Scientometric Portrait of Renowned Scientist Prof. Asokan Kandasami from University of Petroleum and Energy Studies

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Abstract: *The study analyzed publication output of renowned Scientist Prof. Asokan Kandasami from University of Petroleum and Energy Studies, Dehradun. The study used standard bibliometric indicators to assess publication output and citation counts, collaboration networks, and coauthorship patterns. The data was extracted from Scopus citation and abstracting database with author key search and the data analyzed using Microsoft excel and Biblioshiny software. Major highlight was that Prof. Asokan Kandasami published majority of his publications in the form (83.21%) research articles. His top productive of papers came in the year 2018 with 60 articles and highest authorship appearance came in both in five and six authored papers in 98 (17.66%) publications. Asokan Kandasami collaborative work was more dominant were his degree of Collaboration (DC) was 1.00. Kanjilal D was the top collaborative author with 84 articles and "AIP Conference Proceedings" was preferred top communication channel. This study will be helpful in identifying of potential researchers and collaborative scientific communities.*

Keywords: *Scientometric Portrait, Scientometric Studies, Bibliometric Studies, Bio-Bibliometrics, Degree of Collaboration, Asokan Kandasami, Asokan K, University of Petroleum and Energy Studies.*

Introduction

Scientometric portrait is a comprehensive analysis of the scientific output and impact of an individual researcher or group of researchers. It is a type of bibliometric analysis that uses quantitative methods to evaluate the productivity, impact, and influence of scientific research. Scientometric studies typically include a variety of metrics, such as the number of publications, citations, co-authorship networks, and h-index, among others. These metrics are used to evaluate the research performance of the individual or group of researchers and to compare their performance with others in their field.

Scientometric portraits are becoming increasingly important as research evaluation becomes more important in academia and research funding agencies. These portraits can provide a comprehensive overview of a researcher's career and the impact of their research, which can inform funding decisions, promotion decisions, and hiring decisions. Overall, scientometric portraits

provide a valuable tool for evaluating scientific research and informing research policy and decision-making. They allow for a quantitative evaluation of the productivity, impact, and influence of researchers, which can help to improve the quality and impact of scientific research over time.

Review of Literature

(Barik & Jena 2016) evaluated the various attributes of research publications of Indian Nobel laureate and Bharatha Ratna Dr. Amartya Kumar Sen. The study used standard bibliometric indicators to analyse the overall publication output using Scopus data (Barik & Jena 2016). (Manjunath & Ramesha, 2015) study research publications Sri. C V Raman the First Nobel laureate of Indian. Based on the analysis single authored (339) papers were highly dominant and maximum of this multi-author papers were with cross domain authors. Similar study was conducted by (Kavitha & Chandrashekara, 2020) on the contributions of Prof. K Byrappa of 378 articles indexed in google scholar. His h-index was 31 and received 7774 citations for this scholarly work.

Kademani, B. S.; Kalyane, V L and Kumar, (2000) studied the citations of Vikram Ambalal Sarabhai renowned Physicist and Astronomer of India (Kademani, et al., 2000). Majority of his publications came in the form of articles and significantly contributed in two major domain 'Cosmic Rays' and 'Science and National Development'. Kalaiappan & Yesudoss, (2018) studied research publications outcome of two eminent scientists Prof. G N Ramachandran and Prof. C N R Rao from India (Kalaiappan & Yesudoss, 2018). The overall study found that CNR publications contributions was upper hand when compare with the contributions Prof. GNR contributions (Kavitha & Chandrashekara, 2020).

Madhu & Kannappanavar (2020) examined the publication output of former director IIS, Bangalore prof. P Balaram. Majority of this publication came out in the form of research articles and this most collaborative authorship came with Shamala N and Karle I L (Madhu & Kannappanavar, 2020). His most productive publication years was between 1994-1998 with 68 publications and Biopolymers journals was most used journal publish his works. Kumar, M., Ruhela, A., & Kumar, S. (2018) analyzed research contribution of eminent scientist and Nobel laureate Jeffrey C Hall in area of geneticist (Manjunath, 2015). The 201 publications with 18, 896 citations that was recorded from Scopus database which was published in various journals. The most of publications came in forty-three papers with two authored paper with collaboration co-efficient of 0.89. Another similar study was conducted by Munnolli, S. S., Pujar, S. M., & Kademani, B. S. (2011) on Nobel Laureate Harald Zur Hausen from Germany from physiology domain. The results reported that he has used 74 different communication channels to publish his work and 82.43% were journals in this overall publication output. The average publications rate was 6.19% per year and his most prolific collaborator was L Gissman with 39 publications.

