



### TABLE OF CONTENTS

●	<b>Description</b>	<b>p.1</b>
●	<b>Audience</b>	<b>p.2</b>
●	<b>Impact Factor</b>	<b>p.2</b>
●	<b>Abstracting and Indexing</b>	<b>p.2</b>
●	<b>Editorial Board</b>	<b>p.2</b>
●	<b>Guide for Authors</b>	<b>p.4</b>



ISSN: 0042-207X

### DESCRIPTION

*Vacuum* is an international rapid publications journal with a focus on short communication. All papers are peer-reviewed, with the review process for short communication geared towards very fast turnaround times. The journal also published full research papers, thematic issues and selected papers from leading conferences.

A report in *Vacuum* should represent a major advance in an area that involves a **controlled environment** at pressures of one atmosphere or below.

The scope of the journal includes:

1. **Vacuum**; original developments in vacuum pumping and instrumentation, vacuum measurement, vacuum gas dynamics, gas-surface interactions, surface treatment for UHV applications and low outgassing, vacuum melting, sintering, and vacuum metrology. Technology and solutions for large-scale facilities (e.g., particle accelerators and fusion devices). New instrumentation ( e.g., detectors and electron microscopes).
2. **Plasma science**; advances in PVD, CVD, plasma-assisted CVD, ion sources, deposition processes and analysis.
3. **Surface science**; surface engineering, surface chemistry, surface analysis, crystal growth, ion-surface interactions and etching, nanometer-scale processing, surface modification.
4. **Materials science**; novel functional or structural materials. Metals, ceramics, and polymers. Experiments, simulations, and modelling for understanding structure-property relationships. Thin films and coatings. Nanostructures and ion implantation.

The aim of the short communications is to enable researchers to rapidly share their most exciting work with their colleagues. The expected time from submission to final decision is approximately **6.4 weeks**.

#### Benefits to authors

We also provide many author benefits, such as free PDFs, a liberal copyright policy, special discounts on Elsevier publications and much more. Please click here for more information on our [author services](#).

Please see our [Guide for Authors](#) for information on article submission. If you require any further information or help, please visit our [Support Center](#)

## AUDIENCE

---

Surface Scientists, Materials Scientists.

## IMPACT FACTOR

---

2017: 2.067 © Clarivate Analytics Journal Citation Reports 2018

## ABSTRACTING AND INDEXING

---

PASCAL/CNRS  
Research Alert  
Cambridge Scientific Abstracts  
Current Contents/Physics, Chemical, & Earth Sciences  
Computer Contents  
Current Technology Index  
Engineering Index  
INSPEC  
Current Contents/Science Citation Index  
Current Contents/SciSearch Database  
Chemical Abstracts  
Current Contents/Engineering, Computing & Technology  
Scopus  
Science Citation Index

