अणुविद्या

HBNI NEWSLETTER

Issue No: 11 | June 2024

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 Centres

HRI, Prayagraj

MPMMCC & HBCH
Varanasi

VECC, Kolkata

RRCAT, Indore

SINP, Kolkata

IPR, Gandhinagar

NISER, Bhubaneswar

BARC, Mumbai

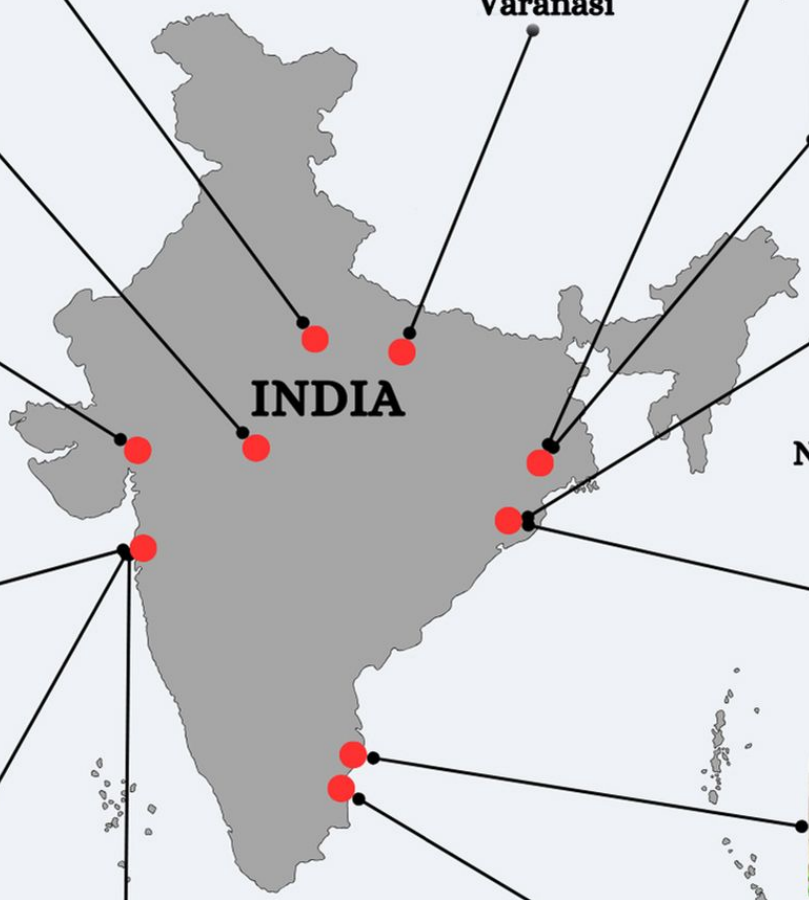
IoP, Bhubaneswar

TMC, Mumbai

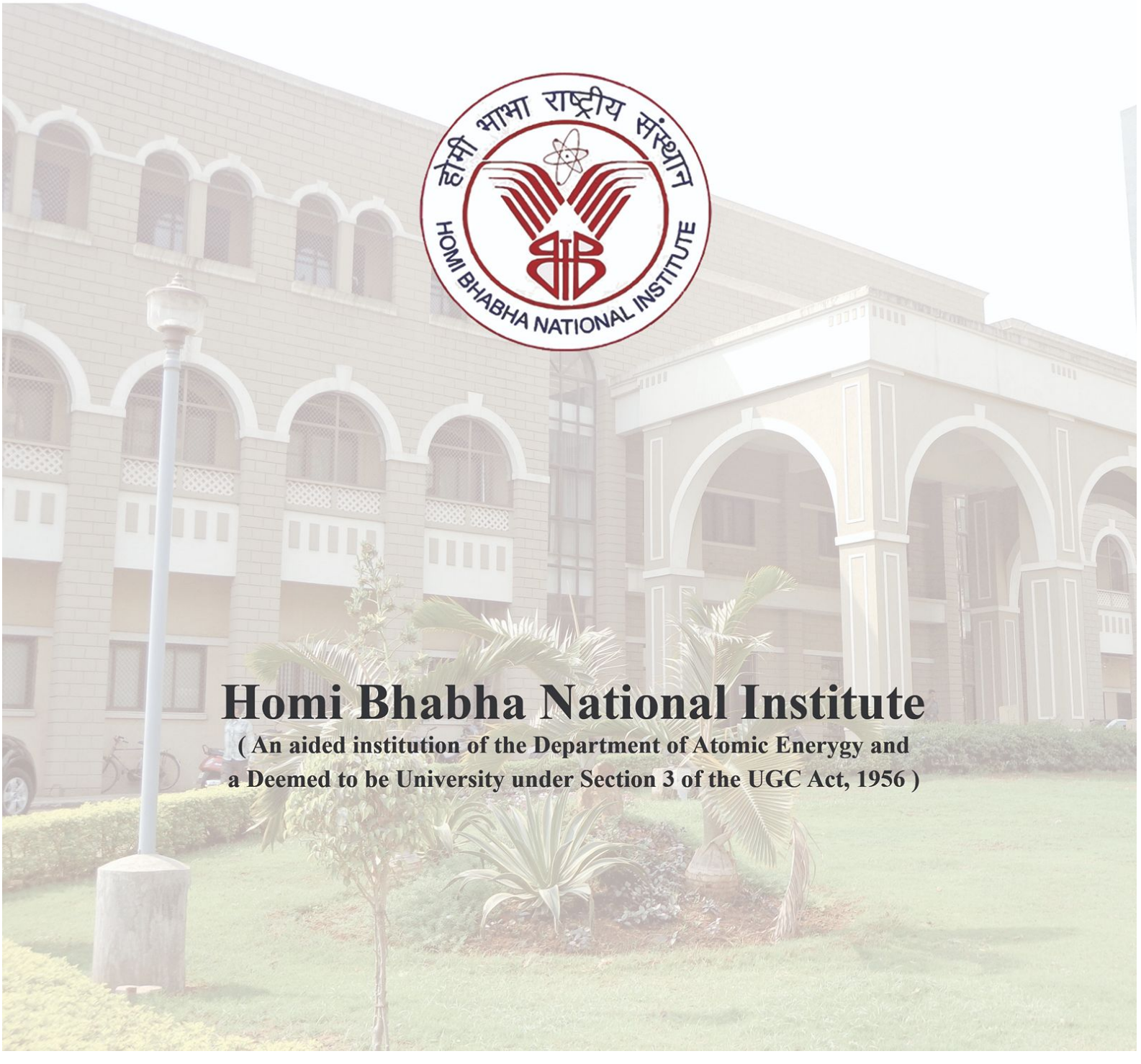
IMSc, Chennai

HBNI Central Office

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)

Council of Management

(As on June 30, 2024)

Prof. A. K. Mohanty, Secretary DAE & Chairman, AEC	Chairman
Prof. U. Kamachi Mudali, Vice Chancellor, HBNI	Member
Shri Vivek Bhasin, Director, BARC	Member
Ms. Seema Jain, Member (Finance), AEC	Member
Shri Shankar V. Nakhe, Director, RRCAT	Member
Prof. Sudeep Gupta, Director, TMC	Member
Prof. Gautam Bhattacharyya, Director, SINP	Member
Prof. V. Ravindran, Director, IMSc	Member
Prof. Mustansir Barma, Professor Emeritus, TIFR Centre for Inter-Disciplinary Sciences, Hyderabad	Member
Prof. Surendra Prasad, Former Director, IIT, Delhi	Member
Prof. A. K. Tyagi, Dean, HBNI	Member
Dr. P. C. Selvin, Registrar, HBNI	Non-Member Secretary

Academic Council

(As on June 30, 2024)

Prof. U. Kamachi Mudali, Vice Chancellor, HBNI	Chairperson
Prof. A. K. Tyagi, Dean, HBNI	Member
Shri Vivek Bhasin, Director, BARC	Member
Shri C. G. Karhadkar, Director, IGCAR	Member
Shri Shankar V. Nakhe, Director, RRCAT	Member
Prof. Sumit Som, Director, VECC	Member
Prof. Gautam Bhattacharyya, Director, SINP	Member
Prof. Shashank Chaturvedi, Director, IPR	Member
Prof. Karuna Kar Nanda, Director IoP	Member
Prof. V. Ravindran, Director, IMSc	Member
Prof. Dileep Jatkar, Director (Acting), HRI	Member
Dr. Sudeep Gupta, Director, TMC	Member
Prof. H. N. Ghosh, Director, NISER	Member
Prof. Siva Umapathy, IISc, Bengaluru	Member
Prof. Manoj K. Tiwari, IIM, Mumbai	Member
Prof. Devang Khakhar, IIT, Bombay	Member
Prof. S. M. Yusuf, BARC	Member
Dr. Pankaj Chaturvedi, TMC, Mumbai	Member
Prof. A. Srinivasan, NISER, Bhubaneswar	Member
Prof. Pranay Swain, Convenor, BoS (Applied Systems Analysis)	Member
Prof. Bedangadas Mohanty, Convenor, BoS (Physical Sciences)	Member
Prof. R. Tewari, Convenor, BoS (Engineering Sciences)	Member
Prof. Partha Saha, Convenor, BoS (Life Sciences)	Member
Prof. Meena Mahajan, Convenor, BoS (Mathematical Sciences)	Member
Prof. S. D. Banavali, Convenor, BoS (Medical & Health Sciences)	Member
Prof. P. K. Mohapatra, Convenor, BoS (Chemical Sciences)	Member
Prof. C. Gunanathan, Convenor, BoS (Int.Master's Programme)	Member
Dr. P. C. Selvin, Registrar, HBNI	Secretary

From the Vice Chancellor's Desk

I am very happy to present the June 2024 issue of HBNI Newsletter, Anuvidhya.

In continuation to the organization of unique online courses of high value, HBNI conducted three online courses during the period January 2024 -June 2024, which include, (i) Disaster Management-Challenges in CBRN Emergencies-Part-II, (ii) Research Methodology, Research and Publication Ethics, a mandatory course for all Ph.D students for pre-registration course work, and a unique course on (iii) Structural Integrity Assessment of Mechanical Components: Concepts & Procedures, which was jointly organized with National Institute for Nuclear Science and Technology (INSTN), CEA, France during March 11-15, 2024.

A one Day National Workshop on "Career Opportunities in Industry" was organized by HBNI Industry Linkage Centre on April 5, 2024 for the benefit of doctoral students of Chemistry and Chemical Engineering as a part of brainstorming session towards Viksit Bhartat@2047 campaign of Govt. of India. HBNI also organized a seminar on "India's Techade-Chips for Viksit Bharat: Breakthroughs in Semiconductor Research," as a part of this campaign. Five HBNI Alumni webinars were conducted during this period. The video recordings of these webinars can be accessed on YouTube channel of HBNI, HBNI Webinar. In association with Madurai Kamaraj University, HBNI conducted an Outreach workshop on Advances in Chemical, Physical and Life Sciences during February 8-10, 2024.

The 19th Foundation Day of HBNI, celebrated on June 3, 2024, received excellent response from students and faculty of the institute. The distinguished presence of Prof. T. G. Sitharam, Chairman, AICTE as Chief Guest on the occasion and his address to the gathering was inspiring element of the event. An MoU between HBNI and Confederation of Indian Industry (CII) Western region, Mumbai was signed on this occasion in the august presence of Prof. A. K. Mohanty, Secretary, DAE & Chairman, AEC, Dr. Anil Kakodkar, Chancellor, HBNI and Ms. Seema Jain, Member (Finance), AEC. HBNI for the first time organized "Anurang" an Annual Cultural Festival with lively participation of students from its CIs/OCC on June 3, 2024. It is now decided to organize the Annual Cultural Festival every year on rotation basis at various CIs/OCCs of HBNI.

I take this opportunity to congratulate HBNI faculty members and students who have received awards, academic honors and fellowships during this period.

U Kamachi Mudali

U. Kamachi Mudali
Vice Chancellor, HBNI

In This Issue……..

