Executive Summary

The Beginning

The Department of Atomic Energy (DAE) was established in 1954 and its mandate includes

i. Research, including fundamental research in matters connected with atomic energy and the development of its uses in agriculture, biology, industry and medicine; and
ii. Advancement of higher mathematics.

In pursuit of its mandate, the DAE has established research and development centres as well as grant-in-aid institutions, and has taken in its fold several existing institutions as its grant-in-aid institutions. Together all institutions under the umbrella of the DAE present a formidable group in terms of expertise in science and engineering and research infrastructure. All research institutions under the umbrella of the DAE had been pursuing academic programmes with affiliation from universities located nearby. These programmes were either research based degree programmes (Ph.D. and M.Sc. by research) or class room based course work programmes in certain specialized areas [Diploma in Radiological Physics (DipRP), and Diploma in Medical Radio Isotope Techniques (DMRIT)] or those having a combination of class room courses and research (M.D., M.Ch. and D.M.). Student intake for these programmes was less than the full potential of the institutions and intensity of academic exchanges between R&D centres and grant-in-aid institutions had scope for improvement.

For developing a well trained manpower to fulfill its mandate, DAE founded the "Training School" at Atomic Energy Establishment, Trombay (AEET) in 1957. There was no opportunity available anywhere in the country to impart sufficiently broad-based training in the field of nuclear science and engineering. The Training School provided just the needed avenue both for training as well as for recruitment. With the renaming of AEET as BARC the Training School has come to be known as BARC Training School and the increased demand for manpower has prompted setting up training schools at other units of the DAE. The Training Schools offer a well designed compact, one year intensive programme for fresh engineers and scientists giving them a sound knowledge base in nuclear science and technology. For historical reasons, the name "Training School" continues, however, given the depth and range of its operation of its programmes, it functions as a Graduate School.

The DAE has also made significant contributions to the development of research activity in the universities in the country. Through the Board of Research in Nuclear Sciences (BRNS), it has strengthened the research programmes in the universities by funding well defined projects. BRNS has

the distinction of being the first agency in the country for funding extra-mural research. In the past one decade, funding through BRNS has been significantly stepped up.

To promote interaction amongst the scientists working in the research centres of the DAE and the faculty from the universities and other institutions of higher learning, and to enable young students to work on programmes of national importance under the joint guidance of the faculty from universities and the scientists of DAE, an Inter-University Consortium was established with its headquarters at Indore As per the present Memorandum of Understanding between the DAE and the UGC signed in 2003, the consortium is named as DAE-UGC-Consortium for Scientific Research and collaboration covers the disciplines of physical sciences, chemical sciences, life sciences and engineering sciences. This institutional arrangement, whereby advanced and major research facilities such as research reactors and accelerators of the DAE are made available to the academic institutions, provides an organic link between the Universities and the DAE institutions.

Considering continued expansion of the atomic energy programme and considering the fact that the DAE institutions are engaged in human resource development, the DAE Science Research Council in its meeting held on 26 June 2003 in Mumbai, when Dr. Raja Ramanna was in the Chair, recommended that the DAE might establish the Homi Bhabha National Institute (HBNI) having the status of a deemed university after accreditation from appropriate authorities. To advise the DAE on all aspects of the setting up of the HBNI, a Steering Committee with the following composition was set up by the Secretary, DAE.

1) Prof. P. Rama Rao, Former VC, Hyderabad University,	Chairman
2) Prof. S.P. Sukhatme, Former Director, IIT, Bombay	Member
3) Prof. S. Bhattacharya, Director, TIFR,	Member
4) Dr. Baldev Raj, Director, MCRG, IGCAR, Kalpakkam	Member
5) Dr. V.C. Sahni, Director, Physics Group, BARC,	Member
6) Dr. R.B. Grover, Director, SPG, DAE,	Member Secretary

The Committee drafted a proposal for submission to the Ministry of Human Resource Development (MHRD) and the University Grants Commission (UGC) in consultation with all possible constituent institutions. At this point of time, TIFR had already become a deemed university. All the remaining grant-in-aid institutions and R&D Centres concurred with the idea of setting up of the HBNI and therefore, after all internal approvals a proposal was submitted to the MHRD and the UGC by the Secretary, DAE.

After completion of further steps as stipulated by the UGC, an Expert Committee chaired by Prof. S.K. Joshi was appointed by the UGC and visited Trombay on March 28, 2005 to interact with the team from the HBNI and day-long deliberations were held with the HBNI team. Based on the report of the Expert Committee and its acceptance by the MHRD, the HBNI was notified as a deemed to be university on June 3, 2005 and started its academic programmes in 2006.

Setting up of the HBNI ensures that the DAE scientists and scientific establishments remain at the forefront of the pursuit of excellence in research in science and engineering, comparable with the best global standards. The HBNI brings together the following ten premier institutions of the DAE, called as Constituent Institutions (CIs) of the HBNI, under a single research-driven framework.

1. Bhabha Atomic Research Centre (BARC), Mumbai established in 1957 and having campuses at other places including Kalpakkam, Tarapur and Mysore, and field laboratories at all nuclear power stations, Gauribidanur, New Delhi, Kolkata, Hyderabad, high background radiation areas in Kerala, high altitude laboratories in Gulmarg, gamma ray telescope at Mount Abu etc. and BARC Training Schools at Mumbai, Indore, Kalpakkam and Hyderabad;
2. Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam set up in 1969;
3. Raja Ramanna Centre for Advanced Technology (RRCAT), Indore set up in 1984;
4. Variable Energy Cyclotron Centre (VECC), Kolkata. Cyclotron became operational in 1977 while VECC was still a part of BARC;
5. Saha Institute of Nuclear Physics (SINP), Kolkata set up in 1950;
6. Institute for Plasma Research (IPR), Gandhinagar set up in 1986;
7. Institute of Physics (IoP), Bhubaneswar, set up in 1972,
    - National Institute for Science Education and Research (NISER), Bhubaneswar set up as a project of IoP in 2006 and is functioning from the campus of IoP;
8. Harish-Chandra Research Institute (HRI), Allahabad set up in 1966;
9. Tata Memorial Centre (TMC), Mumbai set up in 1941; and
10. Institute of Mathematical Science (IMSc.), Chennai set up in 1962.