## EDITORIAL BOARD

---

### *Editor-in-Chief:*

**L.G. Hultman**, Linköping University, Linköping, Sweden

### *Editor*

**P. Eklund**, Linköping University, Linköping, Sweden

### *Special Issue Editor:*

**J.S. Colligon**, STFC Daresbury Laboratory, Warrington, Cheshire, United Kingdom

### *Associate Editors*

**O.B. Malyshev**, STFC Daresbury Laboratory, Warrington, Cheshire, United Kingdom

**P. Mayrhofer**, TU Wien, Wien, Austria

**L. Sabbatini**, Università degli Studi di Bari Aldo Moro, Bari, Italy

### *Editorial Board Member:*

**G. Abadias**, Université de Poitiers, Chasseneuil-Futuroscope, France

**M. Anderle**, Autonomous Province of Trento, Trento, Italy

**K. Baba**, Industrial Technology Center of Nagasaki, Nagasaki, Japan

**S. Baba**, Seiki University, Tokyo, Japan

**S. Baragetti**, University of Bergamo, Dalmine BG, Italy

**L. Bardos**, Uppsala University, Uppsala, Sweden

**M. Bartosik**, TU Wien, Wien, Austria

**F. Berto**, Norwegian University of Science & Technology NTNU, Trondheim, Norway

**H. Biederman**, Charles University, Praha 2, Czech Republic

**W. Dai**, Pennsylvania State University, University Park, Pennsylvania, USA

**J.L. de Segovia**, Instituto de Ciencia de Materiales de Madrid, Cantoblanco, Madrid, Spain

**Y. Du**, Central South University, Changsha, Hunan, China

**R.G. Elliman**, Australian National University, Canberra, Australian Capital Territory, Australia

**A. Erdemir**, Argonne National Laboratory, Argonne, Illinois, USA

**A. Goodyear**, The Open University, Milton Keynes, UK

**J.H. Huang**, National Tsing Hua University, Hsinchu, Taiwan

**R.E. Hurley**, Queen's University Belfast, Belfast, Northern Ireland, UK

**A. Ignatiev**, University of Houston, Houston, Texas, USA

**K. Jousten**, Physikalisch-Technische Bundesanstalt, Berlin, Germany

**D.S. Karpuzov**, University of Alberta, Edmonton, Alberta, Canada

**R. Kersevan**, CERN, Geneva 23, Switzerland  
**S. Kodambaka**, University of California at Los Angeles (UCLA), Los Angeles, California, USA  
**M.K. Lei**, Dalian University of Technology, Dalian, China  
**K. Ludwig**, Boston University, Boston, Massachusetts, USA  
**R. Miles**, Northumbria University, Newcastle Upon Tyne, UK  
**Y.K. Mishra**, University of Kiel, Kiel, Germany  
**A.Z. Moshfegh**, Sharif University of Technology, Tehran, Iran  
**D. Music**, RWTH Aachen University (RWTH), Aachen, Germany  
**J. Musil**, University of West Bohemia, Plzen, Czech Republic  
**V. Nagirnyi**, University of Tartu, Tartu, Estonia  
**H. Pedersen**, Linköping University, Linköping, Sweden  
**I. Petrov**, University of Illinois at Urbana-Champaign, Urbana, Illinois, USA  
**H. Pouraliakbar**, WorldTech Scientific Research Center (WT-SRC), Tehran, Iran  
**A. Prakash**, Intersil, A Renesas Company, Tempe, Arizona, USA  
**C. Rego**, Manchester Metropolitan University, Manchester, UK  
**A. Rossi**, Università di Cagliari, Cagliari, Italy  
**Y. Saito**, KEK Japan, Tsukuba, Japan  
**J. Šetina**, Institute of Metals and Technology, Ljubljana, Slovenia  
**F. Sharipov**, Universidade Federal do Paraná (UFPR), Curitiba, Brazil  
**L. Siller**, Newcastle University, Newcastle Upon Tyne, UK  
**C.Q. Sun**, Nanyang Technological University, Singapore, Singapore  
**Y. Tanimoto**, KEK Japan, Tsukuba, Japan  
**D. Valougeorgis**, University of Thessaly, Volos, Greece  
**H. Wang**, Texas A&M University, College Station, Texas, USA  
**M.S. Wong**, National Dong Hwa University, Hualien, Taiwan  
**V.E. Yurasova**, M.V. Lomonosov Moscow State University, Moscow, Russian Federation  
**W. Zheng**, Jilin University, Changchun City, China

## GUIDE FOR AUTHORS

---

### INTRODUCTION

*Vacuum* is an international rapid publications journal with a focus on short communication. All papers are peer-reviewed, with the review process for short communication geared towards very fast turnaround times. The journal also published full research papers, thematic issues and selected papers from leading conferences. A report in *Vacuum* should represent a major advance in an area that involves a controlled environment at pressures of one atmosphere or below.

The scope of the journal includes:

1. Vacuum; original developments in vacuum pumping and instrumentation, vacuum measurement, vacuum gas dynamics, gas-surface interactions, surface treatment for UHV applications and low outgassing, vacuum melting, sintering and vacuum metrology. Technology and solutions for large-scale facilities (e.g., particle accelerators and fusion devices). New instrumentation ( e.g., detectors and electron microscopes).
2. Plasma science; advances in PVD, CVD, plasma-assisted CVD, ion sources, deposition processes and analysis.
3. Surface science; surface engineering, surface chemistry, surface analysis, crystal growth, ion-surface interactions and etching, nanometer-scale processing, surface modification.
4. Materials science; novel functional or structural materials. Metals, ceramics, and polymers. Experiments, simulations, and modelling for understanding structure-property relationships. Thin films and coatings. Nanostructures and ion implantation.

