A&A 420, E1–E14 (2004)
DOI: 10.1051/0004-6361:20040182

Astronomy & Astrophysics

Editorial

Editorship and peer-review at A&A

Claude Bertout[1] and Peter Schneider[2]

[1] Editor-in-Chief, Astronomy & Astrophysics, Observatoire de Paris, 61, Avenue de l'Observatoire, 75014 Paris, France
[2] Letters Editor, Astronomy & Astrophysics, Institut für Astrophysik und extraterrestrische Forschung der Universität Bonn, Auf dem Hügel 71, 53121 Bonn, Germany

Abstract. We present an overview of current issues involved in editing *Astronomy & Astrophysics*, going from the detail of editorial policies and procedures to some more general aspects.

1. Introduction

Astronomy & Astrophysics is currently sponsored by seventeen European countries and publishes research articles originating from more than fifty countries. For many years, A&A has been considered a reference journal in research areas dealing with the local universe, mainly in solar and stellar physics, interstellar medium, and Galactic structure studies. Besides these traditional strengths of our Journal, we are now witnessing in A&A the emergence of high impact work in several new domains, from planetary system physics to extragalactic astronomy and cosmology. This welcome evolution is the result of the driving role of the ESO VLT in European astronomy today and of community access to several extremely successful European space and ground observatories from X-ray to millimeter wavelengths. Acting as Editors of A&A during this particularly exciting period is a challenging, but also extremely rewarding, occupation.

As a contributor to and reader of A&A, you have certainly noticed a number of changes in the Journal over the last few years. The most important of these are undoubtedly:

- the change of publisher and the merging of the Main Journal and Supplement Series in 2001;
- the recent modification of the editorial system, where we moved from the long-standing system with two Editors-in-Chief and the Letters Editor to a more distributed system with one Editor-in-Chief, seven Associate Editors and the Letters Editor;
- the now imminent opening of the A&A community of sponsoring countries to non-European nations, first of all Argentina, Brazil, and Chile, which demonstrates the appeal of our Journal outside its traditional borders

Along with these major changes, more technical but nevertheless important issues have been tackled. The Journal's presentation and layout were improved with the active collaboration of our new publisher, EDP Sciences, including the introduction of a cover figure. The editorial, peer-review and publishing processes are now done entirely via electronic communications, while the cooperation with CDS for archiving observational data has been widened. Finally, we now offer services such as language editing for all Main Journal papers and press releases for results of potentially wide interest. The Directors and Editors of A&A believe that all these changes are making your professional Journal a more attractive and efficient vehicle for validating, communicating, and archiving your exciting research.

While the most important of these changes were announced in the Journal by letters from the A&A Board of Directors, the editorial policies of A&A have never been openly presented in the Journal, except implicitly in the Instructions for Authors. As a result, some editorial actions may have appeared arbitrary or obscure. We therefore felt that a detailed description of the current A&A editorial policies and procedures was in order. This is the aim of the present editorial, which will address many issues of the editorial and peer-review processes in turn, with particular emphasis on those that are sometimes misunderstood by authors or referees.

2. Considering a submission for publication

As explicitly stated in their contract with the A&A Board of Directors, the Editors are ultimately responsible for the contents of the Journal. This responsibility can only partially be shared with referees since it involves issues both of Journal policy (Editors

enforcing decisions made by the Board of Directors) and of scientific excellence, for which the Editors rely mainly on the expertise of referees. Deciding whether a submitted paper should be sent to a referee for a scientific evaluation is therefore the first question that the Editors ask themselves upon receipt of a new regular paper or Letter.

2.1. Regular papers

More than 95% of all the papers we receive are sent to referees, but it will be useful to give the reasons here why an A&A Editor might either not do so or request some changes in the paper prior to sending it to a reviewer. To start with, we do not consider for publication papers that are obviously flawed. Nor do we send to referees papers that we believe are of insufficient scientific content.

While the first criterion is clear, the second one deserves some explanation. Papers published in the Journal should *present new astronomical results or ideas of sufficient interest to the community as concisely as possible*. In their initial reading of a new submission, the Editors are not judging the scientific value of the paper in detail (this is the referee's role), but must gauge its potential scientific interest and information content, because both are important aspects of new submissions. A paper presenting an important result of high scientific interest can see its information content diluted by details or digressions that are unnecessary for understanding the result. Conversely, a catalog with a large information content might have little *apparent* scientific interest but will be extremely useful to the community for further astrophysical research.

You should be aware that the information content required of new submissions is something that has varied with time. Thirty years ago, when astronomical information was much scarcer than now, it was easy for ambitious young researchers to publish at least one paper after every short observational run on a 1 to 2 m-class telescope, because there were indeed new and useful ideas to be gained even from limited observations of exotic celestial objects. Today, the situation is entirely different, due to the huge amount of astronomical information that flows from large optical telescopes and radio arrays, space observatories, and surveying telescopes. As a consequence, the typical information content of a paper must be substantially larger in order for the journals and readers to keep up with the information flow and stay up-to-date with the science that follows from this flow.

To give an example, we recently refused to consider a paper that presented standard photometry for an unremarkable binary eclipsing star together with a standard interpretation of its light curve. Clearly, our decision was not based on the quality of the science – both observations and interpretation were sound – but we considered that the paper was of insufficient information content and scientific interest by today's standards to justify publication in A&A. The decision would have been different if the observed binary had been truly remarkable, as this would have increased the paper's scientific impact. Thirty years ago, the decision would also have been different because these results were timelier than now. This does not mean, of course, that A&A is not publishing research on binary stars anymore. We will still gladly consider most papers on binary stars: for example, studies presenting a sizable amount of observational material that is interpreted in a relevant physical context, or papers discussing new astrophysical ideas about their evolution.

As another example, the recent advent of several highly successful X-ray observatories has led to a tremendous increase in the number of papers describing X-ray observations of individual celestial objects. As a result the Editors had to discuss whether they should still consider these studies for publication, when they remain essentially descriptive and do not really bring substantial new knowledge.

A third example concerns the discovery of "new" objects. A paper on the discovery of the first $z > 4$ quasar (or galaxy) is very exciting, but should a full paper be devoted to the 38th such discovery, if it is not peculiar when compared to others already recorded in the literature?

We should also mention here that A&A is result-oriented; i.e., Editors will not consider a paper presenting, say, an unsuccessful search for some exotic celestial objects *unless* this null result has some interesting astrophysical implications, that are equivalent to exciting results and likely to lead to further science.

To conclude, we note that the criteria for considering a paper for publication or not cannot be set in tablets of stone. The Journal must adapt to the changing trends in research, and it is the role of Editors to follow (and, if possible, anticipate) these trends in order to ensure the continued relevance of the Journal. In particular, we want to emphasize that A&A contributors submitting a new paper for publication need to consider the paper's information content, besides the usual aspects of scientific interest and quality. The new editorial structure offers the advantage that criteria for considering papers for publication can now be discussed in a collegial way. The Editors thus hope to minimize prejudices and errors that might lead to unjust decisions when implementing editorial policies.

