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Research Article

Tracing the Academic Legacy of Prof. Dipankar Das Sarma, Renowned Scientist from IISc Bengaluru: A Bio-Bibliometric Analysis of Scientific Productivity and Research Impact

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ABSTRACT

Objectives: This study presents a bio-bibliometric analysis of the research productivity, citation impact, and collaborative patterns of Dipankar Das Sarma over the period 1980-2025. **Methodology:** The present study utilised Scopus, a widely recognised abstracting and citation database developed by Elsevier, for the retrieval of bibliographic records through author-based search strategy. The extracted data were subsequently curated, organised, and tabulated using Microsoft Excel for descriptive and statistical analysis. In addition, VOSviewer was employed to generate collaboration networks and thematic visualisation maps, enabling the identification of research linkages and thematic structures within the scholarly output of the author. **Results:** The findings indicate a steady increase in output, with 2004-2015 emerging as the most productive phase (177 publications; 34.30%), while 1992-2003 showed the highest citation intensity (CPP: 58.82). Research articles dominated the output (85.85%), though review papers demonstrated higher citation impact. The analysis further reveals a strong collaborative pattern, with 507 multi-authored publications (98.26%) and a collaboration coefficient of 0.98, including 272 international collaborative papers (52.71%) generating 11,234 citations. The global collaboration network spans 38 countries, with major partnerships involving Germany, Italy, Japan, and the United States. Keyword analysis identified 2,314 terms, with dominant themes such as perovskite, electronic structure, and nanocrystals, alongside high linkage strength in nanoscience-related topics. **Conclusion:** Overall, the findings highlight sustained productivity, significant citation impact, and extensive collaboration as key factors underpinning the author's scholarly influence.

Keywords: Bio-Bibliometrics, Collaboration Co-efficient, IISc, India, Publication Productivity, Scientometric Portrait.

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INTRODUCTION

The rapid growth of scientific literature in recent decades has led to the increasing use of quantitative methods to assess research productivity, impact, and patterns of collaboration. In this context, bio-bibliometric analysis has emerged as a well-established approach for examining the development, structure, and influence of scholarly communication at the level of individual researchers across disciplines (Madhu and Kannappanavar, 2020). By employing indicators such as publication output, citation counts, authorship patterns, and keyword co-occurrence, such analyses provide valuable insights into the intellectual contributions and evolving research focus of individual scholars. In the domain of condensed matter physics and materials science, individual researchers have made significant contributions to both theoretical advancement and experimental development.

Among these, Prof. Dipankar Das Sarma (DDS), a distinguished scientist associated with the Indian Institute of Science (IISc) Bangalore, particularly in the Solid State and Structural Chemistry Unit (SSCU), has contributed extensively over several decades (IISc, n.d.). His research spans areas such as electronic structure, transition metal oxides, nanocrystals, and perovskite materials, reflecting a broad and interdisciplinary profile. Despite his substantial and widely cited body of work, systematic quantitative studies examining his publication trends, citation impact, and collaborative patterns remain limited. The present study, therefore, undertakes a Bio-Bibliometric analysis of his publications indexed in Scopus over an extended period. It focuses on key indicators, including annual publication trends, citation performance, authorship characteristics, collaboration patterns, and keyword-based thematic development, with the aim of providing a comprehensive assessment of his research contributions and their influence within the scientific community (Madhu *et al.*, 2025; Pradeep *et al.*, 2025).

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REVIEW OF LITERATURE

A review of selected studies provides an overview of bio-bibliometric analyses focusing on research productivity, citation impact, and collaboration patterns of individual scientists. Relevant prior studies considered for the present investigation are outlined as follows:

Kalyane and Munnolli (1995), conducted a scientometric analysis of T. S. West, revealing a highly productive research career comprising 410 publications, with a productivity coefficient of 0.45 and a publication density of 8.54. The study indicates a strong collaborative orientation, with major contributions alongside R. M. Dagnall and G. F. Kirkbright, and the predominance of keywords were atomic fluorescence and atomic absorption spectroscopy reflects his sustained contributions to the field of analytical chemistry. Garg and Kumar (2019), examined the research productivity of Dr. Hari Chand Sharma, analysing his 595 publications, of which approximately 45% were journal articles published mainly in medium-impact journals from the UK, USA, and the Netherlands. The study highlights a strong collaborative pattern, reflected in a collaboration coefficient of 0.66 and co-authorship with over 1,000 researchers, with peak productivity observed during the age of 58-60 years. A high citation per paper further indicates that his work is well integrated into mainstream scientific research. Koley and Sen (2021), analysed the research output of A. P. J. Abdul Kalam, noting that his first publication appeared in 1974 at the age of 43 and that his most productive phase occurred during 2004-2008 (aged 73-77), with an average of five publications per year. His contributions were mainly as first and second author, with a higher share of books and festschrift publications, and the majority of his journal articles appearing in national journals. Gholampour and Noruzi (2022) studied significant contributions made by Wolfgang Glänzel who made a significant contribution on quantitative studies of science, earning the Derek John de Solla Price Award. Over a 37-year career, his 276 publications, predominantly collaborative reflect peak productivity during 2008-2017, with major research contributions in scientometrics, citation analysis, text mining, and bibliometric indicators, often in collaboration with scholars from KU Leuven and the Hungarian Academy of Sciences. Gupta *et al.* (2025) conducted a bibliometric study of Dr. Raju Vaishya (2008-2024), reporting a total of 318 publications that received 6,834 citations, with an average of 21.49 citations per paper, and identifying 2020-2024 as the most productive period (208 publications). The findings indicate a high level of collaboration (96.22%), including notable national (55.66%) and international (29.24%) contributions, highlighting the importance of collaborative research in enhancing scholarly impact in orthopedics.

OBJECTIVES OF THE STUDY

- To examine the growth and distribution of publications of Prof. Dipankar Das Sarma (DDS) over the study period.
- To analyse the temporal evolution of research productivity and impact across different phases of the author's career.
- To analyse the citation impact and performance, including total citations, citation per paper, and highly cited works.
- To identify the authorship pattern and degree of collaboration, including single-authored, multi-authored, and mega-authored publications.
- To evaluate the collaborative research structure, including inter-institutional, national, and international collaborations.
- To assess the preferred sources of publication, including document types, journals, and impact factor distribution.
- To examine the thematic structure of research through keyword analysis and co-occurrence mapping.
- To identify the major research domains and influential works based on top-cited publications.

METHODOLOGY

The present study adopts a bio-bibliometric approach to examine the research productivity, citation impact, and collaborative patterns of Prof. Dipankar Das Sarma (DDS). Bibliographic data were retrieved from Scopus, a widely recognised source for peer-reviewed literature and a product of Elsevier. Publications were identified using author-based search strategies and refined to ensure accuracy and relevance, with data fields including publication year, document type, citations, authorship details, source titles, and keywords. The dataset was subsequently exported, organised, and cleansed using Microsoft Excel, which was also employed for descriptive and statistical analyses such as publication trends, citation indicators, authorship patterns, and collaboration measures. For network visualisation, VOSviewer was utilised to generate keyword co-occurrence maps and identify major research clusters. Standard scientometric indicators, including total publications, total citations, citation per paper, collaboration coefficient, and keyword co-occurrence measures, were applied to interpret the data, thereby enabling a systematic assessment of the author's research performance, thematic orientation, and collaborative profile.