### *Types of Paper*

*Vacuum* will consider three types of peer-reviewed manuscripts:

1. Short Communications: should have the format of a letter (main text without headings) and are intended as brief reports of significant, original and timely research results, which require rapid publication. The submitted manuscripts should be kept concise and short; the number of figures and tables should also be kept to a minimum. See below for details. In considering a manuscript for publication, particular attention will be given to the originality of the research and the desirability of speedy publication and the clarity of the presentation. The editors will aim for a rapid review process and only manuscripts that need no changes or only minor revisions will be accepted.
2. Full Research Papers: should be full reports including in-depth analysis and extensive discussion. The described research should be complete and thorough, and there are no limitations to text length or number of figures/tables, as long as they add to the understanding of the described research. Criteria for publication are completeness, novelty, and clarity. Manuscripts may be accepted after major revisions. The editors will aim to apply a thorough review process.
3. Besides these two types of manuscripts, *Vacuum* will publish reviews, thematic issues and a selection of conference papers. These contributions must have the Full Research Paper structure. Such contributions must be prepared in consultation with the special issues editor and can only be submitted after invitation by the guest editor for that issue.

### *Submission checklist*

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

#### **Ensure that the following items are present:**

One author has been designated as the corresponding author with contact details:

- E-mail address
- Full postal address

All necessary files have been uploaded:

*Manuscript:*

- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided
- Indicate clearly if color should be used for any figures in print  
*Graphical Abstracts / Highlights files* (where applicable)  
*Supplemental files* (where applicable)

#### Further considerations

- Manuscript has been 'spell checked' and 'grammar checked'
- All references mentioned in the Reference List are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including the Internet)
- A competing interests statement is provided, even if the authors have no competing interests to declare
- Journal policies detailed in this guide have been reviewed
- Referee suggestions and contact details provided, based on journal requirements

For further information, visit our [Support Center](#).

## BEFORE YOU BEGIN

### **Ethics in publishing**

Please see our information pages on [Ethics in publishing](#) and [Ethical guidelines for journal publication](#).

### **Declaration of interest**

All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double-blind) or the manuscript file (if single-blind). If there are no interests to declare then please state this: 'Declarations of interest: none'. This summary statement will be ultimately published if the article is accepted. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is important for potential interests to be declared in both places and that the information matches. [More information](#).

### **Submission declaration and verification**

Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see '[Multiple, redundant or concurrent publication](#)' for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service [Crossref Similarity Check](#).

### **Preprints**

Please note that [preprints](#) can be shared anywhere at any time, in line with Elsevier's [sharing policy](#). Sharing your preprints e.g. on a preprint server will not count as prior publication (see '[Multiple, redundant or concurrent publication](#)' for more information).

### **Use of inclusive language**

Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Articles should make no assumptions about the beliefs or commitments of any reader, should contain nothing which might imply that one individual is superior to another on the grounds of race, sex, culture or any other characteristic, and should use inclusive language throughout. Authors should ensure that writing is free from bias, for instance by using 'he or she', 'his/her' instead of 'he' or 'his', and by making use of job titles that are free of stereotyping (e.g. 'chairperson' instead of 'chairman' and 'flight attendant' instead of 'stewardess').

## Changes to authorship

Authors are expected to consider carefully the list and order of authors **before** submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only **before** the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the **corresponding author**: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors **after** the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

### *Article transfer service*

This journal is part of our Article Transfer Service. This means that if the Editor feels your article is more suitable in one of our other participating journals, then you may be asked to consider transferring the article to one of those. If you agree, your article will be transferred automatically on your behalf with no need to reformat. Please note that your article will be reviewed again by the new journal. [More information](#).

## Copyright

Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see [more information](#) on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. [Permission](#) of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has [preprinted forms](#) for use by authors in these cases.

For gold open access articles: Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' ([more information](#)). Permitted third party reuse of gold open access articles is determined by the author's choice of [user license](#).