2.2. Letters

In addition to the criteria described above, Letters should require rapid publication, as written in the Instructions for Authors. This criterion is not very well defined, though, and its meaning has changed with time. There are now other ways than journals to communicate essential information quickly. In particular, we note a clear shift towards using the astro-ph preprint server as a

communication channel for timely results in the extragalactic community. In addition, publication times in the Main Journal are not much longer than for the Letters. What, then, makes a manuscript a Letter, and does it actually matter?

The second question is easy to answer with yes, as can be seen by the protests of some authors whose manuscripts are transferred from the Letters Office to the Main Journal. Authors *do* care, which indicates that in their view the Letters have a higher reputation than regular papers.

In order to qualify for a Letter, a manuscript should be both timely and of very high quality. In addition, the manuscript should not exceed 4 journal pages. Automatically then, manuscripts are not considered for publication as a Letter if their contents appear less than timely – for example, if the reference list contains no paper on the subject from the past few years – or if it is too long. The length restriction has been relaxed at times, but a manuscript with 5 pages must be of exceptional quality, and referees are given particular instructions about this.

In contrast, it is against editorial policy to sacrifice clarity to brevity. Trying to shorten a manuscript to Letter length at the cost of legibility is therefore not acceptable. It is also against editorial policy to defer essential information to a later, longer manuscript. An expert reader must be able to judge a scientific paper based on the information presented in the work or already available in the literature. A reference to work "in preparation" is not useful evidence for evaluating a paper's contents and the manuscript may either need expansion – and thus most likely exceed the page limit for a Letter – or be postponed until the article referred to becomes publicly available.

2.3. Papers describing instruments and observational techniques

Papers about instrumentation pose a particular challenge to A&A Editors. On the one hand, we do not want to publish, say, the description of some standard instrumentation that has been newly installed at an observatory, because of its limited usefulness. On the other hand, we will consider new instrumental developments that might, at present or in the future, interest the community (see, e.g., recently published papers on hyper-telescopes or new developments in integrated optics), and we also publish instrumental papers in Special Issues (see Sect. 4.2.3). Obviously, it is the choice of the Editors to decide which instrumental papers can be considered, and some authors have at times complained about the perceived arbitrariness of the process. We thus have published some guidelines for instrumental papers in the Instructions for Authors, where it is explicitly required that *papers describing existing instruments and/or observational procedures contain a significant amount of new results obtained with the instrument or technique described.* It is also stated there that the Editors are generally reluctant to consider papers of purely instrumental nature unless they fulfill at least one of two criteria: *(a) be of interest to a large fraction of the community or (b) report a significant advance in instrumentation.* Finally, we state that these papers should be written as concisely as possible, and details should appear in appendices to be published in the electronic version of the Journal.

In principle, therefore, the instructions are quite clear. However, authors interpret them in different ways and we still receive a number of instrumental papers that we cannot consider for publication in A&A. Among them, a number of works deal with the preparation of future, already selected space missions (e.g., Planck or Gaia). While we do publish some of those works that seem to be of sufficient scope, it is not the Journal's role to publish all the mission preparation studies, since they often only interest those people involved in the project[1].

One proposal made by the Editors three years ago was to open A&A Section 13 (Instruments, observational techniques, and data processing) more widely with the understanding that this Section would be on-line only, in order to limit the impact of this more liberal policy on the number of printed pages. The feedback that this proposal got was mixed. Many instrumental researchers thought that this was a viable solution to the problem, but some feared that on-line papers would not be considered as highly as printed papers by the community. In other words, they thought that this proposal would *de facto* introduce two classes of papers: good, printed papers, and not-so-good, on-line papers. This fear was, of course, totally unjustified since we were proposing to use the very same peer-review process as for all other A&A papers. In any case, the A&A Board of Directors found that an on-line section only is still premature.

2.4. Catalogs and data papers

The Supplement Series was the natural place to publish catalogs and large collections of data. With the advent of electronic archiving, A&A pioneered a collaboration with the Center for astronomical Data in Strasbourg (CDS), the well-known internationally-funded archival and data mining facility. Under the current agreement, the CDS archives data published in the Journal after validation in the A&A peer-review process. We understand by data not only catalogs and primary observational data, but also theoretical results of lasting value such as stellar evolutionary tracks or atomic data. All these data are directly accessible to the potential user by clicking on a link in the on-line version of the Journal. In order to give renewed visibility to those data papers

[1] We are aware that these works are often performed by doctoral students and young researchers who need peer-reviewed publications in order to have a chance when evaluated by hiring committees, but this aspect must not affect the selection of articles published in our journal. Other communities – such as the experimental high-energy particle physicists with their huge collaborations and long preparatory time before first scientific results are obtained – face similar problems and found ways to solve them; the journals cannot play this role.

in the Journal now that the Supplement Series do not exist anymore, the Board of Directors has approved the opening of a new section entitled "On-line Catalogs and Data" that will receive short papers describing the on-line data archived at CDS.

2.5. Papers on special subjects

Although the Instructions for Authors state that "A&A publishes papers on all aspects of astronomy and astrophysics", there are topics that are on the borderline of the subjects covered by A&A and by the other main astronomical journals. Examples are the theory of strange stars, the physics of gravitational waves, some aspects of planetary science, experiments related to the detection of WIMPs, etc.

One quick way we check how much a subject is covered in the major astronomical journals is by looking at the paper's reference list. If none, or hardly any, of the cited papers have appeared in the major astronomical journals, then the Editor needs to consider the question of why this paper should be published in A&A and not in one of the specialized journals to which the manuscript refers. No strict policy for these cases has been formulated yet, however, and decisions are made on a case-by-case basis. Referring to the example of strange stars, such a manuscript can be published in A&A if, e.g., predictions are made that can be tested astronomically, say by properties of pulsars, but will normally be rejected if it does not discuss astrophysical consequences. One criterion to be applied here is whether this article will interest people who read A&A regularly. In these cases, the Editor cannot usually rely on advice from the referee alone, as the referee is an expert on the subject and will therefore almost certainly find it relevant. Furthermore, the criterion will change in time: whereas at present neutrino experiments are usually outside the range of topics considered for A&A (with the exception of the SN 1987A neutrinos), future experiments will open the window to neutrino astronomy which then clearly becomes a topic of interest to the A&A readership. A similar situation is expected for gravitational waves.

3. Some style issues

Editors may momentarily refuse to consider a paper not for scientific reasons, but because its style and language are obstacles to understanding the science. While linguistic and stylistic improvements can be made at the editorial office upon acceptance of the paper, we are not in a position to rewrite badly written papers before sending them on to referees nor should we be. We used to seek referee reports for all but the most poorly written papers, but referees often complained about that. We also noticed that the peer-review process of those papers was less constructive and took a much longer time than average. We are thus now making sure before starting the peer-review process that the language is not an obstacle to comprehending the science. While A&A authors are often non-native English speakers who cannot be expected to write perfect English, those who have not yet developed full control of the language are urged to find a native English-speaking colleague or friend to read and correct their work.