The Institute has a distributed structure and is a unitary deemed to be university. Its Constituents Institutions have already been carrying out advanced research and development for several decades. These have made India self-reliant in this sensitive and advanced field of national importance. Mission, vision and guiding values of the Institute were formulated in this background and are as follows.

Mission

- To encourage pursuit of excellence in sciences (including engineering sciences) and mathematics in a manner that has major significance for the progress of indigenous nuclear technological capability.

Vision

- To provide an academic framework for integrating basic research with technology development.
- To encourage inter-disciplinary research.
- To nurture an environment for attracting high quality manpower in the sciences including engineering sciences to take up a career in nuclear science and technology and related areas.

Guiding values

- Always adhere to highest ethical standards.
- Put good of students first.
- Value excellence in research and foster innovation and creativity.
- Recognize importance of science for the development of society.

Distinctive Characteristics of the Institute

HBNI is a research university and educates students at the doctoral and masters level, and pursues research in accordance with its mandate. It is meritocratic in hiring and promotion of faculty, admission and progression of students and all other policy aspects. As a result, it has a high concentration of talent in its faculty members and students.

Distinctive characteristic of the Institute is to advance indigenous nuclear technological capability. Technology control regime is an established practice in the nuclear field and for India to exploit full potential of nuclear sciences, it is necessary to develop a complete range of nuclear technologies based on indigenous efforts. Nuclear technologies have applications in generation of nuclear power; in health care where it is useful in diagnosis, therapy as well as sterility assurance; in industry for radiography, nuclear gauging and gamma scanning of chemical towers; isotope hydrology; and research. Mathematics is basic to all branches of sciences and serious research in pure and applied mathematics including theoretical computer science is very important for indigenous development of information technologies and for cyber security.

Nuclear engineering is an inter-disciplinary subject and any institution involved in its development has to have expertise in several branches of engineering, physical sciences, chemical sciences, life science, health sciences and mathematics. Scope of the HBNI is very vast.

The DAE has pursued a science based approach for nuclear power development and this has resulted in indigenization of nuclear power programme including associated fuel cycle facilities. This approach has also given India confidence to construct reactors based on technology development in the country. This is demonstrated by the ongoing construction of Prototype Fast Breeder Reactor, which is now nearing completion. India's participation in the international venture ITER has been possible only because of robust basic research in plasma physics and development of related technologies at IPR and other institutions in the country over the past three decades. DAE institutions continue to pursue basic research in areas such as nuclear physics, accelerator physics, laser physics, astrophysics, biophysics, string theory, quantum information and computation, pure and applied mathematics, theoretical computer science, organo-metallic materials, nano and condensed matter physics, atomic/ molecular clusters, catalysis, generation and storage of hydrogen, molecular mechanisms of abiotic stress tolerance, molecular marker techniques for marker assisted selection, development and characterization of transgenic plants, oncology and nuclear medicine, and many other similar areas including several areas which may be classified as blue sky research.

To pursue research, the Institute has a wide range of facilities ranging from table top set up to mega science facilities such as research reactors, accelerators and tokamaks. Computational resources available to faculty and students are quite extensive and faculty is well trained to build own instrumentation and facilities. The Institute seeks to serve the following categories of students.

- Doctoral students in all branches of science and engineering having a relation with nuclear technology and mathematics and underlying basic sciences. Doctoral students in HBNI work on problems related to the mandate of the DAE and deliver a lot in terms of research output. Increased intake of doctoral students can contribute a lot towards realizing the full potential of the research infrastructure and help the DAE in accelerating the pace of developing indigenous technologies. Employees of DAE also register for Ph.D. programme. Employees also have the possibility of enrolling for M.Sc.(Engg).
- Young graduates inducted in the DAE for a job have to study nuclear science and engineering for a period of one year at the BARC Training Schools. After setting up of the HBNI, for engineers, the programme has been converted to an M.Tech. programme by adding one year project work. Scientists are given three options, (i) getting an M.Phil by doing one year of project work, (ii) using the credits earned during the one year at the Training School towards course work for a Ph.D. from the HBNI and (iii) getting an M.Tech. by doing one year of project work. The third option is available only to those who work in applied areas such as lasers, accelerators, radiological safety

engineering, material science and exploration geosciences. Those who do just one year of course work get a PG Diploma.

- Medical doctors continue to pursue post-graduate medical programmes at TMC and intake of students has been significantly increased both at the post-graduate level and at the super-specialty level.
- DipRP, DRM and DMRIT programmes conducted at BARC continue as earlier

It may be noted from the above that a significant percentage of students of the Institute are either employees or potential employees. All BARC training School students are potential employees and roughly half of the doctoral students are employees of the DAE institutions.

A brief description on the three characteristics of the Institute viz., emphasis on collaborations, a robust research output and capable faculty follows.

Collaborations

The DAE has always encouraged collaborations at the national level and provided funding for research in tune with its mandate through its funding agencies. Funding agencies have insisted on a collaborative approach wherein every project has a principal collaborator from within the DAE in addition to principal investigator. With the setting up of the HBNI, collaborations with academic institutes have been further strengthened by signing formal agreements of cooperation between the HBNI and institutes and universities. The HBNI has entered into formal Memorandum of Understanding with the following Institute/ Universities.

1. Institute of Chemical Technology, Mumbai
2. Indian Institute of Science, Bangalore
3. Indian Institute of Technology, Bombay
4. Indian Institute of Technology, Madras
5. Indian Statistical Institute, Kolkata
6. Jadavpur University, Kolkata
7. Indian Institute of Technology, Kanpur
8. Tata Institute of Fundamental Research, Mumbai
9. The Rector and Visitors of the University of Virginia
10. The Commissariat á l'énergie atomique et aux énergies alternatives (CEA), France
11. University of North Texas, USA

Research Output

CIs of HBNI are engaged in research and technology development. Indigenous nuclear technology capability is a testimony to the technological output of CIs. It is to be noted that while technologies related to generation of nuclear power and associated nuclear fuel cycle facilities have been deployed by the public sector companies and industrial units within the DAE, non-power related technologies have been transferred to entities outside of the DAE. Institutions of the DAE have a well structured mechanism for transfer of technologies. It may be added that as per the section 20 of the Atomic Energy Act, 1962, inventions related to atomic energy are not patentable in India and accordingly CIs have not filed many patents.