## Author rights

As an author you (or your employer or institution) have certain rights to reuse your work. [More information](#).

### *Elsevier supports responsible sharing*

Find out how you can [share your research](#) published in Elsevier journals.

## Role of the funding source

You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

### *Funding body agreements and policies*

Elsevier has established a number of agreements with funding bodies which allow authors to comply with their funder's open access policies. Some funding bodies will reimburse the author for the gold open access publication fee. Details of [existing agreements](#) are available online.

## Open access

This journal offers authors a choice in publishing their research:

### **Subscription**

- Articles are made available to subscribers as well as developing countries and patient groups through our [universal access programs](#).

- No open access publication fee payable by authors.
- The Author is entitled to post the [accepted manuscript](#) in their institution's repository and make this public after an embargo period (known as green Open Access). The [published journal article](#) cannot be shared publicly, for example on ResearchGate or Academia.edu, to ensure the sustainability of peer-reviewed research in journal publications. The embargo period for this journal can be found below.

#### **Gold open access**

- Articles are freely available to both subscribers and the wider public with permitted reuse.
- A gold open access publication fee is payable by authors or on their behalf, e.g. by their research funder or institution.

Regardless of how you choose to publish your article, the journal will apply the same peer review criteria and acceptance standards.

For gold open access articles, permitted third party (re)use is defined by the following [Creative Commons user licenses](#):

#### *Creative Commons Attribution (CC BY)*

Lets others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

#### *Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)*

For non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

The gold open access publication fee for this journal is **USD 2200**, excluding taxes. Learn more about Elsevier's pricing policy: <https://www.elsevier.com/openaccesspricing>.

#### *Green open access*

Authors can share their research in a variety of different ways and Elsevier has a number of green open access options available. We recommend authors see our [green open access page](#) for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. [Find out more](#).

This journal has an embargo period of 24 months.

#### *Elsevier Researcher Academy*

[Researcher Academy](#) is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.

#### *Language (usage and editing services)*

Please write your text in good English. Authors must make sure that their manuscript does not have grammatical or spelling errors. If the English language of your submitted manuscript is not appropriate, your submission will not be considered for publication and will not be sent out for peer-review. Authors who feel their manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the [English Language Editing service](#) available from Elsevier's WebShop.

## **Submission**

Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable files (e.g., Word, LaTeX) are required to typeset your article for final publication. All correspondence, including notification of the Editor's decision and requests for revision, is sent by e-mail.

### *Referees*

Please submit, with the manuscript, the names, addresses and e-mail addresses of five potential referees. The referees must be independent international experts who have published recently in the field. Note that the editor retains the sole right to decide whether or not the suggested reviewers are used.

## **Additional information**

Please ensure that acronyms and their full version appear in the main text when first used, but only one of these (usually the acronym) appears in the title.

## **PREPARATION**

### **Peer review**

This journal operates a single blind review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. [More information on types of peer review.](#)

### *Use of word processing software*

It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor's options to justify text or to hyphenate words. However, do use bold face, italics, subscripts, superscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the [Guide to Publishing with Elsevier](#)). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

### *Article Structure*

Follow this order when submitting manuscripts: Title, Authors, Affiliations, Abstract, Keywords, Main text, Acknowledgements, Appendix, References, Figure Captions and then Tables. For submission via the website you are requested to import low-resolution images into the article at the approximate location you wish them to appear. Thus the PDF which is created for refereeing purposes will contain all necessary information. In addition you will be asked to separately upload high quality images. Collate acknowledgements in a separate section at the end of the article and do not include them on the title page, as a footnote to the title or otherwise.

### *Text Layout*

Use double spacing and wide (3 cm) margins. (Avoid full justification, i.e., do not use a constant right-hand margin.) Ensure that each new paragraph is clearly indicated. Present tables, figures and figure legends at the point they will appear in the manuscript. If possible, consult a recent issue of the journal to become familiar with layout and conventions. Number all pages consecutively, use 12 or 10 pt font size and standard fonts.

### **Subdivision Main Text:**

This journal accepts two different types of unsolicited manuscripts with different subdivision of text: Short Communications (Letters) and Full Research Papers.

