The Elsevier–Stanford List and the Research skyscape over the IISc and IITs

The latest Elsevier BV data-update (version 3, August 2021) for 'Updated science-wide author databases of standardized citation indicators' was published on 19 October 2021 (doi:10.17632/btchxktzyw.3, contributors: Jeroen Baas *et al.*). It originated as a publicly available database of over 100,000 top-scientists based on citation metrics from Scopus[1]. Separate datasets are given for career-long (updated to end-of-2020) and single year impact (only for 2020), and metrics with and without self-citations and ratio of citations to citing papers are given. Scientists are classified into 22 scientific fields and 176 sub-fields. Field- and subfield-specific percentiles are also provided for all scientists who have published at least five papers. The selection is based on the top 100,000 by a composite c-score (with and without self-citations) or a percentile rank of 2% or above in the sub-fields (hence top 2% scientists).

The latest dataset and code provide an update to previously released version 1 data under https://doi.org/10.17632/btchxktzyw.1. The version 2 dataset is based on the 6 May 2020 snapshot from Scopus and is updated to citation year 2019 available at https://doi.org/10.17632/btchxktzyw.2. Version 3 is based on the 1 August 2021 snapshot from Scopus and is updated to citation year 2020. https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw/3 gives complete details.

The Single Year list gives the current citation impact during the single calendar year 2020 and the Career list assesses scientists for career-long citation impact, from 1996 until the end of 2020. Taken together, the Single Year and Career lists allow us to separate the stars into three distinct groups. The 'rising' stars are those found in the Single Year list but are missing in the Career list (often too early in their career to make a long-term impact). The 'setting' stars are those in the Career list but absent from the Single Year list (too old to make an impact in the most recent year). Many names remain common to both lists, and it is to this cohort that we shall assign the 'steady' appellation. Note that Rau and Jaksic[2] use a nearly similar classification for a categorization of Chilean ecologists in the two world-wide rankings: newcomers, old-timers and the bypassed. There is no category in their list for 'steady', just as here, it is not possible for us to identify the bypassed.

The Indian Institute of Science (IISc) and the 23 Indian Institutes of Technology (IITs) are arguably among the finest institutions of higher education and research in the country. All are declared as institutions of national importance. It is not surprising that 808 of the scientists from India (i.e. nearly 20%) who have been listed among the top 2% of scientists worldwide[1] come from these prestigious institutions.

As in all social activities, even in scientific research, there will always be the stars who stand out from the rest. In such a skyscape, there will be the rising stars, and the setting stars, and the steady stars who remain in the firmament for some time. The so-called Elsevier–Stanford list[1] allows us to explore this theme. The authors whose institutional address is shown as the IISc or one of the IITs were carefully curated from the Excel spreadsheets from the Elsevier dataset. A total of 808 scientists from 22 institutions (the IITs at Bhilai and Palakkad are yet to open their account) appear in the list of the top 2% of scientists worldwide[1]. This is shown in Table 1.

Table 1 displays the count of rising, steady and setting stars from the Single Year and Career lists of Ioannidis *et al.*[1]. For example, in IISc, there are 34 rising stars, 77 steady stars and 37 setting stars for a total of 148 stars. The best ranking IIT according to this metric is IIT Delhi with 27 rising stars, 66 steady stars and 20 setting stars for a total of 113. These are old institutions. The rising stars are just about replacing the setting stars. Among the young IITs, IIT Indore with 13 rising stars, 3 steady stars and 1 setting star (total of 17) and IIT Patna with 13 rising stars, 2 steady stars and no setting stars (total of 15) show a hopeful picture of planned investment in a replacement generation.

Figure 1 shows the skyscape of rising, steady and setting stars in the same representative institutions of national importance. We can see from such pie-charts whether an institution is under investing in

Table 1. The count of rising, steady and setting stars from the Single Year and Career lists[1]

Name	Rising stars	Steady stars	Setting stars	Total
Indian Institute of Science (IISc)	34	77	37	148
IIT Delhi	27	66	20	113
IIT Kharagpur	27	55	11	93
IIT Bombay	21	37	14	72
IIT Kanpur	27	32	9	68
IIT Madras	21	38	9	68
IIT Roorkee	26	26	5	57
IIT Banaras Hindu University	18	14	1	33
IIT (Indian School of Mines), Dhanbad	18	10	2	30
IIT Guwahati	13	15	2	30
IIT Indore	13	3	1	17
IIT Hyderabad	9	6	1	16
IIT Patna	13	2	0	15
IIT Ropar	8	3	0	11
IIT Mandi	6	1	3	10
IIT Jodhpur	4	5	0	9
IIT Bhubaneswar	4	2	1	7
IIT Gandhinagar	2	3	0	5
IIT Goa	0	2	0	2
IIT Jammu	0	2	0	2
IIT Dharwad	0	1	0	1
IIT Tirupati	1	0	0	1
IIT Bhilai	0	0	0	0
IIT Palakkad	0	0	0	0
All IITs	258	323	79	660
IISc + IITs	292	400	116	808

