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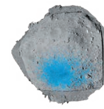

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Opening up peer review

A transparent process to publish referees' reports could benefit science, but not all researchers want their assessments made available.

When *Nature* asks experts to review manuscripts for possible publication, we promise that the reports they send back will be kept confidential. But should we? This week we publish a Comment article (page 545) that comes with a provocative challenge: more journal editors should commit to publishing peer-review reports. Doing so, the authors argue, benefits science. It puts published work in useful context and helps junior scientists to understand how review works.

Nature and the Nature research journals have long welcomed suggestions to make peer review work better for the communities we serve. In 2016, *Nature Communications* started to publish referee reports — with names removed — as long as the authors of the papers agreed.

The reaction has been instructive. For one, it demonstrated that authors in specific fields of the life sciences are more likely to welcome such openness. Take-up from those in other disciplines, including many in the physical sciences, has been much slower. In fact, *Nature Communications* lost several reliable reviewers in chemistry when the referees were told their unsigned reviews would be made public if the author opted for it. They resented not having a say in the process, and felt that their reports would have little value outside the small intended audience.

As such, *Nature* and the Nature research journals have no plans to make publishing referee reports compulsory for all. But we are actively exploring ways to offer it as a wider service in future, when readers, referees and authors say that they want the option.

The desire for transparent peer review is likely to vary across different communities as they consider the questions involved. Will reviewers shift their focus from a small audience devoted to improving a single manuscript, to persuading a broader audience of their own views of the topic? Will authors be as able to take criticism in their stride, knowing that it will be made public? Will the scientific community get confused by reading criticisms of an earlier draft that no longer apply? Will sections of peer-review reports be presented out of context by campaigners or opponents?

For a publisher, there are other issues to address. An important concern (as when publishing any critical and opinionated material) is the risk of libel in a reviewer's comments or, more commonly, the inclusion in author responses of copyrighted or sensitive third-party material that helps in the assessment of manuscripts but which cannot be made public.

Some clinical-sciences journals now routinely identify reviewers to avoid charges of conflict of interest. By contrast, many journals in the social and political sciences keep authors and reviewers secret during the review process — to encourage frank reports that are not overly awed by prestige or dismissive of under-represented groups. Such double-blind review has been an option on all Nature research journals since 2015.

Nature editors find review reports invaluable. We know that some readers would find them useful as well. We hope that the Comment piece helps to stimulate wider debate. We welcome insights and feedback on this issue from across the scientific spectrum as we continue to align our own practices with the needs of different disciplines. ■

Gravity check

Physicists are stripping uncertainty from the loosest fundamental constant — Big G.

Of the fundamental constants that rule the physical Universe, by far the most perplexing is 'Big *G*', which quantifies gravitational attraction. The highest and lowest results for *G* differ by a whopping 0.05%. That might not sound like much, but it's a maddeningly loose fit for physicists in a world that now routinely measures other constants to ten or more decimal places.

The lack of mastery of *G* is a mystery. But results reported in *Nature* this week go some way to resolving it (see page 582). The new measurements still don't pin the constant down — in fact, the paper describes two tests from the same laboratory that show a slight statistical difference in their results — but they do offer a way to do so. Because the parallel experiments were performed in the same place, physicists have a chance to narrow down the possible explanations for the discrepancies. (Not only can the set-ups be compared directly, but scientists already know, for example, that the disparities cannot be down to geographical latitude, or to differences in air density.)

Gravity is the weakest of all known forces (think of how easily a tiny fridge magnet overcomes the downward pull of a planet-sized mass). And getting cash for experiments is tough, because few outside metrology lose sleep over *G* (most applications rely on relative, rather than absolute, values of gravitational forces). But as they continue to edge towards the truth, Big *G* researchers can take inspiration from elsewhere in metrology.

The values of some fundamental constants are now so well known that the General Conference on Weights and Measures, which oversees the International System of Units (the SI system), is going to use them in new definitions of the kilogram, ampere, kelvin and mole. The kilogram will no longer be equal to the mass of a physical lump of metal kept in a vault in Paris; instead, it will be defined in terms of Planck's constant, which relates the energy of a wave to its frequency.

Narrowing down these SI constants, such that their uncertainty can now be considered zero, is a triumph of decades-long efforts by labs around the world. It's heartening that such dogged determination continues in the pursuit of Big *G*. Solving one of the most enduring conundrums of the Universe might not change the world, but it could help us to understand how it works. ■