Data Analysis and Interpretation

Overall Publication Productivity of Prof. Dipankar Das Sarma (DDS)

As shown in Table 1, the publication pattern of Dipankar Das Sarma (DDS) reflects a sustained and influential scholarly career spanning 1980 to 2025 (Figure 1). Over this 46-year period, he produced 516 publications, which received 23,215 citations, yielding an overall Citation Per Paper (CPP) of 44.99. His research output shows a gradual but consistent rise, increasing from 3 publications in 1980 to 10 in 2025. The period 2004-2015 was the most productive, contributing 177 publications (34.30%) and 9,117 citations, whereas 1992-2003 recorded the highest citation intensity (CPP: 58.82), indicating the strong influence of publications produced during that phase. At the annual level, 2000 and 2004 stand out as the most impactful years, with CPP values of 146.56 and 145.11, respectively. The data also reveal a pronounced collaborative orientation, with 131 inter-institutional, 110 national, and 275 international collaborative publications, in addition to 140 funded papers, underscoring the broad collaborative base of his research activity.

As presented in Supplementary Table S1, the publication pattern of Prof. DDS is overwhelmingly collaborative, with only 9 papers (1.74%) being single-authored. Three-authored papers formed the largest share, followed by four- and five-authored publications, while mega-authored papers also made a notable contribution. The consistently high collaboration coefficient (0.98-0.99) confirms that collaboration remained a defining characteristic throughout his career. Likewise, Supplementary Table S2 shows that two-authored publications accounted for the largest share (17.25%), followed by single-authored (16.47%) and three-authored papers (14.73%), indicating a balanced yet collaboration-oriented authorship structure. Further,

Table 1: Annual Production of Publications of Prof. DDS.

Year	TP	TC	%TP	CCP	IICP	NCP	ICP	FP	Year	TP	TC	%TP	CCP	IICP	NCP	ICP	FP
1980	3	697	0.58	232.33	2	1	-	-	2005	17	757	3.29	44.53	2	5	10	2
1981	4	101	0.78	25.25	3	1	-	-	2006	17	494	3.29	29.06	2	4	12	4
1982	8	164	1.55	20.50	8	-	-	1	2007	17	1147	3.29	67.47	1	6	10	-
1983	3	1	0.58	0.33	3	-	-	1	2008	14	637	2.71	45.50	2	9	3	1
1984	5	86	0.97	17.20	5	-	-	1	2009	16	712	3.10	44.50	3	5	8	3
1985	9	130	1.74	14.44	-	-	9	-	2010	16	1212	3.10	75.75	-	11	5	4
1986	8	162	1.55	20.25	-	-	8	-	2011	16	724	3.10	45.25	2	7	7	4
1987	11	331	2.13	30.09	6	1	4	2	2012	11	598	2.13	54.36	-	3	8	4
1988	16	601	3.10	37.56	6	-	10	3	2013	12	450	2.33	37.50	1	2	9	5
1989	16	468	3.10	29.25	8	1	7	2	2014	18	367	3.49	20.39	1	5	13	5
1990	7	134	1.36	19.14	4	-	4	-	2015	14	713	2.71	50.93	1	1	12	6
1991	8	102	1.55	12.75	4	-	4	1	2016	21	1111	4.07	52.90	3	4	14	13
1992	10	609	1.94	60.90	9	-	1	-	2017	12	695	2.33	57.92	3	3	6	9
1993	10	453	1.94	45.30	4	2	4	2	2018	17	638	3.29	37.53	4	3	10	15
1994	11	609	2.13	55.36	7	-	4	1	2019	9	400	1.74	44.44	1	3	5	5
1995	6	524	1.16	87.33	4	-	2	-	2020	8	135	1.55	16.88	2	-	6	6
1996	15	774	2.91	51.60	6	1	8	-	2021	12	114	2.33	9.50	4	-	8	9
1997	10	322	1.94	32.20	1	2	7	-	2022	3	22	0.58	7.33	-	-	3	2
1998	11	584	2.13	53.09	3	3	5	-	2023	8	195	1.55	24.38	-	1	7	7
1999	8	367	1.55	45.88	5	2	1	1	2024	10	78	1.94	7.80	-	5	5	9
2000	9	1319	1.74	146.56	4	3	2	-	2025	10	28	1.94	2.80	-	6	4	7
2001	14	996	2.71	71.14	2	5	7	-	1980-1991	98	2977	18.99	30.38	49	4	46	11
2002	11	445	2.13	40.45	3	-	8	1	1992-2003	131	7705	25.39	58.82	48	20	63	5
2003	16	703	3.10	43.94	-	2	14	-	2004-2015	177	9117	34.30	51.51	16	61	101	42
2004	9	1306	1.74	145.11	1	3	5	4	2016-2025	110	3416	21.32	31.05	17	25	69	82
-	-	-	-	-			-	-	Grand Total	516	23215	100	44.99	131	110	275	140

TP: Total Publication; %TP: Total Percentage; TC: Total Citation; CPP: Citation Per Paper; IICP: Inter Institutional Collaborative Publications; NCP: National Collaborative Publications; ICP: International Collaborative Publications; FP: Funded Publications.

Supplementary Table S3 highlights that the most productive cumulative phase was 2005-2009, contributing 81 publications (15.70%), followed by 2010-2014 and 2015-2019, each with 73 publications (14.15%). With 507 out of 516 papers being multi-authored, the overall collaboration rate of 0.98 clearly demonstrates that collaborative scholarship remained a stable and central feature of his research productivity across all career stages.

Publications Types

Table 2 presents the publications distribution by Prof. DDS. Out of a total of 516 publications, the highest 443 (85.85%) publications were in the form of research articles. Followed by, 33 (6.40%) publications were conference papers and 14 (2.71%) publications were review articles. In terms of citations counts, research articles received highest citations count with 21512 Total Citations (TC), followed by, review articles (TC-1081), and conference papers (TC-265). In terms 7 citations impact, review articles recorded the highest Citation Per Paper (CCP) of 77.21, followed by short survey received CCP of 67.00 and research article received CCP of 48.46.

International Collaborative Countries

Out of Prof. DDS total 516 publications, 272 (52.71%) publications were produced through international collaboration. These 272 publications accounted a total of 11234 citations (averaging 41.20 CCP). Through his 46-research career (1985-2025), Prof. DDS established scientific collaborations with 804 foreign authors affiliated with 448 organizations across 38 countries. Table 3 details with top nine collaborative countries in Prof. DDS research productivity. Prof. DDS Internationally Collaborative Papers (ICP's) demonstrate his international collaboration networks as follows: The highest number of collaborations recorded with two European countries, particularly with Germany (92

Table 2: Publications Types of DDS.

Document Types	TP	%TP	TC	CPP
Article	443	85.85	21512	48.56
Conference paper	33	6.40	265	8.03
Review	14	2.71	1081	77.21
Erratum	7	1.36	5	0.71
Editorial	6	1.16	21	3.50
Letter	6	1.16	121	20.17
Book chapter	4	0.78	123	30.75
Note	2	0.39	20	10.00
Short survey	1	0.19	67	67.00
Grand Total	516	100	23215	44.99

TP: Total Publication; %TP: Total Percentage; TC: Total Citation; CPP: Citation Per Paper.