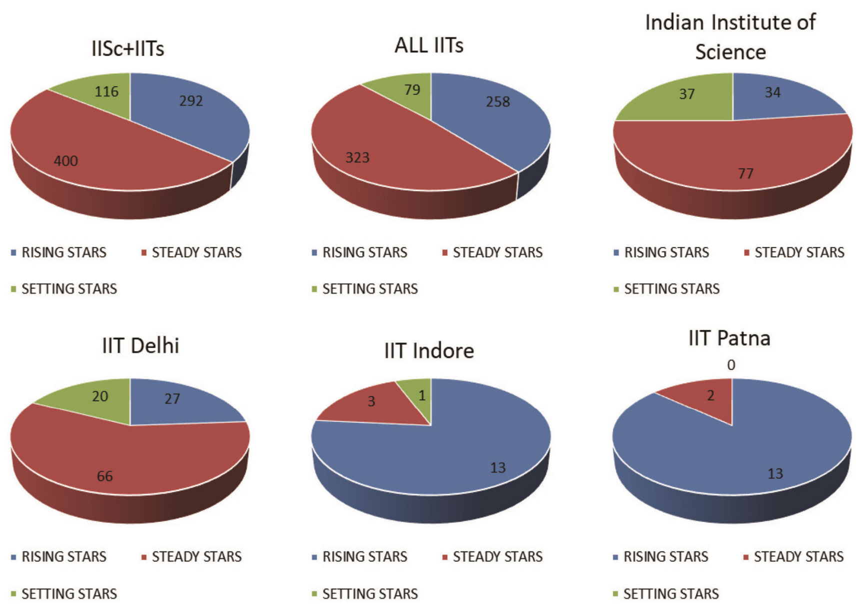

Figure 1. The skyscape of rising, steady and setting stars in some representative institutions of national importance. The IITs at Indore and Patna are clearly investing in a replacement generation.

its rising stars (as seen for IISc), or whether it is doing enough to ensure its robust future (as is the case here with the IITs at Indore and Patna).

The author is indebted to Sabu Thomas of M. G. University, Kottayam, Kerala for provoking him into this line of thinking in terms of rising, steady and setting stars.

1. Ioannidis, J. P. A., Boyack, K. W. and Baas, J., *PLoS Biol.*, **2020**, 18(10), e3000918; https://doi.org/10.1371/journal.pbio.3000918.
2. Rau, J. R. and Jaksic, F. M., *Rev. Chilena Hist. Nat.*, **2022**, 95(1); https://doi.org/10.1186/s40693-021-00105-3.

GANGAN PRATHAP

A. P. J. Abdul Kalam Technological University,
Thiruvananthapuram 695 016, India, and
Institute of Computer Science & Digital Innovation,
UCSI University,
Kuala Lumpur, Malaysia
e-mail: gangan_prathap@hotmail.com

Acknowledging the influence of Carlos F. Barbas III's work on organocatalysis

The News item by Santanu Mukherjee[1] provided glimpses of two organic chemists, Benjamin List and David W. C. MacMillan, who shared the 2021 Nobel Prize in Chemistry, much to the delight of organic chemistry enthusiasts. As the note reminisced on their contributions to the origins and development of organocatalysis, it would be apt to remember and acknowledge the pioneering contributions of Carlos F. Barbas III (1964–2014, Scripps Research Institute, USA), whose work on biomimetic catalysis also influenced the birth of this field.

Barbas was among the first scientists to initiate research that combined organic chemistry with structural biology and medicine. An important outcome of this was his ideation of the catalysis of organic reactions by antibodies, in a metals-free approach. Stereoselective aldol transformations were catalysed by catalytic antibodies without need for modification of the interacting ketones – for example, into preformed enolates. His body of work on such catalytic antibodies was placed under 'biomimetic catalysis'.

List was a postdoctoral student of Barbas in 1999, and his first report on asymmetric catalysis of the aldol reaction between acetone and *para*-nitro benzaldehyde was co-authored by Barbas. Incidentally, Richard A. Lerner was the postdoctoral advisor of Barbas. Later, Barbas conducted comparative studies between proline catalysis and aldolase antibodies-catalysis of the Hajos–Eder–Sauer–Wiechert (aldol cyclodehydration) reaction. This work fuelled the excitement in establishing proline as an efficient 'active-site equivalent' – later termed as 'an organocatalyst'. These studies and parts of his earlier comparative mechanistic studies with aldolase antibodies were crucial in establishing the enamine pathway of proline catalysis[3].

The field of organocatalysis received the right impetus from Barbas's initial findings that aldolase antibodies were better catalysts than proline. His group was also among the first to systematically establish the superior catalytic efficiency of proline over non-proline amino acids. He notably also initiated studies in RNA and DNA catalysis – a follow-up of which has led to sophisticated nucleic acid catalysts. As we honour and cherish the contributions of the two 2021 Nobel Laureates in Chemistry, it is both apt and essential to remember with gratitude, the influence of Barbas's work on the origins of organocatalysis. He unfortunately passed away in 2014, succumbing to a rare form of medullary thyroid cancer. The Nobel Prize is not presented posthumously. If he had been alive, Barbas might well have been considered as a joint recipient of this Prize.

1. Mukherjee, S., *Curr. Sci.*, 2021, **121**(9), 1148–1151.
2. List, B., Lerner, R. A. and Barbas III, C. F., *J. Am. Chem. Soc.*, 2000, **122**, 2395–2396.
3. Wagner, J., Lerner, R. A. and Barbas III, C. F., *Science*, 1995, **270**(5243), 1797–1800.

ERODE N. PRABHAKARAN

Department of Organic Chemistry,
Indian Institute of Science,
Bengaluru 560 012, India
e-mail: eprabhak@iisc.ac.in