

# A glimpse of doctoral training among Swarnajayanti Fellows

Inderpal Singh

*The recipients of Swarnajayanti Fellowship (1997–2016) are associated with only 23 different R&D institutions across India and are mostly from the Indian Institutes of Technology (IITs); Indian Institute of Science (IISc), Bengaluru; Tata Institute of Fundamental Research (TIFR), Mumbai and Council of Scientific & Industrial Research (CSIR) laboratories. The pattern shows that 43% of Swarnajayanti Fellows (SJFs) are also recipients of the prestigious Shanti Swarup Bhatnagar (SSB) Prize. The study reveals that 70% of SJFs with doctoral training under the supervision of Bhatnagar awardees are the recipients of the SSB Prize followed by 66% with foreign Ph Ds and 52% with Indian Ph Ds. IISc and CSIR laboratories have the distinction that all SJFs with doctoral training under the supervision of Bhatnagar awardees are recipients of the SSB Prize, while TIFR has the most with foreign Ph D.*

**Keywords:** Academic training, awards and fellowships, foreign and domestic Ph Ds, SSB prize.

THE Department of Science and Technology (DST), Government of India instituted the 'Swarnajayanti Fellowships' to recognize accomplishments of Indian scientists between 30 and 40 years of age, residing in India or abroad in all branches of science, engineering and medicine<sup>1</sup>. Under this scheme, a selected number of young scientists, with excellent track record, are provided special assistance and support to enable them to pursue research in frontier areas of science and technology. The Swarnajayanti Fellows (SJFs) are provided a fellowship of Rs 25,000 per month supplemented by unfettered research grant for a period of five years<sup>1</sup>. As of 2016, the Swarnajayanti Fellowships have been conferred upon 143 young researchers (including 6 women scientists) since its introduction in 1997.

The academic training, in particular the Ph D programme and formative research experience of a scientist have tremendous influence on his/her academic career. Researchers are benefited from observing their supervisors operating and performing – their method of work, their standard and the research culture. The knowledge that is passed down from the role models benefits both the individual and the organization. A significant portion of SJFs have doctorate degrees from the US, UK or other advanced countries. Many of them have completed their doctorate degrees under supervisors who have been conferred with the Shanti Swarup Bhatnagar (SSB) Prize, India's most prestigious prize in science and technology.

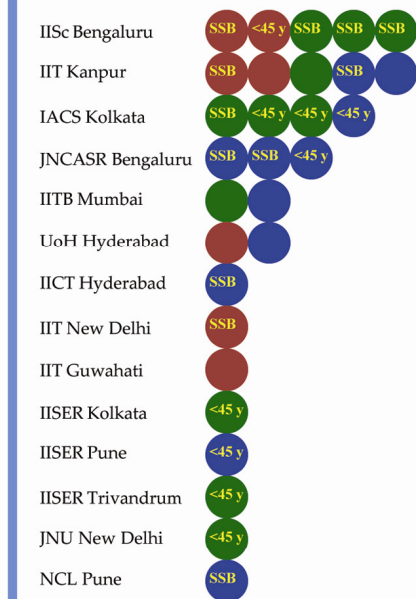
The SSB Prize instituted in 1957 is bestowed in seven disciplines (biological, chemical, earth–atmosphere–ocean–planetary, engineering, mathematical, medical and physical sciences) by the Council of Scientific and Industrial Research (CSIR), in recognition of conspicuously important and outstanding contributions to human knowledge and progress through work done primarily in India<sup>2</sup>. Over the years, the Bhatnagar awardees have acquired a unique status among the scientific community and serve as role models for younger scientists to emulate<sup>3</sup>. As of 2016, 62 SJFs have been conferred with the SSB prize. In this study, we map doctoral training among SJFs for the period 1997–2016. The educational background of the SJFs was studied and categorized into three groups: foreign Ph Ds – category A, domestic PhDs – category B and Ph Ds under the supervision of Bhatnagar awardees – category C.