Biographical Sketch of Asokan Kandasami

Currently, sir Asokan Kandasami is a working has professor at dept. of Physics at University of petroleum and Energy studies, Dehradun and adjacently was scientist (1994-2021) at Inter University Accelerator Centre (IUAC) established by University Grant Commission (UGC). His major areas of interest are (i) Electronic structure of materials; semiconductors, oxides using Synchrotron Radiation based techniques like x-ray absorption spectroscopy and related spectroscopies (ii) Ion beam interaction in materials: energy materials, magnetic systems, polymers etc.

Asokan Kandasami got his B.Sc degree from the University of Madras, later pursued his M.Sc. Ed. in Physics at the Regional Institute of Education, Mysore. He got his Ph.D. from the University of Rajasthan, did this Post-doctoral fellow programme at Tamkang University in China, and finally got his brain pool fellowship from Inha University in South Korea. He is currently a life member of Ion Ben Society of India.

Objective of the Study

- To discover and differentiate the literature publications of Dr. Sundararajan Asokan

- To evaluate author appearance in each of his articles through year-wise appearance and explore the extended collaborative research performed with similar core subject authors.

- To identify the different communication channels used for publishing the publications.

- To evaluate the top-cited paper and top authored keywords.

Methodology

The study used Bib-Bibliometric to analyse the publications output Dr. Asokan Kandasami scientist and professor of University of petroleum and Energy studies, Dehradun in the Physics domain. Based on the previous literature many renowned methods have been incorporated in this study. The data had collected from the "Scopus Citation Indexing and Abstracting" database product of Science Direct using author key search. The study specifically analyzed the research articles of concerned author to know, frequency of authorship occurrence and collaboration with fellow subject authors, communication channels used to publish, highly cited paper and top preferred keywords and all the data was tabled using Microsoft excel and Biblioshiny.

Results and Discussion

Data analysis and interpretation

Contributions: Table-1 clearly specifies that the highest contribution of Asokan Kandasami came in the form of 555 (83.21%) research articles, followed by 101 (15.1%) conference papers, 6 (0.90%) erratum, 3 (0.45) on review papers and 2 (0.30%) on short Note (Table 1 and Figure 1).

Table 1: Publication Types Contributed by Prof. Asokan Kandasami

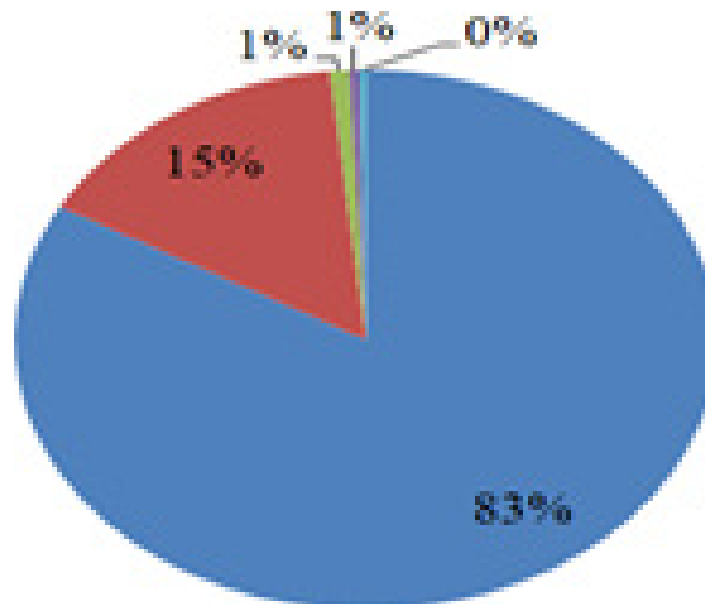| Sl. No	Document Type	No	%
1	Article	555	83.21
2	Conference Paper	101	15.14
3	Erratum	6	0.90
4	Review	3	0.45
5	Note	2	0.30
Total		**667**	**100.00**

Figure 1: Publication types contributed document types. Note: ■ *Article,* ■ *Conference paper,* ■ *Erratum,* ■ *Review,* ■ *Note*

Author productivity: Asokan Kandasami published total of 555 research articles in this prolonged career. Has single author he published only one paper in 1992 and his top productive of papers came in the year 2018 with 60 (10.81%) articles. Has first authorship appearance he came in 16 (2.88%) papers and his highest authorship appearance came in both in five and six authored papers in 98 (17.66%) publications. Compare to his individual contribution made his collaborative work was more dominant were his Degree of Collaboration (DC) was 1.00 (Subramanyam, 1983) (Table 2).

SA=Single Author

P=position

MAT=Main Author Total

CAT=Co-author Total

CT=Cumulative Total

CT= Co-Author Total

DC=Degree of Collaboration

Top collaborators: The status of Prof. Asokan Kandasami with his top collaborators in Table-3 shows that Kanjilal D was the top collaborative author with 84 articles. Further, Kumar P has 54 collaborative articles, Dong CI with 41 articles, Chae KH with 41 articles, Chae KH and Kumar A each with 40 articles respectively (Table 3).

