

# SCIENTOMETRIC ANALYSIS OF INFLATION COSMOLOGY RESEARCH PUBLICATIONS

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**Abstract:** This paper discusses or analyses trends in Inflation Cosmology research during from 2011-2017, the data have been collected from web of science database. Aim of the study to source wise research output, year wise publications, country wise output and authorship pattern. The study finds that articles occupies first place among various forms of sources, during the study period in the year 2017 published highest research output, USA have published highest publication among the Inflation Cosmology research, majority research papers published themes of Inflation Cosmology on scientific field.

**Keywords:** Inflation, cosmology, fluctuation and evaluations.

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## 1. INTRODUCTION

Inflation theory was first developed in 1979 by theoretical physicist Alan Guth at Cornell University. It was developed further in the early 1980s. It explains the origin of the large-scale structure of the cosmos. Quantum fluctuations in the microscopic inflationary region, magnified to cosmic size, become the seeds for the growth of structure in the Universe (see galaxy formation and evolution and structure formation). Many physicists also believe that inflation explains why the universe appears to be the same in all directions (isotropic), why the cosmic microwave background radiation is distributed evenly, why the universe is flat, and why no magnetic monopoles have been observed.

The detailed particle physics mechanism responsible for inflation is unknown. The basic inflationary paradigm is accepted by most physicists, as a number of inflation model predictions have been confirmed by observation; however, a substantial minority of scientists dissent from this position. The hypothetical field thought to be responsible for inflation is called the inflation.

### Objectives

To major objectives are formulated the present study as mentioned below:

1. To examine the Inflation Cosmology output during the study period.
2. To study the country wise research output of Inflation Cosmology research.
3. To identify the authorship pattern.
4. To study the language wise and institution wise Inflation Cosmology research publications studies.
5. To identify the country wise research output in Inflation Cosmology research.

## 2. METHODOLOGY

This study aims to analyze the trend in the development of Inflation Cosmology research in scientometrics. It is also focused to trace the past trends in the area of Inflation Cosmology research publications in scientometrics based on the sample data. The study evaluates the contribute on countries to the growth pattern and development of research productivity in this discipline during the last few decades.

### Data collection

The publication of research output on Inflation Cosmology research in scientometrics is obtained from various sources, such as Journals articles, Conference papers. Review, short survey, note, editorial press release, and letter. The research data required for the present study are downloaded from the web of science database. All the publications retrieved from the web of science database on Inflation Cosmology and scientometric cover the period from 2011-2017. Further, the researcher has downloaded the data in the form of notepad files; then the bibliographical details are converted to the form of MS-EXCEL format using the PHP (Hypertext Preprocessor) scripting language text unique data are rearranged in MS-EXCEL format to eliminate duplication from the download data. Overall data retrieved by the researcher are 1529 records for analyzing the present study.

### Limitations

The findings of this study apply only to Inflation Cosmology studies in to the fields related to the physical cosmology, cosmic inflation, cosmological inflation, or just inflation. This study covers Inflation Cosmology with respect to the scientific field, brought under the purview of the study and no other themes. This study makes a special attention only on the performance of research output in Inflation Cosmology research. This study covers the years from 2011 to 2017 only.

### Analysis and Interpretation

**Table 1: year wise publication in Inflation Cosmology research**

S. No	Publication Year	Recs	Percent
1	2011	167	10.9
2	2012	185	12.1
3	2013	183	12.0
4	2014	252	16.5
5	2015	240	15.7
6	2016	246	16.1
7	2017	256	16.7
	Total	1529	100.00

**Note:** TLCS: Total Local Citation Score, TGLS: Total Global Citation Score

The year wise productivity of publications in Inflation Cosmology research during from year 2011 to 2017 is presented in table-1. It shows that the publication of output is gradually increased and decreased trend. In the 2017 occupied first position that the output is increased (10.9%) compared to 2011 and 2012. It is clearly stated that in future the research productivity in Inflation Cosmology research is increasing trend.

