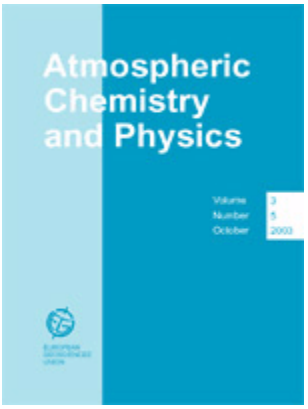
Atmospheric Chemistry & Physics

According to a recent analysis for in-cites, the journal* Atmospheric Chemistry & Physics *has entered the top 50% of journals in the field of Geosciences in the* ISI Essential Science Indicators℠ *Web product (see New Entrants). The journal's record in this field includes 440 papers cited a total of 983 times to date. Published by the Copernicus Society,* Atmospheric Chemistry & Physics *is an international and interactive science journal of the European Geosciences Union. In the interview below, Chief Executive Editor Dr. Ulrich Pöschl discusses the journal's history, goals, and citation record.

Did you expect the *Atmospheric Chemistry & Physics* to become highly cited, or is this surprising to you?

When my colleagues and I launched *Atmospheric Chemistry & Physics* (ACP) and its discussion forum *Atmospheric Chemistry & Physics Discussions* (ACPD) in 2001, we hoped and expected that our new approach to scientific publishing (interactive open access journal concept as described below and detailed on the journal website*), would enable efficient scientific exchange, attract top-quality papers, and thus ultimately lead to high citation rates. Otherwise we would not have launched a new journal.



"The interactive open access journal concept of* ACP *has been designed to foster scientific discussion, maximize the effectiveness and transparency of scientific quality assurance, enable rapid publication of new scientific results, and make scientific

Nevertheless, we were very pleased to see that ISI started to index our publications very soon after the journal launched, that the journal impact factor of ACP very quickly reached a value among the traditional top journals of our field, and that it still continues to increase.

> ***publications freely accessible."***

 **How would you account for the increased citation rate of ACP?**

The high and increasing citation rates of ACP are certainly due to multiple reasons, most of which are related to the advantages of its interactive open access journal concept (freely accessible two-stage publications with public peer review and interactive discussion as detailed on the journal website*). We think that the following aspects are most important:

1. free internet accessibility of all articles (open access publishing);
2. rapid dissemination of novel scientific results as discussion papers on the ACPD website (minimum time from submission to publication on the order of one week);
3. public documentation of the review process (quality assurance) and availability of complementary information in fully citable interactive comments from the referees, authors, and other interested scientists, which have not been publicly available in traditional scientific journals; and
4. top quality and information density of the final papers published in ACP after revision and peer review completion in view of the interactive public discussion, including referee comments like in the traditional closed peer review process plus the input from other interested scientists.

 **Was there a change in policy or editorial direction that might account for this?**

The interactive open access journal concept of ACP has been designed to foster scientific discussion, maximize the effectiveness and transparency of scientific quality assurance, enable rapid publication of new scientific results, and make scientific publications freely accessible. It has been developed by scientists for scientists, making full use of the opportunities provided by the internet and modern information technologies (advances of computer network hardware and software).

From the very beginning, the development of the interactive open access journal concept and infrastructure of ACP was based on the input, different views, and constructive discussion of top scientists from a wide range of different disciplines across the journal scope (including the Nobel Laureate Paul Crutzen), on the dynamics of an interdisciplinary scientific society (European Geosciences Union [EGU]*), and on the technological competence of an innovative scientific service provider and publisher (Copernicus Society*).

At present, the technical infrastructure of the journal (website, electronic editorial support office, production office, etc.) is undergoing continued optimization. Due to the thorough discussion and preparation of the underlying intellectual and technical concepts, however, the innovative two-stage publication process with public peer review and interactive discussion worked very well from the beginning, and no major modifications were required.

 **What historical factors have contributed to the success of ACP?**

The traditional ways of scientific publishing and peer review do not live up to the needs of efficient communication and quality assurance in today's rapidly developing and highly diverse world of science. Thus research and teaching are increasingly inhibited by a lack of scientific information density, accessibility, and reliability, and there are many good reasons for the increasing number, strength, and public recognition of initiatives and declarations aiming at worldwide open access to scientific publications (economic, educational, and scientific aspects).

Some of the most important advantages of free online availability of scientific information are the opportunities for enhanced scientific quality assurance, which are unfortunately often neglected in discussions and reports about open access publishing*.

Scientific publishing generally faces a dilemma between two important and conflicting needs to which the traditional ways of journal publishing and peer review do not and cannot live up: rapid publication and dissemination vs. thorough review and discussion of new results and ideas.

