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Assessing the Research Performances of Indian Institutes of Science Education and Research (IISERs): A Scientometric Exploration of 15 Years Contribution

DHIMAN MONDAL*
PROF. BIPLAB CHAKRABARTI**

The study presents the scientific research contribution of the faculty members of selected IISERs for the last 15 years period, 2006-2020 as covered in the Web of Science (WoS) database. The faculty members produced 10,494 journal articles comprising a 35.1% share of internationally collaborated articles. The retrieved articles were interpreted in terms of chronological distribution, collaboration trend, emphasis areas, scholarly communication channels, participating institutions, collaborating countries, keywords and citations impact. The IISER Pune contributed the largest share of 30.67% of articles followed by IISER Kolkata registering a 28.81% share. The present collaboration scenario strongly stresses more inter-level collaboration among IISERs. Besides, physics and chemistry were the most productive research areas of IISERs. The publishing outputs demand more priority on other areas of fundamental sciences as well and the study may be helpful to policymakers/ funding agencies in determining the allocation of resources to IISERs for strengthening research infrastructure in enhancing more quality research.

Keywords*: Indian Institute of Science Education and Research; IISER; Research Performances; Publications; Scientometrics; India*

1 INTRODUCTION

Based on the recommendations of the Scientific Advisory Council (SAC) to the Prime Minister of India led by Prof. C. N. R. Rao, in 2006 the Government of India founded two Indian Institutes of Science Education and

* Librarian, Ananda Mohan College, Kolkata-700009, India.

** Professor, Dept. of Library & Information Science, University of Calcutta, Kolkata, India.

Research (IISERs) located in Pune and Kolkata[1]. Subsequently, five more IISERs were added to the family to focus on quality education and research in basic sciences, with special emphasis on interdisciplinary areas[2]. The vision was to create a research institute of excellence in which teaching and education in basic sciences will be integrated with state-of-the-art research facilities[1].

The IISERs were declared as institutions of national importance under the NIT (Amendment) Act, 2012 (NIT Act 2007)[3]. The IISERs began as an autonomous institutions offering a five-year BS-MS, Integrated Ph.D. and Ph.D. programmes in Biology, Chemistry, Mathematics, Physics and interdisciplinary areas[4].

However, a few IISERs have expanded their academic and research activities by incorporating other disciplinary areas like computational data sciences, engineering, humanities and social sciences. According to the Nature Index, five established branches of IISERs were considered among the leading 100 'young universities' across the globe[5].Further, IISERs were considered as India's top ten institutions that have the strongest collaboration linkages with International counterparts[6].

This year the IISER project is completing 15 years and it is now the right time to take a fresh review on its scientific research productivity and collaborations through scientometric explorations. Scientometrics is a quantitative methodology used to examine scientific research patterns of an institution, discipline or country. The present scientometric study is an attempt to determine the research productivity of the faculty members and scholars of selected IISERs over the past 15 years.

2 REVIEW OF RELATED LITERATURE

The literature review focuses on the earlier studies on the research contribution of IISERs to scientific research. For instance,

Visakhi, Gupta & Gupta[7] assessed 2,542 research publications of the five IISERs during 2010-14and found that an annual average growth rate of 34.92% was evidenced. The study also reported that 30.80% of articles appeared due to international collaborative partnerships. Further, chemistry, as well as physics,were the emphasized areas of research efforts while USA, Germany, UK and France were the favoured partnering countries for collaboration. In another study, Visakhi, Dhawan, Gupta and Gupta[8]evaluated the highly cited papers of IISERs in chemistry during 2008 – 2015 and pointed out that the chemistry discipline produced nearly 43% share of their total publications output and highly cited papers constituted only 4% share in chemistry. Apart

from these, organic chemistry produced the largest number of highly cited papers followed by inorganic and physical chemistry.

On the contrary Solanki, Uddin and Singh[9]made an attempt to identify the research competitiveness of IISERs during 2010-14 and showed that despite being young institutions, the IISERs performed better in terms of research productivity–impact and also comparable with benchmark Indian institutions like Indian Institute of Science, Bengaluru and Indian Institute of Technology system.