## Descriptive analysis and results

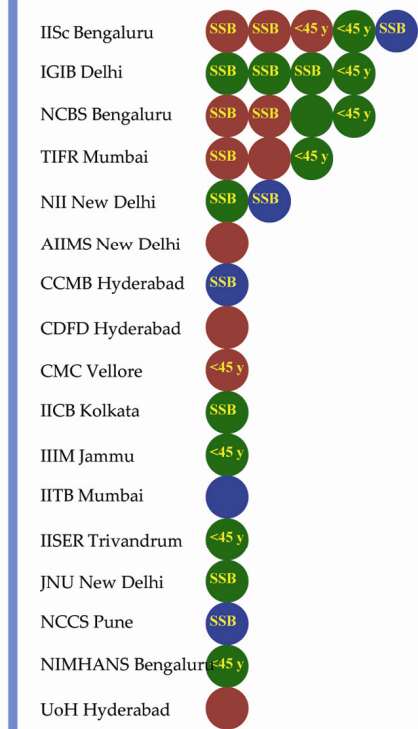
As presented in Figure 1, 61 SJFs have earned their Ph Ds abroad, 46 from domestic universities and 36 under the supervision of Bhatnagar awardees. Among the 62 SJFs conferred with the SSB prize, 30 are in category A, 13 in category B and 19 in category C. Among 35 SJFs who did not receive the SSB Prize, 15 are in category A, 12 in category B and 8 in category C. If we consider December 2016 as the cut-off date for age-wise eligibility criteria for nomination to the SSB Prize, 46 SJFs are suitable for nomination prize in the forthcoming years. Of these, 17 are in category A, 20 in category B and 9 in category C.

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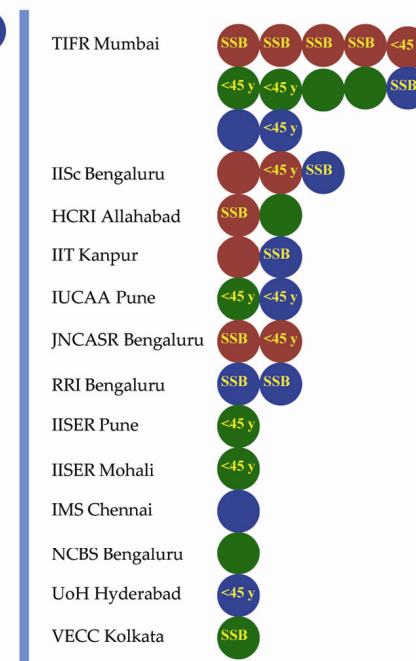
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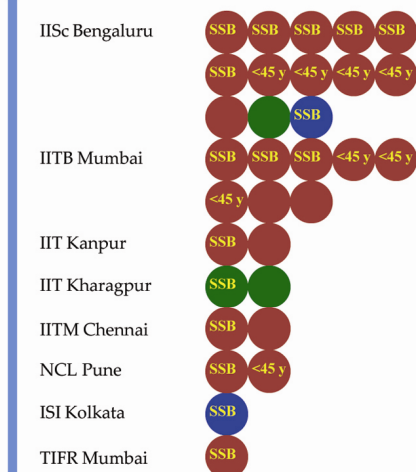
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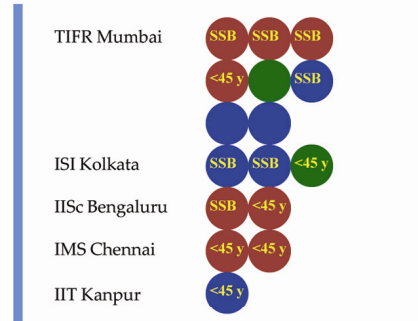
**Physical Sciences**



**Engineering Sciences**



**Mathematical Sciences**



**Earth and Atmospheric Sciences**



● Category A : SJFs with foreign PhD  
● Category B : SJFs with domestic PhD  
● Category C : SJFs with PhD under supervision of Bhatnagar awardees  
 Circles filled with "SSB" represent SJFs conferred upon SSB prize.  
 Circles filled with "< 45y" represent SJFs below 45 years of age as on December 2016 and fulfils age criteria of nomination for the SSB prize.

Figure 1. Distribution of Swarnajayanti fellows from 1997 to 2016.