1. Short Communications



Short Communications should be kept concise and short, the number of figures and tables should also be kept to a minimum. The main text of the manuscripts should not exceed 2,500 words, and the number of combined tables/images/figures should not exceed 5. Abstract should contain less than 150 words. The main text should not contain any headings. The main text should end with a concluding statement and optional acknowledgement.

## 2. Full Research Papers

The described research should be complete and thorough, and there are no limitations to text or number of figures/tables, as long as they add to the understanding of the described research. The main text of your article should be divided into clearly defined and numbered sections with appropriate headings (Introduction, Materials and Methods, Theory/Calculation, Results, Discussion, Conclusions). Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

### *Introduction*

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

### *Material and methods*

Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

### *Theory/calculation*

A Theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. In contrast, a Calculation section represents a practical development from a theoretical basis.

### *Results*

Results should be clear and concise.

### *Discussion*

This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

### *Conclusions*

The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

## **Essential title page information**

- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
- **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**
- **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

## **Abstract**

A self-contained abstract of up to 150 words for Short Communications (Letters) and 200 words for Full Research Papers, outlining in a single paragraph the purpose of the research, the principal results and major conclusions. An abstract is often presented separate from the article, so it must be able to stand alone. For this reason, references should be avoided, but if essential, they must be cited in full, without reference to the reference list. Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

### *Graphical abstract*

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view [Example Graphical Abstracts](#) on our information site.

Authors can make use of Elsevier's [Illustration Services](#) to ensure the best presentation of their images and in accordance with all technical requirements.

### *Highlights*

Highlights are mandatory for this journal. They consist of a short collection of bullet points that convey the core findings of the article and should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point). You can view [example Highlights](#) on our information site.

## **Keywords**

Immediately after the abstract, provide a maximum of 6 keywords, using British spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

### *Acknowledgements*

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

### *Formatting of funding sources*

List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

### *Math formulae*

Please submit math equations as editable text and not as images. Present simple formulae in line with normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y. In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by exp. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

## Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

## Units to be used in 'Vacuum'

**Pressure:** Authors are asked to use bar (bar), millibar (mbar) or the pascal (Pa).

The SI unit of pressure is the pascal (Pa), the special name for the newton per square metre (N m<sup>-2</sup>). The standard atmosphere (atm) is defined in ISO 31/111-1978 (E) as exactly 101.325 kPa. The standard atmosphere should only be used to define a reference environment and not as a pressure unit. The 'bar' has become widely used as a unit of pressure in vacuum measurement.

1 bar = 10<sup>5</sup> Pa exactly

1 millibar (mbar) = 100 Pa exactly.

Other units of pressure are sometimes to be found in published literature but their use is deprecated in ISO 31/111-1978(E) and in some countries their use is unlawful for certain purposes. A table of conversion factors for such units is given below to allow authors to change their units to pascals or millibars.

The pascal can be combined with other SI units to give the units for other quantities commonly measured in vacuum science and technology. Some examples of these quantities are given below.

**Pump speed:** Authors are asked to use cubic metre per second (m<sup>3</sup> s<sup>-1</sup>), cubic metre per hour (m<sup>3</sup> h<sup>-1</sup>), or, litre per second (l s<sup>-1</sup>).

The SI unit for volumetric rate of flow such as is used when expressing the speed of a vacuum pump is cubic metre per second (m<sup>3</sup> s<sup>-1</sup>). The speed of most mechanical pumps is expressed in terms of cubic metre per hour (m<sup>3</sup> h<sup>-1</sup>).

1 m<sup>3</sup> h<sup>-1</sup> = 1/3600 m<sup>3</sup> s<sup>-1</sup> 0.000278 m<sup>3</sup> s<sup>-1</sup>.

The speed of most high vacuum pumps such as diffusion and turbomolecular pumps is expressed in terms of liter per second (l s<sup>-1</sup>).

1 l s<sup>-1</sup> = 10<sup>-3</sup> m<sup>3</sup> s<sup>-1</sup>.

**Leak rate:** Authors are asked to use pascal metre cube per second (Pa m<sup>3</sup> s<sup>-1</sup>) or millibar litre per second (mbar l s<sup>-1</sup>).

