Growing Importance of Conference Proceedings in Astronomy and Astrophysics and Its Impact on Collection Development

A. Vagiswari & Christina Louis

Indian Institute of Astrophysics, Bangalore, India

Abstract

This paper analyses the change in the referencing pattern among the astronomers. There has been an increase in the number of conference proceedings (CP) during the last 10 years. In astronomy alone there were around 131 international conference proceedings in 1980 and it rose to 267 in 1990. The number of references to conference proceedings have also increased. In Astrophysical Journal, the reference to conference proceedings papers has increased from 1.48 in 1980 to 3.80 in 1990, an increase of about 150%. In view of this importance, the paper discusses the problems encountered by librarians in acquiring proceedings volumes in limited-budget countries like India.

1 Introduction

In this study we were essentially motivated to understand the increasing importance of conference proceedings in scientific communications. We noticed that in recent years there has been a tremendous increase in the number of conferences held, this is true of any field in science and is also true of astronomy and astrophysics. Conferences seem to respond well to the current research and development interests of the people who attend them. They provide fast publication of new information and submit this information to immediate informed criticism, which are brought out as proceedings (De Reuck & Knight 1967). These conference proceedings have become invaluable for scientists in their work. The proceedings of a conference contains the papers presented at a conference which convey "hot" results. The papers also generally contain the discussion held at the end of a presentation. These discussions are as important as, if not more than the presentation itself. They normally supplement the ideas present in the research papers. Thanks to desk top publishing (DTP) technology, which has accelerated the publication of the proceedings, many times the proceedings are available in the same year as the conference itself. So the time interval between the meeting and publication of the volume is getting minimised, which helps the scientists to access the volume immediately. If the author has been correctly briefed, a research monograph that normally required 44 weeks can be produced in 10 weeks (Mitton 1991). Due to this increase in publication of conference proceedings, the librarians are witnessing a change in their acquisition policy. The libraries with limited budgets are faced with a problem of reallocating their funds, and changing the ratio of conference proceedings to other documents like books, journals, and reports.

2 Objectives

In this study an attempt is made to show the increase in publication of the conference proceedings during 1980 – 1990, and their use by the scientists. This 'use' aspect is analysed by estimating references to conference proceedings during the decade and calculating the changing ratio of references to proceedings to other documents. Secondly, the immediacy of the usage of the results presented in conference proceedings is estimated to show that scientists depend on very recent papers for their research work. Finally, we have tried to analyse the implications of the increase in conference proceedings on Collection Development Policy in a research library.

3 Methodology and Data Collection

We made an inventory of the conference proceedings published in astronomy during the three years – namely, 1980, 1985, and 1990 – from the Astronomy and Astrophysics Abstracts which index the entire Astronomy & Astrophysics literature twice a year. Data on references were collected from 38 volumes of the Astrophysical journal, published during these three years namely 1980, 1985, and 1990. We chose Astrophysical Journal (ApJ) since it is one of the most prestigious core journals in this field (Garfield 1990) and is also international in character (Abt 1990). All the volumes of ApJ for these three years were scanned and the references counted for all the articles. From these, the references to conference proceedings were estimated. Simple statistical methods were used to show the increase in the ratio of total references to conference proceedings references (Little & Harris 1990)

4 Analysis

Table 1 gives the data on the number of volumes scanned in the years 1980, 1985, 1990, the corresponding number of articles, the total no. of references and reference to conference proceedings.

Table 1
Data collected from ApJ for the years 1980, 1985 and 1990

Yr	# of pap.	# of Ref.	Ref to CP	Ref to CP per paper	Ref per Pap.	Ref to CP per paper
1980	941	27,593	1367	4.95	29.33	1.48
1985	1005	33,863	2578	7.61	33.69	2.56
1990	1296	47,739	4932	10.33	36.83	3.80

From this Table, a clear trend is observed which shows a significant increase in the volumes published, the number of articles written and also the number of references. Table 1 shows an increase in the number of papers, and in the citations to published papers. The number of references increased by 25% during 1980 – 90 during which period the number of references to conference proceedings increased by about 150%, quantitatively underlining the increase in the importance of conference proceedings.

The bar chart given in Figure 1 shows the total references and the citations to conference proceedings.

The total number of volumes published increased from 8 volumes in 1980 to 12 volumes in 1985 to 18 in 1990. They contained 941, 1005 and 1296 articles respectively. There were 27,593 references in the year 1980 and this increased to 33,863 in 1985 and to 47,739 in the year 1990. Correspondingly the references to conference proceedings increased from 1367 in 1980 to 2578 in 1985 to 4932 in 1990. The percentage of references to conference proceedings was 4.95 in 1980 which increased to 7.61 in 1985 to 10.33 in 1990.

To find the ratio between the total number of references and the references to conference proceedings the following calculation was done.

The average no. of references per paper in the year 1980 = 29.33.

The average no. of conference proceedings references per paper in the year 1980 = 1.48.

The average no. of references per paper in the year 1985 = 33.69.

The average no. of conference proceedings references per paper in the year

1985 = 2.56.

The average no. of references per paper in the year 1990 = 36.83.

The average no. of conference proceedings references per paper in the year 1990 = 3.80.

To find the ratio, for the year 1985, the total no. of references

$$\frac{33.69 - 29.33}{33.69 + 29.33} = 0.138 \tag{1}$$

for the year 1985, the no. of conference proceedings references,

$$\frac{2.56 - 1.48}{2.56 + 1.48} = 0.534 \tag{2}$$

for the year 1990, the total no. of references,

$$\frac{36.83 - 33.69}{36.83 + 33.69} = 0.089 \tag{3}$$

for the year 1990, the no. of conf.proc.references,

$$\frac{3.80 - 2.56}{3.80 + 2.56} = 0.389 \tag{4}$$

Fig. 1. Bar diagram showing the total references and the references to conference proceedings.