Solanki, Karmakar, Banshal and Singh[10] also addressed social media attention onthe research output of leading Indian institutions and narrated that higher social media coverage was seen in case of institutions attached with Medical Science or Multidisciplinary areas. In addition, Kolkata, Pune and Bhopal branches of IISERs had performed well with 59.69%, 44.19% and 39.08% of their articles getting social media coverage respectively.

In their two attempts, Royand Mandal[11, 12]measured the research outputs of IISER Kolkata and IISER Puneduring 2006 to 2020 and showed that the two IISERs contributed 3,130 and 3,308 articles respectively. IISER Kolkata shared maximum papers in chemistry while IISER Pune contributed the majority of its papers in the physics discipline. Furthermore, USA, Germany and England were the preferred collaborating countries in both the cases.

Visakhiand Gupta[13] analysed 186 research papers of IISER Mohali during 2008-12 and stated that the majority of research output occurred in the field of physics & astronomy (36.02%) followed by chemistry (32.80%). Additionally, N. Sathymurthy of the chemistry department authored maximum of 18 papers followed by S. Sinha of the physics department with 14 papers.

Hadimani, Mulla& Kumar[14]examined 187 research publications of IISER Bhopal during 2009- 13 and showed that total 451 authors participated in research having 2.42 average authors per paper. The majority of articles appeared in the Organic Letters journal followed by Crystal Engineering Communication.

The review explores that research in IISERs started since its inception and afterwards a significant steady growth has been observed collaborating with domestic as well as international partners. In the initial years, two efforts[7, 9] have been depicted to outline the research contribution and competitiveness of group of IISERs from 2010 to 2014. But after that, no such comprehensive attempt yet to find on research productivity of group of IISERs to gauge their publications trend. However, from time to time fewanalytical studies have been made on individual IISER. Keeping in mind the above fact, the present endeavour vividly compares the research trend and performancesof five

established IISERs over the past 15 years.

3 OBJECTIVES OF THE STUDY

The primary aim of study is to identify the research contribution and scholarly impact of the faculty members of selected IISERs. The objectives are to:

i. reveal the year-wise contribution of IISERs,
ii. exhibit collaboration pattern and citation impact,
iii. illustrate emphasis research areas and scholarly communication channels,
iv. evaluate collaborating partners, countries and their impact,
v. determine research trends through keywords and citation impact through quantitative indicators.

4 DATA SOURCE, LIMITATIONS AND METHODOLOGY

The present study focuses on the research contribution of the faculty members of five recognized Indian Institutes of Science Education and Research (IISERs) (table-1) over the last 15 years period, 2006- 2020. The other two IISERs i.e. IISER Tirupati and IISER Berhampur are in the early days of development. Therefore, these two newly IISERs have been excluded from the study.

Table 1: Five Established IISERs with NIRF Ranking

Name of the IISER	Year of establishment	NIRFRanking#
IISER – Kolkata (IISER-K)	2006	29
IISER – Pune (IISER-P)	2006	25
IISER – Mohali (IISER-M)	2007	59
IISER – Bhopal (IISER-B)	2008	40
IISER – Thiruvananthapuram (IISER-T)	2008	80

For this purpose, the Web of Science (WoS) - core collection citation database (www. web of science.com) of Clarivate Analytics was consulted during the 3rd and 4th week of June, 2021. The full record of research articles

of individual IISER as well as group IISERs were searched using 'Organization-Enhanced' field tag and then the results were further refined usingthe following strategies:

Organization-Enhanced: Indian Institute of Science Education & Research (IISER) – Pune OR Indian Institute of Science Education & Research (IISER) – Kolkata OR Indian Institute of Science Education & Research (IISER) – Mohali OR Indian Institute of Science Education & Research (IISER) – Thiruvananthapuram OR Indian Institute of Science Education & Research (IISER) – Bhopal

Refined by:Document Types: Article

Timespan: 2006 – 2020

Indexes: SCI-Expanded, SSCI, A&HCI

The search query retrieved total 11,374 records including article (10,494), review (334), meeting abstract (242), editorial material (159), correction (71), proceedings paper (67), letter (40), book chapter (28),early access (14) and news item (14) etc. Of these, only journal articles (10,494) were selected and exported in two different formats i.e., plain text and tab-delimited (win) for further analysis to get desired output as specified in the objectives of the study. Additionally, the Biblioshiny web interface of Bibliometrix package of R software[15] and VOSviewer softwaretool have also been used for mapping the network visualisation. Here, different scientometric indicators like ACPP,*p*-index[16], *h*-index[17], *A*-index[18]and highly cited papers have been applied for assessing the scholarly citation impact.