The SI unit for leak rate is pascal metre cube per second (Pa m<sup>3</sup> s<sup>-1</sup>). Other commonly used units of leak rate with their conversion to the SI unit are given in the table.

**Outgassing rate:** Authors are asked to use pascal metre cube per second per square metre (Pa m<sup>3</sup> s<sup>-1</sup> m<sup>-2</sup>) or millibar litre per second per square centimetre (mbar l s<sup>-1</sup> cm<sup>-2</sup>).

The SI unit for outgassing rate from surfaces is pascal metre cube per second per square metre (Pa m<sup>3</sup> s<sup>-1</sup> m<sup>-2</sup>). Other commonly used units of outgassing rate with their conversion to the SI unit are given in the table.

## 1 (1) Quantity

measured in (2) Multiply by (3) Resulting number in (4) Multiply

column (3) by (5) Resulting

number in torr 133.322 Pa 0.01 mbar mm Hg 133.322 Pa 0.01 mbar micron 0.133322 Pa 0.01 mbar technical atmospheres (kgf cm<sup>-2</sup>) 98.0665 kPa 10 mbar m<sup>-3</sup> h<sup>-1</sup> 0.000278 m<sup>3</sup> s<sup>-1</sup> l s<sup>-1</sup> 0.001 m<sup>3</sup> s<sup>-1</sup> torr l s<sup>-1</sup> 0.133322 Pa m<sup>3</sup> s<sup>-1</sup> 10 mbar l s<sup>-1</sup> standard atmosphere (cm<sup>3</sup> s<sup>-1</sup>) 0.101325 Pa m<sup>3</sup> s<sup>-1</sup> 10 mbar l s<sup>-1</sup> torr l s<sup>-1</sup> cm<sup>-2</sup> 1333.22 Pa m<sup>3</sup> s<sup>-1</sup> m<sup>-2</sup> 0.001 mbar l s<sup>-1</sup> cm<sup>-2</sup> **Table of conversion factors**

## Artwork

### Electronic artwork

#### General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.

A detailed [guide on electronic artwork](#) is available.

**You are urged to visit this site; some excerpts from the detailed information are given here.**

#### Formats

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.

Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

EPS (or PDF): Vector drawings, embed all used fonts.

TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.

TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.

TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

#### Please do not:

- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

#### Color artwork

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. **For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article.** Please indicate your preference for color: in print or online only. [Further information on the preparation of electronic artwork.](#)

#### Figure captions

Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (**not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

## Tables

Ensure that each table has a caption. Supply captions separately, not attached to the table. Number tables consecutively in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

## References

#### Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

### *Web references*

As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

### *Data references*

This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

### *References in a special issue*

Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

### *Reference management software*

Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support [Citation Style Language styles](#), such as [Mendeley](#) and [Zotero](#), as well as [EndNote](#). Using the word processor plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. [More information on how to remove field codes](#).

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:

<http://open.mendeley.com/use-citation-style/vacuum>

When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.

### *Reference style*

*Text:* Indicate references by number(s) in square brackets in line with the text. The actual authors can be referred to, but the reference number(s) must always be given.

Example: '..... as demonstrated [3,6]. Barnaby and Jones [8] obtained a different result ....'

*List:* Number the references (numbers in square brackets) in the list in the order in which they appear in the text.

#### *Examples:*

Reference to a journal publication:

[1] J. van der Geer, J.A.J. Hanraads, R.A. Lupton, The art of writing a scientific article, *J. Sci. Commun.* 163 (2010) 51–59. <https://doi.org/10.1016/j.Sc.2010.00372>.

Reference to a journal publication with an article number:

[2] Van der Geer, J., Hanraads, J.A.J., Lupton, R.A., 2018. The art of writing a scientific article. *Heliyon.* 19, e00205. <https://doi.org/10.1016/j.heliyon.2018.e00205>.

Reference to a book:

[3] W. Strunk Jr., E.B. White, *The Elements of Style*, fourth ed., Longman, New York, 2000.

Reference to a chapter in an edited book:

[4] G.R. Mettam, L.B. Adams, How to prepare an electronic version of your article, in: B.S. Jones, R.Z. Smith (Eds.), *Introduction to the Electronic Age*, E-Publishing Inc., New York, 2009, pp. 281–304.

