RRCAT staff and invitees from public. The theme of this year's National Science Day was "Global Science for Global Wellbeing".



*National Science Day-2023 celebration at RRCAT*

### **International Women's Day Celebration at IGCAR**

IGCAR organized a week-long celebration on the occasion of the International Women's Day during from March 1-8, 2023. Several special lectures by women speakers and various competitions for women employees of IGCAR were organized as a part of celebration. Smt. M. Leela Meenatchi, IIS Joint Director, NSD, RNU, Chennai delivered a special address on "Who is Preventing Us from being a Leader?" on March 3, 2023. Ms. Renu Maheshwari, SEBI Registered Investment Advisor and Co-founder, Finscholarz Wealth Managers delivered a special lecture on the topic, "Know Your Money," on March 6, 2023. Miss Blossom Rodriguez, the founding member of Mehetva school for special children and Miss Chitra Swaminathan, Mehetva member were honored and girl students from nearby schools who excelled in studies, sports and cultural activities were also felicitated. All the employees of IGCR actively participated in the event.



*Glimpses of International Women's Day Celebrations at IGCAR*

### **IPR-LDCE National Technology Day 2023**

IPR, in association with LD College of Engineering, Ahmedabad conducted a 2-day program to celebrate the National Technology Day 2023 (NTD 2023) at the LDCE campus at Ahmedabad during May 18-19, 2023. This is the second year in succession that IPR and LDCE are jointly conducting this state level programme. The guests of the event were Shri Nilesh M. Desai (Director SACISRO), and Dr. Shashank Chaturvedi (Director IPR). The NTD2023 showcased several competitive events such as Quiz, Skit, Elocution, Code and Circuit Debugging, Technical Models and Drafting Dynamics. Student participants from engineering colleges across Gujarat also exhibited their scientific projects at the event.



*View the exhibition of Plasma as well as the technical models by engineering students*



*Director, IPR lighting the lamp and addressing the gathering during inauguration of the event*



*Glimpses of IPR-LDCE National Technology Day Celebrations at LDCE Campus*

## Scientific Outreach Activities Conducted by CIs/OCC

### Scientific Outreach Activities conducted by IPR

During the period January 2023 to May 2023, IPR organized several outreach activities for students of various schools and colleges all over India with a main objective to create awareness about plasma and its applications among the students.

In the month of February 2023, the Outreach Cell of Centre of Plasma Physics-Institute for Plasma Research (CPP-IPR) conducted two “Seminar-cum-Workshop on Plasma Physics”. The main objective of these programmes was to sensitize the college students of North Eastern region of India about plasma physics. The first programme was held at Jagiroad College, Jagiroad, Assam on February 2, 2023 and was attended by 43 students from Jagiroad college and 11 students from Dimoria College, Khetri, Assam. The second programme was conducted at Anandaram Dhekial Phookan College, Nagaon, Assam on February 17, 2023 and was attended by more than 250 students of the college.



*Scientific Outreach activity by IPR at various colleges of Assam*

## Scientific Outreach Activities conducted by NISER

The Khordha District Administration, Tata Memorial Center, and NISER co-hosted a Cancer Awareness Programme on February 4, 2023, at the Pathani Samanta Auditorium, NISER. Around 700 students from universities, colleges, and high schools participated in the programme. NISER hosted the First P. K. Parija Lecture in Life Sciences on March 24, 2023, thanks to a generous also endowment fund from the Prof. Pran Krushna Parija Charitable Trust (Odisha). Professor K. Vijay Raghavan, a DAE Homi Bhabha Chair Professor at National Centre for Biological Sciences, Bengaluru, delivered the lecture titled ‘The Brain in Development, Health and Illness.’”

## Awards and Academic Honors Received by HBNI Faculty

- ◆ Prof. Archana Sharma, BARC, has been elected as Governing Council member of INAE for the period 2023-24. She has also got recognition as “Torch Bearer of Indian Women in STEM” by IW3D Printing Organization and by Indian National Academy of Engineering (INAE)-Vigyan Prasar. Her name features in the book Women Engineers of India-Vol.1, 2023.
- ◆ Prof. J. Mohanty, BARC, has received IUPAC 2023 Distinguished Award for Women in Chemistry.
- ◆ Prof. Awadesh Kumar, BARC has been elected as a fellow of National Academy of Sciences (NASI).
- ◆ Dr. Dimple Dutta, BARC has been elected as a member of Royal Society of Chemistry, UK.
- ◆ Dr. J. Mohanty, BARC has been selected for the prestigious IUPAC Distinguished Woman award in Chemistry for the year 2023.
- ◆ Dr. Sugam Kumar, BARC, has been selected as an Associate of Indian Academy of Sciences (IASc), and Member of The National Academy of Sciences, India in 2022. He has also been awarded DAE-SSPS Young Achiever Award-2022.