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)
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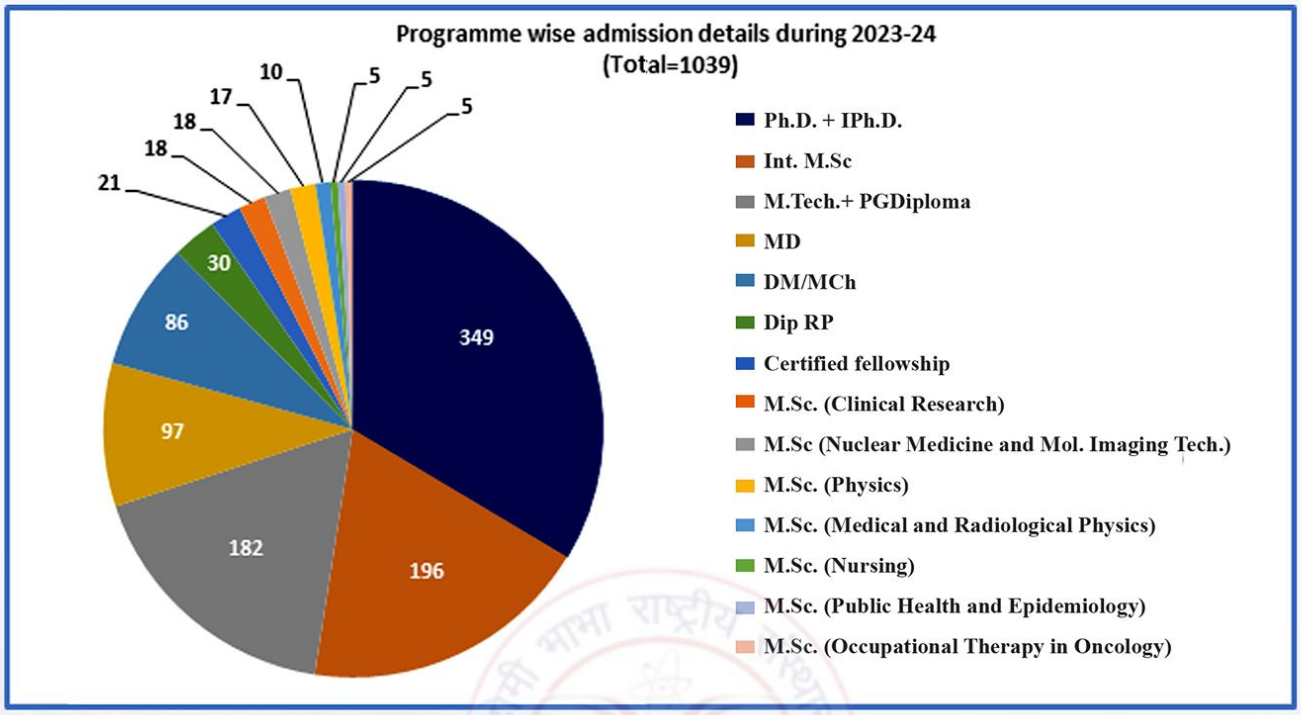
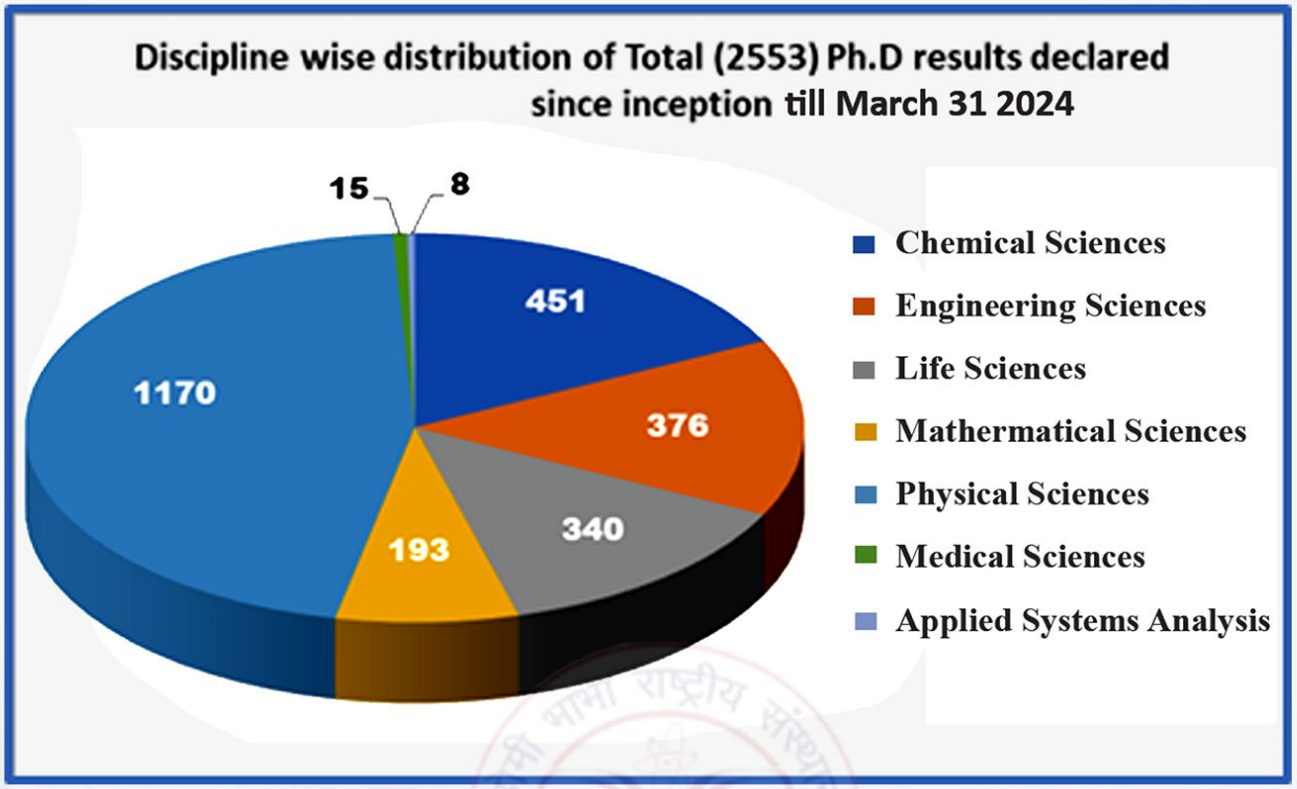
Academic Data of HBNI



CIs/OCC wise enrolment data for 2023-24

Academic Programme	BARC	IGCAR	RRCAT	VECC	SINP	IPR	TMC	IoP	IMSc	HRI	NISER	Total
Ph.D. + Integrated Ph.D	57	35	8	7	22	27	47	9	15	20	102	349
M.Tech + PG Diploma	154	20	....	....	....	8	....	....	....	....	....	182
M.D.	6	....	....	....	....	....	91	....	....	....	....	97
Dip RP	30	....	....	....	....	....	....	....	....	....	....	30
D.M./M.Ch	....	....	....	....	....	....	86	....	....	....	....	86
M.Sc. (Physics)	....	....	....	....	....	....	....	....	....	17		17
Integrated M.Sc.											196	196
M.Sc. (Nursing)	....	....	....	....	....	....	5	....	....	....	....	5
M.Sc (Nuclear Medicine	6	....	....	....	....	....	12	....	....	....	....	18
M.Sc. (Medical and	....	....	....	....	....	....	....	....	....	....	10	10
M.Sc. (Public Health and	....	....	....	....	....	....	5	....	....	....	....	5
M.Sc. Clinical Research							18					18
M.Sc. (Occupational Therapy	....	....	....	....	....	....	5	....	....	....	....	5
Certified fellowship	....	....	....	....	....	....	21	....	....	....	....	21
Total	253	55	8	7	22	35	290	9	15	37	308	1039



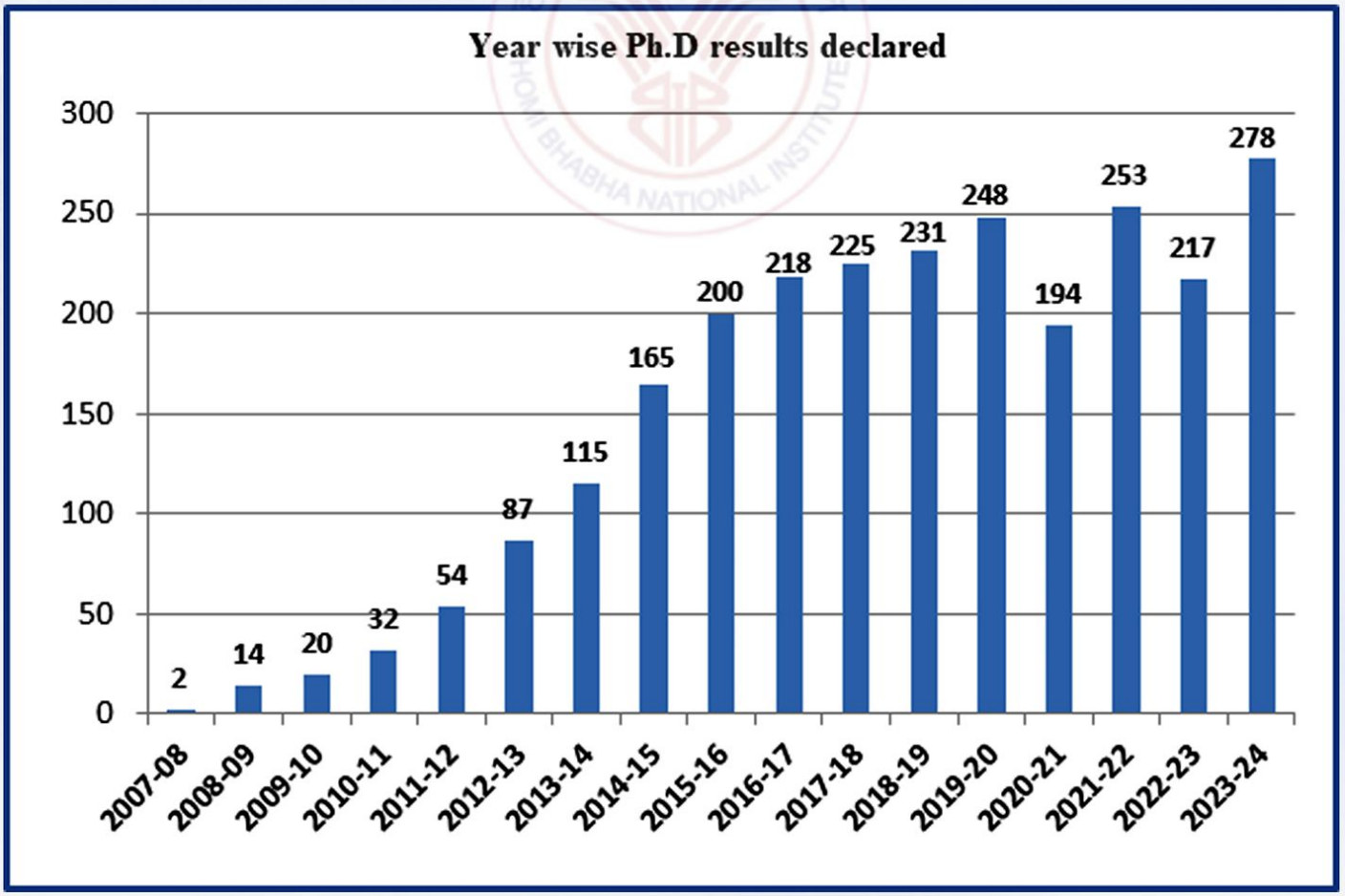
CIs/OCC wise total Ph.D. results declared since inception till March 31 2024