The Instructions for Authors provide precise guidelines concerning the style that Editors expect, and new contributors to the Journal are kindly invited to read them carefully before writing their first papers. The manuscript preparation as a TeX-file, now standard in all major journals, has put additional burden on authors, as they are expected to prepare an almost camera-ready version of their paper. However, besides a burden, this also provides the author with nearly full control over the manuscript and leaves much less room for mistakes during the final processing of the paper at the publisher. To exercise this control, however, the style guidelines[2] need to be followed exactly.

A few words about the length of papers is in order here. Over many years, the average length of A&A papers has been constant at 10.0 printed pages. In the last two years, we have witnessed an increase in the papers' average length that we try to compensate for by publishing parts of some papers in the electronic version of the paper only, as we shall discuss in detail below. While the scientific content of many papers fully justifies their length, a number of submissions appear verbose and unfocused. A&A Editors understand very well that differences in style can be attributed partly to cultural differences between authors but since A&A is an international journal, contributors need to cultivate the usual unadorned style of international scientific communications.

Finally, we have noticed in recent years a large increase of the number of figures that are included in papers, some of which do not appear necessary to the comprehension of the text. We would therefore like to remind our authors here that figures must be included only when they are absolutely necessary to support the scientific discussion. The information content of the figures should be carefully optimized and the width of most figures should be restricted to one column except in truly exceptional cases. Figures that are included for completeness but are not necessary to understand the paper's results will be published in the on-line version of the paper (see Sect. 5.4).

[2] We mention here the most frequent style errors, in the hope that they will occur less frequently in the future: units should be in roman; subscripts denoting abbreviations should be in roman; variables should appear in italics, i.e., in math mode. Minus signs should be real minus signs, i.e., they must be placed between dollar signs. Table captions should be above a table, not below. In the references, the first 3 authors of papers with more than 5 authors should be mentioned, followed by 'et al.'; and not 'et al.' already after the first author.

4. The peer-review process at A&A

In recent years, the usefulness of academic Journals has been cast into doubt by scientists who believe that open archives such as astro-ph make traditional publishing obsolete. To us, astro-ph is a useful tool for quickly disseminating scientific information, i.e., a tool that complements but does not replace peer-reviewed journals. We believe that the need for peer-review is as strong as ever, because it is the foundation on which academic careers are built.

Organizing a consistent, professional peer-review is costly, and this is (or should be) the main reason for the existence of academic journals. In this regard, the structure of A&A is quite unique in the world of astronomical publishing: the peer-review process is financed almost entirely by the national contributions paid by the sponsoring countries to the Journal. This is why we do not require page charges from authors working at institutes located in sponsoring countries. The subscription price, on the other hand, covers the Journal's publication costs, i.e., the copy-editing, final typesetting, printing, and distribution costs.

A&A Editors, like Editors of the other major scientific journals, are driven by two somewhat conflicting goals:

- offer the Journal's authors and readers the strong quality control that is the trademark of validated scientific work;
- do so with the speed and reactivity that are necessary in today's competitive science.

In the following, we first explain how the Journal organizes the peer-review process and then proceed with a report on how we deal with problems that sometimes arise in the process.

4.1. How do we select referees?

First, we should emphasize that we look for the best possible referee for any given paper without resorting to pre-existing lists[3] but by using ADS to find a potential referee within the group of people who have worked in the recent past on the topic of the submitted paper. If the field of research and/or the people involved are unfamiliar to the Editor, (s)he will look at the recently published works to find out whether there are competing groups on the same topic, who the most cited people are, and so on. With the on-line tools available nowadays and some experience, the Editor can quickly get a rough idea on any astronomical research field, sufficient to make a good choice of potential referees.

Next, we should point out that we do not restrict the choice of referees to those scientists who work in A&A sponsoring countries. Because astronomical research exists in a framework of global cooperation, the peer-review process also needs to be global. This further ensures that the scientific criteria for paper acceptance are comparable at the main astronomy journals, as demonstrated by their similar rejection rates. We note in particular that about thirty-five percent of all A&A referees are from North America; conversely, the US journals call on many European referees.

Our recipe for selecting referees is as follows. We try to find a scientist who: (a) will have a strong interest in reading the paper, (b) can deal with the paper's topic competently, and (c) is not directly in strong competition with the authors. This last criterion is not necessarily a relevant issue and the weight we give to it in the referee's selection depends on both the people involved and the research area (see also our discussion of possible problems below). If the main point in a manuscript is to criticize another paper, then the authors of the latter will often get an opportunity to comment on the critique, e.g. in the form of a referee report. More often than not, the resulting report in such cases is fair and helps in resolving the apparent conflict. If this is not the case, an independent referee will see the first report and then has both views, based upon which a balanced evaluation should become more easy.

A check for the consistency in the choice of referees is provided by those cases where a referee points out that (s)he has previously recommended rejection of the very same manuscript to a different journal. This indicates that in many cases there are just a handful of "natural candidates" for reviewing a given manuscript and that the Editors routinely manage to identify them. Over the last three years, 97.2% of the more than one thousand A&A authors who filled up the feedback web page provided for articles handled at the Paris office in fact reported that their referee had competently dealt with their manuscript, and similar feedback from Letters' authors shows the same.

We usually use only one referee for any given paper, except when a paper deals with more than one subfield of astronomy, in which case we will request the assistance of a specialist in each subfield. This is, however, a rare occurrence. We also usually request a second referee opinion in case of conflict between author and first referee, as discussed later in this editorial. A few years ago, we tested using two referees for randomly selected papers for a short time. This experience did not convince us that the peer-review system was much improved by adding a referee. Either the two referees were of a similar opinion, and there was little gain from having two reports, or they were of opposite opinions, in which case the Editor was either having to make the decision of accepting or refusing the paper on the basis of the conflicting reports and his/her own opinion of the work or, alternatively, was forced to seek a third referee. In any case this system proved very impractical for many reasons: the additional pressure on the referees' time; the problems associated with partially ignoring the recommendation of one of the referees[4]; the multiple,

[3] We do, however, keep a master list of referees that will soon include how often they have been called by A&A Editors in the recent past.

[4] Referees are understandably sensitive to this, and failure to take their advice into account may impact on their future willingness to act in this role.

often conflicting, suggestions of the two referees to which the author should respond; and the resulting associated delays in the peer-review process.

In some cases, finding a potential referee turns out to be difficult. Examples here are papers in a highly specialized field, e.g., where the reference list contains mainly papers which are published in non-astronomical journals[5]. Another example are papers authored by a large fraction of a community, as is the case when new facilities go into operation, at which point it is difficult to find a person competent to judge the technical aspects of a manuscript. In such situations, we sometimes ask the authors to provide us with a list of a few competent, independent potential referees, and most of them are quite willing to come up with such a list[6]. After a quick check with ADS, appropriate referees are then identified.