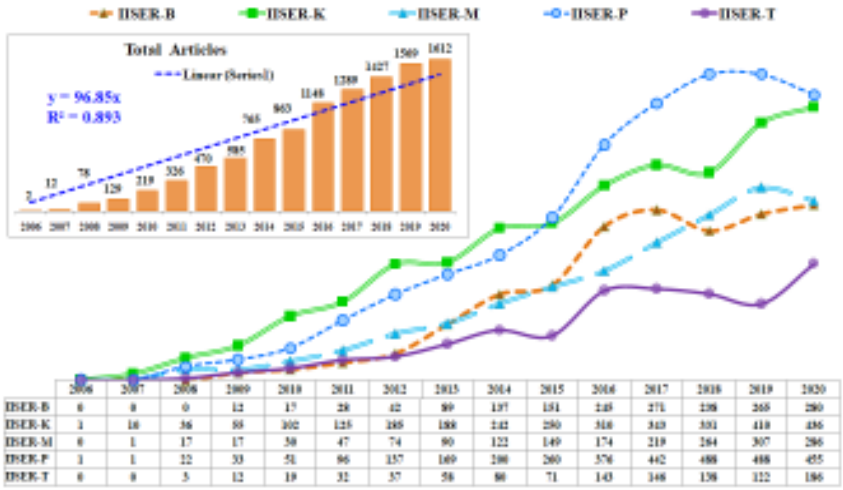
5 RESULTS

The bibliographical details of retrieved records have been categorised and interpreted in the following sub-sections.

5.1 YEAR-WISE CONTRIBUTION OF IISERS

Figure-1 demonstrates the year wise contribution of five selected IISERs. The faculty members published a total of 10,494 journal articles over the last 15 years period. Of these, IISER-P contributed the majority of 3,219 articles (30.67%) followed by IISER-K with 3,024 articles (28.81%). Conversely, IISER-T published a minimum of 1,047 articles. The research journey of IISERs began with 2 articles in the year 2006 while the largest number of 1,612 articles was produced in 2020 followed by the year 2019 having 1,569

articles. Furthermore, the value of *R*- squared (R^2=0.893) on figure- 2 also confirmed the fact that linear trend growth has been witnessed in the publications output. Many articles may come in more than one IISER due to their inter-institutional level collaboration.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
IISER-B	0	0	0	12	17	28	42	89	137	151	245	271	238	265	280
IISER-K	1	16	36	88	102	125	185	188	242	250	310	343	331	418	436
IISER-M	0	1	17	17	30	47	74	90	122	149	174	219	264	307	286
IISER-P	1	1	22	33	51	96	157	169	190	260	376	442	488	488	455
IISER-T	0	0	5	12	19	32	57	58	80	71	143	148	138	122	186