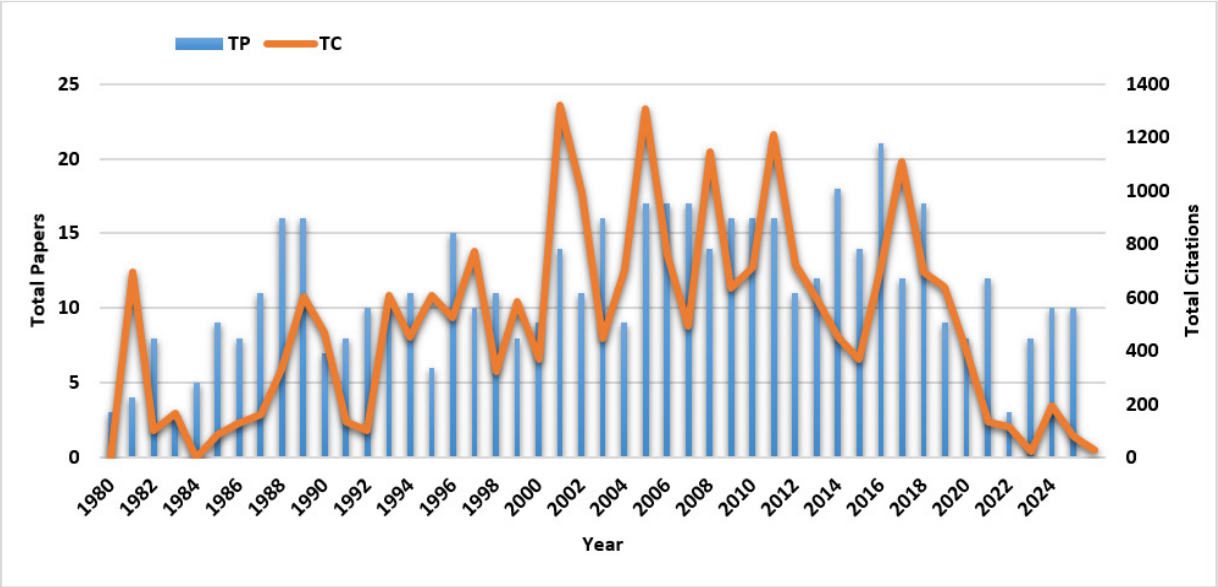

Figure 1: Year Publication Frequency and Citations Impact.

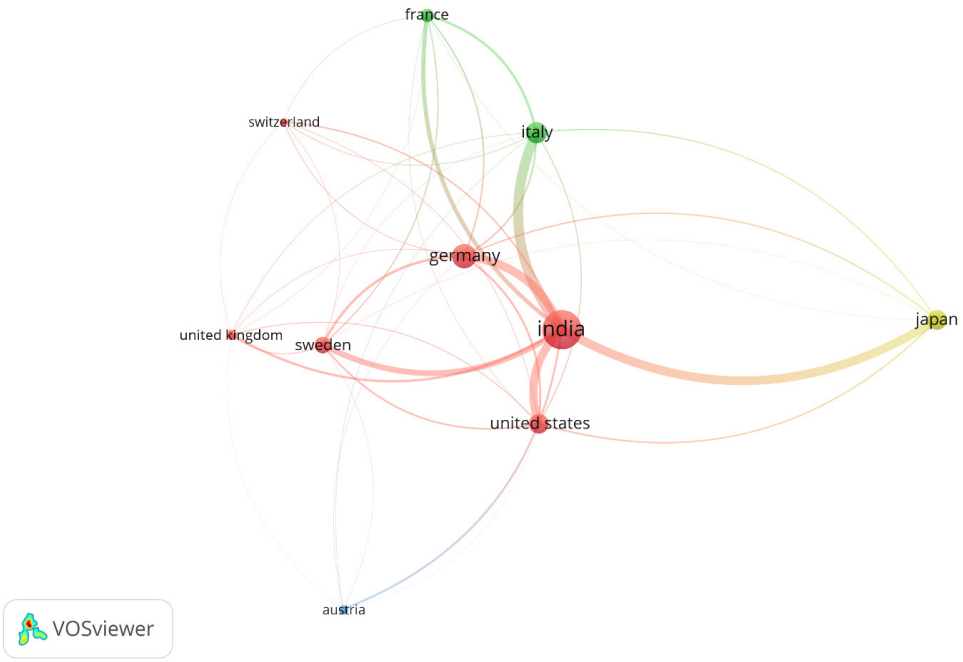

Figure 2: Top foreign collaborative countries with Prof. DDS.

publications, 33.82% share) and Italy (73 publications, 26.84% share); (ii) moderate number of contributions came from Japan (63 publications, 23.16% share), United States (62 publications, 22.79% share), Sweden (45 publications, 16.54% share); (iii) limited collaboration was found with countries such as France (29 publications, 10.66% share), UK (17 publications, 6.25% share), Austria (14 publications, 5.15% share), Switzerland (11 publications, 4.04% share). In terms of citation impact among the top nine collaborating countries, publication with co-authored works form Switzerland (CCP-52.09) and Sweden (CCP-42.76) achieved the highest citation impact. Figure 2 illustrates the Prof. DDS international collaborations network with top 9 foreign countries spread across four clusters, reflecting varying levels of scholarly engagement.

Top Foreign Authors

In Prof. DDS 272 ICPs, a total of 804 foreign authors participated between the time-span of 1980-2025. Table 4 details about the contributions of top nine foreign eight or more publications contributions. Carlo Carbone from Forschungszentrum Jülich GmbH, Germany (TP-21, TC-507) and Atsushi Fujimore from The University of Tokyo, Japan (TP-21, TC-482) top foreign contributors with Prof. DDS. In terms citations impact, with Prof. DDS the impact was Wolfgang Gudat affiliated to Helmholtz-Zentrum Berlin für Materialien and Energie (HZB), Germany (TP-16, TC-1212, CCP-75.75) and Settimio Mobilio affiliated to Tohoku University, Sendai, Japan (TP-13, TC-968, CCP-74.46) were more impactful authors among foreign contributing authors.

Figure 3 illustrates the Prof. DDS co-authorship networks with top nine foreign authors collaborators, across four major thematic clusters of researchers. Cluster 1 (red) includes three authors: Carlo Carbone (TP-21; TLS-41); Roberto Cimino (TP-14; TLS-33); Wolfgang Gudat (TP-16-; TLS-36). Cluster 2 (green) three authors: Atsushi Fujimori (TP-21-; TLS-22); Olof Karis (TP-17; TLS-17). Cluster 3 (blue) includes two authors: Carlo Meneghini (TP-15; TLS-29); Settimio Mobilio (TP-13; TLS-27). Cluster 4 (yellow) includes two authors: Takafumi J. Sato (TP-8; TLS-16) and Takashi Takahashi (TP-8; TLS-16).