In most cases[7], we are quite happy with the work of referees, as the vast majority of them deliver constructive and thoughtful reports. In the opinion of authors given by the feedback questionnaire mentioned above, 94.7% of all referees have a constructive attitude toward their work and 89.6% deliver very useful or useful reports. We note here that some referees go beyond the call of duty to help the authors improve the impact and presentation of their works. In this respect, we would like to emphasize that we do not expect referees to correct the style, language, or typographical mistakes of the papers they review, although we are of course pleased if they do so. The following paragraph discusses what A&A Editors expect from their referees.

4.2. The referee report

Referees should focus primarily on the scientific contents of the paper. A&A provides a short questionnaire that indicates the various aspects of the evaluation that the Editors would like the referee to address. A report prepared by a seasoned referee will not necessarily address all these questions explicitly but will do so implicitly instead. This is perfectly fine, as the questionnaire is mainly intended as a guideline that will be useful mainly to referees with little previous experience of the peer-review process. We now comment on the various aspects of the evaluation.

4.2.1. Regular papers

We reproduce hereafter (in italics) the questionnaire that referees of regular papers are asked to fill out. The first three points are multiple-choice questions, the last two represent the report *per se*.

1. Scientific content

In your opinion the paper is

A. *acceptable without revision.*
B. *acceptable after minor revision.*
C. *acceptable after major revision. or*
D. *not acceptable but the author should be encouraged to make major revision and resubmit.*
E. *not acceptable because the paper is too long for the amount of scientific material presented.*
F_a. *not acceptable because the scientific content is not sufficient, but could possibly be published as a short Research Note.*
F_b. *not acceptable because its scientific content is insufficient and does not correspond to A&A standards.*
F_c. *not acceptable because it contains demonstrable errors.*

We have added here the traditional A&A grading system from A to F that goes back to the beginning of the Journal. The grade no longer appears in the questionnaire but is still used by the editorial office where it refers to specific standard letters sent to the authors with the corresponding report grade.

While the question asked to the referee is self-explanatory, one should notice that by assigning a grade from A to C to a paper, the referee recommends eventual acceptance of the paper (after possible revision) while a grade from D to F is an explicit rejection. In other words, a first report with grade B or C recommending acceptance after revision cannot, on logical grounds, be followed by a report on the revised version that would recommend rejection. We have witnessed a few cases where a crucial problem became apparent to the referee only after revision of the paper, but these are truly exceptional cases.

In the course of the past years, we were led to distinguish three cases of firm rejection (F) that correspond to different situations. Following a rejection, and depending on his own opinion of the paper and report, the Editor will possibly allow for a second opinion at the author's request.

[5] We feel that the referee should be selected from the same pool of people likely to read articles published in the journal.

[6] In a very few cases, the authors themselves were unable to identify such an independent competent person within the astronomical community!

[7] The occasional problem cases will be discussed in Sect. 4.3.

2. Style and language

In your opinion

a. *the paper is well-written, concise but self-contained.*
b. *the paper could be reduced by xx% without loss of scientific content.*
c. *the paper would greatly benefit from extensive language editing.*

These questions are self-explanatory. Concerning the style requested of submitted papers, please refer to the section on style above. An average paper should not exceed about 10 printed pages (or about 20 pages in referee format). The Editors will often try to shorten the printed version of accepted papers that are longer than this average by publishing some parts of the works electronically (see Sect. 5.4.2).

3. Concerning anonymity

Do you wish to be identified as the referee?

A&A used to explicitly ask referees to waive their anonymity but the Editors understand now that there are strong cultural differences in the way referees consider this issue. As a general rule, referees from North-America often insist on anonymity while Europeans are less concerned about revealing their identity. A&A Editors guarantee strict anonymity unless the referee explicitly agrees to waive it. In order to avoid possible personal conflicts, however, they sometimes overrule referees who want to be identified, depending on the nature of the report and the Editors' experience with authors.

4. Confidential comments to the Editors

We expect a frank assessment of the paper's strengths and weaknesses. The Editor relies heavily on this report in the subsequent treatment of the paper. The importance of a frank but balanced opinion thus cannot be overemphasized.

5. Detailed scientific report

This part of the report is sent to the author, who expects a factual and courteous discussion of the paper's contents. In order to help less experienced referees, we have added a few guidelines, as seen below.

Please address the following questions in your report to the Scientific Editor

1. *Why should this paper be published?*
2. *Are the assumptions spelled out clearly?*
3. *Are the methods fully described?*
4. *Are the new results adequately emphasized?*
5. *Are all the figures and tables necessary and properly laid out?*
6. *Which material (sections, tables, figures) should be published in electronic form only?*
7. *Is the designation of objects according to IAU rules?*

Question 1 is indeed the basic question that needs to be answered by the referee. Not always a specialist in the exact field of research of the submitted paper, the Editor alone may not be in a position to judge the relevance of the work, its usefulness to the community, or its validity. It is on these three points that the referee's expert opinion is extremely valuable.

The other questions address more specific areas, while Questions 6 and 7 call for some explanations. Question 6 concerns the electronic publication of part of the paper. There are two different types of this so-called "on-line material" that can be the source of endless confusion for many authors and referees, so a detailed discussion is needed. Section 5.4 is devoted to this problem.

Question 7 recalls the Journal's long-standing commitment to follow IAU guidelines for naming celestial objects. The Editors consult with the relevant IAU Commission or CDS in case of doubt. Web-based tools are available to the authors for finding or defining IAU-approved acronyms (the links can be found in the Instructions for Authors).

The seven questions above do not apply to all papers. Again, the report does not need to explicitly address them but we expect the referee to consider them all, however briefly. Finally, we need to mention some points that are sometimes overlooked by referees.

- A report recommending direct acceptance of a paper without a round of revision by the authors should be justified. If this is not done, the report lacks credibility and the Editor will be forced to request a second opinion on the paper.
- If revisions have been made by the author as suggested by the referee in a first report, no other justification is needed in recommending acceptance to the Editor.
- If the referee thinks that the paper can be made more concise, the fraction of cutting that can be done needs to be realistically estimated and the report should indicate how this can be achieved.

4.2.2. Letters

Likewise for the Letters, referees are sent a list of items to consider, which is reproduced here:

It is the purpose of a Letter to publish short articles with new scientific results of a timely character. The referee must be convinced that there is a good reason for the increased speed of publication or of the exceptional quality of the article (e.g., will you refer to this paper in the future?). The article must also be in a compact form.

• *Is the article of sufficient timely interest to warrant publication as a Letter?*

(a) in its present form (why?)

(b) after shortening or minor revision (could you please make suggestions)

(c) only after substantial revision (in which case the revised version should be returned for refereeing).

• *Is this article a short version of a longer manuscript? If so, do you see reasons for publishing this manuscript separately as a Letter?*

• *If this article is not acceptable as a Letter, do you think it should be published in the Main Journal?*

(d) in its present form (why?)

(e) after minor revision (could you please make suggestions)

(f) possibly, but only after substantial revision (would you be willing to review such a revised version, or could you please suggest names of possible referees?)