Figure 1: Publication Growth of Five IISERs during 2006 - 2020

5.2 COLLABORATION PATTERN AND IMPACT

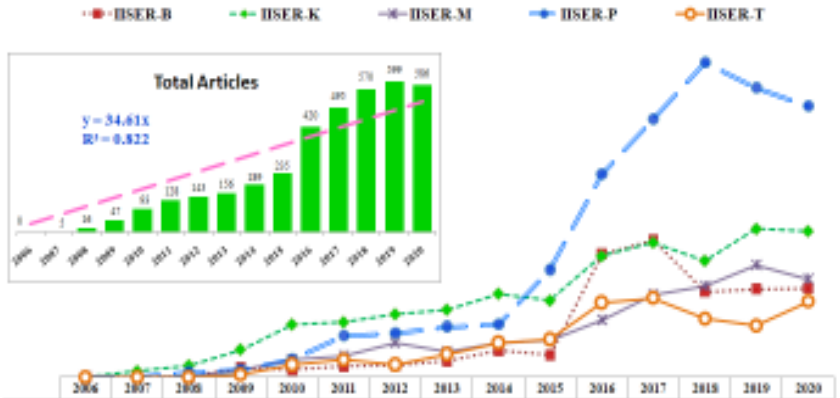
Table-2 reveals the collaboration pattern and corresponding share of scholarly impact. Out of five IISERs, IISER-B produced the highest share of 66% i.e., 1171 nationally collaborated articles followed by IISER-M accounting 65.16% articles. In addition, in terms of international collaborative output, IISER-P contributed the largest share of 45.20% articles followed by IISER-T registering 40% articles. It is worth noting that overall the faculty members of IISERs published 35.1% share of their total publications through international collaborative efforts that also attract wider citations impact as compared to domestic collaborative publications. Only 3.40% of articles were single-authored.

Table 2: Collaboration Trend and Scholarly Impact of IISERs' Publications

IISER	No Collaboration with %	ACPP	NCP with %	ACPP	ICP with %	ACPP
IISER-B (N=1,774)	57 (3.21%)	5.58	1171 (66%)	15.13	547 (30.83%)	19
IISER-K (N=3,024)	97 (3.21%)	6.65	1956 (64.7%)	11.4	971 (32.11%)	47.62
IISER-M (N=1,797)	86 (4.8%)	3.77	1171 (65.16%)	10.86	540 (30.05%)	20.86
IISER-P (N=3,219)	84 (2.61%)	4.33	1680 (52.2%)	16.80	1455 (45.20%)	21.66
IISER-T (N=1,047)	33 (3.15%)	5.82	596 (57%)	14	418 (40%)	78.82
Total=	357 (3.40%)	5.16	6455 (61.51%)	12.3	3682 (35.1%)	29.5

5.3 YEAR WISE DISTRIBUTION OF INTERNATIONALLY COLLABORATIVE OUTPUT

Figure-2 illustrates the year wise contribution of international collaborative efforts. Out of a total 3,682 foreign co-authored articles, IISER-P produced the largest 1,455 articles co-authored with international partners followed by IISER-K having 971 articles while IISER-T contributed a minimum of 418 articles. The collaborative efforts began in the year 2007 with just 5 articles and reached to a maximum of 599 articles in the year 2019 closely followed by the year 2020 with 586 articles. Overall, the *R*- squared value (R^2= 0.822) confirms that a linear growth in international collaborative output has been observed over the last 15 years.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
IISER-B	0	0	0	5	6	9	10	14	25	19	105	120	75	77	75
IISER-K	0	5	10	24	46	48	55	59	73	67	106	118	102	130	128
IISER-M	0	0	1	6	15	18	30	22	30	32	58	72	90	98	86
IISER-P	0	0	4	6	15	36	38	44	46	94	178	226	276	254	238
IISER-T	0	0	0	2	11	15	11	20	30	33	65	69	51	45	66

Figure 2: Year-wise Growth of Internationally Collaborated Articles

5.4 INTER-IISERS COLLABORATION

Table-3 exhibits the data related to inter-institutional research collaboration among the five IISERs. Of these, IISER-P produced a maximum of 218 articles followed by IISER-B with 191 articles and IISER-K with 155 articles whereas IISER-M had weaker collaboration linkage with other IISERs. Subsequently, the strongest research collaboration partnership was apparent between IISER-B and IISER-P comprising the majority output of 161 articles. This is followed by IISER-K and IISER-T having 90 collaborated articles. Conversely, the least number of 3 articles were produced by IISER-M and IISER-T.

