CHAPTER - V

Findings and Conclusions

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The findings of the present study lead to the following concluding remarks:

Out of various sources of research output in astronomy science, the articles that appeared in the journals occupy the first position followed by conference proceedings, books and reports. In general, journal article form of publications have attracted a large number of scientists and journal article form of output is being widely circulated. Hence the researchers prefer this mode of publication as an effective means of propagation of scientific knowledge which is the reason behind its wide popularity.

The analysis of relative growth rate and doubling time ' model reveals the following facts:

At the overall level, the relative growth rate has shown a declining trend which means that the rate of increase is low in terms of proportionate increase during all the years of the study period. This has been highlighted by doubling time model. The same findings

are applicable to individual source wise publications of research output in astronomy science.

The findings of language-wise distribution of astronomy science research output convey the following facts

Most of the research output has been published in the English language. Regarding others Japanese language publications are noteworthy. The yearwise variation is higher in non-English language via published research outputs than English.

The findings of pages of publishing astronomy science research output convey the following facts:

More than 900 percent increase in the number of pages of publication is found during the study period. The analysis of relative growth rate indicates that the number of pages of publication has shown a declining trend. It means that there is no proportionate increase in the number of pages of publications as it is evident from the increasing trend in the doubling time of publications.

The findings of international level growth of astronomy science research output examines the following facts:

More than 1000 percent increase in the number of publications has been observed at the international level during the study period. However, the level of multiplication in a number of publications is not proportionate year after year. It is explained with the help of relative growth rate along with the support of doubling time for publication model.

The findings of authorship pattern, collaboration and author productivity convey the following facts:

The single author contributed papers ranks first in order. It is inferred that the trends in the number of publications have reduced significantly when the number of authors increases. In other words, when the number of authors increases, their contribution decreases and vice versa.

The findings of single vs multi authored papers reveal the following facts:

In recent years, research in astronomy science is mainly based on a group of scientists. It results in the increased number of multi–authored papers, and collaboration analysis model also confirms this fact.

The findings of author productivity in astronomy science as per the application of Lotka's law convey the following facts

The analyzed data invalidate the Lotka's findings that the proportion of all contributions that make a single contribution, is less than 60 percent, as it is confirmed by Lotka's Chi-square model.

The findings of areawise research output in astronomy science reveal the following facts

Out of different areas of research output, experimental aspect occupies the first position, practical aspect the second, theoretical and mathematical aspect the third, application aspects the fourth, general aspect the fifth, and new development and other areas the last. USA tops the list in all areas of publishing research output in astronomy science and UK *comes* next in order.

The performance of other countries in different areas of publishing astronomy research output is quite discouraging.

The findings of impact factor for source publishing astronomy science research output received the following facts:

Majority of the sources has less than two impact factors. A few sources have impact factor of more than three. In general, the sources published from the US and the UK record more impact factor than those of other countries. Though some sources have published more
papers, their impact is low.

The publication of more number of papers is not a criterion to judge the quality of research. The quality of research depends on its wider utility and it has been mainly published in reputed journals. The publication of papers in such journals is not an easy process and it involves a thorough examination of papers by a group expert committees.

The findings of individual performance in astronomy science reveal that scientists of the USA predominate in publishing more number of papers during the period of
analysis.

That the formulated first hypothesis of journal sources of publication of astronomy science research output occupies the predominant place in comparison with other sources of publication is identified and validated as it is evident that more than 60 percent of the
output are published in journals.

That the formulated second hypothesis of relative growth rate of astronomy science literature shows a declining trend and significantly the doubling time for publications, explains, and its increasing trend, is proved. It has been confirmed in an overall analysis, individual source wise analysis, pages of publication analysis, international level analysis and language wise publication analysis.

That the formulated third hypothesis that there has been an increasing trend in collaborative research in recent years, is identified as validated as per the results obtained through Subramaniayam's formula. That the formulated fourth hypothesis of non-applicability of Lotka's law to the author productivity in astronomy science research, is proved on the basis of results obtained through Lotka's Chi-square model.

That the formulated fifth hypothesis of considerable inter- institutional variation in astronomy science research outputs is identified as validated. It is clear that research institutions top the list and others lag behind them.

That the formulated sixth hypothesis of significant level of variation in research outputs' performance of various branches of astronomy science research outputs, is proved. It is noted that the experimental and practical aspects are the major areas of research, and general aspect and new development-cum- other areas receive less attention on the part of the researchers.

Thus, that the last formulated hypothesis of considerable variation in impact factor among the sources, which publish astronomy science research output is substantially proved.