- ◆ Dr. Sharmistha Dutta Choudhury, BARC, has been elected as a member of Maharashtra Academy of Sciences.
- ◆ Dr. Veerendra K. Sharma, BARC, received Indian Physics Association-Buti Foundation Award 2022.
- ◆ Dr. K. R. S. Chandrakumar, BARC, has been awarded CRSI Bronze Medal by Chemical Research Society of India.
- ◆ Prof. V. Sudarsan, BARC, has been awarded Society for materials Chemistry (SMC) Silver Medal.
- ◆ Dr. V. G. Gupta and Dr. B. P. Mandal and Dr. Jitendra Bahadur, BARC, have been awarded Society for materials Chemistry (SMC) bronze medal.
- ◆ Prof. S. M. Yusuf, BARC, has been elected as President of Indian Physics Association (IPA).
- ◆ Dr. Kinshuk Dasgupta, BARC has received UDCT Alumni Association (UAA)-ICT Distinguished Alumnus (Research) award, 2022.
- ◆ Dr. John Philip, IGCAR has been appointed as Associate Editor of Hybrid Advances of Elsevier Publishers.
- ◆ Prof. Arup Dasgupta, IGCAR, has been elected as a Fellow of IIM for the year 2022. He has also received “The Above and Beyond Appreciation for Editorial Leadership” award from Springer for the year 2022.
- ◆ Dr. B. B. Lahiri, IGCAR has received Young Achiever Award, at the DAE Symposium on Nuclear Physics 2022.
- ◆ Dr. M. Vasudevan, IGCAR has been selected as an Editorial Board Member of Journal, “Engineering Failure Analysis” published by Elsevier Publishers.
- ◆ Dr. Dirtha Sanyal, VECC has been elected as a Fellow of the Royal Society of Chemistry, UK.
- ◆ Dr. Pratap Roy, VECC, has been awarded the IPA "Aswini Kumar Rath Memorial Award" in Nuclear Physics for the year 2022. He has also received Young Achiever Award-2022 at DAE Symposium on Nuclear Physics 2022



- ◆ Dr. Sangram Bagh, SINP, has been elected as a Fellow of the Royal Society of Chemistry, UK.
- ◆ Dr. Sudip Chakraborty, HRI has been appointed as Editorial Advisory Board member of Energy Advances, a journal of Royal Society of Chemistry (RSC), UK.
- ◆ Dr. Kirtiman Ghosh, IoP, has received prestigious MATRICS (Mathematical Research Impact Centric Support) grant funded by the Science and Engineering Research Board (SERB) for the theoretical research and development of some specific new variants of Extra Dimensional Model.
- ◆ Dr. Shamik Banerjee, IoP, has been awarded the INSA Young Scientist Award 2022.
- ◆ Prof. Bedangadas Mohanty, NISER has been appointed as Deputy Spokesperson of the ALICE experiment at the Large Hadron Collider in CERN starting January 2023 for a period of three years. He has also been appointed as Editorial Board Member, Journal of Superconductivity and Novel Magnetism (Springer), Associate Editor, Frontiers of Physics in Condensed matter physics (Frontiers) and Associate Editor, Frontiers in Nanotechnology in the Section of Nano electronics (Frontiers).
- ◆ Dr. Himansu Sekhar Biswal, NISER, has become an affiliate member of the Royal Society of Chemistry, UK. He also holds the post of Member, Board of Studies, Chemistry, HBNI, Member Project Assessment Committee, DST, Govt. of Odisha, Member, Board of Studies, Chemistry, CET, Odisha, Member, Board of Studies, Chemistry, Berhampur University, Odisha.
- ◆ Dr. Ponneri C. Ravikumar, NISER, has been awarded with CRSI Bronze Medal, 2022. He is also recognized by American Chemical Society (ACS) as Top 3% highly cited ACS Author from India.
- ◆ Dr. Amaresh Jaiswal, NISER, has received Young Achiever Award, at the DAE Symposium
- ◆ Dr. Palok Aich, NISER, has been elected as Editor-in-Chief, Microenvironment and Micro ecology Research, TMR publishing Group, New Zealand and as Guest Editor, Special issue on Role of Microbial Metabolites in the Regulation of Host Immunity and Metabolism, Metabolites, MDPI, Basel, Switzerland.