Table 3: Inter-level Research Collaboration among the IISERs

IISER	IISER-B	IISER-K	IISER-M	IISER-P	IISER-T
IISER-B	--	15	13	**161**	7
IISER-K	15	--	26	29	**90**
IISER-M	13	26	--	16	3
IISER-P	**161**	29	16	--	14
IISER-T	7	**90**	3	14	--
Total=	191	155	57	218	109

5.5 FOCUS RESEARCH AREAS OF IISERS

Figure-3 discloses the data related to research emphasis areas as reflected in the WoS research areas. The scientists of selected IISERs produced a majority of 3,973 research articles (37.86%) in the field of '*Chemistry*' closely followed by '*Physics*' discipline having 3,353 articles (31.95%) and '*Materials science*' having 1,359 articles (12.95%).Conversely, very few research articles appeared in the areas of '*Mathematics*', '*Biochemistry Molecular Biology*', '*Environmental Sciences*' and '*Geology*'.

Figure 3: Most Productive Research Areas of IISERs

5.6 SCHOLARLY COMMUNICATION CHANNELS

Table-4 depicts the most productive source journals for publishing research results.The faculty members of IISER-K, IISER-M and IISER-T preferred Physical Review D journal and contributed the majority of 97, 85 and 56 articles in that order. In the case of IISER-B, Organic Letters journal shared the highest 67 articles while the Journal of High Energy Physics played a

prevalent role by disseminating maximum of 270 articles of IISER-P. Alternatively, the articles in Physical Review Letters gained larger citations impact of 145.11 average citations per paper and also maximum of 25 articles received at least 100 or more citations. Furthermore, in figure-4, a Sankey plot has been sketched to illustrate the relationship among leading source journals, countries and authors.

Table 4: Leading 15 Journals for Scholarly Communication

Journal with publisher	IISER-B	IISER-K	IISER-M	IISER-P	IISER-T	Total Articles	ACPP	AC_{100}
Physical Review D, American Physical Society	36	**97**	**85**	109	**56**	331	16.66	5
Journal of High Energy Physics, Springer	64	8	13	**270**	7	308	16.04	4
Chemical Communications, Royal Society of Chemistry	65	65	15	92	24	261	23.92	8
Physical Review B, American Physical Society	48	29	38	56	32	199	13.3	1
RSC Advances, Royal Society of Chemistry	30	67	23	30	19	168	13.67	0
Physics Letters B, Elsevier	37	15	5	134	0	157	25.83	5
Physical Review Letters, American Physical Society	15	39	30	78	18	152	**145.11**	**25**
Journal of Physical Chemistry C, American Chemical Society	11	45	7	51	32	145	16.14	2
Chemistry – A European Journal, Wiley	40	39	15	36	12	140	19.41	2
Physical Review A, American Physical Society	12	47	40	34	8	139	11.4	2
European Physical Journal C, Springer	32	25	9	91	3	134	23.69	4
Journal of Organic Chemistry, American Chemical Society	39	26	24	34	9	131	18.99	2
Organic Letters, American Chemical Society	**67**	4	12	43	4	130	33.02	5
Scientific Reports, Nature	24	37	19	34	16	128	12.46	0
Dalton Transactions, Royal Society of Chemistry	29	40	25	20	10	123	15.89	1