Rapid publication is required for efficient exchange of new findings, and it is widely pursued in current scientific publishing. Most successful scientific journals in physics, chemistry, and life sciences push for very short peer review times (2-4 weeks), and short papers with a lack of detailed information and scientific rigor are often treated preferentially. The legitimate quest for rapid exchange and the unfortunate trends and ambitions for ever shorter peer review, reduced article lengths, and high publication numbers entail that the scientific information market is flooded by journal articles, preprints, and proceedings with little or no quality control. Thorough review and discussion are essential for the detection and minimization of flawed and useless research activities and results, but under the given conditions they are hard to achieve and tend to be neglected.

Solutions for the dilemma of rapid scientific exchange vs. thorough quality assurance require a two-stage (or multi-stage) publication process, and efficient quality assurance in today's highly diverse world of science requires interactive forms of peer review and public discussion. Therefore, the most promising, if not the only practicable way to substantially improve mainstream scientific publishing and quality assurance on a short to medium time scale (years to decade) is the implementation of a two-stage publication process with interactive peer review and public discussion in scientific journals. To our knowledge, ACP has been the first journal in the field of natural sciences to follow this approach.

 **Have there been specific developments in the fields served by ACP that may have contributed?**

With respect to scientific publishing, the recent developments in the fields of atmospheric research and geosciences have been essentially the same as in other fields of natural sciences. The increasing demands for free accessibility and improved quality assurance of scientific publications has not been met by existing traditional journals, and have thus fuelled the foundation of innovative open access publishing initiatives.

What, in your view, is this journal's main significance or contribution in the field of Geosciences?

To our knowledge, ACP has been the first major open access journal in the field of geosciences, and it certainly has been the first journal with two-stage publications, public peer review, and interactive discussion. The achievements of ACP, including publication and citation statistics as well as the feedback from colleagues around the world, show that the opportunities and advantages of open access, public peer review, and interactive discussion are very much appreciated by authors, referees, and the scientific community. The ISI Journal Citation Report 2004 confirms that only three years after its launch, ACP was already firmly established among the top journals in the fields of environment and geosciences*.

EGU has adopted the interactive open access journal concept of ACP for all future publication activities. Over the past couple of years, three new sister journals have been launched (*Biogeosciences, Climate of the Past, Ocean Science*) and one traditional journal has been adapted to the new publishing approach (*Hydrology and Earth System Sciences*). Further EGU interactive open access journals are in preparation (*Geology, Geodesy*, etc)*.

We hope that the other EGU interactive open access journals will also soon be indexed by ISI.

How do you see your field(s) evolving in the next few years?

We expect that more and more journals and scientific publishers will provide open access to their publications. Moreover, we hope and expect that besides EGU also other publishers in the geosciences will adopt the interactive open access journal concept or similar ways of two- or multi-stage publishing with public peer review and interactive discussion.

What role do you see for your journal?

We hope and expect that ACP and its interactive open access journal concept will continue to serve as a role model for the improvement of scientific communication and quality assurance by open access publishing with public peer review and interactive discussion. Multiple scientific societies and commercial publishers in related and different fields of science, including biology, engineering, and economics, have expressed interest in adopting the interactive open access publishing concept.

Overall, ACP and the other EGU interactive open access journals demonstrate that:

(1) scientific societies indeed can and do take a lead in open access publishing with innovative techniques of manuscript processing and quality assurance;

(2)open access publishing indeed allows to enhance scientific quality assurance by interactive forms of review and discussion open to the whole scientific community;

(3)high quality open access journals indeed can be financed by modest service charges levied from the authors (sustainability of "author pays" business model for open access publishing); and

(4) two-stage (or multi-stage) publication processes with public peer review and interactive discussion indeed allow to foster scientific discussion; enhance the effectiveness and transparency of scientific quality assurance; and achieve rapid publication and dissemination of new scientific results.

Based on the experiences of ACP and the other EGU interactive open access journals and other innovative and successful open access publishing initiatives, the following measures are proposed to pave the way for substantial large-scale improvement of scholarly communication and scientific quality assurance:

(1) support open access publishing by transformation of subscription charge funds into open access service charge funds to create a more dynamic and innovative market for the exchange of scientific information;

(2) promote the implementation of two-stage (or multi-stage) publication processes with interactive forms of peer review and public discussion as new standards of scientific publishing and quality assurance; and

(3) exploit the full potential of open access and interactive public discussion to develop new and improved tools and (statistical) indicators for the assessment of the impact and quality of scientific publications.

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