Top Foreign Organisation

In total 448 foreign organisations collaborated with Prof. DDS out of 275 publications. Among them, the top eight organisations remarkable made twelve or more publications collaboration. Table 5 highlights the top eight leading foreign collaborative organization, the highest coloration came with Forshugszentrum Julich Gmbh, from Germany (TP-43, TP-1064) and Uppsala Universitet, Uppsala, Sweden (TP-38, TC-1515) In terms of citation impact, namely two affiliation recorded high in citations per papers (CCP): Max Planck Institute for Solid State Research, Baden-Wurttemberg, Germany (TP-12, TC-554, CCP-46.17) and The University of Tokyo, Tokyo, Japan (TP-28, TC-1375, CCP-49.11). Figure 4 shows the Prof. DDS parent affiliation and his international collaboration network among top 8 foreign organisations.

Table 3: Top Countries with 10 and more publications.

Sl. No.	Country	TP	TC	CCP	TLS
1.	Germany	92	3001	32.62	135
2.	Italy	73	2445	33.49	128
3.	Japan	63	2628	41.71	95
4.	United States	62	2101	33.89	118
5.	Sweden	45	1924	42.76	94
6.	France	29	956	32.97	74
7.	United Kingdom	17	535	31.47	42
8.	Austria	14	952	68.00	23
9.	Switzerland	11	573	52.09	32

TP: Total Publication; TC: Total Citation; CPP: Citation Per Paper; TLS: Total Link Strength.

Table 4: Top foreign Authors with 8 and more publications.

Sl. No.	Authors	Affiliation	TP	TC	CCP	TLS
1.	Carlo Carbone	Forschungszentrum Jülich. GmbH, Germany	21	507	24.14	41
2.	Atsushi Fujimori	The University of Tokyo, Tokyo, Japan	21	482	22.95	22
3.	Olof Karis	Uppsala Universitet, Sweden	17	422	24.82	17
4..	Wolfgang Gudat	Helmholtz-Zentrum Berlin für Materialien und Energie (HZB), Germany	16	1212	75.75	36
5.	Carlo Meneghini	Università degli Studi Roma Tre, Italy	15	895	59.67	29
6.	Roberto Cimino	Laboratori Nazionali Di Frascati, Italy	14	593	42.36	33
7.	Settimio Mobilio	Università degli Studi Roma Tre, Italy	13	968	74.46	27
8.	Takafumi J. Sato	Tohoku University, Sendai, Japan	8	493	61.63	16
9.	Takashi Takahashi	Tohoku University, Sendai, Japan	8	388	48.50	16

TP: Total Publication; TC: Total Citation; CPP: Citation Per Paper; TLS: Total Link Strength.

Table 5: Top Foreign Organisation with 12 and more publications.

Sl. No.	Affiliation Name	TP	TP	CCP	TLS
1.	Forschungszentrum Jülich Gmbh, Julich, Germany	43	1064	24.74	31
2.	Uppsala Universitet, Uppsala, Sweden	38	1515	39.87	84
3.	The University of Tokyo, Tokyo, Japan	28	1375	49.11	39
4.	European Synchrotron Radiation Facility, Grenoble, France	18	681	37.83	45
5.	Infn, Laboratori Nazionali Di Frascati, Frascati, Italy	18	524	29.11	42
6.	Elettra-Sincrotrone Trieste S.C.P.A., Basovizza, Italy	15	409	27.27	30
7.	Dipartimento Di Fisica, Rome, Italy	13	365	28.08	31
8.	Max Planck Institute for Solid State Research, Baden-Wurttemberg, Germany	12	554	46.17	22

TP: Total Publication; TC: Total Citation; CPP: Citation Per Paper; TLS: Total Link Strength.

Top Indian Collaborators

Table 6 highlights the top 15 collaborators of Indian origin with Prof. DDS. Out of 220 Indian authors, 15 authors made remarkable contributions with five or more publications collaborations. In terms publications count, Priya Mahadevan recorded highest publications with 22 publications, followed by, Tanusri Saha-Dasgupta with 13 publications. In terms citations impact, six authors recorded highest Citations Per Publications (CCP) namely: Chintamani Nagesa Ramachandra Rao (CNR Rao) (TP-45, TC-1871, CCP-41.58) Priya Mahadevan (TP-34, TC-1369, CCP-40.26). In terms of citation impact: Sammer Sapra (TP-13, TC-1730, CCP-133.08) and Ranjani Viswanatha (TP-12, TC-1197, CCP-99.75) are top impact authors with Prof. DDS. Figure 5 illustrates the Prof. DDS co-authorship networks with top nine Indian authors collaborators.

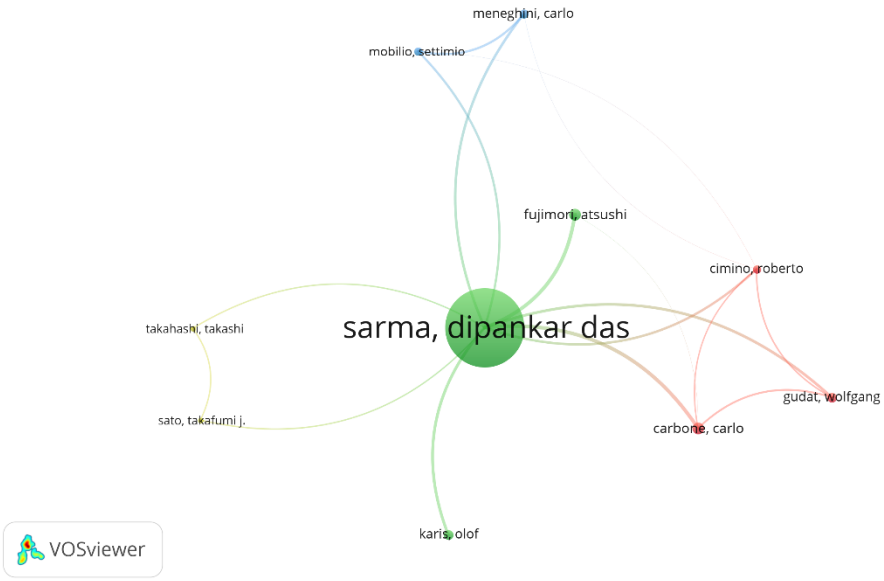

Figure 3: Top foreign authors collaboration with Prof. DDS.

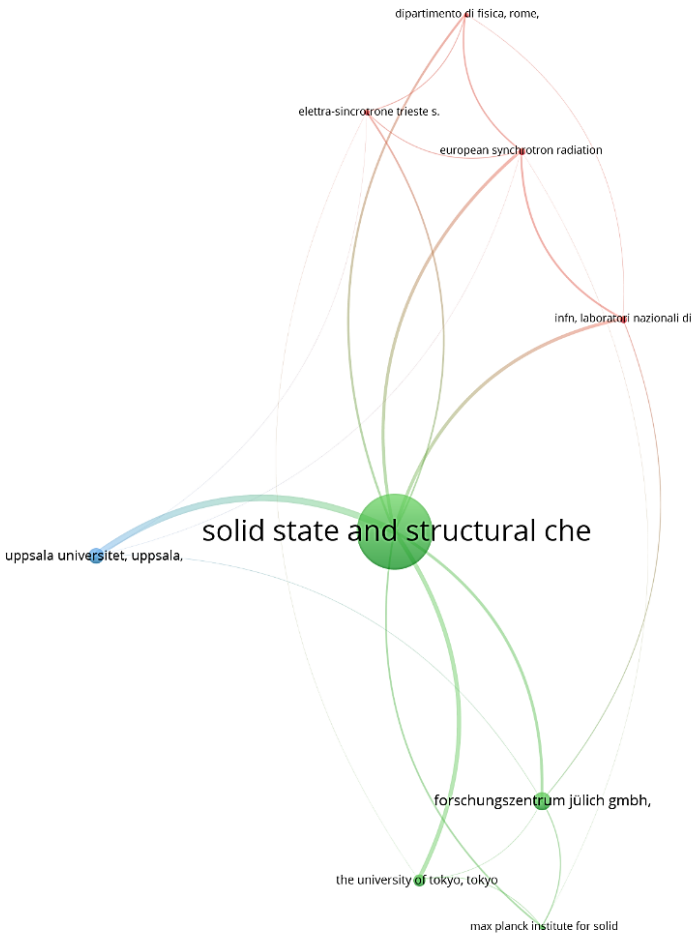

Figure 4: Top foreign collaborative organisation with Prof. DDS.