Research output of CIs is impressive both in terms of total number of publications and citations thereof. Publications data was downloaded from the *Web of Science* (WoS) for the period of 2009-2013 during the last week of March, 2014[1]. A total of 15194 publications from CIs of HBNI and 71686 citations thereof during the period were downloaded. All the records were classified into 10 broad subject categories based on *WoS* Subject Categories. The following tables and bar chart give a summary of publication record of HBNI.

Table giving a CI wise summary of publication record for the period 2009-2013

Sr. No.	Constituent Institution	TP	APY	TC	ACP	*h*-Index	AIF	IF Range (JCR 2012)
1.	BARC	6978	1395.60	30684	4.40	45	2.11	0.00 - 41.30
2.	IGCAR	1741	348.20	4964	2.85	22	1.51	0.00 - 09.74
3.	SINP	1572	314.40	10405	6.62	38	3.11	0.00 - 44.98
4.	TMC	935	187.00	5002	5.35	27	2.85	0.00 - 51.66
5.	RRCAT	827	165.40	2312	2.80	16	1.76	0.00 - 38.60
6.	VECC	656	131.20	5576	8.50	36	3.11	0.00 - 38.60
7.	IMSc	629	125.80	2403	3.82	23	2.39	0.00 - 44.98
8.	IoP	596	119.20	4826	8.10	33	3.33	0.00 - 38.60
8a.	IoP(NISER)	244	48.80	841	3.45	13	3.72	0.00 - 35.75
9.	IPR	521	104.20	1193	2.29	11	1.54	0.00 - 09.74
10.	HRI	495	99.00	3480	7.03	26	3.77	0.00 - 22.93
Total		15194	3038.80	71686	4.72	-	2.34	-

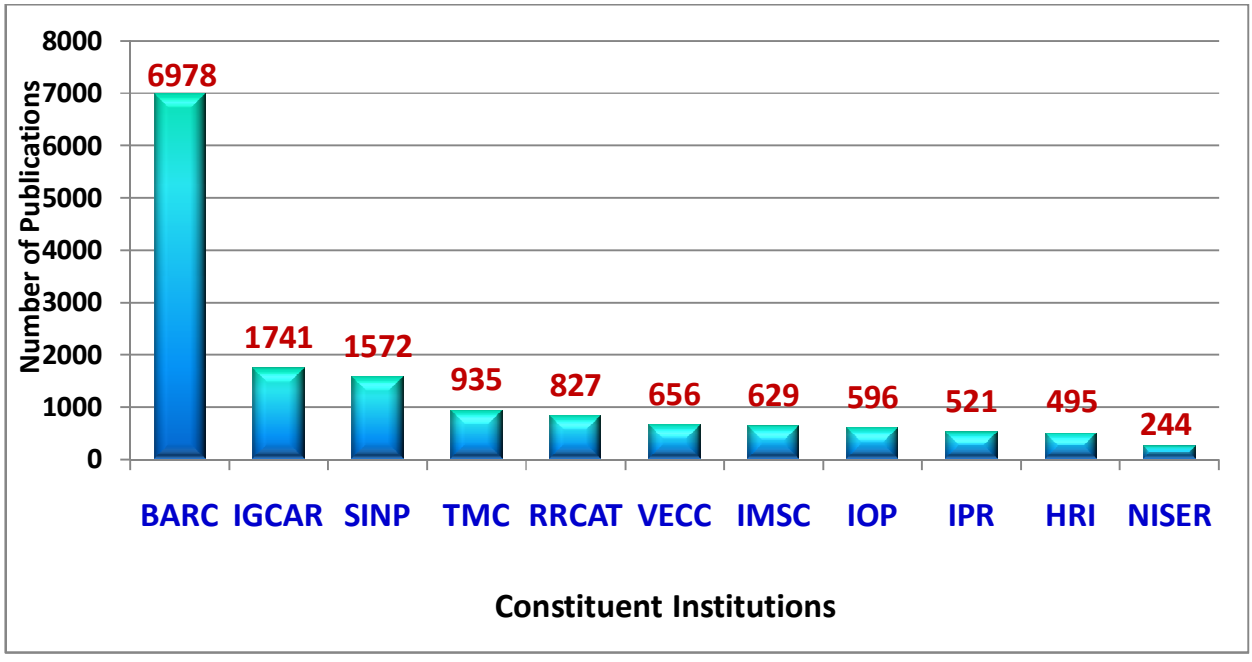
[1] Data compilation was done by Scientific Information Resource Division, BARC.

TP=Total Publications; APY=Average Publications per Year; TC=Total Citations; ACP=Average Citations per Publication; AIF=Average Impact Factor per Publication; JCR=Journal Citations Report

Table giving subject-wise Distribution of Publications of for the period 2009-2013

Subjects	TP	% of TP	TC	ACP	AIF	IF Range (JCR-2012)
Physical Sciences	5956	39.20	36340	6.10	2.88	00.00 - 44.98
Chemical Sciences	2790	18.36	12302	4.41	2.43	00.00 - 41.30
Materials Sciences	1513	9.96	4268	2.82	1.39	00.00 - 23.19
Engineering Sciences	1343	8.84	4998	3.72	1.48	00.00 - 07.71
Medical Sciences	1076	7.08	5023	4.67	2.61	00.00 - 51.66
Biological Sciences	862	5.67	4123	4.78	2.68	00.00 - 31.96
Nuclear Science & Technology	607	3.99	921	1.52	0.68	00.00 - 01.03
Multidisciplinary Sciences	484	3.19	2694	5.57	2.68	00.00 - 38.60
Earth and Environmental Sciences	301	1.98	742	2.47	1.47	00.00 - 04.74
Mathematical Sciences	262	1.72	275	1.05	0.64	00.00 - 02.98
Total	15194	100%	71686.00	4.72	2.34	00.00 - 51.66

Bar chart giving a CI wise summary of publication record for the period 2009-2013



Faculty

Faculty of the Institute has excellent credentials. Prof Ashoke Sen of Harish-Chandra was awarded Fundamental Physics Prize and it is a privilege to have him as a faculty. In addition to Academies in India, he is a Fellow of Royal Society, London, UK. About 100 members of faculty and scientists of CIs are fellows of prestigious academies and nine have won prestigious national civilian awards. **The tables below include names of those individuals who are with the Institute as on 31.03.2014.**