- ◆ Dr. Asima Bhattacharyya, NISER has been appointed as an Editorial Board Member, Current Research in Physiology (Elsevier); Guest Editor, Frontiers in Microbiology (Frontiers); and Handling Editor, Frontiers in Oncology (Frontiers).
- ◆ Dr. Manjusha Dixit, NISER, has been appointed as Guest Editor, Journal of Visualized Experiments, Cambridge.
- ◆ Dr. Debasmita P. Alone, NISER has become a Co-opted Member, Expert committee in Life Sciences on SRG, NPDF & ECRA schemes in SERB, New Delhi, India.
- ◆ Dr. Sutanu Roy, NISER, has been selected as a CNRS visiting researcher, Laboratoire de mathématiques de Besançon, France.

## Awards Received by HBNI Students

- ◆ Shri Rajath Alexander, BARC has received Young Scientist in Material Science award by Indian Science Congress Association for his paper titled, “Synthesis of three-dimensional self-assembled carbon nanotube aerogel and its application as a high-performance virus filter,” in January 2023.
- ◆ Shri Amit Kumar Sharma, BARC received Best Poster Award for his poster titled, “Comparative Study of Radiopeptides,  $^{177}\text{Lu}$ -DOTA-A9 and  $^{177}\text{Lu}$ -DOTA-PEG4-A9 Targeting HER2-receptors in Breast Cancers”, at 1st HBNI interaction meeting in Chemical Sciences, NISER, Bhubaneswar, 18-20 Jan, 2023. He also received Best Poster Award given by American Chemical Society (ACS) for his poster titled, “Electrochemical and Spectroscopic Investigation of HER2-Targeting Peptide”, in the Conference on Electrochemistry for Industry, Health and Environment, Mumbai, 7 – 11 Feb, 2023.
- ◆ Ms. Debarati Das, BARC received Best Poster Award for her poster titled, ‘Defect and valence engineering in  $\text{CeO}_2$  through aliovalent ion doping for enhanced activity towards ORR catalysis”, in the Conference on Electrochemistry for Industry, Health and Environment, Mumbai, 7–11 February, 2023.

- ◆ Ms. Sudipa Manna, BARC received Best Poster Award for her poster titled, “BiVO<sub>4</sub> and 3D Graphene Nano Composite Photoanodes for Improved Photoelectrocatalytic Splitting of Water”, at 1st HBNI interaction meeting in Chemical Sciences, NISER, Bhubaneswar, held during Jan 18-20, 2023. She also received ACS Best Oral Presentation Award for her paper titled, “Catalyst-carbon nanocomposites for enhanced electrochemical & photoelectrochemical water splitting”, in the Conference on Electrochemistry for Industry, Health and Environment, Mumbai, held during February 7–11, 2023.
- ◆ Mr. D Satish Kumar, BARC received Best Paper Award for his paper titled, “Developing Methodology for Evaluating Design Basis Flood Level (DBFL) for Coastal Sites of Nuclear Facilities,” at PhD Connect Conclave 2023 Elevator's Pitch - Physical & Numerical Studies.
- ◆ Ms. K. Swetha, BARC received second prize in Best Poster award category for her poster titled, “Groundwater contaminant source identification using simulation optimization technique,” at PhD Connect Conclave 2023 - Smart Technologies.
- ◆ Ms. Swarnima Rawat, Ph.D. (Chem. Sci.), BARC has been selected as one of the winners of Popular Science Stories-Ph.D. category award by AWSAR-DST (Department of Science and Technology) in March 2023.
- ◆ Mr. Krishna Kumar Yadav received Best oral presentation award in National Symposium (AMALGAM- 2023) on Recent trends in Metallurgy & Material Science held at IIT Madras during April 22-23, 2023.
- ◆ Shri Surendra Yadav, RRCAT, has received Innovative Students Project Award (ISPA), 2023, for Best Thesis presentation.
- ◆ Mr. Jaydeep Joshi (ITER-IPR) has been adjudged as the Winner of the Fronius India Best Welding Engineer Competition for the year 2022.

# Core Values of Homi Bhabha National Institute





## होमी भाभा राष्ट्रीय संस्थान

### Homi Bhabha National Institute

( परमाणु ऊर्जा विभाग की एक सहायता प्राप्त संस्था और यूजीसी 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 )