Table 6: Top Indian Authors with 10 and more publications with Prof. DDS.

Sl. No.	Authors	Affiliation	TP	TC	CCP	TLS
1.	Chintamani Nagesa Ramachandra Rao (CNR Rao)	Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru, India	45	1871	41.58	47
2.	Priya Mahadevan	IISc, Bengaluru, India	34	1369	40.26	45
3.	Tanusri Saha-Dasgupta	IISc, Bengaluru, India	15	1170	78.00	20
4.	Ashish Atma Chainani	IISc, Bengaluru, India	14	1008	72.00	16
5.	N. Shanthi	IISc, Bengaluru, India	14	643	45.93	24
6.	Sameer Sapra	IISc, Bengaluru, India	13	1730	133.08	21
7.	Ranjani Viswanatha	IISc, Bengaluru, India	12	1197	99.75	19
8.	Ashutosh Kumar Shukla	IISc, Bengaluru, India	11	522	47.45	12
9.	Somobrata Acharya	Indian Association for the Cultivation of Science, Kolkata, India	10	150	15.00	10

TP: Total Publication; TC: Total Citation; CPP: Citation Per Paper; TLS: Total Link Strength.

Table 7: Top Indian Organisation with 5 and more publications with Prof. DDS.

Sl. No.	Affiliation Name	TP	TP	CCP	TLS
1.	Indian Institute of Science, Bengaluru, Ka, India	52	1740	33.46	35
2.	Centre For Advanced Materials, Indian Association for The Cultivation of Science, Kolkata, Wb, India	36	1466	40.72	68
3.	Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru, Ka, India	36	2734	75.94	61
4.	S. N. Bose National Centre for Basic Sciences, Kolkata, Wb, India	27	1431	53.00	54
5.	Department Of Physics, Indian Institute of Science, Bengaluru, Ka, India	25	1134	45.36	36
6.	Council Of Scientific and Industrial Research India, New Delhi, India	8	169	21.13	19
7.	Department Of Materials Science, Indian Association for The Cultivation of Science, Kolkata, Wb, India	8	1254	156.75	10
8.	Tata Institute of Fundamental Research, Mumbai, Mumbai, Mh, India	6	376	62.67	7
9.	Department Of Condensed Matter Physics and Material Sciences, S. N. Bose National Centre for Basic Sciences, Kolkata, Wb, India	5	91	18.20	7
10.	Indian Association for The Cultivation of Science, Kolkata, Wb, India	5	112	22.40	8

TP: Total Publication, TC: Total Citation, CPP: Citation Per Paper, TLS: Total Link Strength.

Top Indian Organisation

In total 80 Indian organisations collaborated with Prof. DDS out of 110 publications (Figure 6). Among them, the top ten organisations remarkable made 5 or more publications collaboration. Table 7 highlights the top leading Indian collaborative organization, in terms of publications count, two institutes contributed highest publications with Prof. DDS namely: Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru (TP-52, TC-1740) and Centre for Advanced Materials, Indian Association for the Cultivation of Science, Kolkata (TP-36, TC-1466). In terms citations impact, two organisation recorded highest Citations Per Publications (CCP) namely: Department of Materials Science, Indian Association for The Cultivation of Science, Kolkata (TP-8, TC-1254, CCP-156.75) and Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru, Ka, India (TP-36, TC-2734, CCP-75.94). Figure 2 illustrates the collaborations network of Prof. DDS with top 10 Indian organisation spread across four clusters, reflecting varying levels of scholarly engagement.

Citation Performance

Supplementary Table S4 details the citation of performance of Prof. DDS. In total of 516 publications, 29 (5.62% share) publications were uncited. Followed by, 375 (69.19%, TC-6254)

Table 8: Top Cited Papers of DDS.

Sl. No.	Title	Authors	Source Title	Year	TC
1.	XPES studies of oxides of second- and third-row transition metals including rare earths	Sarma, D.D., Rao, C.N.R.	Journal of Electron Spectroscopy and Related Phenomena	1980	641
2.	Electronic structure of Sr2FeMoO6	Sarma, D.D., Mahadevan, P., Saha-Dasgupta, T., Ray, S., Kumar, A.	Physical Review Letters	2000	512
3.	Size-selected zinc sulfide nanocrystallites: Synthesis, structure, and optical studies	Nanda, J., Sapra, S., Sarma, D.D., Chandrasekharan, N., Hodes, G.	Chemistry of Materials	2000	415
4.	Near-room-temperature colossal magnetodielectricity and multiglass properties in partially disordered La 2NiMnO 6	Choudhury, D., Mandal, P., Mathieu, R., Hazarika, A., Rajan, S., Sundaresan, A., Waghmare, U.V., Knut, R., Karis, O., Nordblad, P., Sarma, D.D.	Physical Review Letters	2012	408
5.	Structural and doping effects in the half-metallic double perovskite A2CrWO6 (A=Sr, Ba, and Ca)	Philipp, B., Majewski, P., Alff, L., Erb, A., Gross, R., Graf, T., Brandt, S., Simon, J., Walther, T., Mader, W., Topwal, D., Sarma, D.D.	Physical Review B - Condensed Matter and Materials Physics	2003	374
6.	Electronic structure of early 3d-transition-metal oxides by analysis of the 2p core-level photoemission spectra	Bocquet, A., Mizokawa, T., Morikawa, K., Fujimori, A., Barman, S.R., Maiti, K., Sarma, D.D.	Physical Review B - Condensed Matter and Materials Physics	1996	339
7.	Understanding the quantum size effects in ZnO nanocrystals	Viswanatha, R., Sapra, S., Satpati, B., Satyam, P.V., Dev, B.N., Sarma, D.D.	Journal of Materials Chemistry	2004	333
8.	Evolution of the electronic structure with size in II-VI semiconductor nanocrystals	Sapra, S., Sarma, D.D.	Physical Review B - Condensed Matter and Materials Physics	2004	330
9.	Synthesis and characterization of Mn-doped ZnO nanocrystals	Viswanatha, R., Sapra, S., Sen Gupta, S.S., Satpati, B., Satyam, P.V., Dev, B.N., Sarma, D.D.	Journal of Physical Chemistry B	2004	304
10.	Electron-spectroscopy study of the semiconductor-metal transition in La1-xSrxCoO3	Chainani, A., Mathew, M., Sarma, D.D.	Physical Review B	1992	300
11.	Band theory for ground-state properties and excitation spectra of perovskite LaMO3 (M= Mn, Fe, Co, Ni)	Sarma, D.D., Shanthi, N., Barman, S.R., Hamada, N., Sawada, H., Terakura, K.	Physical Review Letters	1995	294
12.	Physics of Ultrathin Films and Heterostructures of Rare-Earth Nickelates	Middey, S., Chakhalian, J., Mahadevan, P., Freeland, J.W., Millis, A.J., Sarma, D.D.	Annual Review of Materials Research	2016	278
13.	Role of Polar Phonons in the Photo Excited State of Metal Halide Perovskites	Bokdam, M., Sander, T., Stroppa, A., Picozzi, S., Sarma, D.D., Franchini, C., Kresse, G.	Scientific Reports	2016	273
14.	Supramolecular control of the magnetic anisotropy in two-dimensional high-spin Fe arrays at a metal interface	Gambardella, P., Stepanow, S., Dmitriev, A., Honolka, J., de Groot, F.M.F., Lingenfelder, M., Sen Gupta, S.S., Sarma, D.D., Benčok, P., Stanescu, S., Clair, S., Pons, S., Lin, N., Seitsonen, A.P., Brune, H., Barth, J.V., Kern, K.	Nature Materials	2009	268