1. Fellows of Indian National Academy of Engineering, New Delhi

S. No.	Name	Year of birth	Year of election	CI
1.	Anil Kakodkar*	1943	1991	BARC
2.	Srikumar Banerjee*	1946	1993	BARC
3.	R.B. Grover*	1949	1999	Director HBNI
4.	R.K. Sinha	1951	1999	Chairman, CoM
5.	H.S. Kushwaha**	1946	2000	BARC
6.	P. Chellapandi	1956	2001	IGCAR
7.	S.C. Chetal**	1949	2001	IGCAR
8.	T.K. Bera	1954	2002	BARC
9.	B K Dutta	1953	2004	BARC
10	V.K. Mehra**	1948	2004	BARC
11	Sekhar Basu	1952	2005	BARC
12	L.M. Gantayet	1950	2005	BARC
13	T. Jayakumar	1955	2005	IGCAR
14	B.B.Biswas**	1948	2006	BARC
15	Manjit Singh	1950	2006	BARC
16	S. Venugopal	1955	2006	IGCAR
17	A.K.Bhaduri	1959	2007	IGCAR
18	G K Dey	1957	2008	BARC
19	K. Velusamy	1959	2008	IGCAR
20	R.R.S. Yadav	1952	2008	BARC
21	U. Kamachi Mudali	1960	2009	IGCAR
22	P.K. Wattal	1951	2010	BARC
23	K.K. Jayarajan	1962	2011	BARC
24	R. Natarajan	1953	2011	IGCAR
25	K.K. Vaze	1950	2011	BARC
26	R.K. Singh	1953	2012	BARC
27	A.K. Sinha	1956	2012	BARC
28	S. Chaturvedi	1962	2013	BARC
29	C.K. Pithawa	1951	2013	BARC
30	S.B. Roy	1956	2013	BARC

* Homi Bhabha Chair

** Raja Ramanna Fellow (RRF)

2. Fellows of the Indian National Science Academy, New Delhi

	Name	Year of Birth	Year of Election	CI
1.	P.K. Kaw***	1948	1984	IPR
2.	R. Balasubramanian	1951	1988	IMSc
3.	Bikash Sinha*	1945	1989	VECC
4.	Srikumar Banerjee*	1946	1992	BARC
5.	Probir Roy**	1942	1992	SINP
6.	J.B. Joshi*	1949	1995	HBNI
7.	J. Maharana**	1945	1995	IoP
8.	Ashoke Sen	1956	1996	HRI
9.	Romesh Kaul	1952	1998	IMSc
10.	S.K. Apte	1952	1999	BARC
11.	Swapan K. Ghosh	1949	1999	BARC
12.	M.K. Sanyal	1954	2001	SINP
13.	A.M. Jayannavar	1956	2002	IoP
14.	B.K. Chakrabarty	1952	2003	SINP
15.	V.S. Sunder	1952	2004	IMSc
16.	Sunanda Banerjee	1952	2005	SINP
17.	Abhijit Sen****	1946	2006	IPR
18.	S.M. Bhattacharjee	1957	2008	IoP
19.	V. Chandrashekar	1958	2008	IOP(NISER)
20.	Y.P. Viyogi**	1948	2009	VECC
21.	R. Gopakumar	1967	2010	HRI
22.	M.V. Hosur	1950	2010	BARC
23.	Parthasarathi Mitra	1951	2012	SINP
24.	Gautam Bhattacharyya	1966	2013	SINP
25.	S.L. Chaplot	1955	2013	BARC
26.	S. Kailas	1949	2013	BARC
27.	C.S. Sundar	1952	2013	IGCAR
28.	D. K. Palit	1957	2014	BARC
29.	Anjan Kundu	1953	2014	SINP

*Homi Bhabha Chair, **RRF, ***DST Professor, ****S. Chandrasekhar Chair

3. Fellows of the Indian Academy of Sciences, Bangalore

	Name	Year of Birth	Year of Election	CI
1.	P.K. Kaw***	1948	1974	IPR
2.	R. Balasubramanian,	1951	1987	IMSc
3.	Probir Roy**	1942	1989	SINP
4.	Srikumar Banerjee*	1946	1990	BARC
5.	Swapan K. Ghosh	1949	1991	BARC
6.	J.B. Joshi*	1949	1991	HBNI

7.	Ashoke Sen	1956	1991	HRI
8.	V.S. Sunder	1052	1992	IMSc
9.	J.K. Bhattacharjee	1952	1993	HRI
10.	Romesh K Kaul	1952	1993	IMSc
11.	J. Maharana**	1945	1994	IoP
12.	S. Kailas	1949	1995	BARC
13.	Abhijit Sen****	1946	1995	IPR
14.	A.M. Jayannavar	1956	1996	IoP
15.	B.K. Chakraborty	1952	1997	SINP
16.	Anil Kakodkar*	1943	1998	BARC
17.	C.S. Sundar	1952	1999	IGCAR
18.	S.M. Bhattacharjee	1957	2000	IoP
19.	M.K. Sanyal	1954	2001	SINP
20.	Sunanda Banerjee	1952	2002	SINP
21.	V. Chandrashekar	1958	2003	IOP(NISER)
22.	R. Gopakumar	1967	2007	HRI
23.	P.K.Gupta	1954	2007	RRCAT
24.	D.K. Palit	1957	2007	BARC
25.	P. Sankaran	1959	2007	IMSc
26.	S.K. Apte	1952	2008	BARC
27.	G.K. Dey	1957	2008	BARC
28.	S. Kesavan	1952	2008	IMSc
29.	S.M. Sharma	1952	2008	BARC
30.	D.S. Nagaraj	1958	2010	IMSc
31.	Amita Das	1965	2011	IPR
32.	V. Ravindran	1965	2012	HRI
33.	H.N. Ghosh	1966	2013	BARC
34.	T.K. Nayak	1958	2013	VECC
35.	Arun K. Pati	1966	2013	HRI
36.	A.K. Tyagi	1964	2013	BARC

*Homi Bhabha Chair, **RRF, ***DST Professor, ****S. Chandrasekhar Chair

4. Fellows of the National Academy of Sciences, India, Allahabad

	Name	Year of Birth	Year of Election	CI
1.	P.K. Kaw***	1948	1989	IPR
2.	R. Balasubramanian	1951	1992	IMSc
3.	S.F. D'Souza	1949	1993	BARC
4.	S.K. Apte	1952	1995	BARC
5.	V.K. Jain	1956	1995	BARC
6.	Abhijit Sen****	1946	1995	IPR
7.	J.K. Bhattacharjee	1952	1997	HRI
8.	S. Kesavan	1952	1997	IMSc
9.	Ashoke Sen	1956	1997	HRI