• *If the article should be rejected, could you please indicate the reason.*

• *We would like to communicate your name to the author; do you agree?*

In addition, if the length of a manuscript exceeds the 4 page limit, an additional question is posed:

• *Given that the article exceeds the nominal length of 4-pages for a Letter, it should only be accepted for publication in the Letters section if it is of exceptional quality. Any advice on this issue would be highly valuable.*

As for the Main Journal, referees often write a report without specifically addressing these questions; nevertheless, these reports are usually easily interpreted as to which of these categories is meant.

4.2.3. Special A&A Issues

Taking up opportunities provided by newly installed telescopes or instruments, A&A publishes Special Issues featuring these facilities. Prominent examples are Special Issues on the ESA missions ISO, XMM-Newton and Integral, while shorter Special Issues have been published on various VLT instruments and the ODIN satellite. These Issues increase the visibility of A&A in a number of ways. First, the community eagerly awaits "First Results" from these new facilities and finds it convenient to have them published all together in one issue, which enhances the readership. Second, by organizing such Special Issues, we are attracting authors who would normally publish in other journals, but who like to have their papers part of the Special Issue. Third, the organizations responsible for these new facilities consider a Special Issue a very convenient way to advertise their success, usually order these issues from the publisher in large number and therefore participate indirectly in broadening the distribution and visibility of the Journal. Also, in several cases these organizations pay for color pages, thus allowing for the production of these Issues in full color. Fourth, and perhaps most relevant for A&A itself, articles in these Special Issues have a considerably higher-than-average citation rate. Papers describing the instruments and their performance, which are typically included in these Special Issues, are amongst the best-cited papers of A&A and therefore help increase the impact factor.

Finding referees for these Special Issues presents a somewhat different task than for normal papers for a variety of reasons. First, since often whole communities are involved, it can be difficult to find a truly independent and competent person. For example, in the early phases of an instrument, the reliability of scientific results depends on the quality of the calibration, and the best people to judge are in the team operating this instrument. Second, since all papers of a Special Issue have to be published simultaneously, no delay in the refereeing process should occur. For example, for the Integral Special Issue 76 manuscripts were received almost simultaneously at the Letters Office (which represents about one quarter of its usual yearly submissions), and they must be processed through the peer-review procedure within less than two months in order to be published in time. This obviously requires increased pressure on referees. Third, the referees must understand that the justification for publishing a manuscript in a Special Issue is somewhat different as "First Results" will not necessarily stand the test of time, but may nevertheless immediately inspire additional research. Also, descriptions of instruments, which would normally not be published in A&A, are a very valuable part of such Special Issues, and are among the best-quoted articles in A&A (e.g., four of the five most cited articles in A&A in 1996 are from the ISO Special Issue, and the eight most cited A&A papers from 2001 are part of the XMM-Newton Special Issue). Therefore, referees are informed that the manuscript is part of a Special Issue, and most of them take this information into account in their evaluation and recommendations.

Some of these problems become much easier by including one or more contact persons in the process at the organization running the facility. These persons can take over much of the communication with the authors, such as informing them about deadlines, putting pressure on them when needed, providing recommendations for appropriate referees, helping in organizing the financial deals with the publisher (such as color pages), etc.

4.3. Possible complications in the peer-review process

After several years of experience as Editors, we can testify that the peer-review process in fact works extremely well in most cases. Many colleagues consider that refereeing is an integral part of their professional duties and are keen to deliver constructive and thoughtful reports within a reasonable time frame.

Of course, there are also possible complications that fall into four broad categories:

- delay in finding a suitable referee;
- delay in producing a referee report;
- offensive attitude of referee or author;
- delay in revising the paper.

As we see from this list, all parties involved in the peer-review process can contribute to delaying the publication of a worthy paper, so that we need to discuss these various problems in some detail.

4.3.1. Delay in finding a referee

We currently receive about 2200 articles and 300 Letters per year, which means that the number of referees that we call for reviews of new submissions every year is around 2500. Since A&A represents somewhat less than thirty percent of the astronomical information published in refereed Journals, this means that the various astronomy journals send about 8000 refereeing requests for *new* papers every year. To this, we must add the reviewing of *revised* papers, since more than two-thirds of all papers are seen twice by the referee. The number of astronomers worldwide is in the range of ten thousand and many of these are doctoral students who are not called for refereeing work except in some exceptional circumstances. Obviously, then, most senior astronomers will be asked by the various astronomy journals to provide at least one referee review every year and the most competent of them will be asked to provide several reviews.

This strong demand on referee time has the obvious consequence that referees may refuse to review a paper on the grounds either that (s)he is already busy with a paper for another journal or has done several reports recently. However, we have noticed that referees seldom refuse to review a paper when they really want to know what it contains, so this appears a primary incentive for a scientist to accept a refereeing request. Providing the paper's abstract, as we do routinely for regular papers, also helps referees to decide whether they can deal competently with the paper. Sometimes, the paper has been posted on astro-ph prior to submission and the potential referee that we contact has already read it but is eager to comment on it. Nevertheless, we sense that the fraction of refereeing requests that are refused is slowly increasing over the years that we have been editing A&A. One reason for this is the growing pressure on the time of senior scientists exerted by funding agencies and astronomical organizations. In addition to the demand on refereeing for journal articles, the senior researchers are faced with an increasing number of reviewing requests: time allocation committees for a constantly growing number of observatories, science foundations, grant applications, reference letters, evaluation committees, advisory boards, etc.

In many cases, the Editor will quickly think of someone who would be eager to see the submitted paper and there will be no need to ask several people in turn, a process that results usually in long delays. Sometimes, however, bad luck will strike and several potential referees will refuse to review the paper because we ask them at busy times or they are already reviewing for another journal. Even worse, some potential referees will neglect to reply to the refereeing request, thus delaying the Editor's search. This attitude ought to be avoided: it is fairer to both Editor and author to reply with a "no" than to say nothing at all. On some occasions, the author's reputation may be an obstacle to finding a referee, in which case there is not much the Editor can do beyond continuing a patient search for someone who will judge the paper on its own merits.

Our new Manuscript Management System (MMS hereafter) allows authors to check the status of their paper. This recent transparency has already led to some complaints about the time it takes for the Editor to find a referee[8]. In recent years, the *median* time between the time of submission registration and the time at which the paper goes to the referee has been 7 to 8 days. However, the tail of the distribution extends to more than thirty days. For the Letters, these times are somewhat shorter; nevertheless, there are exceptional cases where it takes more than three weeks before a referee has been located who is willing to review a manuscript.

4.3.2. Delay in getting the referee report

As already mentioned, competent referees are often extremely busy with a variety of other duties besides their own research and/or teaching work. The chance that the review request will end up being postponed or even forgotten by the referee is therefore not

[8] The Letters Office does not currently use the MMS system, but handles manuscripts with a stand-alone computer. This has the consequence that the Editor-in-Chief cannot access the Letters database, and vice versa. One advantage of this situation is that regular papers co-authored by the Editor-in-Chief can be handled by the Letters Office, and Letters co-authored by the Letters Editor are handled by the Main Journal Office, with the referees preserving anonymity.

negligible. We usually send a first reminder to the referee three to four weeks (two weeks in case of the Letters) after accepting the task, and kindly request an answer. Our authors have suggested that we send automated reminders to the referees but in our experience it simply does not work. The peer-review communication process works best when it is done on a personal level, even when the correspondents do not know each other personally.