Sl. No.	Title	Authors	Source Title	Year	TC
15.	To dope Mn2+ in a semiconducting nanocrystal	Nag, A., Chakraborty, S., Sarma, D.D.	Journal of the American Chemical Society	2008	261
16.	Expanding Interlayer Spacing in MoS2 for Realizing an Advanced Supercapacitor	Sarkar, D., Das, D., Das, S., Kumar, A., Patil, S., Nanda, K.K., Sarma, D.D., Shukla, A.	ACS Energy Letters	2019	260
17.	Emission properties of manganese-doped ZnS nanocrystals	Sapra, S., Prakash, A., Ghangrekar, A., Periasamy, N., Sarma, D.D.	Journal of Physical Chemistry B	2005	258
18.	Advances in light-emitting doped semiconductor nanocrystals	Pradhan, N., Sarma, D.D.	Journal of Physical Chemistry Letters	2011	256
19.	Luminescence, Plasmonic, and Magnetic Properties of Doped Semiconductor Nanocrystals	Pradhan, N., Das Adhikari, S., Nag, A., Sarma, D.D.	Angewandte Chemie - International Edition	2017	255
20.	Magnetoresistance in ordered and disordered double perovskite oxide, Sr2FeMoO6	Sarma, D.D., Sampathkumaran, E.V., Ray, S., Nagarajan, R., Majumdar, S., Kumar, A., Nalini, G., Guru Row, T.N.	Solid State Communications	2000	247

TC: Total Citation.

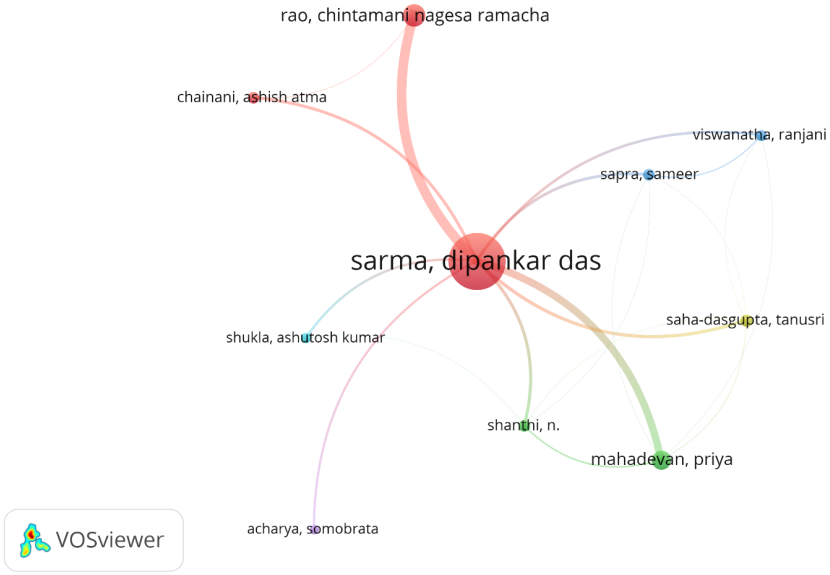

Figure 5: Top Indian collaborative author with Prof. DDS.

publication between 1-50 citation range received moderately cited works and highly cited papers (≥ 51 citations) contribute disproportionately to impact, with 51-150 citations accounted 98 (18.99%, TC-9524) of the total citations. The elite group of high-impacted publications segments ranged from 201-650 together comprises of 24 (4.65%, TC-7437) publications of the overall citations.

Impact Factor Wise Distribution of Published Publication

Supplementary Table S5 presents the impact factor-wise distribution of publications of Prof. DDS. The highest number of publications, 180 (34.88%), appeared in low impact factor journals (0.0-0.99), followed by 146 publications (28.29%) published in non-impact factor (NA) journals. Publications in medium impact factor journals (1.0-3.99) accounted for 139 papers (26.94%), while only 12 publications (2.33%) were published in high impact factor journals (4.0-5.99). Finally, 39 publications (7.56%) were published in very high-impact journals (6.0-18.28). In terms of

journal quartile: 247 (48%) publications published in Q3 listed journals, followed by, In Q2 listed journals published in 146 (28%) publications. In Q1 listed journals published in 103 (20%) publications and 20 (4%) publications journal quartile were not available (Figure 7).

Top citations of Prof. DDS

Table 8 lists the highly cited publications of Prof. DDS and reflects the substantial academic influence of his research across several areas of physical science. The most cited paper, published in 1980 (XPES studies of oxides of second- and third-row transition metals including rare earths) in collaboration with Sarma, D.D., and Rao, C.N.R., received 641 citations, followed by another highly influential work published in 2000 (Electronic structure of Sr2FeMoO6), which accumulated 512 citations. A considerable number of these top-cited papers appeared in internationally reputed journals, particularly in the fields of condensed matter physics, materials science, and nanoscience. Thematically, these publications are largely associated with electronic structure analysis, transition metal oxides, perovskite materials, and semiconductor nanocrystals, indicating both disciplinary depth and interdisciplinary relevance. Overall, the citation pattern of these papers demonstrates the enduring scholarly significance and broad research visibility of his scientific contributions.