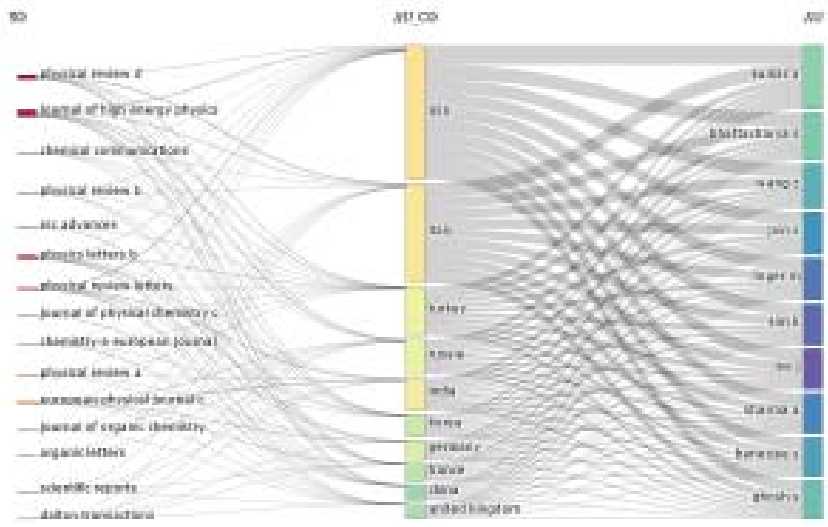


Figure 4: Three Fields (Sources-Countries-Authors) Networking plot

5.7 LEADING COLLABORATING AFFILIATIONS

Table-5 shows the top 10 collaborating partners who were actively involved in research with five IISERs. Tata Institute of Fundamental Research, Mumbai contributed the highest 1,018 articles followed by Centre National de la Recherche Scientifique, France having 926 articles and Russian Academy of Sciences, Russia having 865 articles. The Centre National de la Recherche Scientifique, France received a maximum h-index score of 87 and maximum of 70 articles received at least 100 or more citations. Alternatively, the CNRS National Institute of Nuclear and Particle Physics IN2P3, France attracted the largest 60.7average citations per paper and a p-index score of 142.66.

The composite performance index (*p*-index or mock *h*-index) was formulated by Prathap[16] and can be calculated as follows:

$$p\text{-index} = \left(C . \frac{C}{P} \right)^{1/3}$$; where, C= total number of citations; P= total number of papers

Table 5: Leading Collaborating Institutions

Institute	Articles	Total Citations	ACPP	*h*-index	AC_{100}	*p*-index
Tata Institute of Fundamental Research, Mumbai, India	1,018	49,418	48.54	80	65	133.86
Centre National de la Recherche Scientifique, France	926	51,034	55.11	**87**	**70**	141.15
Russian Academy of Sciences, Russia	865	47,711	55.16	82	66	138.06
Istituto Nazionale di Fisica Nucleare (INFN), Italy	839	49,330	58.8	81	67	142.61
Universite Paris-Saclay, France	828	47,558	57.44	80	64	139.8
United States Department of Energy DOE, United States	806	27,368	33.96	69	43	97.6
University of Florida, United States	799	47,613	59.59	79	64	141.57
CNRS National Institute of Nuclear and Particle Physics IN2P3, France	788	47,834	**60.7**	80	64	**142.66**
University of Mississippi, United States	777	46,641	60.03	77	61	141
Panjab University, Chandigarh, India	776	17,845	23	57	27	74.31

5.8 DISTRIBUTION OF LEADING COLLABORATED COUNTRIES

The collaboration output of the leading 5 countries with the faculty members of individual IISER has been illustrated in table-6.The developed countries such as the USA and Germany were the most favoured countries for research collaboration among all the IISERs. Additionally, England and France were also involved actively with four IISERs research activitiesexcept for IISER-M. In the case of IISER-M, Spain, Australia and Russia were found in the active role. Apart from these, People R. China played an apparent role as a partnering country with IISER-B, IISER-K and IISER-M while Italy was more prominent towards IISER-P and IISER-K.

Table 6: Most Productive Countries with Individual IISER

Sl. No.	IISER	Leading 5 collaborating countries
1.	IISER-B (N=547)	USA (261); Germany (198); England (185); France (159); People R. China (158)
2.	IISER-K (N=971)	USA (261); Germany (198); England (185); France (159); People R. China (158)
3.	IISER-M (N=540)	USA (256); Germany (198); People R. China (104); Spain (104); Australia (103); Russia (103)
4.	IISER-P (N=1455)	USA (900); Germany (741); England (737); France (696); Italy (659)
5.	IISER-T (N=418)	USA (222); England (166); Germany (163); France (125); Italy (121)

5.91 TOP COLLABORATING COUNTRIES AND CITATIONS IMPACT

Table-7 determines the leading 10 collaborating countries and corresponding citations impact. Out of 107 collaborating countries, the USAoccupied the first rankco-authoring 1,771 articles which also received the largest *h*-index score of 101 and maximum of 104 articles cited at least 100 or more times.This is followed by Germany having 1,379 articles, England having 1,143 articles and Peoples R. China having 1,008 articles. Alternatively, the collaborated articles with South Korea attracted the highest average citations of 55.72 per paper. Further, in terms of *p*-indexGermany had a maximum score of 142.2 closely followed by the USA estimating a score of 142. Figure -5 sketches collaboration linkages of the leading 20 countries with the selected IISERs.