As long as e-mail contact between Editor and referee exists, we usually consider that the report will ultimately be received, even if the delay is becoming a problem. In most cases, this attitude is justified and we receive a delayed but usable report.

The worst case scenario is when a referee answers our first reminders by saying that the report is under way, but after two or three reminders, does not bother to answer anymore and does not send a report. We then need to start the process over and find another referee. It is in this case that the longest delays occur. There is not much that the Editor can do to reduce this delay, except to explain the situation to the second referee and kindly request a report on a very short time scale. In such cases, the Editor will often contact trusted personal friends and colleagues who are kept "in reserve" for dealing with these emergencies.

Feedback from authors has revealed that 91.5% of them expect their submission to be reviewed within 5 weeks, while the *median* time spent by a paper at the referee for the first evaluation is already between 5 and 6 weeks. Considering that many authors are also referees, these numbers obviously clash. To help us cut down in reviewing time, we therefore kindly encourage our referees to try to close the gap between their expectations as author and as referee by sending in their reviews within the time frame that they expect as authors.

Often, Editors will be contacted by authors who believe that the referee is actually trying to delay the paper because of supposed competition with the authors. Choosing a referee from a group directly competing with the paper's authors in the very same research field has the obvious advantage that the referee will deal meticulously with the submission. However, when the competition between the two groups is strong, the Editor should of course wonder whether the referee will deliver a biased report and/or will try to delay the publication of papers submitted by the competitors. We find this risk to be likely only in certain subfields of research, usually among the so-called hot topics: for example, extra-solar planet detection, theoretical studies of gamma-ray bursts or turbulence mechanisms in accretion disks are areas where finding suitable referees currently requires some inside knowledge.

We would nevertheless like to emphasize here that in our experience as Editors biased referees are extremely rare, much less common in fact than suspected by authors[9]. In most cases where a conflict of interest can occur and the Editor is not in a position to know that, the referee will usually decline to review the paper and explain the reason frankly. In our many years of practice at A&A, we have witnessed only a few instances of obviously biased reports that were the result of competition.

4.3.3. Offensive attitude of referee or author

A problem that we experience more often with referees is a slight tendency to condescension (in 4 to 5 % of cases, according to the authors). Whether there are grounds for such an attitude or not, it is understandably upsetting to the authors. Therefore, the Editors often edit reports that they perceive to be patronizing. In the few cases that border on offense, the Editors do not send the report to the author but ask the referee to re-write the report or look instead for a second, independent opinion.

Authors can also have offensive attitudes toward referees, in which case the Editors request amended replies or edit them. Again, this is a rare occurrence. A more frequent attitude on the part of the authors is to say in their reply to the report that they have taken the referee's comments in consideration whereas the revised text is basically unchanged. This is very upsetting to the referee and can quickly lead to a stalemate in the peer-review process. In order to avoid this problem as much as possible, the Editors routinely request a detailed reply from the author to the referee report, including a description of the modifications to the text that were made as a result of the referee's remarks.

4.3.4. Delay in revising the paper

We are currently lacking statistics about the time that is necessary for authors to send their revised version because we used to *assume* that it was as short as could be so that there was no need to look into it. Consequently, we attributed most of the delay in the time from paper submission to acceptance to the referee. This assumption might in fact be incorrect and very unjust to the referees. With the new MMS in place, it is much easier than before for the Editors to know how many papers are in revision at any given time, and to our surprise, we noticed that there are many more papers being revised than there are papers with a referee. This is an apparent indication that the time spent in revising the article is much longer than the refereeing time. This unexpected finding will be followed up over the next year and reliable statistics will be given in the 2004 Editors' report.

This issue is of particular relevance for the Letters, in particular when authors try to argue about the urgency of the publication of a manuscript, even after it took them several months to prepare a revised version following the referee report. In these cases, manuscripts are more likely to be forwarded to the Main Journal, since apparently the authors are not all that convinced of the time factor themselves.

[9] Or guessed by these Editors before taking up their duty.

4.3.5. Some statistics and conclusions

Over the past several years the median time between submission registration and acceptance of regular papers varied between 2.7 to 3.1 months. For the Letters, the median time between submission registration and acceptance has been 37 days over the past few years and appears surprisingly stable. The mean acceptance time is substantially longer, though, due to the long tail in the distribution caused by the aforementioned problems.

Whether it is possible to significantly improve the median time for acceptance is a matter of debate. There are two areas where peer-review time could probably be cut down: (a) the time spent by the author for the paper's revision; and (b) the time spent by the referee for reviewing the revised version. This second report should represent, in the many instances where revisions do not affect the structure of the work, much less work than the first report since the referee has already read the paper in great detail. While it is not the Editors' role to put pressure on authors to increase the Journal's speed of publication, we shall in the future try to reduce the time needed for getting a second referee report on revised papers for which the first report suggested relatively minor revisions.

We conclude that the peer-review system works and it works well but of course not always perfectly. That should also not be expected, since all parties involved – authors, referees and Editors – are human beings, and judgment is to some degree inevitably subjective. It is the Editor's role and continuing challenge to minimize mistakes.

5. Acceptance and publication

5.1. Letters

After evaluation of a manuscript, the Letters Editor decides whether a manuscript is acceptable, is in need of revision, should be forwarded to the Main Journal or must be rejected. If and when a paper is acceptable, the Editor quickly checks for style and language before sending out the acceptance notice. If stylistic changes are necessary, these are included in the acceptance mail to the authors with the expectation that they are applied before the final manuscript is sent to the publisher. In order to increase the speed of publication there are no proofs for the Letters, but the number of identified problems that could have been avoided if a proofing stage was included is far below one percent of all published Letters – too few to make proofs worthwhile. In the few cases where the language and/or style of the manuscript are very unsatisfactory, the authors are asked to read the Instructions for Authors carefully and/or to consult a native English speaker to improve the manuscript, since the Letters Office operates without language editing. In all cases this has worked so far, sometimes after more than one iteration. At the same time as the acceptance note is sent to the author the publisher is notified about the manuscript's acceptance.

5.2. Regular papers

The new editorial system introduced a double acceptance process that may be confusing enough to require some explanation. Currently, the Associate Editor in charge of a given paper proposes the paper's acceptance to the Editor-in-Chief, who then sends the author –sometimes with a delay of more than one week– the formal acceptance letter.

Why do we make things so complicated? First, the Editor-in-Chief needs to the make sure that the peer-review process is consistent, i.e., that the Associate Editors all have comparable acceptance criteria. The second reason is that formal acceptance requires several decisions from the Editor-in-Chief. The section of publication and keywords must be chosen and/or corrected; likewise, one must decide what level of language editing is needed, whether part of the article should be published in electronic form only, and whether the paper is subject to page charges.

