

Collaborative Research Pattern of Andre Geim: a Scientometric Portrait

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Abstract

Scientometric analysis of the 184 publications by Andre Geim published during 1981 – 2010 has been done in the present paper. The result of the study shows that Andre Geim had published 2 single-authored and 182 multi-authored (publications) papers during 1981-2010. The multi-authored papers include: two-authored (11), three-authored (20), four-authored (24), five-authored (17), six-authored (22), seven-authored (36), eight-authored (23), nine-authored (10), ten-authored (4), eleven-authored (11), twelve-authored (2), and thirteen-authored (2). His highest productivity was in 1994 with the output of 19 publications (age 36), followed by 16 publications in 2008 (age 50). The 50 percentile productivity life was 15 at the age of 37 years. The total productivity life of the author spans 30 years from the age 23. Andre Geim has received 12189 citations for his 184 articles and his h-index 50.

Keywords: Scientometric Portrait; Scientometrics; Publication Productivity; Research Collaboration.

Introduction

Scientometric portrait studies deal with mathematical and statistical study of individual career of scientists and researchers, and correlating bibliographical analysis of publications, academic and scientific achievements. According to Sangam et al ^[1], scientometric portrait study has received much attention in the recent years by proving to be of great value to the concerned scientists by highlighting various aspects of their career, such as productivity according to biological age, collaborative pattern, authorship and other characteristics. Bio-bibliometrics is a term that was first coined by Sen and Gan ^[2] to mean the quantitative and analytical method for discovering and establishing functional relationships between bio-data and biblio-data elements. Kademani and Kalyane ^[3-4] were the first to use the phrase “Scientometric portrait” to carry out bio-bibliometric studies on scientists including Nobel laureates ^[5].

In the present paper, an attempt has been made to investigate the scientific work done by the Nobel Laureate of 2010, Andre Geim (Russia) and his role for the advancement of science and technology in the world.

Andre Geim was born to Konstantin Alekseyevich Geim and Nina Nikolayevna Bayer on October 1, 1958. Both his parents were Russian-German engineers. In 1965, the family moved to Nalchik, where he studied at an English-language high school. After graduation, he applied to the Moscow Engineering Physics Institute. He took the entrance exams twice but was not accepted. He then applied to the Moscow Institute of Physics and Technology (MIPT) where he was accepted. He received an MSc in 1982, and in 1987 obtained a PhD in Metal Physics from the Institute of Solid State Physics (ISSP) at the Russian Academy of Sciences (RAS) in Chernogolovka. He said that at the time he would not have chosen to study solid-state physics, preferring particle physics or astrophysics, but is now happy with his choice. He got the Nobel Prize in Physics (2010) for study of graphene ^[6].

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Aims and objectives

The main aim of the present paper is to give a scientometric portrait of Andre Geim.

The objectives of the paper are as follows:

1. To investigate the number of articles contributed by the author
2. To study the publication productivity and authorship pattern
3. To calculate the h-index and the number of citations received by Andre Geim.

Data and methodology

Scientific publications seem to provide the best available basis for measuring the research

output. The data source for the study was *ISI Web of Science, Science Citation Index*, published by Thomson Scientific. It is the world's leading abstracting & indexing service providing on all aspects of science. By using suitable strategy related to literature produced by Nobel Laureate Andre Geim (Russia), the bibliographic details for each record including author, title, citation, h-index and country of input were collected. Collected data was analyzed according to the objectives of the study.