Top source: Top communications channels are the key factor were author publishes their work with high impact journals. Prof. Asokan Kandasami used more than 150 Journals to publish his work. Table-5 highlights only the top ten Journals used to publish his work, where, "AIP Conference Proceedings" listed top has first priority of choice in publishing this work with 51 article publications. Followed by "Nuclear Instruments and Methods in Physics Research Section B Beam Interactions with Materials and Atoms" listed second in table with 42 articles (Table 4).

Table 2: Year-wise Publication Productivity of Prof. Asokan Kandasami

Year	SA	1th P	2nd P	3rd P	4th P	5th P	6th P	7th P	8th P	9th P	10th P	11th P	12th P	16th P	18th P	MAT	CAT	Total	CT	DC
1991	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1	1	0.06
1992	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1	2	3	0.06
1997	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	0	3	3	6	0
1998	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1	2	8	0.06
1999	-	1	-	-	1	3	-	1	-	-	1	-	-	-	-	1	6	7	15	0.06
2000	-	1	2	-	1	2	-	-	-	-	-	-	-	-	-	1	5	6	21	0.06
2001	-	3	2	-	-	2	-	1	-	-	-	-	-	-	-	3	5	8	29	0.19
2002	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1	2	31	0.06
2003	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	0	2	2	33	0
2004	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2	35	0.13
2005	-	1	-	1	-	1	-	-	1	-	-	-	-	-	-	1	3	4	39	0.06
2006	-	-	1	-	4	-	1	-	-	-	-	-	-	-	-	0	6	6	45	0
2007	-	-	2	-	-	-	5	2	1	-	-	-	-	-	-	0	10	10	55	0
2008	-	1	2	1	1	2	1	1	1	-	1	-	-	-	-	1	10	11	66	0.06

2009	-	1	1	2	2	1	2	1	-	-	1	-	-	-	-	1	10	11	77	0.06
2010	-	2	-	2	2	-	2	1	-	-	1	-	-	-	-	2	8	10	87	0.13
2011	-	-	3	3	1	4	1	1	2	1	-	1	-	-	-	0	17	17	104	0
2012	-	-	3	6	1	1	3	1	-	1	-	-	-	-	-	0	16	16	120	0
2013	-	-	5	6	2	8	-	4	3	2	1	-	-	-	-	0	31	31	151	0
2014	-	-	3	8	5	5	2	4	1	-	-	1	-	-	-	0	29	29	180	0
2015	-	-	5	8	8	6	11	5	4	1	2	-	-	-	-	0	50	50	230	0
2016	-	-	6	9	14	4	7	3	1	2	-	-	-	-	-	0	46	46	276	0
2017	-	-	7	10	9	9	4	10	3	1	1	-	-	-	-	0	54	54	330	0
2018	-	-	4	15	10	22	5	1	-	-	-	1	1	-	1	0	60	60	390	0
2019	-	-	3	6	5	8	3	6	5	2	4	1	2	1	-	0	46	46	436	0
2020	-	-	2	4	12	11	4	2	2	2	1	-	-	-	-	0	40	40	476	0
2021	-	-	3	4	4	5	5	10	1	4	5	-	-	-	-	0	41	41	517	0
2022	-	-	5	5	12	4	6	2	1	1	1	1	-	-	-	0	38	38	555	0
Total	1	15	60	90	98	98	64	56	27	17	19	5	3	1	1	16	539	555	-	1
%	0.18	2.70	10.81	16.22	17.66	17.66	11.53	10.09	4.86	3.06	3.42	0.90	0.54	0.18	0.18	2.88	97.12	100.00	-	-
CP	0.18	2.88	13.69	29.91	47.57	65.23	76.76	86.85	91.71	94.77	98.20	99.10	99.64	99.82	100.00	-	-	-	-	-

Table 3: Top Ten Collaborators of Prof. Asokan Kandasami

Sl. No	Authors	Articles
1	Kanjilal D	84
2	Kumar P	54
3	Dong Cl	41
4	Chae KH	40
5	Kumar A	40
6	Chen Cl	34
7	Gautam S	29
8	Pong Wf	29
9	Solanki PS	29
10	Singh JP	28

Table 4: Top ten Communications Channels

Sl. No	Source Title	No. of articles published
1	AIP Conference Proceedings	51
2	Nuclear Instruments And Methods In Physics Research Section B Beam Interactions With Materials And Atoms	42
3	Journal Of Alloys And Compounds	31
4	RSC Advances	25
5	Applied Physics A Materials Science And Processing	23
6	Journal Of Applied Physics	21
7	Journal Of Materials Science Materials In Electronics	20
8	Radiation Effects And Defects In Solids	20
9	Applied Physics Letters	19
10	Applied Surface Science	18

Top citations: Prof. Asokan Kandasami in his prolonged academic and research career total published 555 articles and cited by numerous, which helps to increase of H-index of the respective author. Table-4 shows top citations of Asokan Kandasami were "Magnetic and electrical properties of In doped cobalt ferrite nanoparticles" article was published in "Journal of applied physics" which cited 218 times. Followed by two articles titled "Highly sensitive and selective serotonin sensor based on gamma ray irradiated tungsten trioxide nanoparticles" and "Growth kinetics of nanograins in SnO2 fibers and size dependent sensing properties" cited more than hundred times in top impact journals (Table 5).

