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Editorial

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In the wake of ESO's creation in 1964, European astronomers started contemplating the possibility of establishing an international journal devoted to publishing the results of their research. At that time, the publishing situation in astronomy reflected Europe's divisions. There were a number of national journals devoted to publishing national research in their country's own language, as well as several observatory publications where the observational data were archived. After the end of World War II, frustration began running high among European astronomers because their work had very little impact outside their own countries. In stark contrast, American astronomers had already established the ApJ and AJ by the end of the 19th century as the main vectors of communication for the entire US community. The Dutch astronomer Stuart Pottasch, who with Frenchman Jean-Louis Steinberg was a major proponent of merging various national astronomy journals into a single international one, has summarized the early history of A&A in Pottasch (1999). As he clearly states, the new journal was to be run by astronomers for astronomers, and to this day, forty years later, A&A has remained faithful to this objective.

When the Board of Directors asked the Editors to publish a special issue celebrating the 40th anniversary of our Journal, the editorial team decided to take this opportunity to honor A&A authors whose work has had a strong impact in the community at large. It was then easy to decide that we would reprint forty articles in the 40th anniversary issue, and that we would ask prominent members of the global astronomical community to explain the context in which these papers appeared and the advances they have been bringing to their fields.

The next step was to choose the "best" article published each year. To this end, we asked former Editor-in-Chief James Lequeux to help the editorial team. How to define "best" turned out to be a headache as many of us focused on the best papers in their own field of research. It became clear that we would be going nowhere without an "objective" criterion to define the "best" paper of the year. The number of citations came immediately to mind as a possible quality criterion measuring the impact of a paper in the community, even though we are all aware that numerous biases skew the citation rate. Former Editor-in-Chief Harm Habing discusses examples of such biases in his contribution to this special issue, but we just could not come up with any more sensibly objective criterion in spite of this one's drawbacks.

When we obtained the list of the ten most cited A&A papers every year, we noticed that in some years (most notably the late 1980s) the most cited papers had a low number of citations in an absolute sense. It then became evident that the most transparent way to choose the special anniversary content was, quite simply, to take the papers in A&A that have the largest number of citations regardless of their publication date. This automatically introduces a bias against papers published in the last few years, although there is an outstanding exception in observational cosmology. Sadly, the new and fast-moving field of extrasolar planets had no chance, given this selection factor and the size of this research field's community, to enter the top 40 in spite of its obvious impact even outside the scientific community.

We then found ourselves confronted with an unexpected problem. A comparison of the (supposedly incomplete) SAO/NASA ADS data with ISI's citation counts showed discrepancies in the sense that the ADS citation counts were almost always higher than the ISI numbers, and sometimes considerably higher. We thus decided to use ADS as our sole source of citation rates, which has the added advantage that it can easily be checked by everyone in the community.

With this we had a simple selection method. It turned out, not surprisingly, that our selection criterion was giving an advantage to papers that are useful to a wide community of astronomers (instrument descriptions, catalog descriptions, instrument calibrations, and modeling tools used by many people) over works devoted to elucidating physical processes, which are usually read and cited by smaller groups of astronomers. This was a cause of concern among some Editors. But because our primary aim is clearly to include in the special issue results from all astronomical subfields, as we do in the Journal, we felt that the authors of the former papers deserved to be honored in exactly the same way as authors describing exciting new theoretical or observational results. Our aim of maximizing the number of research groups present in the special issue also led us to a slight departure from our original intent. As it turned out, 3 of the 40 most cited papers are devoted to the description of the XXM-Newton satellites and its instruments. We decided to reprint only the most general of these 3 papers as representative of the XMM-Newton community. Also, 2 of the 40 most cited papers are part of a series of papers devoted to stellar evolutionary tracks published by the same group, and we reprint only the most cited of these two papers. We thus reprint in this special issue 40 high-impact works representing the 43 most cited A&A papers.

The next step was to choose appropriate reviewers to write commentaries on the selected papers. The choice of commentators was made during our last editorial meeting, which took place on February 27, 2009. As it turned out, most members

of the editorial team were eager to write a commentary themselves. Many of the esteemed colleagues that we then contacted to compose commentaries were pleased to help and we thank them warmly for their participation in this anniversary issue. Their texts are always insightful and illuminating, and at times even great fun.

There is no need to reprint here the list of selected works that appears in the table of contents of this volume. A few remarks are, however, in order. A striking feature of the article selection is its diversity. Papers range from insightful theoretical studies of astrophysical processes (structure and emission properties of accretion disks, tidal effects in binaries, studies of highly energetic radiative processes, atomic data computations) to large-scale observational studies (various aspects of the Galactic structure, surveys of nearby binary stars and distant supernovae, radio surveys). Descriptions of European space telescopes and their results are prominent. Works that describe theoretical and modeling tools useful to a broad community of researchers (e.g., stellar evolution grids, stellar atmosphere models, galaxy evolution models) hold a deserved place in the list, as do the articles dedicated to calibration and data processing tools. The selection confirms the recognized strength of A&A in stellar physics and interstellar medium studies, but also shows that high-impact research in extragalactic astronomy and cosmology is published in our Journal. Ending on a more sociological comment, one notes that a few individual authors who appear on several papers obviously have a huge impact in their respective research fields. One also recognizes the tendency toward larger groups of coauthors that has developed over the past few decades. There are 6 single-authored papers among the 20 published from 1970 to 1983, but none afterwards, while works authored by large international collaborations first appear in 1996.

What is missing in the current selection of articles is solar physics, although we have been publishing high-quality works on the Sun for some time. A reason for this is probably the relatively narrow community of researchers in this field. However, it seems likely that the A&A 50th anniversary issue, if its contents are chosen in a similar way, will include high-impact solar physics work on the solar granulation. The 40th anniversary issue contains the precursor paper that paved the way to the discovery of the first extrasolar planet, and it is most likely that the 50th anniversary issue will also include papers reporting directly on planet discovery and formation, two areas in which we are currently publishing outstanding articles.

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References

Pottasch, S. R. 1999, A&A, 352, 349