SIGNIFICANT KEYWORDS

Keywords play a crucial role in the accurate indexing of research publications. Across the 516 publications of Prof. DDS, a total of 2,314 keywords were identified, reflecting considerable thematic diversity in his research output. The most frequently occurring

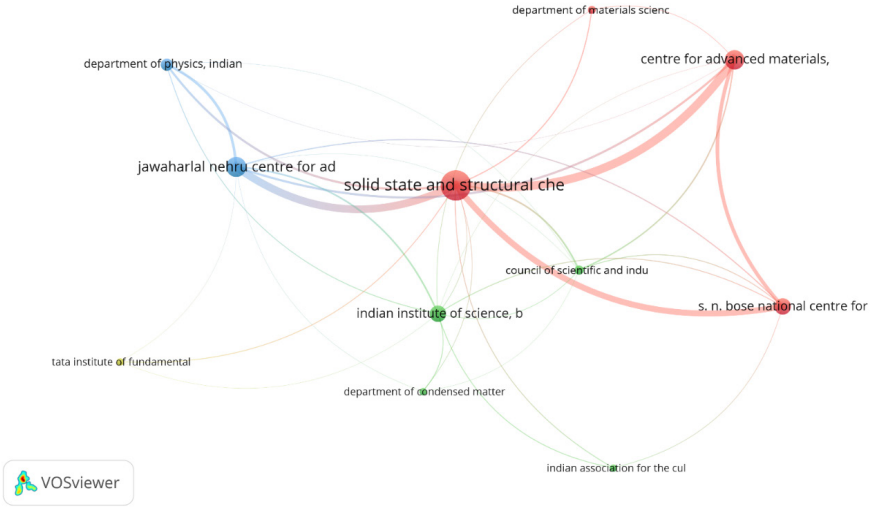

Figure 6: Top Indian collaborative organisation with Prof. DDS.

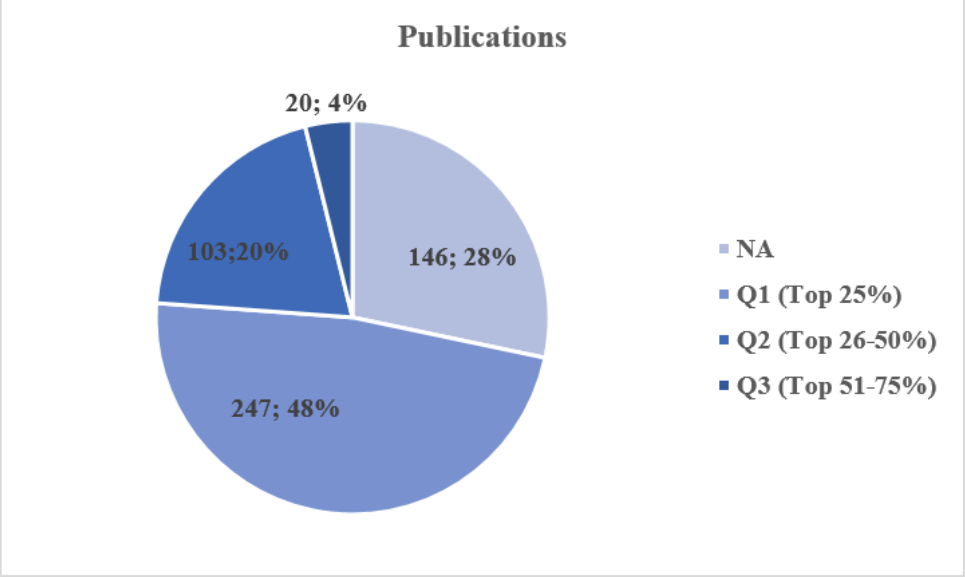

Figure 7: Publications Distribution of Prof. DDS by Journal Quartile.

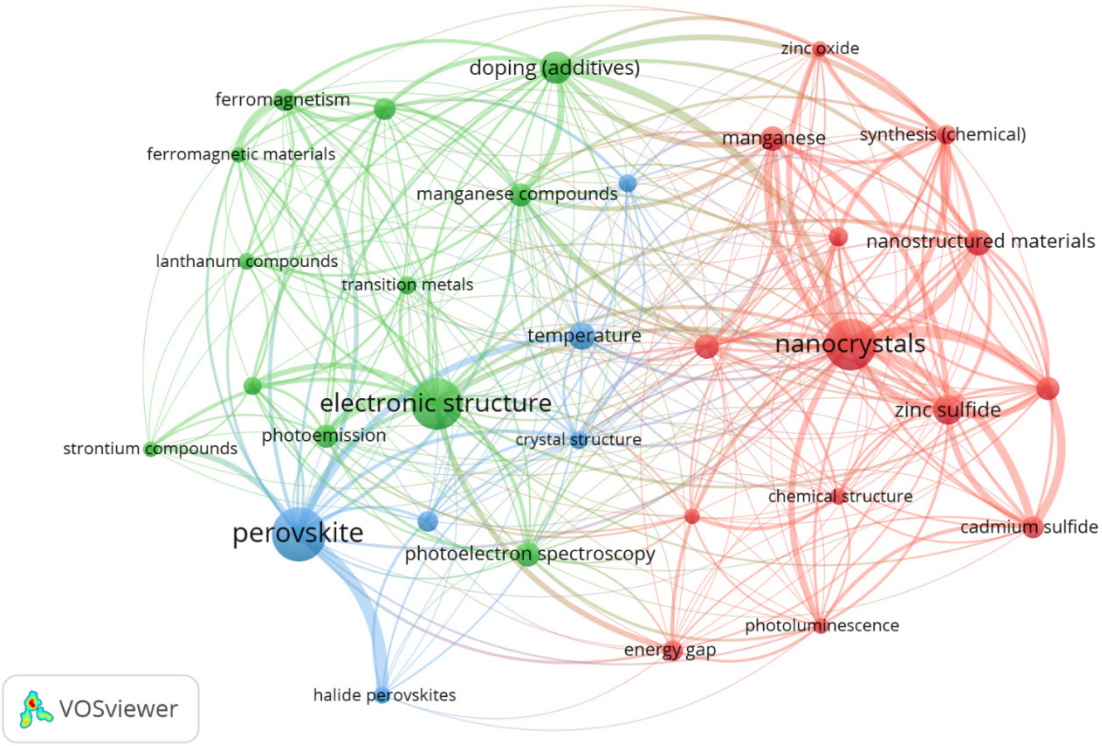

Figure 8: Co-occurrence of Top Keywords.

keywords were Perovskite (42), Electronic Structure (40), and Nanocrystals (40), while Nanocrystals recorded the highest Total Link Strength (TLS: 123), followed by Electronic Structure (87) and Perovskite (79). These patterns indicate that his research is primarily centred on condensed matter physics, materials science, and nanoscience, with strong emphasis on the structural and electronic properties of advanced materials (Table S6).

A co-occurrence analysis of 32 selected keywords resulted in the identification of three major clusters (Figure 8). These keyword clusters represent the principal research themes of Prof. DDS and highlight his major scholarly contributions to condensed matter physics and materials science.

Cluster 1 (Red): Cadmium Compounds, Cadmium Sulfide, Chemical Structure, Energy Gap, Manganese, Nanocrystals, Nanoparticles, Nanostructured Material, Photoluminescence, Synthesis (chemical), X-ray diffraction, X-ray Photoelectron Spectroscopy, Zinc Oxide, Zine Sulfide. Cluster 2 (Green): Doping (additives), Electronic Structure, Ferromagnetic Materials, Ferromagnetism, Lanthanum Compounds, Magnetic Properties, Manganese Compounds, Metal Insulator Transition, Photoelectron Spectroscopy, Photoemission, Strontium Compounds, Transition Metals. Cluster 3 (Blue): Crystal Structure, Halide Perovskites, Magnetism, Perovskite, Single Crystals, Temperature.