10.	V.S. Sunder	1952	1997	IMSc
11.	Swapan K. Ghosh	1949	2001	BARC
12.	Parthasarathi Mitra	1951	2001	SINP
13.	Sumathi Rao	1956	2001	HRI
14.	Probir Roy**	1942	2001	SINP
15.	M.K. Sanyal	1954	2001	SINP
16.	Srikumar Banerjee*	1946	2002	BARC
17.	Anil Kakodkar	1943	2002	BARC
18.	V.C. Sahni*	1945	2002	BARC
19.	K. B. Sainis	1949	2002	BARC
20.	C.S. Sundar	1952	2002	IGCAR
21.	S. Chattopadhyay	1957	2003	BARC
22.	A.M. Jayannavar	1956	2003	IoP
23.	M. Krishna	1956	2003	IMSc
24.	K. I. Priyadarsini	1959	2003	BARC
25.	P.K. Gupta	1954	2003	RRCAT
26.	P.D.Gupta	1952	2004	RRCAT
27.	H. Pal	1959	2004	BARC
28.	A.K. Tyagi	1964	2004	BARC
29.	S.M. Sharma	1952	2005	BARC
30.	B. Mukhopadhyaya	1966	2006	HRI
31.	D.K. Palit	1957	2006	BARC
32.	P. Sankaran	1959	2006	IMSc
33.	S.D. Adhikari	1957	2007	HRI
34.	S.L. Chaplot	1955	2007	BARC
35.	V.P. Viyogi**	1948	2007	VECC
36.	V. Chandrashekar	1958	2007	IOP(NISER)
37.	H.N. Ghosh	1966	2008	BARC
38.	R.K. Vatsa	1963	2009	BARC
39.	V. Kodiyalam	1966	2010	IMSc
40.	S. Panda	1959	2010	HRI/IoP
41.	A.C. Bhasikuttan	1967	2011	BARC
42.	P.S. Chakraborty	1973	2012	IMSc
43.	D. K. Maity	1964	2012	BARC
44.	D. K. Srivasatava	1952	2012	VECC
45.	Arun K. Pati	1966	2013	HRI
46.	B. Ramakrishnan	1961	2013	HRI
47.	P. D. Naik	1959	2013	BARC
48.	Gautam Bhattacharyya	1966	2013	SINP

*Homi Bhabha Chair, **RRF, ***DST Professor, ****S. Chandrasekhar Chair

5. Fellow of National Academy of Agricultural Sciences

	Name	Year of Birth	Year of Election	CI
1.	S K Apte	1952	1998	BARC

6. Fellows of the Third World Academy of Sciences, Trieste, Italy

	Name	Year of Birth	Year of Election	CI
1.	Ashoke Sen	1956	2004	HRI
2.	Srikumar Banerjee*	1946	2007	BARC
3.	G. Baskaran**	1948	2008	IMSc
4.	J.B. Joshi*	1949	2008	HBNI
5.	V. Chandrashekar	1958	2008	IoP(NISER)
6.	Swapan K. Ghosh	1949	2010	BARC

*Homi Bhabha Chair, **RRF

7. Fellow of World Academy of Art and Science

	Name	Year of Birth	Year of Election	CI
1.	R.B. Grover*	1949	2013	Director HBNI

*Homi Bhabha Chair

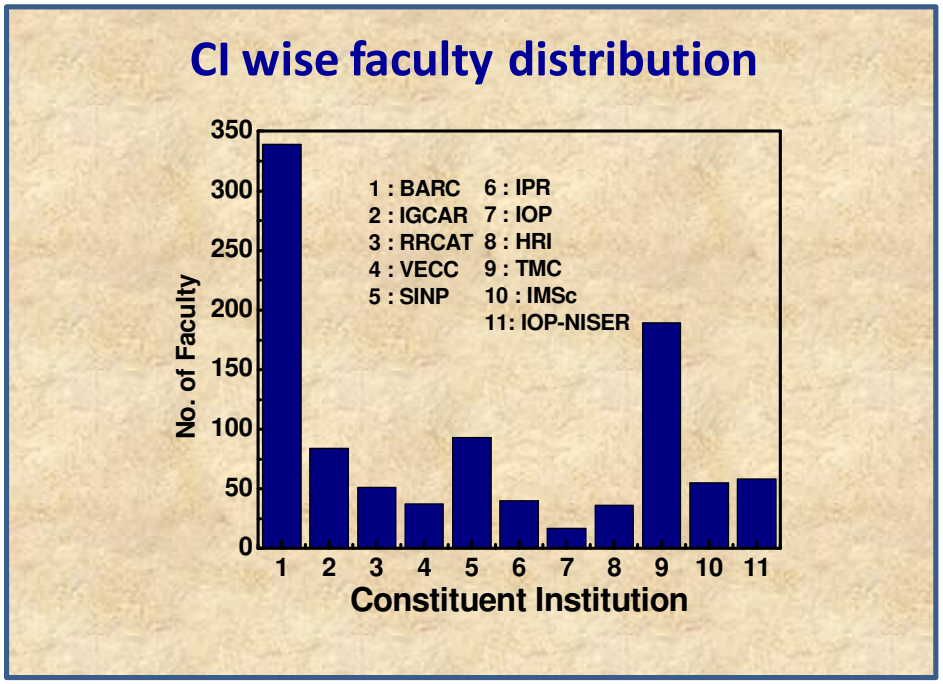
8. Recipient of National Civilian Awards