Table 5: Top Ten Citations of Prof. Asokan Kandasami

SL No	Title of the Article	No. of Times Cited
1	Nongjai, R., Khan, S., Asokan, K., Ahmed, H., & Khan, I. (2012). Magnetic and electrical properties of In doped cobalt ferrite nanoparticles. Journal of applied physics, 112(8), 084321.	218
2	Anithaa, A. C., Asokan, K., & Sekar, C. (2017). Highly sensitive and selective serotonin sensor based on gamma ray irradiated tungsten trioxide nanoparticles. Sensors and Actuators B: Chemical, 238, 667-675.	117
3	Park, J. Y., Asokan, K., Choi, S. W., & Kim, S. S. (2011). Growth kinetics of nanograins in SnO2 fibers and size dependent sensing properties. Sensors and Actuators B: Chemical, 152(2), 254-260.	115
4	Kumar, P., Malik, H. K., Ghosh, A., Thangavel, R., & Asokan, K. (2013). Bandgap tuning in highly c-axis oriented Zn1− xMgxO thin films. Applied Physics Letters, 102(22), 221903.	99
5	Ranjith, K. S., Saravanan, P., Chen, S. H., Dong, C. L., Chen, C. L., Chen, S. Y., & Rajendra Kumar, R. T. (2014). Enhanced room-temperature ferromagnetism on Co-doped CeO2 nanoparticles: mechanism and electronic and optical properties. The Journal of Physical Chemistry C, 118(46), 27039-27047.	88
6	Sultan, K., Ikram, M., & Asokan, K. (2014). Structural, optical and dielectric study of Mn doped PrFeO3 ceramics. Vacuum, 99, 251-258.	74
7	Thakur, P., Chae, K. H., Kim, J. Y., Subramanian, M., Jayavel, R., & Asokan, K. (2007). X-ray absorption and magnetic circular dichroism characterizations of Mn doped ZnO. Applied Physics Letters, 91(16), 162503.	74
8	Sharma, V., Kumar, P., & Kumar, A. (2017). Surbhi; Asokan, K.; Sachdev, K. High-performance radiation stable ZnO/Ag/ZnO multilayer transparent conductive electrode. Sol. Energy Mater. Sol. Cells, 169, 122-131.	73
9	Subramanian, M., Thakur, P., Gautam, S., Chae, K. H., Tanemura, M., Hihara, T.,.. & Jayavel, R. (2009). Investigations on the structural, optical and electronic properties of Nd doped ZnO thin films. Journal of Physics D: Applied Physics, 42(10), 105410.	72
10	Kumar, P., Kumar, P., Kumar, A., Meena, R. C., Tomar, R., Chand, F., & Asokan, K. (2016). Structural, morphological, electrical and dielectric properties of Mn doped CeO2. Journal of Alloys and Compounds, 672, 543-548.	66

Top Authored keywords: Top author keyword identifies the top trending research areas that are preferred by the authors. Thin films were used 163 times by Prof. Asokan Kandasami, followed by below one-fifty times was published in the areas of X-ray diffraction, Irradiation, Ion bombardment and Ions (Table 6).

Table 6: Top Keywords of Prof. Asokan Kandasami

Keywords	No. of times Occurred
Thin films	163
X ray diffraction	148
Irradiation	139
Ion bombardment	119
Ions	118
Heavy ions	91
Scanning electron microscopy	75
Energy gap	71
Atomic force microscopy	65
Ion beams	62

Conclusion

Scientometric portrait studies are a valuable tool for analyzing the research output and impact of individuals or groups in a particular field. By quantifying and analyzing various bibliometric indicators such as publication and citation counts, collaboration networks, and co-authorship patterns, Scientometric portraits can provide valuable insights into the research productivity and impact of individuals or groups, as well as their relationships with other researchers and institutions. These studies have the potential to inform decision-making in academia, such as hiring and promotion decisions, funding allocation, and strategic planning. They can also be useful for researchers themselves to identify potential collaborators and understand their own research impact. Scientometric portrait studies offer a quantitative and objective approach to assessing research productivity and impact, and can provide valuable insights into the dynamics of scientific communities.

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