

# What do we want?

Peer review is the cornerstone of scientific publishing. But it isn't always clear exactly what *Nature Physics* expects of its referees — let us explain.

Overseeing peer review is arguably the most important part of an editor's job. It helps ensure the scientific merits of the papers that we publish, and it is a valuable means of improving the strength and quality of submitted papers, even those that are eventually published elsewhere. Of course, it is also a vital part of the process by which we decide which papers to publish. So if we've asked you to review a paper for *Nature Physics*, what exactly do we want from you?

When a paper is submitted, the first thing the editor will do is read it and the related literature, to reach an editorial decision on whether or not its contents seem to make sufficient advance in scientific understanding or technological capability for publication in *Nature Physics*. Despite the high quality of the manuscripts we receive, only a fraction report the sort of profound advance that will eventually make it into our pages. After this first stage, about a fifth of submissions are chosen for further consideration and sent out for full peer review.

If you've been asked to review a paper for us, it is because we think that you have the expertise to assess at least one important facet of the work. Most of the papers we send out for review have many facets, including the use of different experimental techniques, numerical methods and theoretical frameworks. You needn't be an expert on all of them; we recruit as many reviewers as we feel are needed to cover all facets.

Yet it's not only your assessment of the technical strengths and weaknesses of the work that interests us, but also your opinion on how the work fits into a wider context, from your perspective of the present state of the field. Again, for this we try to obtain a broad range of outlooks: we do not think that theoretical papers should be assessed only by theoreticians, nor experimental papers solely by experimentalists; even for purely theoretical, or predominantly experimental papers we will enlist the help of both theorist and experimentalist reviewers. Indeed, science at its best happens where experiment and theory meet.

There are a number of things that we would ask you to keep in mind when

reading and preparing a report on a paper for *Nature Physics*. The first is that we are not asking you to tell us whether a paper does or doesn't belong in the journal — that decision is solely for the editors, ultimately, to make. But for us to make that decision in an informed and fair way, we need you to explain in detail what you feel are a paper's strengths and weaknesses, and in particular to explain what you consider is its contribution to the field.

So start by telling us what you think the paper is about. If you consider the central advance to be significant, why do you consider it so? If its physical insights go substantially beyond present understanding, in what ways do they do so? If, on the other hand, the paper reports a principally technical advance in capability rather than in fundamental understanding, what does that advance make possible today (or in the very near future) that we weren't able to do yesterday?

## Whatever you think about a paper, it is vital to explain to us exactly why you think it.

These sorts of questions are in some respects subjective. But, in answering them, it can be helpful to consider what your initial reaction was on first reading the paper. Did it make you think to yourself, "Wow! I didn't expect that!"; or, "Wow! That could be really useful!"; This is the kind of reaction we hope to elicit from our readers to all of the papers published in *Nature Physics*.

Whatever you think about a paper, it is vital to explain to us exactly why you think it. Your colleagues among the other reviewers may disagree with your assessment, and we do not base our decisions on a show of hands. Hence detailed critiques carry more weight in informing our decisions than terse affirmations one way or the other (in most cases we would disregard the latter, regardless of who supplied it). A further point to consider is whether the work presented in a paper is similar to what

has been done before — in such a case, please explain exactly what has been done previously and indicate where it was published.

Even among papers that do report major results, very few are so perfectly formed in the hands of their authors as to be suitable for publication with little or no revision. It is to these papers that peer review can be most valuable, and most of a reviewer's report should be in comments that the editors can pass to the authors. Occasionally there may be an issue that you feel is not appropriate to transmit to the authors but of which the editors should be aware. We do want to hear about such issues, but if they directly concern the editorial assessment of the paper, they should be incorporated, tactfully, into your comments to the authors; certainly, the overall assessment reflected in your comments to the authors should be consistent with any confidential remarks to the editors.

Ideally, the significance of every paper we publish should be clear and accessible to any physics graduate. Poor presentation alone is not sufficient reason for us to decline a paper outright, unless of course the presentation is so bad that not even a specialist can make sense of it. And, with the exception of glaring mistakes that could affect the scientific record, we do not need you to copy edit the text — we have a dedicated team of copy editors to take care of that once a paper is accepted for publication. It is, however, helpful to us (and to the authors) if you could point out parts of the text that are particularly turgid or laden with specialist jargon; even so, we would rather you concentrate on the science than be distracted by stylistic issues.

As a general rule, keep things collegial and stick to the facts. These are, after all, your peers, who could quite possibly soon be reviewing your work. The level and tone of your comments will set an example to others, and simple, dispassionate comments will more likely elicit a constructive response from authors.

Peer review is essential for maintaining the integrity of the scientific record. It's well worth the effort. And we thank all of you who make it. □