*Affiliation of Swarnajayanti Fellows at the time of award*

As seen from the complete set of Swarnajayanti Fellowships given between 1997 and 2016, 143 SJFs are associ-

ated with only 23 different institutions/laboratories of the country at the time of award (Figure 2). Of these, 31 SJFs are affiliated with the Indian Institutes of Technology (IITs), (12 each from Kanpur and Mumbai, 3 from Chennai, 2 from Kharagpur, and 1 each from Delhi and Guwahati);

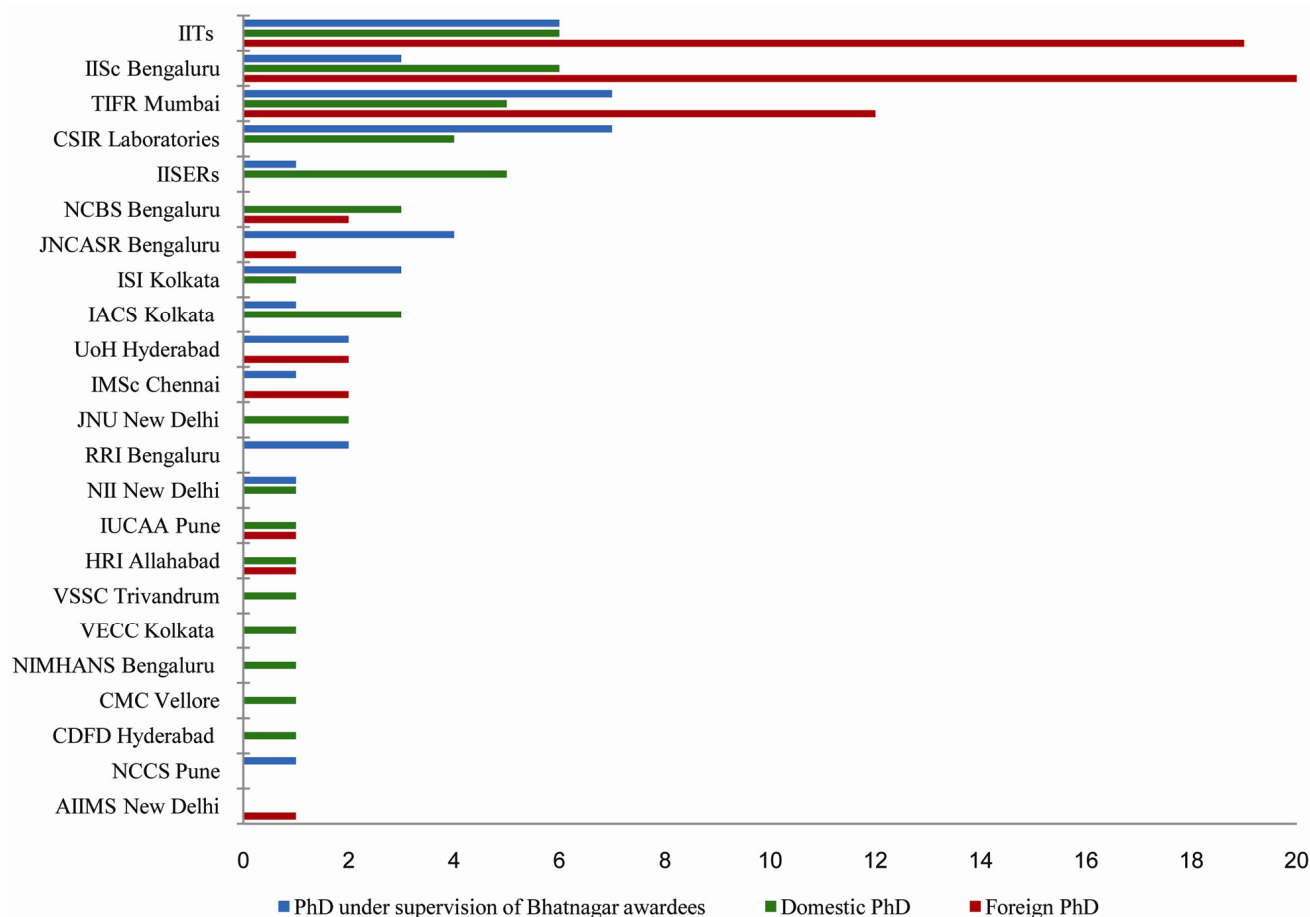


Figure 2. Affiliation of Swarnajayanti fellows from 1997 to 2016.

