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## **Collaborative Peer Review and Quality Assurance**

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- 1) The biggest and most important problem in scientific publishing is quality assurance, and the most limited resources are refereeing capacities.
- 2) A large proportion of scientific publications are careless or faulty. Spectacular cases of scientific fraud are only the tip of the iceberg; the real major problem is a flood of carelessly prepared papers, which dilute rather than generate knowledge.
- 3) The traditional forms of closed peer review and publication are insufficient for quality assurance in today's highly diverse and rapidly evolving world of science. They need to be complemented by interactive, transparent, and well-documented forms of review, publication, and discussion, which are open to the scientific community and to the public. In other words, the closed peer review needs to evolve into what may be called 'collaborative peer review.'
- 4) Open access is instrumental for improving scientific quality assurance. It enables collaborative peer review; it gives reviewers more information to work with; and it facilitates the development of improved metrics to assess the impact and quality of scientific publications.
- 5) The advantages of open access and collaborative peer review can be efficiently and flexibly combined with the strengths of traditional publishing and peer review.

Among the initiatives pursuing this approach and proving its viability, are the interactive open access journal *Atmospheric Chemistry and Physics* (ACP, [www.atmos-chem-phys.org](http://www.atmos-chem-phys.org)) and a growing number of sister journals published by the *European Geosciences Union* (EGU, [www.copernicus.org/EGU](http://www.copernicus.org/EGU)).

These journals are practicing a two-stage publication process with public peer review and interactive discussion. In the first stage, manuscripts that pass a rapid pre-screening (or access review) are immediately published as "discussion papers" on the website of the journal. They are then subject to interactive public discussion, during which the comments of designated referees, additional comments by other interested members of the scientific community, and the authors' replies are also published alongside the discussion paper. The designated referees have the option to remain anonymous, if they wish.

In the second stage, manuscript revision and peer review are completed in the same way as in traditional journals and, if accepted, final papers are published in the main journal. To provide a lasting record of review and discussion, both the discussion forum and the main journal are ISSN-registered, and every discussion paper and interactive comment remains permanently archived and individually citable.

This two-stage publication process resolves the dilemma between rapid scientific exchange and thorough quality assurance. It fosters scientific discussion, deters submission of deficient manuscripts, saves refereeing capacities, and enhances the information density in final papers. Moreover, it can be flexibly integrated in existing journals and in large scale open access publishing systems (such as [arXive.org](http://arXive.org)) – simply by adding an interactive discussion forum.