

THE FUTURE OF PUBLICATIONS IN ASTROPHYSICS: THE VISION OF EDP SCIENCES

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Abstract. Scientific journals live under the pressure of evolution since the Web has revolutionized communication in every domain. What is their future? How to adopt the right position with the “Open Archives”? How to pilot journals in an “Open Access” model world? These are some important questions and my answers will be derived from the vision that we share at EDP Sciences. After a brief reminder of some of the distinctive characteristics of the company and of the journal *Astronomy & Astrophysics*, I will describe some of the measures that we have taken to adapt the way to publish the journal in this new world and especially the hybrid publishing model. Then, I will conclude by giving the framework of the job of scientific publisher and the pragmatic approach that we have at EDP Sciences.

Introduction

The Vision of the future of publishing in the field of Astrophysics that I will describe in this article is upheld by the founding spirit of the journal and our publishing house as well as the economic and editorial policies that they imply.

Three Scholarly Societies own EDP Sciences: The French Physics Society, The French Chemistry Society and the Society for Industrial and Applied Mathematics. We see our profession as a mission, one given by the founders in 1920, which is to actively participate in the transmission of

scientific knowledge. EDP Sciences is directed by scientists for the benefit of the scientific communities.

Our activities focus on the three following areas:

- Service to authors, who we consider as the pivotal point, and from whom all the added value arises, including the commercial activities vital to ensure the promotion of their works.
- From this starting point, we develop our activities based on the notion of service to the scientific communities. This is done in the spirit of partnership, which indeed has become our slogan, “EDP Sciences, partner to the Scientific Communities”.
- Although this is not a purely “for-profit” commercial activity, and we come in the category of a so called “not-for-profit” organization, we make it equally clear that we must ensure the continuity of our project and therefore make it known that we are certainly “not-for-losses”.

The company has a staff of 60 and a turnover of 8M Euros. We diffuse our editorial material in more than 100 countries with a very strong presence in USA and Europe. We have been gaining strength significantly on the Asian and Chinese markets with subscriptions tripling over two years.

In 2007, EDP Sciences has published or co-published, 37 scientific journals representing around 55,000 pages and 5,000 articles published per year. We have also been developing our IT editorial services, such as Web sites and management software programs (Manuscript Management System) for peer reviewing. We own some journals; others are co-edited, which is the case for Astronomy and Astrophysics which was created in 1969 with the merger of six national journals:

- *Annales d’Astrophysique* (France 1938),
- *Arkiv för Astronomi* (Sweden, 1948),
- *Bulletin of the Astronomical Institutes of the Netherlands* (1921),
- *Bulletin Astronomique* (France, 1884),
- *Journal des Observateurs* (France, 1915),
- *Zeitschrift für Astrophysik* (Germany, 1930),

extended in 1992 by the incorporation of the

- *Bulletin of the Astronomical Institutes of Czechoslovakia* (1947).

The journal was first published by Springer from 1969-2000. Following the creation of the Supplement Series in 1980, EDP Sciences published the new Series and took over the publication of the entire journal in 2001, merging both series.

The organizational structure of the journal is unique in the publishing field.

- It is owned jointly by the partners and managed by a “Board of Directors”.

- It is managed scientifically by two Editors-in-Chief: Claude Bertout for the regular articles, based at the Observatoire de Paris , assisted by a technical team of four people and Malcom Warmley, for the letters, working in Pisa, Italy.
- There is a team of 10 co-Editors assisting the Editors-in-Chief.
- The copyright is held by ESO.
- The journal benefits from official, long term support in 22 countries (Table 1).

TABLE 1. Countries supporting A&A.

Argentina (2005)	Greece (1974)
Austria (1981)	Hungary (1994)
Belgium (1969)	Italy (1972)
Brazil (2006)	The Netherlands (1969)
Chile (2006)	Poland (1993)
Czech Republic (1992)	Portugal (2006)
Denmark (1969)	Slovak Republic (1992)
Estonia (1998)	Spain (1988)
Finland (1969)	Sweden (1969)
France (1969)	Switzerland (1970)
Germany (1969)	ESO (1969)

Astronomy and Astrophysics is a broad journal with a very active letters section. In 2006, the journal published more than 19,000 pages and 48 issues. It is linked to all the communication tools in the editorial and astrophysical communities: *ADS* (Astrophysical Data Services, Cambridge, MA), *CDS* (Centre for Stellar Data, Strasbourg, France) and, in addition to a BibCode, we attribute a *DOI* (Digital Object Identifier) for all the articles to include them in *CrossRef*. These links allow a direct navigation article to article or stellar objects linked to references. The articles are archived at ADS and can be accessed three years after embargo. The CDS hosts a mirror site of the journal.