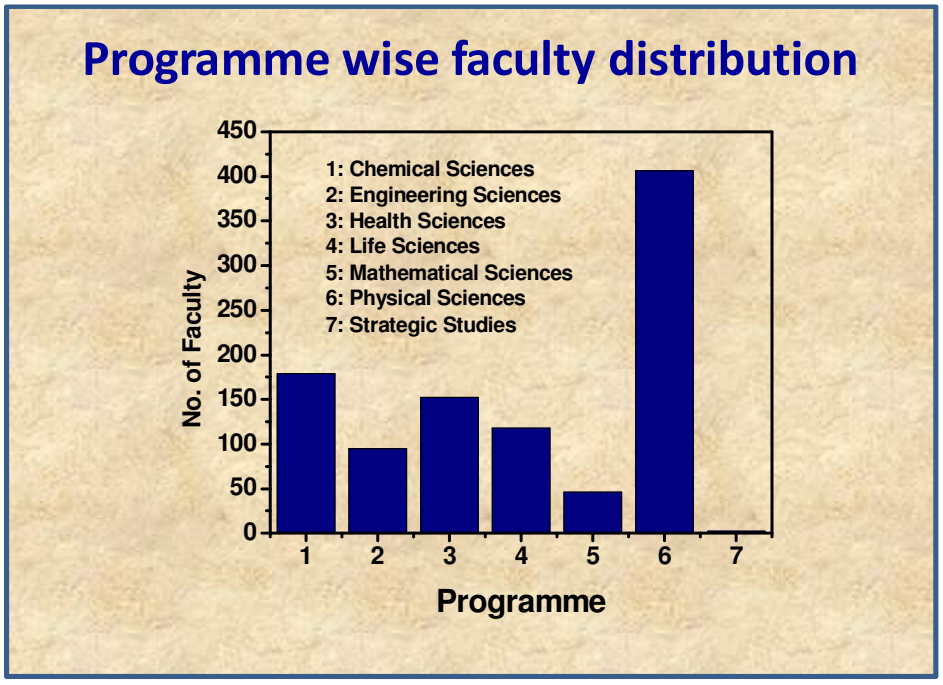
	Name	Year of Birth	Year of Award	CI
Padma Vibhushan				
1.	Anil Kakodkar*	1943	2009	BARC
Padma Bhushan				
2.	Anil Kakodkar	1943	1999	BARC
3.	Ashoke Sen	1956	2013	HRI
4.	J B Joshi	1949	2014	HBNI
Padma Shri				
5.	P K Kaw**	1948	1985	IPR
6.	Anil Kakodkar	1943	1998	BARC
7.	Ashoke Sen	1956	2001	HRI
8.	Srikumar. Banerjee*	1946	2005	BARC
9.	R. Balasubramanian	1951	2006	IMSc
10.	R. A. Badwe	1956	2013	TMC
11.	S P Kale	1954	2013	BARC
12.	R. B. Grover*	1949	2014	HBNI
13.	Sekhar Basu	1952	2014	BARC

*Homi Bhabha Chair, ** DST Professor

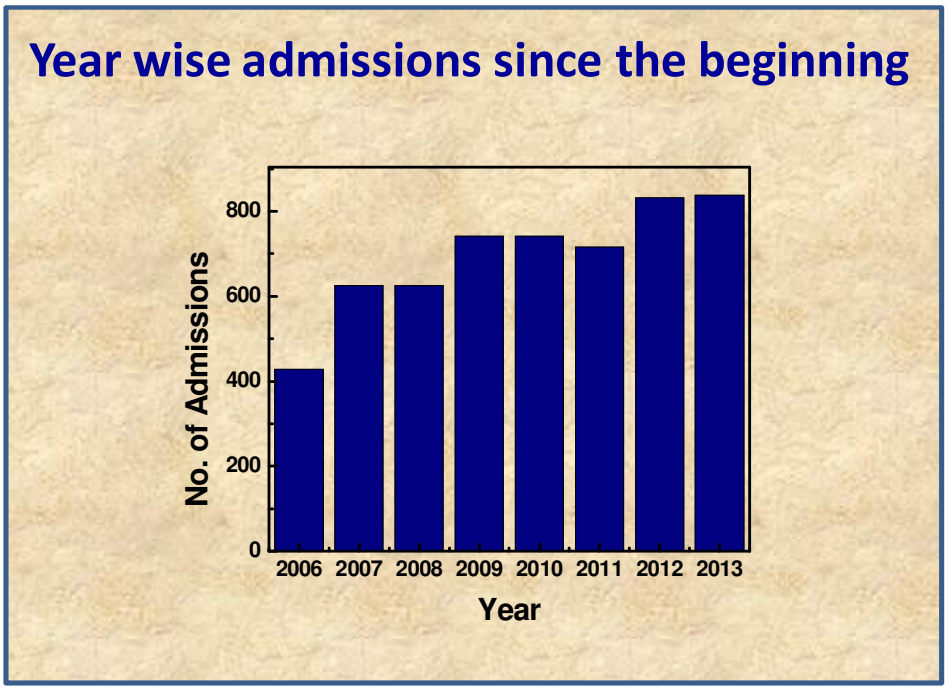
The following two bar charts give CI wise and discipline wise faculty distribution.

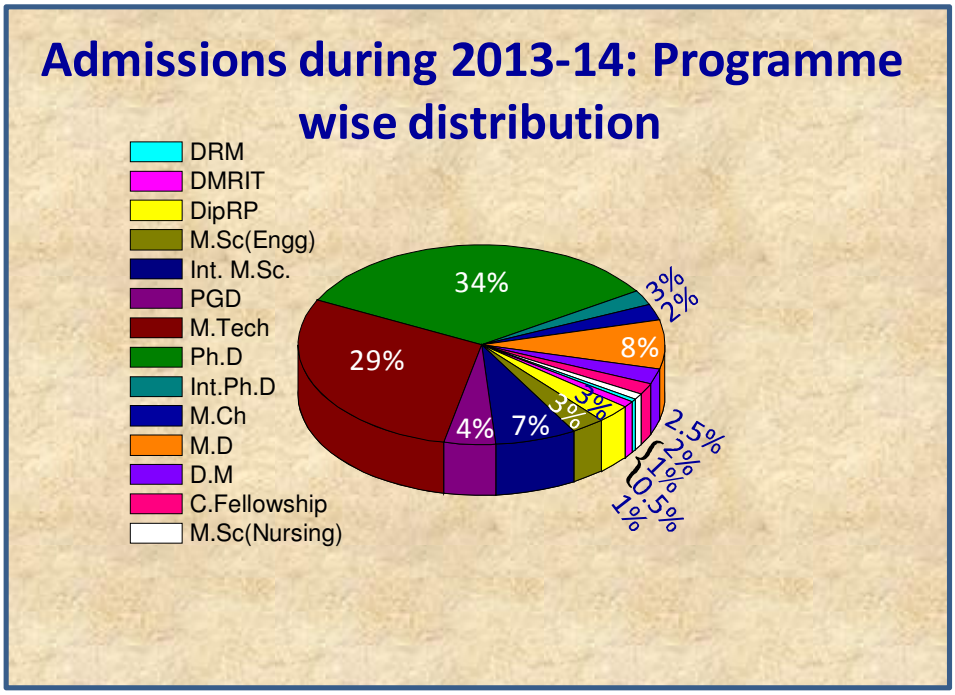
Medical doctors (79 in TMC and 2 in BARC) designated as faculty in accordance with MCI guidelines for teaching and guiding PG and super-specialty courses are included in the data.