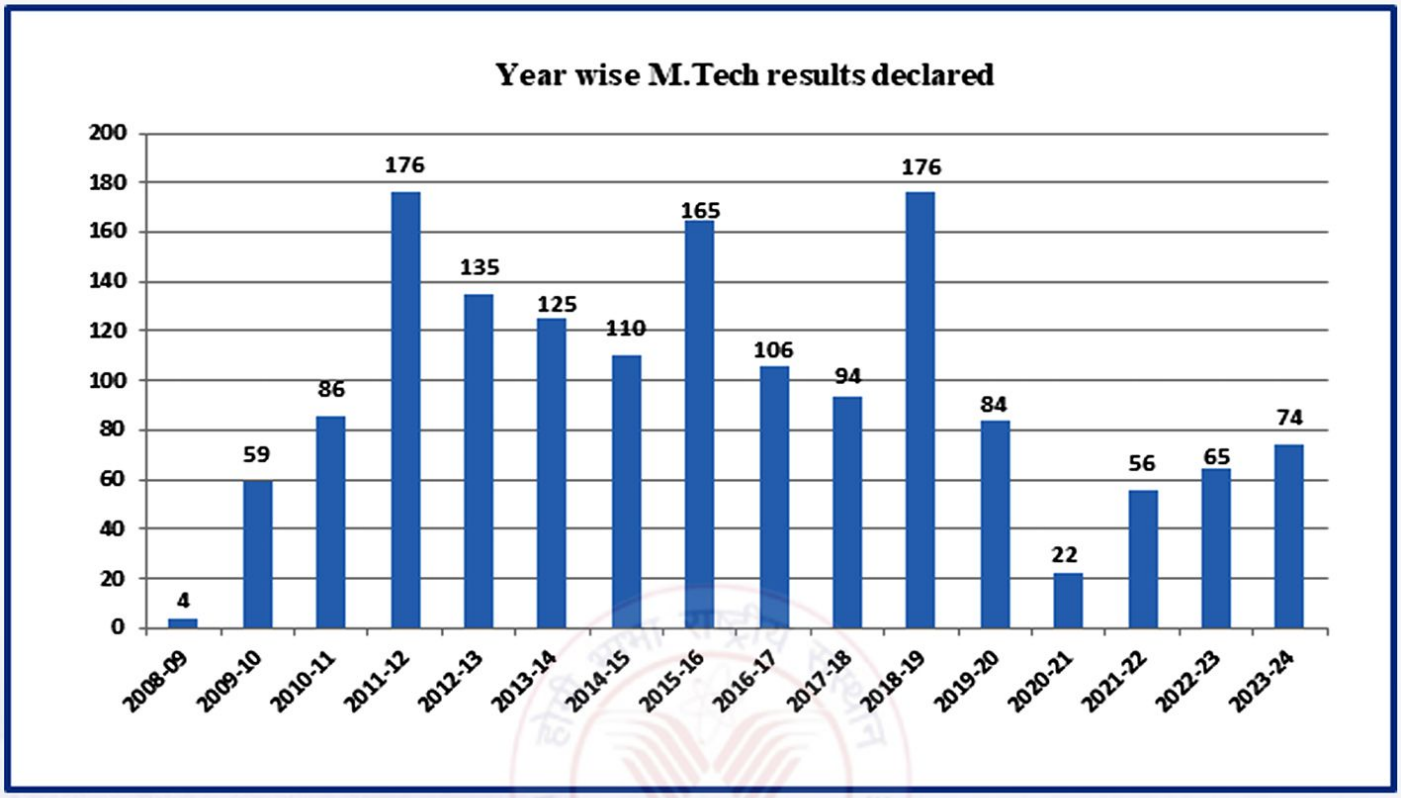
YEAR	BARC	IGCAR	RRCAT	VECC	SINP	NISER	IPR	IOP#	HRI	TMC	IMSc	TOTAL
2007-08	....	....	....	....	....	....	....	2	....	....	....	2
2008-09	....	....	....	....	1	....	....	4	2	....	7	14
2009-10	....	....	....	....	1	....	....	2	7	....	10	20
2010-11	5	....	....	....	2	....	....	6	9	....	10	32
2011-12	15	2	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	....	1	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
2023-24	72	37	5	8	25	60	15	11	11	19	15	278
TOTAL	786	359	121	102	183	241	100	101	160	163	237	2553

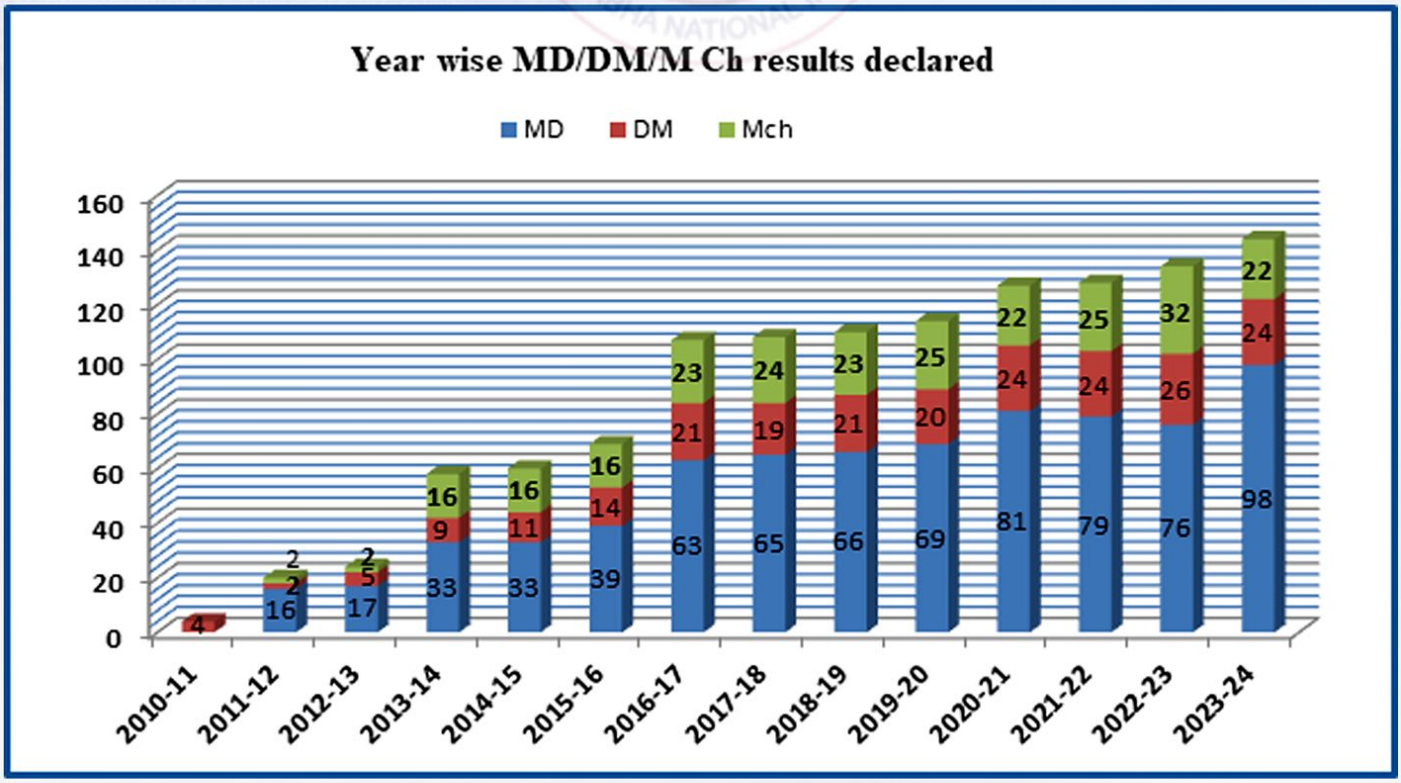
 # Includes NISER results since 2015

CIs/OCC & Discipline wise Ph.D. results declared during 2023-24

Academic Program	BARC	IGCAR	RRCAT	VECC	SINP	NISER	IPR	IOP	HRI	TMC	IMSc	Total
Chemical Sciences	14	13	....	....	....	18	....		....	....	....	45
Engineering Sciences	26	11	1	1	....	....	6	....	....	....	....	45
Medical & Health Sciences	....	....	....	....	....	....	....	....	....	....	....	....
Life Sciences	7	....	....	....	5	13	....	....	....	19	1	45
Mathematics	....	....	....	....	....	4	....	....	5	....	2	11
Physical Sciences	25	13	4	7	20	21	9	11	6		12	128
Applied System Analysis	....	....	....	....	....	4	....	....	....	....	....	4
Total	72	37	5	8	25	60	15	11	11	19	15	278




Year wise M.Tech results declared
200
180
160
140
120
100
80
60
40
20
0
4
59
86
176
135
125
110
165
106
94
176
84
22
56
65
74
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24


Year wise MD/DM/M Ch results declared
MD
DM
Mch
160
140
120
100
80
60
40
20
0
4
16
2
2
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33
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2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24

News Update

- Bhumi Poojan ceremony for construction of two additional wings to existing HBNI building was conducted on January 3, 2024 in the august presence of Prof. A. K. Mohanty, Secretary DAE, & Chairman AEC, Prof U. Kamachi Mudali, Vice Chancellor, HBNI, Shri Vivek Bhasin, Director BARC, Shri K. Mahapatra, Director DCSEM, Prof R. B. Grover, Emeritus Professor HBNI, Prof. P. D. Naik, former Dean HBNI, Prof P. C. Selvin, Registrar HBNI, Shri K. Jayakumar, Controller BARC, Shri Shivaprakasha, Chief Engineer DCSEM and many senior officers from BARC, HBNI and DCSEM.

Glimpses of the Bhumi Poojan ceremony for construction of two additional wings of HBNI

- HBNI conducted faculty induction programs in hybrid mode on January 10, 2024 and March 20, 2024 for the benefit of newly inducted faculty members to brief them about the structure of academic processes and ordinances of HBNI. A total of fifty-two new faculty members and nineteen other teaching staff from different CIs/OCC of HBNI attended the programs.

- Prof. A. K. Tyagi, formerly Director, Chemistry Group, BARC has assumed the charge of Dean, Homi Bhabha National Institute (HBNI), Mumbai in the forenoon of April 2, 2024.

Prof. A. K. Tyagi assuming charge as Dean, HBNI on April 2, 2024

- Ministry of Education has accorded approval for recognizing Mahamana Pandit Madan Mohan Malaviya Cancer Centre & Homi Bhabha Cancer Hospital (MPMMMCC & HBCH), Varanasi, (Unit of Tata Memorial Centre, Mumbai) as Off-Campus Centre of HBNI on May 20, 2024.

- HBNI has signed MoUs with Indian Institute of Technology, Delhi (IITD), Indian Institute of Management, Ahmedabad (IIMA), and Confederation of Indian Industry (CII), and renewed the MoU with TIFR, Mumbai during this period.

HBNI-CII MoU signing ceremony on June 3, 2024

Events at the HBNI Central Office

• Republic Day Celebration

The 75th Republic Day was celebrated at HBNI on January 26, 2024. Prof. U. Kamachi Mudali, Vice Chancellor, HBNI unfurled the National Flag followed by singing of National Anthem by HBNI functionaries and staff members present on the occasion. Prof. Mudali then addressed the gathering of the HBNI functionaries and staff members. In his address, he talked about the achievements of the country in the field of education since its independence, National Education Policy-2020 and Viksit Bharat@2047, a vision of Govt. of India. Prof. R. B. Grover, Emeritus Professor, HBNI also addressed the gathering. This was followed by soulful performances of patriotic songs by staff and students of HBNI.

Prof. U. Kamachi Mudali, VC, HBNI saluting the National Flag after unfurling it

• Observance of Swachhata Pakhwada 2024

As per the directives of the DAE, Mumbai, HBNI observed Swachhata Pakhwada from February 16-29, 2024. The observance of Swachhata Pakhwada 2024 commenced with the Swachhata Pledge being taken by HBNI officials and staff on February 16, 2024. Aligning with the Swachhta Pakhwada vision, a comprehensive cleanliness drive was conducted at HBNI wherein HBNI officials and staff enthusiastically engaged in cleaning of office premises. A special campaign to segregate old records, scrapping unwanted papers and documents, and digitisation of records was also undertaken.