Since the Scientific community considers the Electronic version of the journal as the main version, we have started to transfer certain sections of the journal to an exclusively electronic version. The sections that have migrated to date are “Instrumentation” and “Catalogues and Data”.

The aim of this article being to explain our view on the future of Scientific Publishing and Astrophysics. But before going in this way, I will digress and explain the organization we have set up in the editorial and economic model for the journal, before citing some results from a survey

conducted with scientists in 2007, on the evaluation of the work carried out on the journal. Finally, I will express my feeling and recommendations on the way to approach OPEN ACCESS.

Since 2006, one of the most popular services has been the free-of-charge, latest on line issue of the journal. The contents are put on line entirely free-of-charge but sequentially, issue by issue. Only the last issue remains free-to-access. The service is called “Latest Articles Free”. Around 3000 users are registered for this service. There is a following three-year period of embargo, after which all the articles are once again made available on free access. Finally, the articles considered by the Editors to be of particular interest to Science, the media or presenting important new information, are made available in the press announcements (Press Releases) and left on free access to be widely diffused and of course cited. This has led to articles being cited in *Nature* and in numerous media for the general public. This is a unique service to authors which enhances their work, giving them maximum visibility.

The great innovation is of course the free access to the Letters section on 1 July 2007, to develop its reputation.

The question now remains: should we develop towards a more organized system of Open Access or should we simply choose a so called hybrid model with the option of Open Access per article chosen by the authors, for a payment? How should we decide the price? Or again, should we look for a complete Open Access model with a totally different economic model? However, in this case the risks are extremely high.

Besides these considerations, there are other, more technical projects in progress, notably a new system of numbering the articles. We suggest following the example of the American Physical Society and its publications *Physical Review* and *Physical Review Letters* (PRL) that have traded the traditional numbering (volume/issue/page/), for a system which is more suitable for on-line publishing, data base management and prompt and regular publication (article by article). We think it would be appropriate to come to an agreement between the main journals in the sector and services such as ADS or CDS so that the numbering solution decided on is the same. This will reduce cost and standardise the technical side.

A survey of authors in A&A was conducted in the winter of 2007, with the aim of defining what the community thought of the journal’s current editorial system and the recent changes made to the journal. 1534 completed questionnaires were analysed. I will not go into too much detail about the survey but give some of the results.

1. Performance of the A&A editors

How would you describe the quality of interaction with the Editors handling your papers?

41% optimal
51% satisfactory
4% inadequate
4% no opinion

How would you qualify the attitude of Editors toward you during the peer-review process?

12% very constructive
46% constructive
30% neutral
4% somewhat patronizing
1% antagonistic
7% no opinion

Please rate the general usefulness of the peer-review process in improving the articles that you submitted to A&A

27% very useful
52% useful
18% somewhat useful
1% not useful
2% no opinion

In general, how satisfied are you with the performance of A&A Editors?

9% very satisfied
50% satisfied
33% satisfied
6% somewhat satisfied
2% not satisfied

The current peer-reviewing system seems satisfactory to authors.

2. On line edition of the journal

How do you most frequently choose the A&A articles that you read?

- 77%: following searches for articles of interest to me on ADS, astro-ph, or similar internet tool
- 11% Serendipitously while reading the printed or online edition of A&A
- 10% By looking up references in articles that I am interested in
- 2% other

From which publication provider do you most frequently download the papers you read?

- 72%: ADS
- 19%: Astro-ph or similar preprint server
- 8%: Journal web sites
- 1%: other

ADS has really become the universal search tool: the journals, with different editorial policies, are now only a source for referred articles.

3. On line only sections of the journal (13 & 14)

82.5% of our sponsoring authors agree with the publication of online sections.

71% of instrumentalists agree with the online publication of Sect. 13.

What other A&A Section(s), if any, should we also only publish online?

- 47% none
- 31% all
- 13% Atomic & molecular
- 8% letters

This very balanced result shows that it is not yet the time to stop the paper version and become an exclusively on -line version.

The survey allowed us to evaluate the activity of the scientific team, the way that authors access information and the feeling of authors and readers concerning the eventual closing of the paper version.