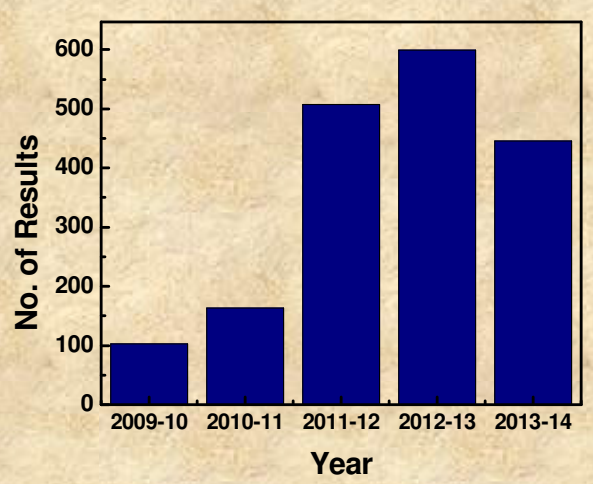


The Institute at a Glance

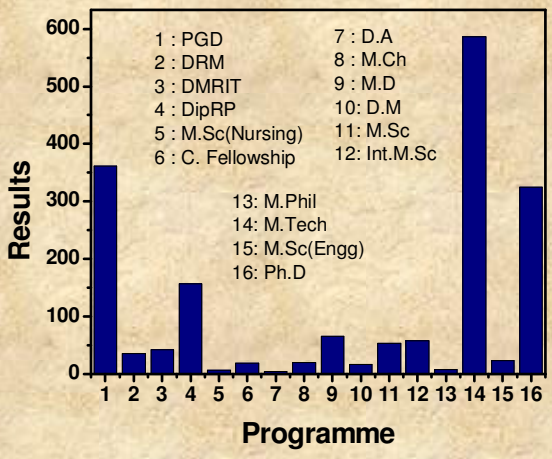


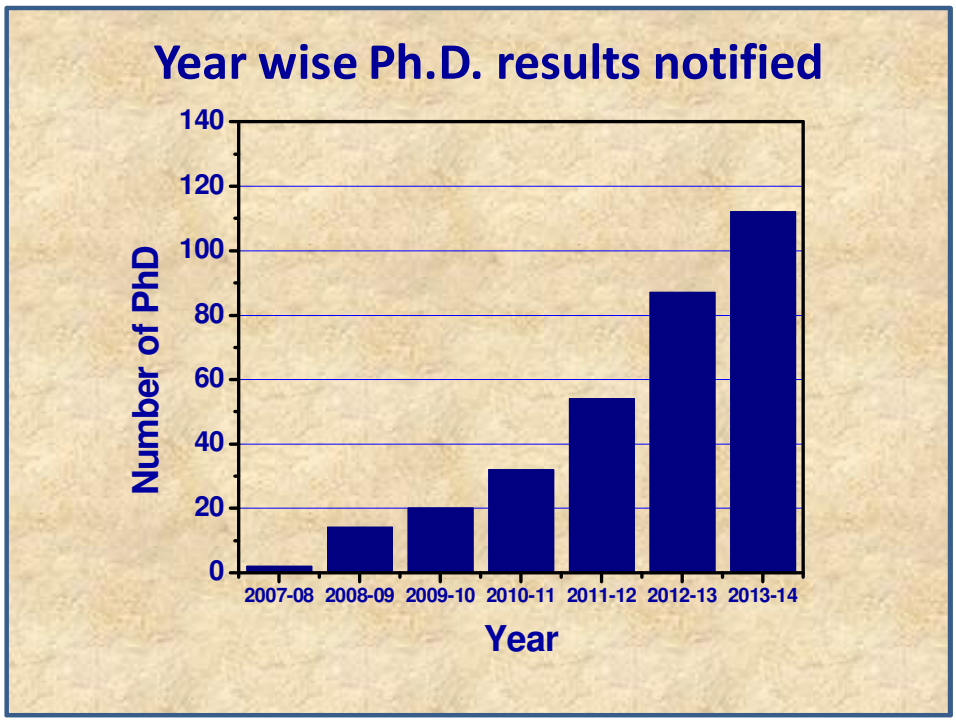


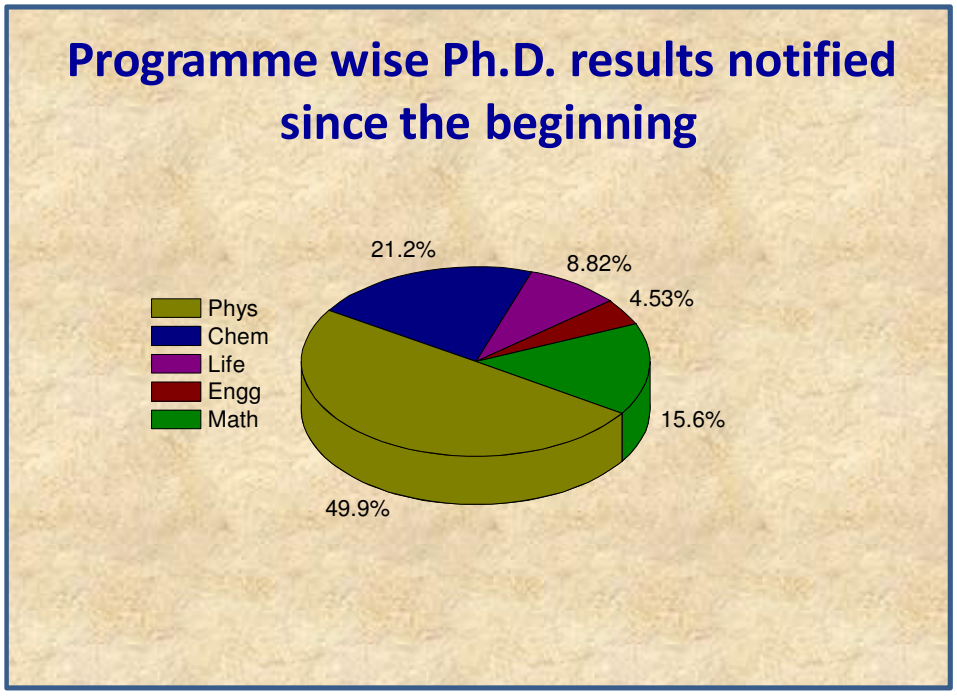
Year wise results notified since the beginning