Table 7: Leading collaborating countries with selected IISERs

Country	Articles	Total Citations	ACPP	*h*-index	AC_{100}	*p*-index
USA	1,771	71,188	40.2	**101**	**104**	142
Germany	1,379	62,975	45.67	96	93	**142.2**
England	1,143	55,701	48.73	89	76	139.5
Peoples R China	1,008	52,743	52.32	87	73	140.26
France	996	52,111	52.32	87	72	139.7
Italy	948	51,200	54.01	83	69	140.36
Spain	945	51,323	54.31	83	68	140.73
Russia	909	50,500	55.56	83	69	141.04
South Korea	883	49,204	**55.72**	80	66	140
Switzerland	864	34401	39.82	73	53	111

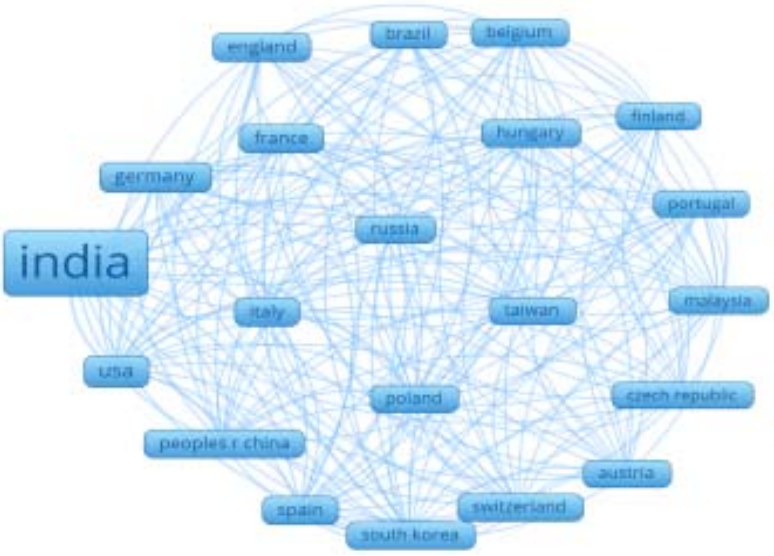


Figure 5: Collaboration network of leading 20 countries with India (IISERs)

5.92 RESEARCH TRENDS THROUGH KEYWORDS

Figure-6 depicts the most popular 20 keywords of IISERs' research as reflected in authors' keywords. Out of total of 15,877 keywords, '*hadron - hadron scattering (experiments)*'occurred most frequently with 187 times (15%) followed by '*cms*' having 127 times (10%), '*physics*' having 100 times (8%) and '*beyond standard model*' having 80 times (7%).

Figure 6: Tree mapping of 20 frequently used author's keywords of IISERs

5.93 THEMATIC EVOLUTION

Thematic evolution of research work contributed by the IISERs is mapped in the figure-7. The author assigned keywords have been selected with three equal time intervals for the years 2006-10, 2011-15 and 2016-20. Furthermore, 100 keywords have been considered with a minimum of 2 cluster frequencies per thousand documents. It is clear from the figure that the 'crystal structure' keyword has been divided into 'fluorescence' and 'density functional theory' during 2011- 15 and later on; these two have been fused with 'self-assembly'. Alternatively, 'sun: coronal mass ejections (cmes)' was known as 'sun: corona' during 2011-15 and later the keyword changed to 'sun: magnetic fields'. It is worthy to note that the keyword, 'hadron- hadron scattering' during 2011- 15 has been separated into 'cms' and 'hadron- hadron scattering (experiments)'.