Dr. P. C. Selvin, Registrar, HBNI and Prof. Naveen Kumar, Associate Dean, HBNI administering Swachhata Pledge to HBNI Officials and staff on February 16, 2024

- **Outreach Workshop on "Advances in Chemical, Physical and Life Sciences"**

HBNI organized an outreach workshop on "Advances in Chemical, Physical and Life Sciences," jointly with Madurai Kamaraj University, Madurai during February 8-10, 2024. The major objectives of the workshop were to foster a deeper understanding of scientific concepts, promote interest in STEM fields, and engage the university students and faculties in frontier educational and research activities. The event was coordinated by Prof. B. K. Nayak, Associate Dean, HBNI and Prof. P. Suresh from Madurai Kamaraj University.

The event was inaugurated by Prof. J. Kumar, VC, Madurai Kamaraj University and presided over by Prof. U. Kamachi Mudali, VC, HBNI. The three-day workshop had presentations highlighting the latest advancements in chemical, physical and life Sciences from renowned scientists invited from different constituent institutions/off-campus centre of HBNI. Four plenary presentations were made by VC, HBNI, Prof. B.Venkatraman, Director, IGCAR, Prof. G. Bhattachatyya, Director, SINP, and Prof. V. Ravindran, Director, IMSc. An exhibition on the atomic energy program of Department of Atomic Energy (DAE) was also organised by IGCAR, Kalpakkam during this event. Research scholars, PG students (total 220) and science faculty members (50) of the university attended the workshop and benefitted from it. The event not only contributed to educational enrichment but also solidified the institution's commitment to make a positive impact beyond the academic realm.

Glimpses of the interactive workshop "Advances in Chemical, Physical and Life Sciences" held at Madurai Kamaraj University during February 8-10, 2024

- **International Women's Day Celebration**

The Women's Cell of HBNI celebrated International Women's Day on March 26, 2024 at DAE Convention Centre, Anushaktinagar, Mumbai by organizing special talks and panel discussion, keeping in mind the UN theme for the year, "Invest in Women: Accelerate Progress." Prof. Archana Sharma, Distinguished Scientist and Director, BTDG, BARC delivered an inspiring talk on the topic, "Women in Engineering," wherein she highlighted the contributions of women engineers from pre-independence to present times including those from DAE who shattered glass ceilings, defied societal norms, and showcased their brilliance in diverse engineering disciplines. Prof. Vandana Nanal, Senior Professor, Tata Institute of Fundamental Research, Mumbai gave a talk titled, "Career in STEM-Challenges for Women," summarizing various factors which hinder women from entering the STEM workforce and ways to overcome them. The talks were followed by an enlightening panel discussion on the topic, "Women Partnership & Women Leadership," wherein panellists put forth their viewpoints about the need and measures to be taken for the advancement of women in leadership positions.

Following the formal program, a colourful cultural program was presented by HBNI students and staff members.

Prof. Dipanwita Dutta, Associate Dean, HBNI welcoming the gathering

Prof. U. Kamachi Mudali, Prof. Aradhan Shrivastava, Prof. Archana Sharma and Prof. Vandana Nanal addressing the gathering on International Women's Day celebration at HBNI (from left to right)

Cultural program presented by HBNI staff and students on International Women's Day celebration at HBNI

- **Workshop on "Career Opportunities in Industry for Chemistry & Chemical Engineering Doctoral Students"**

A one day Workshop on "Career Opportunities in Industry" was organized by HBNI Industry Linkage Centre on April 5, 2024 in hybrid mode for the benefit of doctoral students of Chemistry and Engineering Sciences. The workshop was organized as a part of brainstorming session towards Viksit Bhartat@2047 campaign of Govt. of India. The program was presided over by Prof. U. Kamachi Mudali, VC, HBNI. Prof. B. M. Bhanage, Head, Department of Chemistry, ICT, Mumbai and Prof. J. B. Joshi, Distinguished Professor Emeritus, HBNI gave informative and insightful talks on the topics, "Careers in Chemistry" and "Careers in Industry," respectively, elaborating various job opportunities available for the chemists/ chemical engineers and essential skills required by the students to secure jobs and become entrepreneurs.

Prof. J. B. Joshi delivering his talk during the workshop on "Career Opportunities in Industry"

- **National Technology Day**

HBNI celebrated National Technology Day on May 13, 2024 in hybrid mode. Dr. Sudeep Gupta, Director, Tata Memorial Centre graced the occasion as the Chief Guest. Dr. R. Chidambaram, Former Secretary, DAE & Chairman, AEC and Former PSA to Govt. of India participated in the event.

The programme began with the welcome address by Prof. A. K. Tyagi, Dean, HBNI. Prof. U. Kamachi Mudali, VC, HBNI gave Presidential Address and introduced the speaker. Dr. Sudeep Gupta delivered an informative talk on the topic, "Innovation and Research at TMC: Practical Solutions for Affordable Cancer Care in India." In his talk, Dr. Gupta gave a detailed account of cancer research being caried out at TMC which has led to a breakthrough in cost effective treatments of different types of cancers not only in India but globally too. Dr. P. C. Selvin, Registrar, HBNI proposed the vote of thanks and the event ended with the recitation of National Anthem.


Prof. U. Kamachi Mudali, VC, HBNI welcoming Dr. Sudeep Gupta on National Technology Day celebration at HBNI (left); Prof. Gupta delivering his talk on the occasion (right)

- **Prof. Srikumar Banerjee Memorial Programme**

HBNI organized a memorial programme in honour and remembrance of Prof. Srikumar Banerjee, Former Chancellor, HBNI on his third death anniversary on May 29, 2024 in hybrid mode. Dr. Deependra Singh, Chairman & Managing Directed, IREL (India) Ltd. was the chief guest on the occasion. He gave an informative talk on the topic, "Rare Earths-Discovery, Development and Deliverables" wherein he elaborated on the applications and widespread uses of the rare earth metals and alloys in the field of material science, medicine, aerospace, national defence, etc., based on their unique properties such as luminescence, hydrogen storage, high thermal stability, electric conductivity, magnetic, and optical properties.They are also essential to the growing fields of green energy technology and energy efficiency. He talked about the major challenges faced by India in rare earth elements (RRE) mining which include the lean grade of the ore and its association with radioactivity, making extraction complex and expensive and the absence of extractable quantities of heavy REE. He also spoke about the activities of IREL (India) Ltd. He concluded his talk by stating that India possessing the world's fifth-largest deposits of rare earth minerals, could emerge as a rare earths supplier to the world and use these resources to power a high-end manufacturing economy geared to the needs of 21st century.


Prof. U. Kamachi Mudali, VC, HBNI welcoming Dr. Deependra Singh (left); Dr. Deependra Singh delivering his talk (right)

- **Nineteenth Foundation Day Celebration of HBNI**

The 19th Foundation Day of the Homi Bhabha National Institute (HBNI) was celebrated in hybrid mode at the DAE Convention Centre, Anushaktinagar, Mumbai on June 03, 2024. Prof. T. G. Sitharam, Chairman, All India Council for Technical Education (AICTE), New Delhi was the Chief Guest on the occasion. Prof. A. K. Mohanty, Secretary DAE and Chairman, Council of Management, HBNI presided over the function. Prof. Anil Kakodkar, Chancellor, HBNI, gave special address on this occasion. Ms. Seema Jain, Member Finance (AEC, Space & Earth Commission) was the Guest of Honour. Directors/Heads of CIs/OCC and Functionaries of HBNI at various CIs/OCC and Central Office, and many faculty members, alumni, and students of HBNI participated in the function, in both online and offline mode. Prior to the Foundation Day event, the MoU between HBNI and Confederation of Indian Industry(CII) Western Region was signed in a ceremony in the presence of eminent professionals of both insitutes. An Innovation Showcase consisting of 19 stalls displaying the contributions of HBNI Students and Faculty was inaugurated on this occasion by Ms. Seema Jain, Member Finance. Outstanding students of HBNI in various academic programmes and students selected for JB Joshi Research Foundation Innovation awards for the year 2023 were also honoured during the function.

Prof. A. K. Tyagi, Dean, HBNI welcomed the dignitaries and the gathering with an introduction about HBNI and its growth over the years. Prof. U. Kamachi Mudali, Vice Chancellor, HBNI presented the annual report of HBNI for the period 2023-24. He presented a comprehensive overview of the progress of HBNI in various domains and informed the gathering about the new initiatives taken by HBNI for the benefit of students particularly with respect to implementation of NEP-2020, value added courses, high value webinars and other events conducted by HBNI during the period.

Inauguration of Innovation Showcase by Ms. Seema Jain, Member Finance, AEC

Lighting of the lamp by the Dignitaries

Dignitaries on the dais

Prof. A. K. Tyagi, Dean HBNI welcoming the gathering

Prof. Anil Kakodkar, Chancellor, HBNI addressed the gathering by extending his congratulations to all the award winners and degree recipients. He recalled that HBNI was created to provide an academic environment for the DAE's mission-oriented activities and expressed his happiness to note its progress in the past nineteen years. He further remarked that in higher education domain there is a need for an ecosystem which nurtures high quality research in frontier areas and facilitates its translation into new technologies useful for society and nation and HBNI has been aiming to provide that to its students. In his

presidential address, Prof. A. K. Mohanty said that the kind of skilled human resources which HBNI is generating through its academic programmes is unparalleled to anywhere in the word and new initiatives being taken by HBNI will help to lay the roadmap for self-reliant and developed India. He appreciated the students and faculty members showcasing innovative research through posters, models, and video display on the occasion leading to useful technologies in different disciplines.

Prof. T. G. Sitharam conferred the degree certificates to 77 students from various disciplines and institutions, and presented the outstanding students awards of Ph.D., M.Tech, M.D., D.M. and M.Ch programmes. Thirteen students from various CIs/OCC received the awards and certificates from the Chief Guest. Followed by this he also presented JB Joshi Research Foundation Innovation awards to three best students from IGCAR, IPR and BARC.

Prof. U. Kamachi Mudali, Dr. Anil Kakodkar & Prof. A. K. Mohanty addressing the gathering

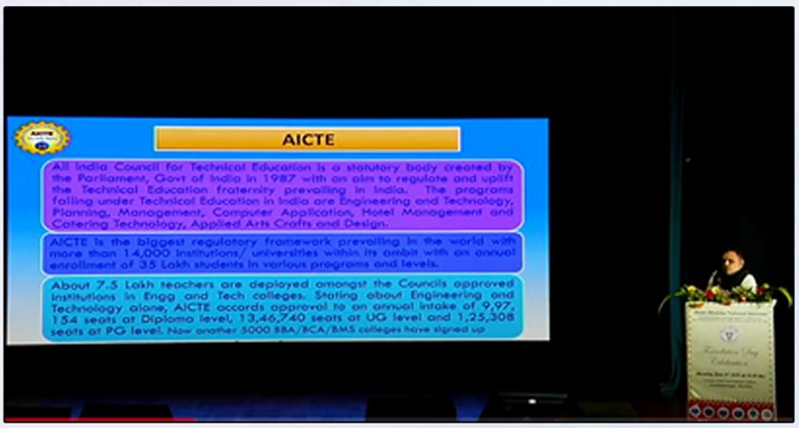
Technology showcasing by HBNI students and faculty

J B Joshi Research Foundation Innovation awardees receiving their awards from Prof. T. G. Sitharam

Prof. T. G. Sitharam delivered an informative and exciting talk on, “Building a Future Ready India - Vision, Plan & Strategy for Technical Education in India during Amrit Kaal.” He presented a detailed road map for transforming India's technical education landscape over the next 25 years, termed 'Amrit Kaal. According to him, this period, marking India's journey towards its centenary of independence, is seen as a pivotal era for accelerating national growth through strategic advancements in higher and technical education. He elaborated

on the key initiatives that can be undertaken to implement the vision of 2047 in education, such as revamping curricula to integrate emerging technologies, enhancing the quality and accessibility of technical institutions, fostering innovation and research through enhanced industry-academia collaboration, encouraging innovation, entrepreneurship, and start-up ecosystem among students, and expanding access to technical education across diverse socio-economic segments. He also discussed about the transformative initiatives taken by AICTE in making Indian students as 21st century highly skilled professionals, innovators, entrepreneurs, and researchers who will contribute significantly towards making India "Viksit Bharat" by 2047.