29 with the Indian Institute of Science (IISc), Bengaluru; 24 with the Tata Institute of Fundamental Research (TIFR), Mumbai; 11 with CSIR laboratories (4 with the Institute of Genomics and Integrative Biology, Delhi; 3 with the National Chemical Laboratory, Pune; 1 each with the Centre for Cellular and Molecular Biology, Hyderabad; Indian Institute of Chemical Biology, Kolkata; Indian Institute of Chemical Technology, Hyderabad, and Indian Institute of Integrative Medicine Jammu); 6 with the Indian Institutes of Science Education and Research (IISERs; 2 each with Pune and Thiruvananthapuram; and 1 each with Kolkata and Mohali); 5 each with the National Centre for Biological Sciences (NCBS), Bengaluru and Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru; 4 each with the Indian Association for the Cultivation of Science (IACS), Kolkata; University of Hyderabad (UoH), Hyderabad, and Indian Statistical Institute (ISI), Kolkata; 3 with the Institute of Mathematical Sciences (IMSc), Chennai; two each with the Harish-Chandra Research Institute (HRI), Allahabad; Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune; National Institute of Immunology (NII),

New Delhi, and Raman Research Institute (RRI), Bengaluru; and 1 each with the All-India Institute of Medical Sciences (AIIMS), New Delhi; Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad; Christian Medical College and Hospital (CMC), Vellore; National Centre for Cell Science (NCCS), Pune; National Institute of Mental Health and Neurosciences (NIMHANS), Bengaluru, Variable Energy Cyclotron Centre (VECC), Kolkata, and Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram (Figure 2).

We observed that IISc and IITs dominate in chemical, engineering and earth and atmospheric sciences, TIFR in mathematical and physical sciences, and CSIR laboratories in life sciences. Considering SJFs aged more than 45 years, it has been observed that in IISc 10 out of 12 in category A, 4 out of 5 in category B, and all 3 in category C are recipients of SSB prize; in IITs – 7 out of 15 in category A, 1 out of 5 in category B, and 2 out of 5 in category C; in TIFR – 9 out of 10 in category A, none in category B, and 2 out of 5 in category C; in CSIR laboratories – none in category A, 4 out of 5 in category B, and all 3 in category C are recipients of SSB Prize (Figure 1).

### Subject-wise distribution

Subject-wise distribution shows 31 SJFs each in engineering and physical sciences followed by 30 in life, 29 in chemical, 16 in mathematical, and 6 in earth and atmospheric sciences. Considering SJFs above 45 years of age as on December 2016, 71% of them in life sciences are the recipients of the SSB Prize followed by 70% in mathematical sciences, 69% each in engineering and physical sciences, 55% in chemical sciences and 33% in earth and atmospheric sciences (Figure 1).

Analysing subject-wise doctoral degrees of SJFs, in chemical sciences three out of six in category A, and four out of seven in categories B and C; in earth and atmospheric sciences none in categories A and C, and one out of two in category B are the recipients of the SSB Prize. We observed that in engineering sciences 12 out of 17 in category A, 1 out of 3 in category B and all 3 in category C; in life sciences 5 out of 9 in category A, 6 out of 7 in category B, and 4 out of 5 in category C; in mathematical sciences all 4 in category A, none in category B, and 3 out of 5 in category C; in physical sciences 6 out of 8 in category A, 1 out of 5 in category B, and 5 out of 7 in category C are recipients of the SSB Prize (Figure 1).

### Conclusion

A general view in India's academic environment is that foreign Ph Ds are better to their domestic counterparts.

Normally, a promising scientist with a foreign degree is likely to be better fit in elite institutions, which demand world-class R&D rather than one from a domestic university. The study reveals that excluding SJFs less than 45 years of age, although the proportion of SJFs having foreign Ph D is less than their domestic counterparts, 66% of the former as against 61% of the latter have been conferred with SSB Prize. At the same time it is heartening to note that 70% of SJFs having doctoral training under supervision of Bhatnagar awardees are the recipients of the SSB Prize.

1. <http://dst.gov.in>

2. <http://csirhrdg.res.in>

3. Singh, I. and Luthra, R., Shanti Swarup Bhatnagar Prize: an inspiration for international recognitions. *Curr Sci.*, 2014, **107**(2), 163–166.

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