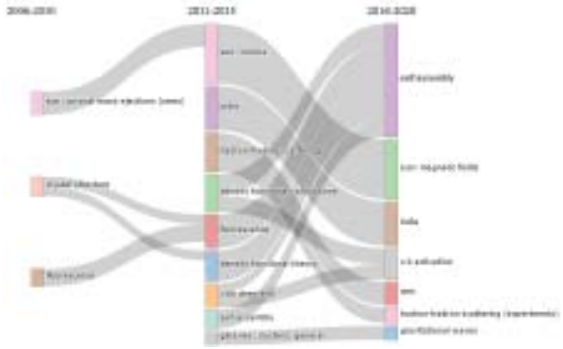


Figure 7: Thematic evolution of keywords of IISERs research

5.94 CITATION PATTERN

Table-8 portrays the scholarly impact of IISERs publications based on different scientometric indicators. The articles of IISER-T attracted the largest 39.6 average citations per paper and an *A*-index score of 428.36. Additionally, IISER-P received the highest *h*-index score of 88 and maximum of 69 articles had at least 100 or more citations. Alternatively, IISER-M received lesser citations impact with 13.52 average citations per paper and maximum of its 10.35% articles remain uncited. In terms of *p*-index, IISER-T gained a maximum score of 118 closely followed by IISER-K with 116.54 and IISER-P with 104.2. Overall, the total of 10,494 articles received 18.05 average citations per paper, *h*-index of 132, *A*-index of 394.03 and *p*-index score of 150.6.Conversely, 9.13% of articles still remain uncited.

Table 8: Citations impact of IISERs publications

IISERs	Total articles	Total Citations	ACPP	*h*-index	*A*-index	AC_{100}	%uncited	*p*-index
IISER-B	1,775	28,391	15.99	64	115.67	24	9.35%	76.85
IISER-K	3,024	69,176	22.88	83	404.85	66	8.46%	116.54
IISER-M	1,797	24,302	13.52	59	128.73	25	**10.35%**	69
IISER-P	3,219	60,329	18.74	**88**	219.1	**69**	8.8%	104.2
IISER-T	1,047	41,464	**39.6**	69	**428.36**	44	10.22%	**118**
Total=	10,494	1,89,398	18.05	132	394.03	195	9.13%	150.6

6 CONCLUSION

This year the IISER project is completing 15 years of existence. Two pioneer branches of IISERs located at Pune and Kolkata were the predominant institutes in terms of scientific research contribution. Since its inception, the faculty members of selected IISERs produced 10,494 research articles comprising 3,682 co-authored articles (35.1%) with international counterparts. The total research articles registered 18.05 average citations per paper and overalllinear growth has been observed in the total research publications output and international collaborative efforts. Here, the share of international collaborative output was slightly higher than the earlier data[7, 9]. In addition, the international collaborative articles attract wider citations impact as compared to domestic collaborative publications as well. It may be argued that a strong domestic collaboration network (61.51%) has been witnessed along with apparent international linkages. Further, the present collaboration phenomenon demands more attention on inter-level collaboration among IISERs. In this context, it is noteworthy to argue that the branches of IISERs should come forward to set up a research consortium to fulfill mutual interest and developmental objectives.

Conversely, chemistry (37.86%) and Physics (31.95%) were the primarily focused research areas of the IISERs. This biased research productivity and skewed trends strongly demandmore emphasis on other areas of fundamental sciences like 'Mathematics', 'Biochemistry Molecular Biology' and 'Earth &Environmental Sciences'. Besides, Tata Institute of Fundamental Research Mumbai, Centre National de la Recherche Scientifique France and Russian Academy of Sciences Russia were the primary research collaborators. Alternatively,USA, Germany and England were the leading collaborating countries that also corroborate the earlier findings[7]. In terms of *p*-index, three branches ofIISERs located at Thiruvananthapuram, Kolkata and Pune performed better. Hope, inthe event of 15 years completion, the insight of the study will be helpful for authorities/ funding agencies in identifying where the groups of IISERs standin scientific research in comparison with other prestigious institutes like IITs, CSIRs, and DBTs etc.Further analysis of other relevant datasuch as innovations, patents obtained and academia-industrycollaborationwould be helpful to make a detailed assessment of the achievements of IISERs[9].

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