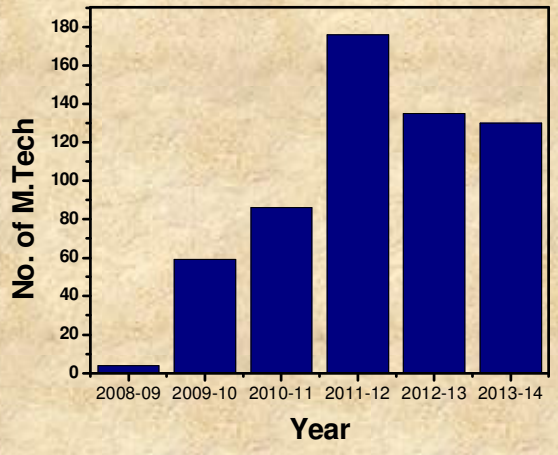
Programme wise results notified since the beginning



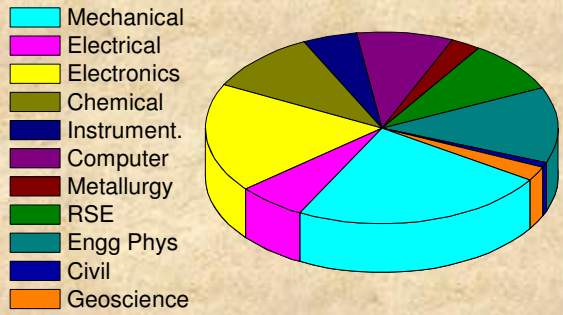

Year wise Ph.D. results notified
Number of PhD
140
120
100
80
60
40
20
0
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
Year


Programme wise Ph.D. results notified since the beginning
Phys
Chem
Life
Engg
Math
21.2%
8.82%
4.53%
15.6%
49.9%

Year wise M.Tech. results notified since the beginning



Programme wise M.Tech. results notified since the beginning



Future Plans

1. To increase intake of doctoral students after establishing infrastructure such as students' hostels,
2. To increase intake of students to Diploma in Radiation Protection (DipRP) programme at BARC.
3. To convert Diplomate of National Board (DNB) programme (accredited by National Board of Examinations) being run in BARC hospital to a MD/MS programme under HBNI,
4. To start M.Sc (Clinical Research) at TMC,
5. To start a Diploma Programme in Fusion Imaging Technology at TMC, and
6. To start M.Tech. in fusion science and engineering at IPR.

A new campus for NISER is under construction and once it moves to its new campus, it is proposed to start schools in Computer Science and Earth Sciences, and integrated Ph.D. programme in all disciplines..

Taking a longer term view, a new campus of BARC is being planned at Vizag and land for the campus has already been acquired. Centre of Plasma Physics, Sonapur, near Guwahati has merged with IPR and academic programmes leading to a Ph.D. could be started there as well in future. TMC is setting up new campuses at Vizag in Andhra Pradesh, and Mullanpur, SAS District, Punjab, near Chandigarh.

Analysis to Identify Strengths, Weaknesses, Opportunities and Challenges (SWOC)

Strengths

1. The quality of students is very good because of very rigorous selection process adopted.
2. The initial training imparted to the students by way of one year rigorous course work is of very high standard.
3. The quality of all facilities viz., experimental, library and physical, available is very good, and the funding is very generous.
4. The faculty is academically robust, nationally and internationally known, and there is a very strong peer pressure on both the faculty and the students to excel.
5. Through its alumni, the Institute is making a valuable contribution to the scientific manpower development in the country. A large number of alumni occupy research and faculty positions in various leading Institutions and Universities.

Weaknesses

1. Pursuit of a meritocratic admission policy sometimes leads to very low intake of students.
2. Misplaced apprehensions about nuclear energy deter some students to join the doctoral programme run by a university under the DAE.
3. The embargo on supply of items subject to technology controls to R&D centres forces students and faculty to devise alternate instrumentation and equipment leading to delays in research as alternate equipment has to be developed or innovative techniques have to be used for getting results.
4. Some of the CIs are small in size and pursue research in limited subject areas. Innovative ideas are being adopted to address this lacuna as otherwise students would not get a broad exposure. For example, TMH is a standalone comprehensive oncology Hospital. Due to this TMH students are rotated through KEM hospital (G S Medical College) for six months to one year training in different subjects.
5. Doctoral programme particularly in engineering sciences has started expanding only in recent years. First priority of some of the faculty is to pursue R&D projects. Due to preoccupation with R&D projects, mentoring of students get less priority and needs to be given more attention by the faculty.
6. Due to availability of alternate non-academic career options, some of the doctoral students leave research in between.
7. Percentage of women scientists is still very low, despite the fact that number of women getting into Ph.D. programme is not that small. This is usually due to conflicting requirements of family care and highly demanding research career.

Opportunities

1. Opportunity to do high level research in frontier areas of basic sciences and engineering having application in national programme.
2. Opportunity to interact with scientist at national level and international level
3. Opportunity to get various forms of national and international recognitions in the form of fellowships and awards
4. Opportunity to develop various types of skills
5. Opportunity to do interdisciplinary research.
6. Opportunity to pool resources of different CIs. Doctoral committees for students have membership from across CIs and this benefits smaller and new CIs. Possibility of collaboration between TMC and BARC Hospital are also being explored.

Challenges

1. For faculty to maintain a balance various types of responsibilities.
2. For employees enrolled for doctoral programmes, maintaining a balance between their responsibility as employees and doctoral students.

3. To ensure superiority in quality of research while doing doctoral research on large scale set ups.
4. To promote quality of research while maintaining a reasonable output of publications for researchers, especially, promoting leadership in research.
5. To strengthen interface with industries in research areas. This requires initiatives from industries as well as a national initiative.
6. To publish results of research in strategic topics without compromising on classified nature of information.
7. To evolve strategies for making research programs and research jobs more compatible with requirements of family care to promote gender equality in research so that qualified women can get appropriate jobs.