Table 1: Publication productivity of Andre Geim in chronological order

APL	Year	Single & multi - authored papers													MT	TP	AA
		1	2	3	4	5	6	7	8	9	10	11	12	13			
1	1981	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1	23
2	1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
3	1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
4	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
5	1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
6	1986	-	-	2	-	-	-	-	-	-	-	-	-	-	2	2	28
7	1987	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	29
8	1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
9	1989	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	31
10	1990	-	-	2	-	-	-	-	-	-	-	-	-	-	2	2	32
11	1991	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	33
12	1992	-	1	3	3	1	1	1	-	-	-	-	-	-	10	10	34
13	1993	-	-	-	2	3	2	-	-	-	-	-	-	-	7	7	35
14	1994	-	-	2	3	-	1	4	5	1	1	2	-	-	19	19	36
15	1995	-	-	-	-	-	1	1	1	-	-	-	-	-	3	3	37
16	1996	-	-	-	2	1	1	5	-	2	-	2	-	-	13	13	38
17	1997	-	-	1	2	-	2	3	1	-	-	-	-	-	9	9	39
18	1998	-	-	-	-	1	1	1	3	-	-	-	-	-	6	6	40
19	1999	-	1	-	1	1	-	1	-	-	-	-	-	-	4	4	41
20	2000	-	1	-	-	-	3	1	1	1	-	1	-	-	8	8	42
21	2001	-	1	3	-	-	1	-	-	-	-	-	-	-	5	5	43
22	2002	-	-	-	1	1	2	-	-	-	-	-	-	-	4	4	44
23	2003	-	-	-	2	1	1	1	-	-	-	-	-	-	5	5	45
24	2004	-	-	-	1	1	1	-	2	-	-	-	-	-	5	5	46
25	2005	-	-	1	1	-	2	3	1	-	-	-	-	-	8	8	47
26	2006	-	-	2	-	1	-	1	-	2	-	1	-	-	7	7	48
27	2007	-	3	-	1	2	2	2	2	1	1	-	-	1	15	15	49
28	2008	-	3	2	-	1	2	3	2	-	-	2	1	-	16	16	50
29	2009	1	-	1	-	2	-	4	2	1	2	2	-	1	15	16	51
30	2010	-	-	1	2	1	1	4	3	2	-	1	1	-	16	16	52
Total		2	11	20	22	17	24	36	23	10	4	11	2	2	182	184	

APL- Age of productive life; MT- Total of multi-authored publications; TP- Total publications; AA-Biological age of the author

Andre Geim had 2 single-authored and 182 multi-authored publications during 1981-2010. The multi-authored publications include: two-authored (11), three-authored (20), four-authored (24), five-authored (17), six-authored (22), seven-authored (36), eight-authored (23), nine-authored (10), ten-authored (4), eleven-authored (11), twelve-authored (2), and thirteen-authored (2). The above table shows that the first paper of the author was published in 1981 when he was 23. Andre Geim had no publications during 1982, 1983, 1984, 1985 and 1988. His highest productivity was in 1994 with the output of 19 publications (age 36), followed by 16 publications in 2008 (age 50). The 50 percentile productivity life was 15 at the age of 37 years.

The total productivity life of the author spans 30 years from the age 23.

Andre Geim had 2 single-authored publications in the domain of Physics (Applied Physics) & Engineering and remaining multi-authored publications in various domains as Physics - Applied Physics & Optics (134), Material Science, Nano Science & Nanotechnology (21), and Engineering, & Multidisciplinary Sciences (29). Year-wise productivity of Andre Geim is shown in Table 1.

Table 3 indicates that Andre Geim has received 12189 citations for his 184 articles and his h-index 50.

Table 2: Publication productivity and authorship patterns of Andre Geim in various scientific domains

No. of authors	Domains				Total no. of papers	%	Total no. of authorship	%
	A	B	C	D				
1 - Author	1	-	1	-	2	1.08	2	0.17
2 - Authors	7	-	4	-	11	5.97	22	1.94
3 - Authors	20	-	-	-	20	10.86	60	5.29
4 - Authors	22	1	1	-	24	13.04	96	8.46
5 - Authors	9	2	6	-	17	9.23	85	7.49
6 - Authors	13	5	4	-	22	11.95	132	11.64
7 - Authors	29	3	4	-	36	19.56	252	22.22
8 - Authors	18	1	4	-	23	12.5	184	16.22
9 - Authors	6	3	1	-	10	5.43	90	7.93
10 - Authors	2	-	2	-	4	2.17	40	3.52
11 - Authors	5	4	2	-	11	5.97	121	10.67
12 - Authors	-	2	-	-	2	1.08	24	2.11
13 - Authors	2	-	-	-	2	1.08	26	2.29
Total	134	21	29	0	184	100	1134	100

A= Physics - Applied Physics & Optics; B= Material Science, Nano Science & Nanotechnology; C= Engineering, & Multidisciplinary Sciences; D= Miscellaneous

Table 3: Authorship pattern and collaborative measures

Nobel Laureate	Authorship pattern & collaborative measures						
	1	2	3	4 & >	Citations	h-Index	TP
Andre Geim	2	11	20	151	12189	50	184

1= Single author; 2= Two author; 3= Three author; 4=4& above author

Conclusion

Scientometric study plays an important role in the dissemination of particular scientists whose interest lies in the number of important papers he or she published. The above study on Andre Geim undoubtedly proves the usefulness of his work to the field of science and technology and gives inspiration to young scientists throughout the world.

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