Outstanding Student Award winners receiving their awards from Prof. T. G. Sitharam



Prof. T. G. Sitharam delivering J B Joshi Research Foundation Endowment Lecture.

Dr. P. C. Selvin, Registrar, HBNI proposed the vote of thanks highlighting the address delivered by the dignitaries and concluded the program appreciating the contribution of various stakeholders from HBNI Central Office, HRDD/BARC, DAE, CIs/OCC, and other institutions. The event ended with recitation of National Anthem.

Outstanding Student Awards for the year 2023

Shyam Kumar Banjare

CHEM11201804007

Thesis Title:

Weak Chelation assisted C-H Bond Activation via Cobaltacycles: A Sustainable Approach towards the Synthesis and Functionalization of N-heterocycles

Dr. Shyam Kumar Banjare, NISER has been conferred Outstanding Student Award for his research work on the development of novel and sustainable C-H activation methods, based on cost effective and earth abundant catalysts, for the synthesis and functionalization of N-heterocycles. The investigated systems include industrially important heterocyclic compounds such as Indole, indoline, and aryl γ-lactam. The methodologies developed in current work are expected to immensely benefit the pharmaceutical industries and organic synthesis communities.

Ph.D (Chemical Sciences)

Bijaideep Dutta

CHEM01201804004

Thesis Title:

Physico-chemical and Biological Evaluation of Organic-Inorganic Nanostructures for Cancer Therapy

Dr. Bijaideep Dutta, BARC has been conferred the Outstanding Student Award for his research work on the synthesis and characterisation of a variety of surface functionalised nanostructured materials for cancer therapeutics and diagnostics. Investigated materials include soft nano-assemblies such as PEGylated stealth liposomes, PEGylated solid lipid nanoparticles and colloidally stable, biocompatible magnetic nanoparticles. His studies were mainly aimed at developing materials and methodologies for the affordable treatment of cancer.

Sutanwi Lahiri

ENGG01201904018

Thesis Title:

A study on Sonochemical Decontamination of Graphite Substrate

Dr. Sutanwi Lahiri, BARC has been conferred the Outstanding Student Award for her research work on development of a complete decontamination strategy for graphite, including its erosion under ultrasound, its prevention strategies, and its recyclability. The salient features of the research are the use of ultrasound as a process intensification technique as an efficient tool for decontamination. The novelty of the work lies in the kinetic studies of decontamination of three different contaminants on graphite through which recovery of uranium, yttria and ceria from graphite have shown significant increase. With the immense surge in demand of graphite, sustainable consumption and reuse of nuclear graphite wastes is the need of the hour. Her research work is an initial attempt in that direction.

Ph.D (Engineering Sciences)

Outstanding Student Awards for the year 2023

Ph.D (Engineering Sciences)

Manu Harilal

ENGG02201604018

Thesis Title:

Development of Fly Ash based High Performance Concrete Blended Nanoparticles and Inhibitor for Marine Applications

Dr. Manu Harilal, IGCAR has been conferred the Outstanding Student Award for his research work on on the development of a novel high performance concrete composition (CFNI) with a combination of OPC, fly ash, nano-$CaCO_3$, nano-TiO_2 and $NaNO_2$ based anodic mixed inhibitor solution for marine applications. Detailed experimental work has been carried out to bring out the performance of CFNI concrete system in terms of improvements in the mechanical strength and durability of the concrete. Moreover, the shortfalls associated with fly ash concrete were suitably addressed and CFNI is made highly promising for applications in marine environments. The CFNI specimens showed enhanced resistance against bacterial and fungal attack in terms of reduced biofilm formation and made the material suitable for all the three chemical environments (seawater, acidic and sulfate).

Gaurav Kumar

ENGG01202101049

Thesis Title:

Studies on Concentrating HCl-H_2O Mixture for Integration of Hydrolysis and Electrolysis Steps of Cu-Cl Cycle

Shri Gaurav Kumar, BARC has been conferred the Outstanding Student Award for his research work on the development of a pressure swing Adsorption (PSA) based an energy efficient process for separation of HCl-H_2O mixture. As a result of this developmental work, it has been possible to demonstrate a first of its kind integrated Cu-Cl closed loop facility for a duration of 170 hours, which makes it the highest recorded duration for any thermochemical cycle globally. The development of the PSA process will result in significant enhancement in the techno-commercial aspect of the Copper-Chlorine cycle thereby rendering hydrogen production at a lower levelized cost.

M.Tech (Engineering Sciences)

Prafulla Subhash Sarode

ENGG01202101054

Thesis Title:

Calciothermic Reduction (CTR) Process for the Production of NdPr Metal Required for NdFeB Permanent Magnet

Shri Prafulla Subhash Sarode, BARC has been conferred the Outstanding Student Award for his research work on the development of technology to produce NdPr (didymium) metal from indigenously produced NdPr oxie by IREL (India) Limited. His work involves optimization of process variables for the preparation of NdPr (didymium metal) metal by calciothermic reduction route at 100 gm scale utilizing the indigenously produced NdPr oxide. Besides understanding the mechanism of converting NdPr oxide to an intermediate NdPr fluoride prior to preparation of NdPr metal, he has also scaled up the process to 1kg scale.

Outstanding Student Awards for the year 2023

Tusar Kanta Acharya

LIFE11201704006

Thesis Title:

Elucidating the Involvement of Thermosensitive Ion Channels (TRPV4 and TRPM8) in Motochondrial Structure-function Relationship: Significance in Physiology and Diseases

Dr. Tusar Kanta Acharya, NISER has been conferred the Outstanding Student Award for his research work on the establishment of the presence of TRPV4 (a hot channel) and TRPM8 (a cold channel) in mitochondria which are important modulators of mitochondrial structure, Ca^{2+}-homeostasis and temperature. The uptake of calcium (Ca^{2+}) ion by mitochondria and its maintenance of a thermal gradient are key regulators for cell survival and various activities like metabolism and signalling. Notably, mutations in TRPV4 and TRPM8 cause bone-related disorders, and interestingly, his research demonstrates the enhancement of bone health by targeting these ion channels using a hydrogel-based drug delivery system.

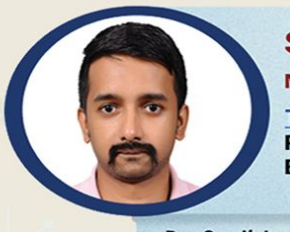
Jyotsna Bhatt

LIFE01201604015

Thesis Title:

Mechanistic Studies on Ubiquicidin-membrane Interaction & Development of Infection Imaging Probes

Dr. Jyotsna Bhatt, BARC has been conferred the Outstanding Student Award for her research work on the development of potent and novel bacterial imaging agents which are important due to the rapid appearance of resistance. Her research work elucidates the mechanistic details of antimicrobial action of Ubiquicidin (UBI) peptide, leading to the design of novel infection imaging agents. The newly designed improved UBI-derived peptides result in the development of prospective radiotracers for early detection and diagnosis of bacteria driven focal infections, particularly those that are challenging to detect by conventional techniques like CT and MRI.



Sunil L Naik

MATH10201804005

Thesis Title:

Prime Divisors of Non-zero Fourier Coefficients of Hecke Eigenforms

Dr. Sunil L. Naik, IMSc has been conferred the Outstanding Student Award for his research work on prime divisors of non-zero Fourier coefficients of Hecke eigenforms. The work belongs to the field of number theory, combining techniques from analytic number theory, algebraic number theory, and Diophantine approximation. The study of the arithmetic and analytic properties of the Ramanujan tau function is a central topic in number theory. His work improves and sharpens several lower bounds from the literature, on the number of prime divisors of tau(n) for infinitely many n, the greatest prime divisor of tau(p) for almost all primes p, and the greatest prime factor of values of tau at prime powers. Such bounds are of interest in light of a famous and yet unresolved conjecture of D.H. Lehmer that the value of the tau function at each natural number is non-zero.

Outstanding Student Awards for the year 2023

Dr. Kapu Venkatesh

HLTH09202010001

D.M. in Medical Oncology

Dr. Kapu Venkatesh, TMC has been conferred the Outstanding Student Award for his research work on retrospective study of clinical spectrum and outcomes of penile carcinoma in Indian tertiary centre. His area of interest is supportive care in cancer and hematology. He has also studied the efficacy of low dose olanzapine, an effective antiemetic agent vs. standard dose in preventing chemo-induced nausea and vomiting.

Dr. Samreen Jaffar

HLTH09202010063

M.Ch. in Plastic and Reconstructive Surgery

Dr. Samreen Jaffar, TMC has been conferred the Outstanding Student Award for her research work on the reconstruction of defects after cancer surgery, for head and neck, breast and bone and soft tissue, with due attention being paid not only to structural reconstruction, but also to function, aesthetics and quality of life of the patient. Her work focussed on new innovations and methods to help the cancer patients heal better and have the best possible outcome.

Dr. Abhishek Palsapure

HLTH09202009054

M.D. in Nuclear Medicine

Dr. Abhishek Palsapure, TMC has been conferred the Outstanding Student Award for his research work on the establishment of FDG PET-CT as a surrogate imaging biomarker in non-small cell lung cancer to predict the molecular profile (i.e., ALK-1, EGFR, PD-L1) that can be targeted with the specific inhibitor drugs currently in use and under research.

Outstanding Student Awards for the year 2023

Dr. Chandni Rana

HLTH09202009019

M. D. in Anaesthesiology

Dr. Chandni Rana, TMC has been conferred the Outstanding Student Award for her research work on pain management of patients undergoing major abdominal surgeries in co- ordination with the Acute Pain Services team of the hospital. She has also contributed towards the perioperative management of patients who are on chronic pain management involving opioids and on cannabinoid drugs (recreational drugs / abuse drugs).

Dr. Shubham

HLTH09202009066

M.D. in Radiodiagnosis

Dr. Shubham, TMC has been conferred Outstanding Student Award for his research work on the development of advanced diffusion and perfusion imaging techniques for brain tumours. This entails spearheading innovative methods to elevate diagnostic accuracy and helps in appropriate follow-up and treatment approaches for patients. By meticulously examining the intricacies of glioma biology and incorporating state-of-the-art imaging modalities, his research aims to set new benchmarks in neuro-onco-imaging.

Ashish Pandav

PHYS11201605002

Thesis Title:

Probing the QCD Phase Diagram via Net-Proton Number Fluctuations at RHIC

Dr. Ashish Pandey, NISER Has been conferred the Outstanding Student Award for his for his research contributions towards the experimental realization of QCD phase diagram using relativistic heavy-ion collisions. His research work threw light on the key features of the QCD phase structure which includes the order of phase transition and critical point.

Medical & Health Sciences

Ph.D (Physical Sciences)

Outstanding Student Awards for the year 2023

Samapan Bhadury

PHYS11201704022

Thesis Title:

Formulation of Relativistic Dissipative Hydrodynamics of Spin-½ Particles from Kinetic Theory

Dr. Samapan Bhadury, NISER has been conferred the Outstanding Student Award for his significant contributions towards the theoretical formulation of hydrodynamics for spin-½ particles in presence of a magnetic field. He obtained the equations for relativistic dissipative non resistive magnetohydrodynamics and showed the emergence of the well-known Einstein-de Haas and Barnett effects.

Astik Haldar

PHYS05201704007

Thesis Title:

Statistical Physics Perspectives on Driven Systems

Dr. Astik Halder, SINP has been conferred the Outstanding Student Award for his pioneering work employing a nonequilibrium statistical mechanics framework to provide fundamental insights into emergent behaviours including phase transitions, pattern formation, large flock, fluid membrane stability. Using highly non-trivial renormalization group techniques he worked on two paradigmatic models of statistical physics: the totally asymmetric exclusion process and the Kardar-Parisi-Zhang equation.