The average number of references rose by 15% (29.3 to 33.69) from 1980 to 1985, however the number of references to conference proceedings increased by 76.5% (1.45 in 1980 to 2.56 in 1985). In 1985 the average number of references was 33.69 and it increased to 36.83 in 1990 an increase of 9.3%. For the same period the average number of references to conference proceedings increased by 48.43% (2.56 to 3.80) which was again about 5 times greater.

Data on the number of conference proceedings brought out during the corresponding years was collected from Astronomy & Astrophysics Abstracts (Bohme et al., 1981, 1986, 1991).

Table 2
The number of proceedings brought out in 1980, 1985 and 1990 from A & A Abstracts.

year	1980	1985	1990
# of CP	131	228	267

The number of proceedings almost doubled during 1980 – 1985, and it showed 20% increase between 1985 – 1990.

The immediacy of the usage of conference proceedings is presented in Fig. 2. The data were collected for the year 1990 only. The graph shows references to the conference proceedings according to their year of publication. In 1990 there were 4932 references to conference proceedings including 146 (or 2%) to conference proceedings published in 1990 itself. This is highly significant considering that these articles were cited in the same year as the papers were published. There were 658 references to conference proceedings published in 1989, 759 published in 1988, 766 published in 1987 (which accounted for nearly 43% of the total conference proceedings references). However the number of references to conference proceedings published earlier than 1987 declined with every preceding year thus showing the citations to conference proceeding papers declined faster than the journal references (Abt, 1981).

5 Discussion

The results of the study reveal that there is a significant increase in the reference to conference proceedings between the year 1980 and 1990. Not only the average references to an article increased but also references to conferences increased and the ratio of total references to conferences changed significantly. A study of references of 1990 volumes of ApJ showed that the number of references to recently published volumes was very high between 1987 – 1990. The rate at which the conference proceedings are being brought out and the increase in the use of these proceedings is bound to bring about change in the acquisition and collection policy of the research library.

Fig. 2. References to conference proceedings according to the year of publication.

A research library has to be fully equipped to meet the requirements of scientists and research workers. The collection of a library is very important in disseminating information (Gopinath & Ravichandra Rao, 1982). There are means and ways to build up the collection of a library which comprises of books, journals, conference proceedings, reports, reprints, preprints etc. Books and journals have gained importance all these years, and now the trend is towards collecting the conference proceedings. From the above discussion we realise that any library which needs to have a dynamic collection, will have to obtain more conference proceedings.

Since conference proceedings have become important documents for researchers, procuring them for the library as soon as they are published has become vital.

Librarians (in India and presumably in other low-budget countries) are facing problems in getting them for their libraries for the following reasons.

1. Announcements of these proceedings are difficult to trace, since many times they are published by lesser-known publishers, and one does not get to see them. Sometimes IAU Information Bulletin does give information on astronomy and astrophysics related conference proceedings (in addition to IAU symposia and colloquia) and is a good source, but it does not list all the proceedings. One has to mainly depend on Astronomy and Astrophysics Abstracts from which we can get information about proceedings published, but this is also not a current source.

2. In India, local booksellers do not handle publishers like Nova, Princeton

University Press, L.Davis Press, Astronomical Society of Pacific, SPIE and others. Hence these publications have to be got directly from the publishers, which means requesting an invoice, getting a check made through the bank and finally receiving the volume through seamail. Many times we have missed getting the proceedings because of limited copies being printed and by the time the order is processed the volume is out of print.

3. The next problem is concerned with the contents of the conference proceedings. Many conferences now deal with multidisciplinary subjects as we find a conference on particle physics with one or two chapters on astrophysics, a conference on meteorites with a chapter on interstellar dust. It becomes difficult for the librarians to decide which of these proceedings should be acquired for the library with limited funds.

4. In some cases the proceedings are brought out as a special issue of the regular journal, and also as a separate volume and the announcements are not very clear and have led to duplicate purchases of the volume. However, in recent times thanks to Astrolib messages we have been able to avoid this to a certain extent.

In view of the above problems, we would welcome suggestions how to overcome some of these difficulties.

References

[1] Abt, H.A. 1981, Publ. Astr. Soc. Pacific, 93, 207

[2] Abt, H.A. 1990, Publ. Astr. Soc. Pacific, 102, 368

[3] Bohme, S. et al. eds.,1981, Astronomy & Astrophysics Abstracts, vols. 27,28, Berlin, Springer-Verlag

[4] Bohme, S. et al. eds., 1986, Astronomy & Astrophysics Abstracts, vols. 39,40, Berlin, Springer-Verlag

[5] Bohme, S. et al. eds., 1991, Astronomy & Astrophysics Abstracts, vols. 51,52, Berlin, Springer-Verlag

[6] De Reuck, A. and Knight, J. eds., 1967, Communication in Science: Documentation and Automation, London, J & A Churchill Ltd.

[7] Garfield, E. 1990, Science Citation Index, Journal Citation Reports, 1990, A bibliometric analysis of science journals in the ISI Data.

[8] Gopinath, M.A. and Ravichandra Rao, I.K. 1982, Collection Development and usage. An analytical approach, DRTC Annual Seminar, 19, Paper AA.

[9] Little, A.E., Harris, R.M. and Nicholls, P.T., 1990, *In* Informatics eds. L. Egghe and R. Rousseau, p. 211

[10] Mitton, S. 1992, *In* Desk-Top Publishing in Astronomy and Space Sciences ed. A. Heck, Singapore, World Scientific, p. 67.