

A snapshot of IIT–JEE all India one rankers (1979–2018)

The JEE (Advanced) (formerly known as IIT–JEE) is regarded as one of the toughest engineering entrance examinations in the world and is one of the most difficult examinations of India to qualify. Over a million students compete every year. It is a dream of several aspirants to be on the list of toppers. A snapshot of

IIT–JEE all India one rankers of the last 40 years shows that 15 of them obtained bachelor's degree from IIT Bombay, 13 from IIT Kanpur, 4 each from IIT Delhi and IIT Madras, and 4 migrated to the US to pursue under-graduation. In most cases, they chose computer science (32), followed by physics (4), electrical (3) and robotics (1). It may be relevant to note that majority of them moved to USA for higher studies and obtained M S/Ph D from the world's top rated institutions (Table 1).

Curiously, if a bright Indian student wants to study for a doctorate at a top rated university in any field of science and technology, he/she is forced to study overseas. Not surprisingly, majority of the toppers, who complete their M S/Ph D from a foreign university, remain overseas, either in a university/institution or corporate sectors.

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Table 1. IIT–JEE all India one rankers affiliated with the listed institutes while obtaining M S/Ph D

Career stage	University/Institution	IIT–JEE all India one rankers	The World University Rank 2018*
M S/Ph D obtained	Stanford University, USA	8	3
	Princeton University, USA	4	7
	University of California, Berkeley, USA	4	18
	California Institute of Technology, USA	2	3
	Massachusetts Institute of Technology, USA	3	5
	Carnegie Mellon University, USA	1	24
	Cornell University, USA	1	19
	Harvard University, USA	1	6
	Stony Brook University, USA	1	251–300
	University of Maryland, USA	1	69
	University of Bath, UK	1	251–300
	University of San Francisco, USA	1	401–500
	University of Waterloo, Canada	1	201–250
	Yale University, USA	1	12

*The Times Higher Education World University Ranking 2018.

https://www.timeshighereducation.com/world-university-rankings/2018/world-ranking#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats

The Prime Minister Fellowship Scheme

The Prime Minister Fellowship Scheme (PMFS), as announced by the Government of India, is now in the implementation stage. It is praiseworthy that the Government wants to encourage merit in scientific research. However, there are several pitfalls in the way its implementation is planned.

First, it is open only to students who have graduated from one of the national institutes of the country with their first degree and with reasonable merit. It is patently wrong to assume that merited students will graduate only from these institutes. Many of these institutes are still in their nascent stage and do not attract the best students. Often students who qualify for entrance to the national institutes give up their admission to these institutes and join local colleges that have long-standing reputation for aca-

demical excellence. Such students will not qualify for the PMFS for what is, in fact, a reasonable decision on the part of the student, purely based on academic reputation of the institutes at the time of making their choice.

The PMFS is tenable only at the IITs and IISc, and there is no good reason for this. As already stated, majority of the IITs are still in the infant stage and are not yet known for excellence in teaching, research, peer group or breadth of academics. On the other hand, there are many institutes such as TIFR and Indian Statistical Institutes which have established themselves as institutions with international reputation, and these have not been included in the list of institutes at which PMFS will be tenable.

The fellowship amount for the PMFS fellows is three times what a regular re-

search scholar in these institutes will get ordinarily as fellowships, not counting the contingency grant that goes with the scheme. This disparity is large considering that the non-PMFS fellows are also selected on the basis of merit through the same rigorous process. This aspect will hugely discourage majority of merited students in these institutes. In the West, many prestigious fellowships are offered to Ph D students like the Hertz fellowship, besides special fellowships offered by the respective institutes. These fellowships are usually about 20% higher than the regular fellowships. Many of these fellowships are also offered for shorter periods and sometimes, for just one year.

To overcome these drawbacks and make PMFS a success, several issues need to be addressed. Foremost among

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them is identifying merited students. In fact, this is an issue which does not have simple solutions like falling back on the grades of the institute which awards the degree. A mechanism needs to be evolved for this purpose and the community needs to spend time to evolve a process by which it is largely satisfactory. Then there is the issue of the largesse offered by PMFS. This needs to be trimmed down significantly so that presumed merit is not rewarded disproportionately. The contingency amount that goes with the fellowship is reasonable and should be retained at the same level. A fellow should be allowed to utilize the contin-

gency for attending reputed schools and workshops anywhere in India or abroad. A fellow must also be allowed to utilize the grant for collaborative work in any national or international laboratory for a short period of time. The period of the fellowship should also be reduced to two or three years, with the regular fellowship coming into force for the remaining period. It is important to learn lessons from the shortcomings of similar schemes such as Shyama Prasad Mukherjee Fellowships and Inspire Fellowships to take corrective measures.

To conclude, the PMFS for students who will pursue research in IISc and IITs

is severely flawed and the issue needs to be taken up by the Science Academies of the country with the Government for introducing corrective measures. I sincerely hope this will lead to better implementation of the PMFS for the benefit of science and the scientific community at large.

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CSIR institutions in SIR 2018

Unlike other ranking exercises which deal only with universities and higher educational institutions, the SCImago Institutions Rankings (SIR) also cover research-focused institutions in the government and private sector.

The latest (2018) version of the report¹ has appeared online. SIR is a secondary evaluation exercise yielding a composite indicator that combines three different sets of indicators based on research performance (50% of the total weight, using primary bibliometric data from SCOPUS), innovation outputs (30% of the total weight, based on PATSTAT) and societal impact measured by their web visibility (20% of the total weight). Until 2015, as background data was also released, it was possible with the help of indirect surrogate performance indicators^{2,3}, to see the time evolution of progress of leading research-focused institutions over reasonably long windows (e.g. a

seven-year window of 2009–2015 in ref. 2).

For several years now we have reported in these pages^{2–5} the progress of CSIR institutions within India and globally. Ranking is based on results generated each year from the data retrieved over a period of five years ending two years before the edition of the ranking. For instance, rankings for 2018 are based on results from the five-year period 2012–2016. The only exception is the case of web indicators which have only been calculated for the last year. Institutions are included if they had published at least 100 works in the SCOPUS database during the last year of the selected time period. The latest release allows us to track rankings continuously from 2009 to 2018, with gaps appearing whenever institutions fall out of the net for not meeting the inclusion criterion. In SIR 2018, 5632 institutions are ranked

globally, of which 271 are from India (i.e. 4.8%). SIR 2018 shows that the government sector in India accounts for 62 institutions (up from 60 last year⁵), the health sector for 12 (down from 13 last year) and the higher education sector for 197 (179 last year). This year, there is not a single research-focused institution from the private sector; Tata Sons Ltd was the solitary presence in 2016 in this sector⁴. In 2018, 30 of the constituent laboratories of the CSIR make this cut (compared to 29 in the previous year). CSIR as a whole is also counted and 30 constituent institutions are listed separately.

Four agencies make the list from India; apart from CSIR, we also have the Indian Council of Agricultural Research, the Defence Research and Development Organisation, and the Indian Space Research Organisation. Table 1 shows the evolution of the rankings of the

Table 1. National and global rankings of the four 'parent' agencies from India from 2009 to 2018

Indian Rank	Agency	Global rank									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2018											
1	Council of Scientific and Industrial Research	135	142	130	117	111	102	105	99	75	132
12	Indian Council of Agricultural Research	682	666	627	589	540	516	498	509	491	563
22	Defence Research and Development Organisation	706	697	674	646	608	590	591	615	569	619
38	Indian Space Research Organisation	819	810	781	731	681	648	643	646	638	691