We shall explain these decisions below, but before doing so, we want to emphasize that *the official date of acceptance of the paper is the day when the paper is accepted by the Associate Editor in charge of the scientific peer-review process.* Time spent after this decision to improve the manuscript and to make the final publishing decisions is editing time for which the author should not be penalized since the scientific content of the paper has already been deemed publishable.

We now detail the editorial decisions: the first two, choice of section of publication and of keywords, should be self-explanatory. Since the author can enter these data in MMS using pull-down menus at the time the submission is sent to the Journal, the Editors should not even have to deal with them. In practice, however, many authors still do not indicate the Journal's section for which the paper is submitted, and the keywords must still be modified in many cases. Contributors are therefore encouraged to pay attention to these important details to save time between acceptance and publication.

5.3. Language editing

Language editing is a relatively new addition to the services offered by the Journal. To our pleasure, the response of the authors to language editing is overwhelmingly positive. One area where improvement is still possible is the communication between author and language editor, since language editing is not done entirely by electronic means; some heavily corrected papers need to go back to the author via snail mail, sometimes resulting in delays of several weeks. We are currently experimenting with various possible solutions to this problem and expect to offer fully electronic language editing within the next few months.

5.4. On-line material

The issue of on-line material probably remains the most controversial editorial activity today and we will try answering here the questions that authors often ask concerning the Journal's policy in this respect.

As a preliminary remark, we emphasize that access to electronic material published with articles is extremely easy: *direct links are provided in each paper to the data archived at the CDS and to the on-line material stored at our publisher EDP Sciences.*

5.4.1. Publishing data at the CDS

By contract with the Journal, the CDS archives the primary data that are published in A&A and puts them graciously at the disposal of the global community. The data are also linked to the general purpose data mining tools developed at CDS. As discussed earlier, data are not only primary observational material, but also tools of general interest such as catalogs, theoretical tables of lasting values, etc.

CDS requires the data tables to be in ascii format and each table is accompanied by a readme.txt file that describes the table's content. The readme file format defines a standard that is used by all major astronomy journals. Again by contract with the Journal, CDS provides help to A&A authors in order to prepare the files.

Primary data can also be archived at the CDS as graphics files in FITS format. This is of particular interest for spectrograms. At this point, no other formats than ascii and FITS are supported by CDS for A&A data.

The collaboration between A&A and CDS is long-standing and works well, and most A&A authors know how to use the CDS archiving capacity. Problems that may arise during the editorial process almost exclusively concern the size of tables that are to be archived at CDS. The Instructions for Authors state that large tables will be published at the CDS. Smaller data tables that are archived at CDS also often appear in print but the Editor sometimes requests smaller tables to be archived at CDS and not printed in order to optimize the information content of the paper's printed version.

5.4.2. On-line material

We are referring here to those parts of the paper that are not printed but appear only in the on-line version of the paper under the link "on-line material". Some of our authors strongly object to the current editorial practice of not printing some parts of the accepted papers; we would therefore like to explain the rationale behind this policy.

Most problems with this issue stem from the fact that we are living a transition period between printed publications and exclusively on-line publications. Historically, transition periods are characterized by strong contradictions between the appeal of the past and the call of the future, and we have such a situation here. Many authors are reluctant to abandon the printed medium, but most of these people readily admit that they use the electronic medium exclusively in their research. A reprint that you can hold in your hand is a concrete result of your work, we all agree, whereas an electronic file that flashes up on your computer screen still smacks of abstraction.

In any case, A&A Editors understand these contradictions but also must live with a strong external constraint: the number of printed pages cannot keep increasing without limit because it would drive the subscription price too high. The current initiative, particularly in biology, for open access to all scientific information, results from the controversial policy of some commercial publishers to increase the academic journals' subscription prices, often with little justification. The situation is fortunately more controlled in astronomy but the writing is on the wall, such that we know that we will lose subscribers if we increase the subscription price substantially above the average inflation rate.

The number of printed pages of A&A has remained constant at 19 000 pages per year over the past few years, but this was achieved in part through expedients. The use of slightly smaller, space-saving fonts was decided in 2002; in 2003 the backlog of papers waiting to be published was slightly increased to allow for the more flexible production required for a weekly journal, as was the number of on-line only pages (every on-line page is counted as 1/4th of a printed page by the publisher in determining the subscription rate). Given the steady annual increase in the number of submissions, we see no way to avoid increasing the number of printed pages unless we drastically increase the number of pages that are published on-line only. Alternatively, the Editors might instead aim at increasing the rejection rate from the current 11% to about 15%.

What parts of articles can we publish on-line only? In theory, every bit of information that is not crucial to understand the paper: observation logs, tables of properties that are also reproduced in figures, long mathematical derivations, redundant figures when only one example is needed to understand the discussion, etc. In practice, interaction between Editor and author is sometimes useful to find the best compromise, and the Editor may defer to authors who provide her/him with good reasons to print some parts of the paper that the Editor first proposed to publish on-line. We should point out here, however, that most scientists read the articles they need for their research neither in the printed Journal at their institute's library nor on-line on their computer screens, but print them instead for easier perusal. *The print-out file, in PDF or postscript format, accessed through the journal page or through the ADS, will automatically include the on-line material.*

5.5. Page charges

Publishing in A&A is free of charge for authors working in the countries sponsoring the Journal. Other contributors are subject to page charges at a rate decided by the A&A Board of Directors; currently, 100 Euros per page. In practice, no page charges are requested when the paper's first author works in a sponsoring country or in the UK[10]. If this is not the case, page charges are requested at the prorata of co-authors who are not working in sponsoring countries.

Traditionally, page charges were often waived by the Editor-in-Chief for those contributors to A&A who work in economically emerging countries. With the additional expenses caused by changing the editorial system and introducing new services, this liberal policy is no longer possible. Furthermore, it is interesting to note that the ratio of income through page charges and the financial contribution of the sponsoring countries, both of which are used solely to operate the Editorial Offices, is about the same as the ratio of authors from countries outside and within the sponsoring countries, so at present the policy seems fair.

6. Outlook

After discussing the current editorial and refereeing procedures at A&A in almost painful detail, we need to look at the wider picture of where our Journal is going from here. Of course, Editors are not in charge of Journal policy, which is the prerogative of the Directors; but we are entitled to suggest directions, and this is what we are doing in the following to give the community a sense of the continuing dialogue between Directors and Editors at the Journal. We shall discuss in turn the impact factor of the Journal and some issues of electronic publication.

6.1. Impact factor issues

In science, the usefulness of journals is primarily measured by their impact factors. In April 2003, Prof. Aage Sandqvist, Chairman of the A&A Board of Directors, published the following remark in the Journal:

"There is the widespread impression that Astronomy & Astrophysics has a smaller impact, as measured by citations to its articles, than some of the other major astronomy journals. This impression is apparently supported by the Journal Citation Report (JCR), which is prepared annually by the ISI Web of Knowledge; in the JCR statistics, A&A indeed shows a considerably lower impact factor than some of the other main journals in the field.