**Table 2: sources wise output in Inflation Cosmology research**

S. No	Document Type	Recs.	Percentage
1	Article	1479	96.7
2	Review	37	2.4
3	Article; Proceedings Paper	5	0.3
4	Editorial Material	4	0.3
5	Review; Book Chapter	3	0.2
6	Letter	1	0.1
	<b>Total</b>	1529	100.00

The source wise output in global level of Inflation Cosmology research is given in table-2. It shows that the Article is occupies first position (96.7%), Review (2.4%); Article; Proceedings Paper (0.3%) followed by Editorial Material, Review; Book Chapter, Letter.

**Table 3: Authorship pattern in Inflation Cosmology research output**

S. No	year	Single	Double	Three	Four	Five	Above Five	Total
1	2011	29	61	42	18	8	9	167
2	2012	35	59	57	19	11	4	185
3	2013	31	63	53	20	8	8	183
4	2014	47	74	75	36	12	8	252
5	2015	52	80	72	26	6	4	240
6	2016	48	74	66	33	10	15	246
7	2017	40	92	67	33	15	6	256
	Total	282	503	432	188	70	54	1529

The author productivity of research output is given in table-3. The authorship pattern is classified as single, double, triple, four, five and above authors. It could be noted that single author contribution is dominated (1529 articles) followed by double, triple authors.

**Table 4: top 10 Authors in Inflation Cosmology research**

S. No	Author	Recs.	Percentage	TLCS	TLCS/t	TLCSx	TGCS	TGCS/t	TLCR
1	Odintsov SD	30	2.0	54	19.33	28	1115	564.45	63
2	Cai YF	24	1.6	54	10.71	37	964	202.19	24
3	Oikonomou VK	21	1.4	24	9.33	11	593	402.83	52
4	Linde A	19	1.2	20	6.67	12	839	231.75	4
5	Brandenberger R	16	1.0	24	4.71	16	368	119.14	11
6	Kallosh R	15	1.0	20	6.67	12	736	207.32	2
7	Saridakis EN	15	1.0	6	2.00	2	568	155.30	7
8	Cicoli M	14	0.9	0	0.00	0	384	83.34	2
9	Myrzakulov R	14	0.9	4	1.33	3	292	78.55	10
10	Pallis C	14	0.9	20	4.50	7	227	54.05	16

Table 4 shows that top 10 authors of global level of Inflation Cosmology research. It could be noted that the Odintsov SD occupied in first position (2.0%) compared to Cai YF second position (1.6%) followed by Oikonomou VK, Linde A and Pallis C occupied in last position(0.9%).

**Table 5: top 10 Journals in Inflation Cosmology research output**

S. No	Journal	Recs.	Percentage	TLCS	TLCS/t	TGCS	TGCS/t	TLCR
1	JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS	382	25.0	0	0.00	6721	1775.50	157
2	PHYSICAL REVIEW D	292	19.1	0	0.00	5092	1332.53	121
3	JOURNAL OF HIGH ENERGY PHYSICS	145	9.5	0	0.00	2635	787.78	53
4	PHYSICS LETTERS B	72	4.7	279	66.54	1349	320.88	33
5	INTERNATIONAL JOURNAL OF MODERN PHYSICS D	67	4.4	12	1.71	616	211.85	31
6	CLASSICAL AND QUANTUM GRAVITY	51	3.3	0	0.00	1489	302.43	25
7	EUROPEAN PHYSICAL JOURNAL C	50	3.3	0	0.00	666	254.34	27
8	MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY	43	2.8	55	12.45	748	171.79	26
9	ASTROPHYSICS AND SPACE SCIENCE	30	2.0	11	2.29	145	53.43	19
10	INTERNATIONAL JOURNAL OF THEORETICAL PHYSICS	28	1.8	10	2.79	183	48.89	3

The journal wise output in global level of Inflation Cosmology research is given in table-5. It could be noted that the Journal of Cosmology And Astroparticle Physics Occupies in first position (25.0%) Compared To Physical Review D (19.1%); Journal Of High Energy Physics (9.5%) followed by Physics Letters B, Followed by International Journal of Theoretical Physics.