Swarnima Singh

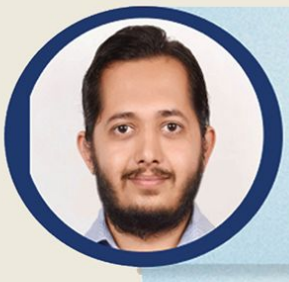
PHYS06201804005

Thesis Title:

Experimental Study of a Quasi Two-dimensional Complex Plasma

Dr. Swarnima Singh, IPR, has been conferred the Outstanding Student Award for her significant contribution to the knowledge of dusty plasma crystallization, rearrangement of lattice structures, existence of triple point, and co-existence of two dusty plasma states. Her research work involves an interdisciplinary endeavour of theory, simulation, and experiment to explore the complex domain of excitation and propagation of linear and non-linear waves in a flowing dusty plasma.

J B Joshi Research Foundation Innovation Awards for the year 2023



Dr. Pavan Aletti Raveendra

ENGG02201505011

Thesis Title:

Study of the Effect of Advanced Welding Processes on the Microstructure, Mechanical Properties and Residual Stresses of Thick type 316L(N) Stainless Steel Weld Joints

Dr. Pavan Aletti Raveendra, IGCAR has been conferred the J B Joshi Research Foundation Innovation Award for his investigation on the three advanced welding processes, namely Activated Tungsten Inert Gas (A-TIG), Hot wire TIG, and Hybrid Laser Metal Inert Gas (HLM) welding and their effect on the weld attributes. The novelty lies in the optimization of process parameters during A-TIG and HLM welding to achieve full penetration of 11 mm in single pass welding at reduced heat input. 11 mm thick 316LN Stainless Steel (SS) weld joints made by A-TIG and HLM welding exhibited significant improvement in creep rupture life of 60% and 80% compared to that of other arc welded 316LN SS joints and exhibited lower residual stresses and distortion. For the first time, it was demonstrated that a 20 mm thick 316LN SS plate could be welded with a straight joint configuration by double-side welding procedure without edge preparation and use of welding consumables. This innovation led to significant cost and time reduction in fabricating large-thickness plates. A-TIG welding technology transferred to Indian industries is already in use for fabricating 316L SS components used in power plants, pharmaceutical and chemical industries.

Dr. Vikas Rathore

ENGG06201804005

Thesis Title:

Study of Plasma Activation of Water and its Applications in Antimicrobial and Agricultural Activities

Dr. Vikas Rathore, IPR has been conferred the J B Joshi Research Foundation Innovation Award for his study on plasma activation of water and potential of Plasma Activated Water (PAW) in disinfection and agriculture. Through inventive plasma device design, he has harnessed the power of reactive oxygen-nitrogen species (RONS) to produce PAW, offering unparalleled efficacy against pathogens. Fine-tuning PAW's properties with optimal parameters ensures its effectiveness. Moreover, the innovative setup allows for increased production of PAW to cater to diverse needs. Beyond disinfection, PAW transforms agriculture by boosting seed germination and plant growth without the use of chemicals. This heralds a promising chemical-free future in medicine, agriculture, and food preservation, etc. marking a significant leap in sustainable technology.

J B Joshi Research Foundation Innovation Awards for the year 2023

Dr. Gargi Bindal

LIFE01201604014

Thesis Title:

A Comparative Study of Type I and Type II CRISPR-Cas Systems for their Applications in Modulation of Gene Expression using racR as Model

Dr. Gargi Bindal, BARC has been conferred the J B Joshi Research Foundation Innovation Award for her work on the development of a novel tool with innovative adaptation of type I Cascade/CRISPR system in microbes. The tool addressed challenges such as off-target effects and synthesis of complex crRNA and provided a simplified and cost-effective approach for efficient gene silencing. As no computational tool is available to assess off-target effects of type I Cascade system, an open-source python code, enabling genome-wide analysis and off-target evaluation was developed. This consolidated platform enables effortless gene silencing with exquisite control, tunability, and multi-gene targeting capabilities. The tool was validated by interrogating an essential gene, racR in E. coli which led to discovery of a novel repressor-toxin system and marked a significant milestone in understanding the function of essential genes. The transfer of this technology to domestic industry is a step towards self-sufficiency in this frontier area.

- **HBNI Students' Annual Cultural Festival, "Anurang-2024"**

For the first time, HBNI has initiated the Annual Students' Cultural Festival named "ANURANG" which will be organized every year at anyone of the CIs/OCCs with the support from HBNI. This year, the first HBNI Students' Annual Cultural Festival "ANURANG 2024" was organized by HBNI with the support of both BARC and TMC, where students from different CIs/OCC of HBNI came to Mumbai to showcase their talents. The event was organized at DAE Convention Centre, Anushaktinagar, Mumbai on June 03, 2024, immediately after the Foundation Day Celebration of HBNI.

Rangoli (left) and Selfie Point (right) at the entrance of the auditorium

Prof. A. K. Mohanty welcoming the Chief Guest Shri Anurag Basu (left); HBNI Students' Cell members of BARC and TMC with Prof. U. Kamachi Mudali, VC, HBNI (right)

It was a true pan India representation of HBNI which was well attended by students from six CIs/OCC of HBNI from all over India. Shri Anurag Basu, acclaimed film director, screenwriter and producer graced the occasion as the Chief Guest and Dr. Sudeep Gupta, Director, TMC was the Guest of Honor for the event. Prof. A. K. Mohanty, Chairman, Council of Management, HBNI and Chairman, AEC, presided over the function, and handed over the memento to the Chief Guest. Seventy-five students from different CIs/OCC of HBNI viz., BARC, TMC, RRCAT, IPR, IGCAR and NISER participated in ANURANG this year and approximately 40 students from HBNI Students' Cells of BARC and TMC were involved in the event co-ordination. A beautiful Rangoli and Selfie Point were made by the students at the entrance of the auditorium hall.

The cultural program began with the welcome address by Prof. A. K. Tyagi, Dean, HBNI. Shri Anurag Basu, Chief Guest of the function shared with the students his keen interest in science during his college days, and described his journey in an altogether different field namely film direction. He emphasized that young students should be passionate in their domain to achieve great success. Dr. Sudeep Gupta, Guest of Honour elaborated upon the importance of cultural programme towards holistic development of students. He appreciated the efforts by HBNI and wished the programme a great success. The cultural program began with Ganesh Vandana having dance and live song performance by students from BARC followed by a variety of performances by HBNI students, including traditional classic dances, folk dances, western and Bollywood style dances, classical vocal performances, songs, live orchestra, and poem recitation. Each performance was synchronized with a visual display in the background. HBNI Student's cell also designed an Instagram page as well as the logo for "Anurang 2024" for wider publicity of the event. At the end of the event, Prof. U. Kamachi Mudali, Hon'ble Vice Chancellor, HBNI distributed memento to every participant. Dr. P. C. Selvin, Registrar, HBNI presented the vote of thanks.

Glimpses of Annual Student Cultural Festival "Anurang"

Anurang-2024 successfully achieved its objectives of celebrating cultural diversity of India and providing a platform to students for their artistic expression. The event not only entertained but also educated attendees about the rich cultural tapestry of our country.

- **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 10th International Yoga Day on June 21, 2024 with great enthusiasm. It was attended by functionaries, staff members and students of HBNI and Human Resource Development Division (HRDD), BARC.

Under the able guidance of Smt. Saroj Singh, Dr. A. Vijay Kumar, and Shri A. G. V. Pillai, yoga instructors from BARC Yoga Circle, Anushaktinagar, all the attendees performed sitting and standing asanas and pranayama. The yoga instructors also highlighted yoga's profound physical, mental, and spiritual benefits. Prof. U. Kamachi Mudali, VC, HBNI presented mementos to the yoga instructors appreciating their efforts. The event concluded with Prof. A. K. Tyagi, Dean, HBNI thanking the yoga instructors for conducting the yoga session and all the attendees for their enthusiastic participation.

International Yoga Day-2024 celebration at HBNI

Prof. U. Kamachi Mudali, VC, HBNI presenting mementos to yoga instructors

Courses Conducted by HBNI

(a) Online Course on Disaster Management - Challenges in Chemical, Biological, Radiological and Nuclear (CBRN) Emergencies - Part II

HBNI conducted Part-II of the online course on "Disaster Management-Challenges in CBRN Emergencies" from January-April 2024 (Part-I was conducted during October-December 2023). The course was curated by Prof. H. S. Mishra, Raja Ramanna Fellow, HBNI. Part-II of the course covered the advanced aspects of disaster management with emphasis laid mainly on Indian CBRN framework and emergency management. The course imparted ample knowledge about the techniques, and the means to attain the right approach for accomplishing the CBRN Disaster Resilient set up.

Eighty participants including science & engineering graduates, emergency handlers from nuclear plants, cement industries, professionals and scientists from CIs/OCC of HBNI and two foreign participants attended the course.

(b) Online course on Research Methodology, Research and Publication Ethics for HBNI Students

University Grants Commission in its 543rd meeting held on August 9, 2019 approved two credit Courses for awareness about publication ethics and publication misconducts entitled "Research and Publication ethics" (RPE) to be made mandatory for all Ph.D. students for pre-registration course work. Accordingly, a course on Research Methodology, encompassing the RPE course has been developed and being offered to the students of all CIs/OCC of HBNI since 2021-2022 academic session. The course consists of 45 lectures and has three modules: (a) Module A: Research design and methods (18 lectures); (b) Module B: Research and Publication ethics (12 lectures); (c) Module C: Computational and experimental methods (15 lectures). Lectures on Module A and B (4 credits) were conducted by HBNI Central Office,

while Module C (2 credits) will be conducted by respective CIs/OCC. The lectures on Module A and B were delivered by Prof. B. K. Nayak, Prof. Prabuddha Ganguli, (Module A), and Prof. V. Siruguri (Module B). Total 304 Ph.D. students from different CIs/OCC of HBNI attended the course for 2023-2024 session which was conducted during February - April 2024.

(c) Course on Structural Integrity Assessment of Mechanical Components: Concepts & Procedures

An advanced course on "Structural Integrity Assessment of Mechanical Components: Concepts & Procedures" was organized by Homi Bhabha National Institute (HBNI) jointly with National Institute for Nuclear Science and Technology (INSTN), France in hybrid mode during March 11 - 15, 2024. The course was jointly coordinated by Prof. Naveen Kumar, Associate Dean, HBNI and Prof. Nihed Chaabane, CEA Saclay, INSTN, France. The course was inaugurated by Shri Dinesh Kumar Shukla, Chairman, Atomic Energy Regulatory Board (AERB). In his inaugural address, Shri Shukla emphasized the role of structural integrity assessment for life extension of existing systems. Mr. Xavier Perrettee, Vice President International Relations, INSTN, and Mr. Thomas Mieusset, Counsellor, French Embassy in India were also present on the occasion.

Prof. Naveen Kumar, Associate Dean, HBNI giving welcome address during inauguration of joint HBNI-INSTN course

The target students for the course were Masters-PhD students and young engineers/researchers. The course imparted ample knowledge on structural integrity assessment of mechanical components specific to pressure vessels and piping. The topics covered under the course included (i) Overview of Structural Integrity (Pressure Vessels and Piping), (ii) Fracture Mechanics based evaluations, (iii) Plasticity, Plastic cycling, Ratcheting, (iv) Fatigue life evaluation, (v) Evaluation of Crack growth due to Fatigue/ SCC, (vi) Assessment for Creep/Stress Rupture failures, (vii) Assessment for Buckling failures, (viii) Material Property Determination, (ix) Overview of Non-destructive Examinations, (x) Defect Assessment using RCC-MRA-16 guide, (xi) Leak-Before-Break/Break Preclusion Concepts.