The Board of Directors of Astronomy & Astrophysics has now received information from the ISI Web of Knowledge that the impact factor statistics is seriously flawed. Owing to the short abbreviation (A&A) with which articles in Astronomy & Astrophysics are usually cited, and the possible non-uniqueness of this abbreviation among the scientific journals covered by the JCR, these are not counted. A similar situation occurred with The Astrophysical Journal, for which the three-letter abbreviation (ApJ) had been considered too challenging. After accounting for citations with ApJ, the impact factor of The Astrophysical Journal increased by more than a factor of two from 2000 to 2001.

After contacting the ISI Web of Knowledge, the Chairman of the Board of Directors was assured that the situation will be changed, and that in the future, the abbreviation A&A will be counted for the citations. In-house studies at the ISI Web of Knowledge have shown that very little confusion arises through this, and, more importantly, after accounting for these citations, the impact factor of Astronomy & Astrophysics becomes comparable to that of the other major astronomy journals."

Upon correction by ISI, the A&A impact factor for 2000 moved from 2.79 to 4.35, and the rank of A&A among 37 astronomical journals moved from 11th to 4th! For details, see Prof. Aage Sandqvist's communication in Vol. 5 of *Organizations and Strategies in Astronomy (OSA)*, Ed. A. Heck, 2004.

With such blunders by the ISI Web of Knowledge, one may wonder about the reliability of published impact factors and about the wisdom of using their data for evaluating research institutions and individual researchers. In any case, there is now good reason to believe that the A&A impact is roughly comparable to that of other major astronomy journals. Since the major journals are basically using the same pool of referees in the peer-review process, the contrary would be very surprising indeed.

Can we improve A&A's impact factor? Most likely we can, by further increasing the perceived quality of the Journal and its visibility in the global community. We must nevertheless emphasize here that because A&A publishes contributions from astronomers originating from a wide variety of countries, some of whom would otherwise have little or no access to the global exchange of information, our Journal has its own specificity and serves a purpose that can not be measured only in terms of impact factor.

6.2. Electronic-only publication of A&A?

We have mentioned earlier that we are currently witnessing a transition in scientific publishing from the printed medium to the fully electronic medium. A question that will arise soon is whether we should jump on the bandwagon and turn A&A into an electronic-only publication.

[10] By virtue of a long-standing, tacit reciprocity agreement motivated by the fact that everyone can publish for free in MNRAS.

If we are to move from our current publishing system, which works quite well, to a fully electronic Journal, there must be very good reasons for doing so. The main reason is, of course, financial: electronic-only publication is supposedly less expensive than traditional publishing. So far, however, we have not heard convincing evidence that going to electronic-only publishing would result in *considerable* savings. If we propose an institutional subscription to the on-line version of the Journal only, our publisher will of course save printing, paper, and mailing costs on these subscriptions. However, as long as the printing process cannot be entirely stopped (currently, a number of libraries require paper copies for archival purposes) the possible savings, according to our publisher, represent approximately 10% of the subscription price.

How could we save more? The national contributions to A&A and page charges pay for the peer-review, editorial work, and language editing, where we cannot save much more. Copy-editing, final layout, archiving and distribution (electronic and paper-based) are done by the publisher, which means that these operations are currently paid for by the subscriptions. We can indeed save by reducing the role of the publisher, e.g, by reducing or perhaps cutting out entirely the final copy-editing and layout. In other words, savings can possibly be made at the expense of the final articles' quality. If the authors require a truly professional-looking paper, they will need to spend more time on typographical details instead of focusing on their main competence, astrophysical research. The social consequence of such a dubious transfer of competence is not great either since it will put the efficient A&A copy editors out of work.

For even more savings, we can imagine abandoning paper archives entirely and getting rid of the publisher altogether, since the only remaining distribution will be electronic. The cost of setting up and maintaining a reliable article server must, however, be borne by someone, presumably a public research agency, and paid for (e.g., in the form of page charges). Whether this makes sense in economic and social terms remains to be seen.

We can even go a step further and ask the provocative question of whether we will need a peer-reviewed journal like A&A in the future. After all, in some communities, astro-ph has taken over the role of communicating new results. Is astro-ph not sufficient? A few aspects of a potentially very long answer to that question are as follows: many authors submit their manuscript to astro-ph, but only after it has been peer-reviewed, which shows that most researchers consider the peer-reviewing essential. People's achievements are often judged by their *refereed* papers. Certainly at present, peer-reviewing is seen as a kind of quality stamp on manuscripts, and we are here to witness that papers *are* improved in the course of the refereeing process.

But what if astro-ph is supplemented by a refereeing process, essentially in the same way as the major journals do today, so that a manuscript gets a "green tick-mark" after successfully passing the reviewing stage and being "frozen", i.e., cannot be replaced with an updated version anymore. We suspect that this is possible, although it would require a fairly large board of Editors to cope with the numbers of submissions to astro-ph, accompanied by costs that would have to be covered by someone. If this system were to replace the current journals, then one would end up with a single electronic-only astronomy journal and preprint service system. What if a paper is not passing through the refereeing stage? At present, a paper rejected by one journal can still be submitted to a second one, thus getting another chance to be published. We consider this second-chance opportunity a necessary feature for a fair peer-reviewed information flow. Hence, we would need more than one "astro-ph"-like system with different boards of editors, and this brings us back closely to a system of several electronic-only journals.

Authors and readers of a scientific article share the same interest in its high scientific and technical quality and wide availability. For economic reasons, these two interests are not easily compatible. On the one hand, astro-ph is available worldwide without charge, but manuscripts are not subject to detailed quality checks. On the other hand, the academic journals operate a peer-review system and produce a high-quality version of the accepted manuscripts at a price that leads to restricting access to these papers to the journal's subscribers – a restriction that is not in the best interest of authors. If a source of financing could be identified that would allow for the Journal to be made freely available worldwide, it would make it very attractive for authors. Before concluding that this is wishful thinking divorced from the current economic reality, we would like to point out that the cost of the publishing process (that is, operation of Editorial Offices and production of the Journal) is substantially less than 1% of the full costs of obtaining the published results when taking into account the researchers' and technicians' salaries, the development and running costs of telescopes and instruments, etc. Must one sacrifice the proven concept and tradition of the major astronomical journals for this comparatively small amount?

We have taken here the role of devil's advocate to demonstrate that issues in going electronic-only are far from being as simple and clear-cut as some open-access gurus would like us to believe. Obviously, electronic publishing is a timely and controversial issue that we will continue to consider in the coming years. The future of publication will be decided less by Boards of Directors and Editors, or by publishers, than by the community at large. With the availability of electronic-only journals, authors make their own decision on where to submit a manuscript. At present, this vote is clearly in favor of traditional journals, but as that may change we will remain open and ready to adapt.

Acknowledgements. We thank our colleagues Editors Drs. J. E. Beckman, F. Combes, A. Jones, N. Langer, W. Schmidt, S. N. Shore and C. M. Walmsley for many helpful and detailed comments on this text, as well as the members of the Board of Directors for constructive input and encouragement. It is a pleasure to thank Ms. Joli Adams for smoothing out the English.