**Table 6: Languages wise in Inflation Cosmology research output.**

S. No	Language	Recs.	Percentage	TLCS	TGCS
1	English	1526	99.8	654	40945
2	Arabic	1	0.1	0	0
3	Russian	1	0.1	0	0
4	Spanish	1	0.1	0	0
	<b>Total</b>	1529	100.00	-	-

The language wise output in global level of Inflation Cosmology research is given in table-6. It could be noted that the English is occupies in first position (99.8%) compared to Arabic (0.1%); Russian(0.1%) followed by Spanish.

**Table 7: Top ten Country wise in Inflation Cosmology research output**

S. No	Country	Recs.	Percentage	TLCS	TGCS
1	USA	433	28.3	175	26553
2	UK	200	13.1	31	20115
3	Spain	141	9.2	84	12909
4	Canada	140	9.2	89	19293
5	Japan	139	9.1	93	3796
6	Italy	133	8.7	37	12075
7	Germany	123	8.0	98	13449
8	India	123	8.0	28	10158
9	Peoples R China	118	7.7	111	1696
10	Russia	118	7.7	112	11665

The country wise output in global level of Inflation Cosmology research is given in table-7. It could be noted that the USA is occupies in first position (28.3%) compared to UK (13.1%); Spain(9.2%) followed by Canada and etc.

**Table 8: Top ten Institutions wise in Inflation Cosmology research output.**

S. No	Institutions	Recs.	Percentage	TLCS	TGCS
1	Ist Nazl Fis Nucl	74	4.8	26	10800
2	Univ Tokyo	66	4.3	30	2349
3	Stanford Univ	58	3.8	11	11412
4	CERN	57	3.7	21	10768
5	McGill Univ	51	3.3	60	10479
6	Chinese Acad Sci	50	3.3	76	815
7	Perimeter Inst Theoret Phys	50	3.3	19	2016
8	Univ Cambridge	38	2.5	7	10059
9	Tomsk State Pedag Univ	37	2.4	57	1103
10	Princeton Univ	36	2.4	19	17336

The institution wise output in global level of Inflation Cosmology research is given in table-8. It could be noted that the is Ist Nazl Fis Nucl University is occupying in first position (4.8%) compared to University Univ Tokyo (4.3%); Stanford Univ (3.8%) followed by CERN and etc.

**Table 9: word wise in Inflation Cosmology research output**

S. NO	Word	Recs	Percent	TLCS	TGCS
1	INFLATION	406	26.6	195	8062
2	COSMOLOGY	258	16.9	106	5422
3	INFLATIONARY	198	12.9	72	2786
4	UNIVERSE	146	9.5	101	1667
5	COSMOLOGICAL	133	8.7	52	15927
6	GRAVITY	133	8.7	70	2565
7	NON	125	8.2	62	1945
8	FIELD	117	7.7	32	1927
9	QUANTUM	114	7.5	37	2033
10	PRIMORDIAL	111	7.3	50	1937

The word wise output in global level of Inflation Cosmology research is given in table-9. It could be noted that the is occupies in first position Inflation (26.6%) compared to Cosmology(16.9%), Inflationary (12.9%) followed by Universe and etc.

### 3. CONCLUSION

It is due to the pivotal place of journal as a medium of scientific communication than any other form of publication; majority of the research output published in article in general. It could be deduced from the discussion that, during the study period the research paper publication trend is increasing and decreasing. Highest percent of publication published in 2017. Very lowest percent of research paper published in the year 2011. Conclude from the study, multi authored contributions is high compare to single authorship pattern. More papers published theme of cosmology, cosmic inflation, cosmological inflation or just inflation its evident of global level developed scientific field.

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