The course was covered in seventeen lectures of ninety minutes duration which were delivered over five days by international experts in the field from HBNI-DAE and INSTN-CEA, France. In total ninety-two participants from India and abroad (42 attended in person and 50 online)

including research scholars, working professionals from academia, industry, public sector units, regulatory bodies, and R&D centers of HBNI attended the course. The course concluded successfully on March 15, 2024. The valedictory function of the course was held on March 15, 2024 in the distinguished presence of Prof. U. Kamachi Mudali, VC, HBNI, Mr. Xavier Perrette, Mr. Thomas Mieusset, Prof. Nihed Chaabane, Prof. Jayant Chattopadhyay, Head, Reactor Safety Division, BARC, and Prof. A. K. Dureja, Head, HRDD, BARC. Prof. U. Kamachi Mudali, gave the valedictory address and the function concluded with a vote of thanks delivered by Prof. Naveen Kumar, Associate Dean, HBNI.

Participants of the course with dignitaries

Webinars Conducted by HBNI

HBNI conducted several webinars for the benefits of its research scholars and students across all CIs/OCC during the period January 2024 to June 2024. HBNI webinars are 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. The list of the webinars conducted by HBNI is given below:

(a) Webinars Series "India's Techade-Chips for Viksit Bharat: Breakthroughs in Semiconductor Research" (as part of brainstorming session towards Viksit Bharat@2047 Campaign of Govt. of India; 13.03.2024)

(i) Germanium: A Semiconductor Material

Dr. Shashwati Sen Yeram, Head, Crystal Technology Section, Technical Physics Division, BARC, Mumbai.

(ii) High Purity Silicon for Semiconductor and Radiation Detector Industry

Shri Sulabh Gupta, Heavy Water Division, BARC, Mumbai.

(iii) Semiconductor processing using Plasma and Ion beam

Dr. Mukesh Ranjan, PSED, IPR, Gandhinagar.

(iv) Fabrication of Compound Semiconductor Chips for Lasers and Detectors

Dr. Tarun Kumar Sharma, Head, Materials Science Section, RRCAT, Indore.

(v) Monolayer MoS_2 for flexible and high-mobility electronics

Dr. Kishore Kumar Madapu, Materials Science Section, IGCAR, Kalpakkam

(b) Alumni Webinars

(i) Musings of a Scientist: Incremental Steps Towards Commercialization (23.02.2024)

Dr. Nikhil Sangith, Director (Research), Xact Diagnotek Pvt Ltd., Hyderabad.

(ii) Opportunities in Biopharma Industry (18.03.2024)

Dr. Manoj Ramteke, Senior Manager, R&D Cell Biology Department, HiMedia Laboratories Pvt. Ltd, Mumbai.

(iii) From PhD to Independent Faculty (04.04.2024)

Dr. Lalit Sehgal, Assistant Professor, Division of Hematology, The Ohio State University, USA.

(iv) Oncology Practice in Tier 3 City (24.05.2024)

Dr. Amitkumar Bagdia, Surgical Oncologist, Bagdia Cancer Hospital, Akola, Maharashtra.

(v) Bridging the Gap: Navigating the Transition from Academia to Industry (28.06.2024)

Dr. Arnab Deka, Lalit Sehgal, Capegemini Engineering, India.

Events at CIs/OCC

- **Republic Day Celebration at IPR**

The 75th Republic Day was celebrated at the IPR main campus on January 2024 with full enthusiasm and patriotism. On this occasion, Prof. Shashank Chaturvedi, Director IPR received the Guard of Honour from the security staff and unfurled the National Flag, followed by the National Anthem. In his address, Prof. Chaturvedi gave a comprehensive view of the scientific and technological achievements of the Institute in the previous year. During his speech, he discussed various scientific experiments and technological achievements, these included the non-Neutral plasma, High Temperature Superconductor, Neutron and Ion Irradiation Facility, commissioning of ITER-India High Power Gyrotron Test Facility, Raudra - Plasma Pyrolysis System, Lead Lithium Loop, High-Pressure Helium Circulator, and the progress of LIGO India project.

Unfurling of the National Flag and addressing the gathering by Prof. Shashank Chaturvedi, Director, IPR

- **National Science Day at CIs/OCC**

National Science Day is celebrated every year to commemorate the discovery of 'Raman Effect' by India's eminent scientist and Nobel Laureate Professor C.V. Raman. All the CIs/OCC of HBNI celebrated National Science Day with great fervour by organizing theme meetings, lectures by eminent scientists, visits of school and college students to the research facilities and laboratories of CIs/OCC, science quiz, debates, and open house for the school and college students, teachers, etc. The theme of this year's National Science Day was "Indigenous Technologies for Viksit Bharat." Glimpses of the National Science Day celebrations by CIs/OCC of HBNI are given below.

National Science Day celebration at BARC, February 28, 2024-March 1, 2024

Glimpses of National Science Day celebration at VECC, February 28, 2024

Glimpses of National Science Day celebration at IPR, conducted under aegis of the Platinum Jubilee Celebrations of the Department of Atomic Energy (DAE), February 10-11, 2024

National Science Day celebration at RRCAT, February 24-25, 2024

Dr. Debiprasad Durari giving his talk on the topic "Cosmos - the final frontier" during National Science Day celebration at SINP

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

International Women's Day Celebration was celebrated at IGCAR on March 7, 2024 by Indian Women Scientists' Association, Kalpakkam branch. Ms. Shiny Surendran, Nutritionist, Founder & Director, Art of Eating LLP, Chennai delivered an informative talk on the topic, "Eat Right-Get Fit." Faculty and students participated in large numbers in the event and had excellent interaction with the speaker during the programme.

Ms. Shiny Surendran, Nutritionist, Founder & Director, Art of Eating LLP, Chennai delivering the special lecture on International Women's' Day Celebration at IGCAR

- **International Yoga Day Celebration at HRI**

International Yoga Day was celebrated at HRI on June 21, 2024. Under the guidance of Ms Sunita Tripathi, a Yoga trainer, participants practiced various pranayama techniques including Bhastrika, Anulom-Vilom, Kapal-Bhati, Brahmari and several asanas including Surya Namaskar.

International Yoga Day celebration at HRI

Conferences/Workshops organized at CIs/(OCC)

(a) Symposium on Current Trends in Analytical Chemistry at BARC

The 3rd DAE-BRNS Symposium on Current Trends in Analytical Chemistry was organized by Analytical Chemistry Division, BARC during March 6-9, 2024 at DAE Convention Centre, Anushaktinagar, Mumbai. The symposium was inaugurated on March 6, 2024 by Prof. U. Kamachi Mudali, Vice Chancellor, HBNI. There were 350 registered participants in the symposium including participants from abroad. The symposium had 17 technical sessions having two plenary talks, one special evening talk, 20 invited talks, 14 short invited talks by eminent analytical scientists from India and abroad. The talks covered wide range of topics including nuclear fuels, reference materials, radiopharmaceuticals, nanomaterials, atomically precise clusters, ground water discharge, chemical process technologies, geomaterials, catalysts, environment, water treatment, speciation, etc. There were 26 oral presentations and 3 poster sessions (204 posters). A panel of experts evaluated the oral as well as poster presentations for selection of award winners. There were 5 poster presentation awards from ACS and RSC publications along with oral and poster awards from the organizers. The symposium was concluded with feedback session and valedictory function. The technical content of the symposium was well appreciated by all participants.

Participants of symposium on Current Trends in Analytical Chemistry

(b) Theme Meeting on Recent Trends in Solid State Chemistry at BARC

A one-day theme meeting on Recent Trends in Solid State Chemistry (RTSSC) was organized by Chemistry Division, BARC, and Society of Materials Chemistry at DAE Convention Centre, Anushaktinagar, Mumbai on April 06, 2024. The objective of the meeting was to highlight the current and upcoming developments in solid state research that have applications in energy, environment, and health.

The theme meeting consisted of lectures by eminent scientists and academicians from reputed institutes who covered various frontline research areas in solid state chemistry such as structure-property relations, nano materials and low-dimensional solids, nuclear and functional materials, battery materials, electrical and magnetic materials and rational design of materials and materials for energy and health applications. Around 350 participants from different institutes all over India attended the theme meeting fortifying its national outlook and status.

Release of Souvenir of theme meeting by dignitaries (left); Participants of the meeting (right)

(c) DAE-BRNS Theme Meeting on Wastewater Remediation Strategies: Current Status and Future Perspectives (WRS-2024) at BARC

Under the aegis of DAE's societal mandate to promote the 'Swachh Bharat Mission" a one-day theme meeting on "Wastewater Remediation Strategies: Current Status and Future Perspectives" was organized by Radiochemistry and Isotope Group, BARC in association with Association of Separation Scientists and Technologists (ASSET). The primary objective of the meeting was to serve as a platform for experts, researchers, industrialists, and stakeholders to share knowledge, discuss technological advancements and promote the practical application of sustainable wastewater treatment technology-based solutions. The meeting was attended by about 200 participants from both within and outside the DAE fraternity. Eminent speakers from DAE, IIT Bombay, NCL Pune and Luthra Group of Companies, Surat delivered nine lectures in two technical sessions. Important topics on wastewater management, such as regulatory aspects, treatment of textile, tannery and oil industry wastewater, newly developed technologies based on oxidative treatment and hydrodynamic cavitation, and actual industry case studies were comprehensively covered. A thematic ASSET bulletin on WRS-2024 was prepared on articles submitted by the invited

speakers and released by the Chief Guest Shri Vivek Bhasin, Director, BARC, during the inaugural session.

Release of ASSET bulletin by Shri Viviek Bhasin, Director BARC (left): Participants of Theme Meeting, WRS-2024 (right)

(d) Workshops Organized at HRI

(i) Workshop on Harmonic Analysis: Fourier Multipliers and Related Topics

The Mathematics Group at HRI organized a Workshop on Harmonic Analysis: Fourier Multipliers and Related Topics during February 19-March 2, 2024. The objective of the workshop was to teach the broad theory of Fourier multipliers on Lebesgue spaces and cover some important tools used in the study, such as maximal functions, singular integrals, and Littlewood-Paley square functions. The applications to PDEs and related subjects like Pseudo Differential Operators, Bi-Linear Fourier Multipliers, Restriction Theorem, and others were also discussed by eminent mathematicians from HRI, IISc Bangalore, IIT Kanpur, IISER Bhopal, IISER Mohali and TIFR-CAM, Bangalore.

(ii) Instructional Workshop in Particle Physics

The Physics Group at HRI organized an Instructional Workshop in Particle Physics during March 7 - 16, 2024. The workshop featured pedagogic lectures by experts in the field for young graduate Ph.D. students from educational institutes across the country and extensive discussions amongst the invited lecturers and fostering research collaborations. Sixty-six research scholars attended the workshop.

Participants of Workshop in Particle Physics at HRI

(iii) Workshop on Analytic and Combinatorial Number Theory

The Mathematics Group at HRI organized a workshop on Analytic and Combinatorial Number Theory for research scholars from March 20- 30, 2024. The workshop illustrated how the method of analysis, combinatorics and probability theory has helped answer deep questions in Number theory. This workshop was helpful to many young researchers to enhance their knowledge in Analytic and Combinatorial Number Theory.

Participants of Workshop Analytic and Combinatorial Number Theory

Scientific Outreach Activities conducted by CIs/OCC

- **Scientific Outreach Activities conducted by IPR**

During the period of January 2024 to June 2024, IPR organized academic visits to the institute and conducted outreach activities for students of various schools and science and engineering colleges all over India. IPR also organized plasma exhibitions at the educational institutes all over India with an objective to create awareness about plasma and its applications among the students.

Students and Teachers from Marwadi University, Rajkot during their visit to IPR, February 7, 2024

Students and Teachers from LDRP Institute of Technology and Research, Gandhinagar, during their visit to IPR, March 6, 2024

Students and Teachers from University College of Engineering, Banswara, Rajasthan during their visit to IPR, June 19, 2024

Plasma exhibition at Rabindranath Tagore University, Hojai, Assam, March 18-20, 2024

- **Scientific Outreach Activities conducted by HRI**

HRI conducted a Summer Program in Mathematics (SPIM-2024) from June 17-July 6, 2024. Fifty-five participants (15 local participants; 40 from educational institutes all over India) were selected and given lectures and tutorial sessions in Algebra, Analysis and Topology.