CONCLUSION

The present bio-bibliometric analysis of Dipankar Das Sarma demonstrates a sustained and influential research career spanning 1980-2025, with 516 publications and 23,215 citations (CPP: 44.99). The findings indicate steady growth in productivity, with 2004-2015 emerging as the most productive phase, while earlier periods exhibited higher citation intensity, reflecting the foundational impact of his contributions. His publication profile is dominated by research articles, though review papers show comparatively higher citation impact, and the distribution across journal impact factors suggests a balanced publication strategy. A notable characteristic of his scholarly output is the strong collaborative orientation, evidenced by a high collaboration rate (0.98) and extensive national and international partnerships across 38 countries. The predominance of multi-authored works and wide institutional linkages highlights the importance of collaborative research in shaping his academic influence. Keyword and network analyses further reveal a coherent thematic focus on condensed matter physics, materials science, and nanoscience, particularly in areas such as electronic structure and perovskite materials. Overall, the study underscores that sustained productivity, collaborative engagement, and thematic consistency have been central to his enduring research impact.

ACKNOWLEDGEMENT

None.

ABBREVIATIONS

CC: Collaboration Co-efficient; **CPP:** Citation Per Paper; **FP:** Funded Publications; **ICP:** International Collaborative Publications; **IFL:** Impact Factor Level; **IICP:** Inter Institutional Collaborative Publications; **MA:** Multi-Authors; **NA:** Not Available; **NCP:** National Collaborative Publications; **NJ:** No. of Journal; **NO:** No. of Occurrences; **SA:** Single Author; **TC:** Total Citation; **TLS:** Total Link Strength; **TP:** Total Publication; **%TP:** Total Percentage.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

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SUPPLEMENTARY TABLES

Supplementary Table S1: Authorship Distribution of Prof. DDS during 1980-2025.

Year	1	2	3	4	5	6	7	8	9	10	MA (11-26)	TP	CC
1980-1991	1	14	12	13	11	8	14	10	2	1	13	99	0.99
1992-2003	2	14	17	19	18	17	11	7	5	2	18	130	0.98
2004-2014	4	19	27	26	24	16	10	7	8	7	15	163	0.98
2015-2025	2	13	26	16	13	12	12	7	7	7	9	124	0.98
Total	9	60	82	74	66	53	47	31	22	17	55	516	0.98
%TP	1.74	11.63	15.89	14.34	12.79	10.27	9.11	6.01	4.26	3.29	10.66	100	

TP: Total Publication; %TP: Total Percentage; TC: Total Citation; MA: Mega Authors; CC: Collaboration Co-efficient.

Supplementary Table S2: Authorship Appearance of Prof. DDS during 1980-2025.

Year	1	2	3	4	5	6	7	8	9	10	MAP (11-26)	TP
1980-1991	42	32	11	6	2	1	4	0	0	0	0	98
1992-2003	31	27	31	14	9	5	5	4	2	2	1	131
2004-2014	5	24	26	28	28	16	16	9	9	1	15	177
2016-2025	7	6	8	13	13	17	8	4	8	7	19	110
Total	85	89	76	61	52	39	33	17	19	10	35	516
%TP	16.47	17.25	14.73	11.82	10.08	7.56	6.40	3.29	3.68	1.94	6.78	100

TP: Total Publication, %TP: Total Percentage, TC: Total Citation, MA: Mega-Authors Publications, CC: Collaboration Co-efficient.

Supplementary Table S3:Five to Six Years of Cumulative Publications Productivity Prof. DDS.

Five to Six of Cumulative Years	SA	MA	TP	%TP	Collaboration Rate	Productive Age	Actual Age
1980-1984	1	22	23	4.46	0.96	1-5	25-29
1985-1989	0	60	60	11.63	1.00	6-10	30-34
1990-1994	1	45	46	8.91	0.98	11-15	35-39
1995-1999	1	49	50	9.69	0.98	16-20	40-44
2000-2004	0	59	59	11.43	1.00	21-25	45-49
2005-2009	2	79	81	15.70	0.98	26-30	50-54
2010-2014	0	73	73	14.15	1.00	31-35	55-59
2015-2019	3	70	73	14.15	0.96	36-40	60-64
2020-2025	1	50	51	9.88	0.98	41-46	65-70
Total	9	507	516	100.00	0.98	46	70

SA: Single Author; MA: Multi-Authors; TP: Total Publication; %TP: Total Percentage.

Supplementary Table S4: Citation Performance of DDS.

Citation Slot	TP	%TP	TC	%TC
0-0	29	5.62	0	0.00
1-10	135	26.16	669	2.88
11-20	92	17.83	1404	6.05
21-30	65	12.60	1649	7.10
31-40	39	7.56	1359	5.85
41-50	26	5.04	1173	5.05
51-100	73	14.15	5162	22.24
101-150	25	4.84	2997	12.91
151-200	8	1.55	1365	5.88
201-300	15	2.91	3781	16.29
300-650	9	1.74	3656	15.75
Grand Total	516	100.00	23215	100.00

TP: Total Publication, %TP: Total Percentage, TC: Total Citation, %TC: Total Citation Percentage.

Supplementary Table S5: Impact Factor Wise Distribution of Published Publication of Prof. DDS.

IF Range	IFL	NJ	TP	%TP
6 and above (6.0-18.28)	Very High	7	39	7.56
4.0-5.99	High	3	12	2.33
2.0-3.99	Medium	10	73	14.15
1.0-1.99	Medium	17	66	12.79
0.0-0.99	Low	64	180	34.88
NA	-	34	146	28.29
Total	-	135	516	100.00

IFL: Impact Factor Level; NJ: No. of Journal; TP: Total Publications; NA: Not Available; %TP: Percentage of Publications.

Supplementary Table S6: Top Keywords.

Sl. No.	Keywords	No. of Occu.	TLS	Sl. No.	Keywords	No. of Occu.	TLS
1.	Perovskite	42	79	17.	Energy Gap	16	34
2.	Electronic Structure	40	87	18.	Single Crystals	16	27
3.	Nanocrystals	40	123	19.	Nanoparticles	15	42
4.	Doping (Additives)	25	73	20.	Synthesis (Chemical)	15	56
5.	Zinc Sulfide	23	68	21.	Crystal Structure	14	42
6.	Temperature	21	41	22.	Magnetism	14	28
7.	Nanostructured Materials	20	60	23.	Metal Insulator Transition	14	33
8.	Manganese	19	58	24.	Transition Metals	14	29
9.	Photoelectron Spectroscopy	19	40	25.	Chemical Structure	13	31
10.	X-ray Diffraction	19	53	26.	Halide Perovskites	13	26
11.	Cadmium Compounds	18	61	27.	Lanthanum Compounds	13	27
12.	Manganese Compounds	18	55	28.	Ferromagnetic Materials	12	30
13.	Photoemission	18	34	29.	Photoluminescence	12	39
14.	Cadmium Sulfide	17	52	30.	Strontium Compounds	12	21
15.	Ferromagnetism	17	43	31.	X-ray Photoelectron Spectroscopy	12	25
16.	Magnetic Properties	17	42	32.	Zinc Oxide	12	37

NO: No. of Occurrences; TLS: Total Link Strength.