Before giving my opinion on the future of Open Access publications, I think it is worthwhile to think about the concept of a Scientific Journal, the role of the Editor and the differences between an open archive and a journal.

What is a scientific journal?

- A link between an author and a reader: dissemination of Science
- A scientific project driven by scientists
- A source of high quality scientific information (peer review)
- A way to access data
- A primary source of bibliographic data
- A tool to promote the authors, their work and their institutions
- A tool for the evaluation: number of citations and calculation of indexes (“Impact factor”, “H-index”, etc.)
- And nowadays, a journal is not only a vehicle for scientific communication but also a Brand name

What is a scientific publisher?

Traditionally:

- A workflow manager (referring, quality editing, fast production, wide dissemination)
- An added value maker
- A Producer: paper and electronic versions
- A service provider: a primary producer of bibliographic data, tools for the referring process, etc.
- An agent for the promotion of the authors, their work and their institutions: maximization of the evaluation indexes (“Impact factor”, “H-index”, etc.)

And now, we are also professionals of:

- IT technologies
- Document management: indexation, text mining, standardization of documents for machine usage (XML ...)
- Specialized services (DOI, linking of articles: CrossRef ...)
- Feeder for dozens of databases and indexing services
- Marketers on the web,
- ...

Our job has changed incredibly over the last 15 years!

What has changed?

- Technology has made the diffusion of the information easier.
- The web allows easy access to a countless number of articles of random quality
- Some scientists claim that nowadays there is no longer a need of journals and publishers ...
- The libraries are empty ...

However:

- It is more and more difficult to identify the best quality articles (There is a profusion of personal web sites, preprint servers, institutional repositories, etc.) Are we sure that young scientists are basing their work on the best and most reliable/consistent references? It is so easy to find versions of an article on the web: which one is the right one? What about the problem of plagiarism? Time is precious: how to avoid wasting it reading articles of poor scientific quality? ... Scientists have to be convinced that a published journal remains a reliable source of articles and one of the highest quality scientific material.
- It is true that investment and facilities are necessary to produce a journal and this has a cost. It is a common to under-estimate the amount of work and the cost of the current industrialized production process of documentation.
- Furthermore, the global bibliographic system uses the “journal system” to build the citation system (journal title/year/volume/(issue)/article) and it is dangerous to under-estimate the risk of a failure in the bibliographic system if the present indexing system aborts.

Open Archives/Journals (OA): Not the same usage!

Preprint servers and Open Archives:

- Provide rapid publication of non-referred material in bulk
- Show the global production of the scientific institutions
- Don't discriminate on the quality level

Journals “Open” or traditional:

- A journal is in itself a scientific project (type of referring, style, “color”, ...) often created by the scientists not the publishers, providing:
- Dated publication of the peer-reviewed version of an article
- Enhancement of the work and the authors career.
- Guarantee of indexing, in the long term, in the global bibliographic scientific record system.
- Added Value from the publisher

I am convinced that both systems will remain in use over the next 10 years.

How to deal with the “Open issue”

- Make a clear distinction between Open Archives / OA Journals as described above.
- Advocate the added value of journals (the part which is not paid by the public grants).

- Be “open minded” on the copyright issue.
- Remember, Open Access is beneficial for journals only when this option is sustainable: be careful!

Some questions remain. For example: what is more important: the text or the services? Why not give a basic version of the articles free-of-charge and sell only the services? This idea could be relevant providing the services are of a higher quality than those of ADS.

Publishers, what have we to do?

- Deliver what scientists need
- Add value to their work (a journal has to be much more than an Open Archive)
- Work in co-operation the communities projects
- Help scientists to promote their career and their projects
- Publish a corpus of the best reviewed science (quality)
- Cooperate with the librarians to educate the young scientists (there is not only Google, Astro-ph)
- Be flexible, adaptable and sustainable!

Finally, how do we foresee the future of publishing at EDP Sciences?

As we cannot predict the future with certainty, we have a very pragmatic approach to Open Access. Overall, we are open-minded on this issue and adopt a policy according to the journals and opportunities:

- We try to move a title to OA, when the option is sustainable. In some other cases we choose it when it is mandatory (by contract).
- However, we continue to use the Subscription Model in most cases.

We have already set up a hybrid model, as many other publishers have done, and are classified *Green publisher* in the SHERPA/RoMEO classification.

EDP Sciences already publishes one journal in OA and we have other projects for 2008 and 2009. No matter what, these projects will have to be included in or supported by some communities' projects according to our vision of the task of a scientific publisher.