Participants of SPIM - 2024 at HRI

- **Scientific Outreach Activities conducted by NISER**

The outreach cell of NISER celebrated National Science Day on February 29, 2024 by hosting an exposure visit for school science teachers. Thirty-eight science teachers from State Government Schools in Khordha and DAV Public Schools in Bhubaneswar participated in the event. Through hands-on demonstrations, guided tours, and discussions, participating teachers gained valuable insights to enhance their teaching methodologies. Po1pular talks by eminent scientists were also organized. Prof. P. Balaram, Former Director, IISc Bangalore gave an informative talk on the topic, "The Origins of Life: The Evolution of Biochemistry and the Birth of Biology," on January 19, 2024 and Prof. Naba K Mondal, INSA Sr. Scientist, SINP, Kolkata gave a talk on "The World of Neutrinos," on February 16, 2024. The School of Mathematics, NISER organized the Summer Outreach Program in Mathematics (SOPM 2024) for students in their second and third year of B. Sc. in Mathematics during May 20 -June 8, 2024. The students were offered a course on Algebra and Analysis.

- **Scientific Outreach Activities conducted at SINP**

During the period January to June 2024, SINP conducted several outreach activities including Sundarban Utsab, Meghnad Saha Smarak Vigyan Mela, Science & Technology Fair and Gramin Krishi O Shilpo Mela

Prof. Gautam Bhattacharyya, Director, SINP, delivering inaugural address during Meghnad Saha Smarak Vigyan Mela

Awards and Academic Honors Received by HBNI Faculty

1. Prof. A. K. Tyagi, Dean, HBNI has been awarded J C Bose Fellowship by Science and Engineering Research Board (SERB), Department of Science and Technology (DST), India.
2. Prof. S. M. Yusuf, BARC has become the President of the "The Asia-Oceania Neutron Scattering Association" (AONSA) for the period Jan 2024 –Dec 2025, and a member of the Government of India Quantum Mission Project Monitoring Committee (2023 onward).
3. Prof. Meena Mahajan, IMSc has been awarded J C Bose Fellowship by SERB, DST, India for the period 2024-2028.
4. Prof. Bedangadas Mohanty, NISER has been awarded J C Bose Fellowship by SERB, DST, India. He has also joined the Editorial Board of the Journal Nuclear Science and Techniques (Springer publishing) in 2024.
5. Prof. Aditi Sen, HRI is the recipient of G. D. Birla Award for the year 2023.
6. Prof. Umasankari Kannan, BARC has been elected as a Fellow of Indian National Academy of Engineering.
7. Dr. Nandita Maiti, BARC has been elected as a Fellow of Royal Society of Chemistry, Indian Chemical Society and Maharashtra Academy of Sciences.
8. Professor Tapas Das, BARC has been elected as a Fellow, Maharashtra Academy of Sciences. He has been invited to join the Editorial Board of 'Applied Radiation and Isotopes' as one of the Editors of the Journal.
9. Dr. K. K. Singh, BARC has been selected as a Member of Indian National Young Academy of Sciences (INYAS), Indian National Science Academy (INSA), New Delhi.
10. Dr. V. K. Sharma, BARC has received prestigious INSA distinguished Lecture Fellow (2024) under Physics by Indian National Science Academy (INSA), New Delhi.
11. Dr. Raghumani Singh Ningthoujam, BARC has received an award in honor of P. N. Sazhin, Russian Academia, State Atomic Energy Corporation Rosatom, Moscow, Russia for his contributions to the development of science in the field of material science research.
12. Dr. Prabhat Kumar Singh, BARC has been inducted as a member of National Committee for IUPAC.
13. Dr. Surender Kumar Sharma, BARC has received ESAB India Award-2023 for best paper across all categories for his paper titled, "Simulation and experimental analysis of magnetic pulse welding for joining of dissimilar materials," presented at the National Welding Seminar 2022-23 held at the Chennai Trade Centre, Nandambakkam, Chennai from 19-21 January 2023.

14. Dr. K. Prabhakar, IGCAR has received Fulbright Nehru Academic and Professional Excellence Fellowship" for 2023-2024 to work at University at Buffalo, The State University of New York, USA.
15. Prof. Arun Kumar Nayak, IoP is appointed as Trigger Officer in the physics coordination of the CMS Collaboration for the period 2024-26.
16. Prof. Sanjib Kumar Agarwalla, IoP has been awarded Rajib Goyal Prize in Physical Sciences by Kurukshetra University.
17. Prof. Himansu Sekhar Biswal, NISER has been elected as a Fellow of Royal Society of Chemistry, UK.
18. Prof. Chidambaram Gunanathan, NISER is the recipient of INSA Associate Fellow for the year 2024.
19. Dr Manas Ranjan Sahoo, NISER is the recipient of INSA Associate Fellow for the year 2024.
20. Dr Sayantani Bhattacharyya, NISER is the recipient of INSA Young Scientist Associate for the year 2024.
21. Dr. Bishnu Prasad Biswal, NISER has received Prof. R C Tripathi Memorial Award from Odisha Chemical Society. He has also become Head of Max Planck Partner Group at NISER Bhubaneswar, Max Planck Society, Germany.
22. Dr. Sayan Choudhury, HRI has received Alumni Excellence Award from IISER Kolkata in January 2024.
23. Dr. Santosh Kumar Gupta, BARC has been selected as a member of the global young academy (GYA) Berlin, Germany.
24. Prof. Ajit Balram, IMSc has received MATRICS grant from SERB.
25. Dr. Akashrup Banerjee, SINP has received Startup Research Grant, from SERB.
26. Dr. Biswarup Satpati, SINP has become a Fellow of Electron Microscope Society of India (EMSI) in the Material Science category.
27. Dr. Syed Khizer Hasan, ACTREC has been recognized by the Board of Directors of the Society of Hematologic Oncology (SOHO) as an “Ambassador” from India for year 2024.

Awards Received by HBNI Students

1. Ms. Sudipa Manna, BARC has received Best Poster award for her poster titled, "$WO_3/BiVO_4/NiFeO_x$ heterojunction photoanodes for improved photoelectrocatalytic splitting of water," presented at 17th DAE-BRNS Biennial Trombay Symposium on Radiation & Photochemistry, DAE Convention Centre, Anushaktinagar, Mumbai, January 07-11, 2024.
2. Ms. Sangita Dhuri, BARC has received one of the Best Oral Presentation Award for her talk titled, "Probing shell effects in fission of nuclei with A≈200," presented at The Young Scientists Conference, 9th India International Science Festival (IISF held at DBT Translational Health Science and Technology Institute, RCB campus, Faridabad, Haryana, during January 17-20, 2024.
3. Shri Dheeraj Kumar Singh, BARC has received one of the Best Thesis Award for his thesis titled, "Study of high voltage discharge and optimization of electrical parameters in copper vapor laser," presented at 32nd DAE-BRNS National Laser Symposium held at RRCAT, Indore during January 29-February 1, 2024.
4. Ms. Neelam Singh, M.Tech. student, BARC has received Springer-SRESA Award for her paper titled, "C2 and phishing domain detection using DNS analysis," presented at International Conference on Reliability, Safety & Hazard Conference (ICRESH 2024) held at BARC, Mumbai during February 21-24, 2024.
5. Ms. Debarati Das, BARC has received one of the Best Poster Prize for her posted titled, "Investigation of ion-irradiation induced vacancy defects in MAX phase Ti_3AlC_2: A Positron Annihilation Spectroscopic Study," presented at DAE-BRNS Theme Meeting on Nuclear Probes for Materials, Medicine, and Industry (NPMMI-2024), held at DAE Convention Centre, Anushaktinagar, Mumbai during June 7-8, 2024.
6. Ms. Sanchita Ghosh, BARC has received one of the Best Poster Award by the Royal Society of Chemistry (RSC) for her poster titled, "Intrinsically ^{69}Ge-labeled biocompatible gallium oxide nanoparticles: A new nanoprobe for PET imaging of cancer" by the Royal Society of Chemistry (RSC) presented at 17th Chemical Research Society of India (CRSI) - RSC Joint Symposium and 32nd CRSI National Symposium in Chemistry (CRSI-NSC-32) held at Birla Institute of Technology and Science (BITS), Pilani during February 1-4, 2024.
7. Shri Sachin S. Kadlag, BARC has received ACS Best Poster Award for his poster titled, "TMB doped Ce(IV)-based coordination polymer nanoparticles: A Promising probe for colorimetric sensing of dopamine," presented at 3rd DAE-BRNS Symposium on Current Trends in Analytical Chemistry held at DAE Convention Centre, Anushaktinagar, Mumbai during March 6-9, 2024.
8. Ms. Trupti A. Chavan, BARC has received one of the Best Poster Award for her poster titled, "Enhancing the Sr uptake on resorcinol formaldehyde polycondensates by modifying the structure and shape," presented at 3rd DAE-BRNS Symposium on Current Trends in Analytical Chemistry held at DAE Convention Centre, Anushaktinagar, Mumbai during March 6-9, 2024.

9. Mr. Aditya Naugraiya, M. Tech. student, IPR received Best Paper Award for his talk titled, "A simulation analysis of 30 kV / 5A DC power supply for neutral beam injectors" presented at the 3rd IEEE International Conference on Power, Control and Computing Technologies (ICPC²T - 2024), NIT Raipur, during 18-20 January 2024.
10. Mr. Renjith Kumar R, IPR received Best Poster Award for his poster titled, "Studying the melt dynamics of a thin-film using a probe laser" at International Conference on Light Matter Interaction & Ultrafast Processes held at Mahatma Gandhi University (MGU), Kottayam, Kerala, during 1-4 March 2024.
11. Shri Pradeep Kumar Gupta, RRCAT has received one of the Best Thesis Award for his thesis titled, "Studies on multimode interference and pulse shaping in fibre lasers," presented at 32nd DAE-BRNS National Laser Symposium held at RRCAT, Indore during January 29 - February 1, 2024.
12. Shri Partha Sarathi Padhi, RRCAT has received one of the Best Thesis Award for his thesis titled, "Studies on Al_2O_3/TiO_2 nanolaminates for energy storage applications," presented at 32nd DAE-BRNS National Laser Symposium held at RRCAT, Indore during January 29 - February 1 2024.
13. Ms. Geetanjali, RRCAT has received one of the Best Poster Award for her poster titled, "Magneto-optical transport studies InGaAs/GaAS quantum structure," presented at 32nd DAE-BRNS National Laser Symposium held at RRCAT, Indore during January 29-February 1, 2024. She has also received M. P. Young Scientist Award for the year 2023-24 from M. P. State Science Congress.
14. Ms. Kritika Vijay, RRCAT has received Best Poster Award for her poster titled, "Observation of quasi-localized flat band in Kagome semimetal CoSn with Fe-doping," presented at International School on Higher European Research Course for Users of Large Experimental Systems (Hercules-2024) held at Grenoble, France during February 26 - March 28, 2024.
15. Shri Pratik Prataprao Deshmukh, RRCAT has received Best Poster Award for his poster titled, "Investigation of LaF_3 based nanophosphor for bioimaging applications," presented at 32nd DAE-BRNS National Laser Symposium held at RRCAT during January 29 - February 01, 2024.
16. Ms. Samruddhi Sudhir Deolekar, TMC secured second place and won four silver medals in the Open Senior Asian Powerlifting Championship 2024 held at Hong Kong during May 6-11, 2024.


NATIONAL INSTITUTIONAL RANKING FRAMEWORK 2024
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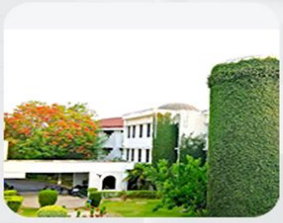

Harish-Chandra Research Institute (HRI)

Tata Memorial Centre (TMC)

Mahamana Pandit Madan Mohan Malaviya Cancer Centre & Homi Bhabha Cancer Hospital (MPMMCC & HBCH)

National Institute of Science Education and Research (NISER)

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