Reference to a website:

[5] Cancer Research UK, Cancer statistics reports for the UK. <http://www.cancerresearchuk.org/aboutcancer/statistics/cancerstatsreport/>, 2003 (accessed 13 March 2003).

Reference to a dataset:

[dataset] [6] M. Oguro, S. Imahiro, S. Saito, T. Nakashizuka, Mortality data for Japanese oak wilt disease and surrounding forest compositions, *Mendeley Data*, v1, 2015. <https://doi.org/10.17632/xwj98nb39r.1>.

### *Journal abbreviations source*

Journal names should be abbreviated according to the [List of Title Word Abbreviations](#).

## **Video**

Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. . In order to ensure that your video or animation material is directly usable, please provide the file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including [ScienceDirect](#). Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our [video instruction pages](#). Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

## **Data visualization**

Include interactive data visualizations in your publication and let your readers interact and engage more closely with your research. Follow the instructions [here](#) to find out about available data visualization options and how to include them with your article.

## **Supplementary material**

Supplementary material such as applications, images and sound clips, can be published with your article to enhance it. Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article and supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version.

## **Research data**

This journal encourages and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. If you are sharing data in one of these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the [research data](#) page.

### *Data linking*

If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.

There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the [database linking page](#).

For [supported data repositories](#) a repository banner will automatically appear next to your published article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

### *Mendeley Data*

This journal supports Mendeley Data, enabling you to deposit any research data (including raw and processed data, video, code, software, algorithms, protocols, and methods) associated with your manuscript in a free-to-use, open access repository. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to *Mendeley Data*. The datasets will be listed and directly accessible to readers next to your published article online.

For more information, visit the [Mendeley Data for journals page](#).

### *Data in Brief*

You have the option of converting any or all parts of your supplementary or additional raw data into one or multiple data articles, a new kind of article that houses and describes your data. Data articles ensure that your data is actively reviewed, curated, formatted, indexed, given a DOI and publicly available to all upon publication. You are encouraged to submit your article for *Data in Brief* as an additional item directly alongside the revised version of your manuscript. If your research article is accepted, your data article will automatically be transferred over to *Data in Brief* where it will be editorially reviewed and published in the open access data journal, *Data in Brief*. Please note an open access fee of 500 USD is payable for publication in *Data in Brief*. Full details can be found on the [Data in Brief website](#). Please use [this template](#) to write your Data in Brief.

### *Data statement*

To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the [Data Statement page](#).

### **Mendeley Data**

Mendeley Data is an open access, free-to-use data repository, which allows you to make available the data associated to your article, and receive extra citations. If you wish to make your data available, please visit this [link](#) to create a dataset. Your dataset will receive a reserved DOI upon creation - please notify your Journal Manager that you have created a dataset for your article, sending them the dataset DOI. Once your article is published, log in to Mendeley Data and publish your dataset. We will place links between your article and the dataset, making your data easily accessible with one click for your article readers. See the [Mendeley Data FAQ](#) for more information.

### **ORCID**

ORCID is an alphanumeric code to uniquely identify researchers. It addresses the problem that a particular author's publications can be hard to electronically recognise, since names are not unique and can be abbreviated in different ways. When an author registers with [ORCID](#) they can then link their published articles to their ORCID. Users of EVISE are given the option to link their ORCID to their consolidated user profile during registration or when updating their account information. When you submit a new manuscript and do not have an ORCID linked to your profile, you will be given the option of linking an ORCID to the submission. Co-authors of the manuscript will also receive an email after submission, giving them the chance to link their ORCID to the submission. Please note that adding an ORCID to your account or submission is optional, and is not a requirement.

## **AFTER ACCEPTANCE**

### **Online proof correction**

Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.

If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.

We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this

stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

### **Offprints**

The corresponding author will, at no cost, receive a customized [Share Link](#) providing 50 days free access to the final published version of the article on [ScienceDirect](#). The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier's [Webshop](#). Corresponding authors who have published their article gold open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

### **Additional information**

#### **Author Benefits**

*No page charges.* Publishing in Vacuum is free

#### **AUTHOR INQUIRIES**

Visit the [Elsevier Support Center](#) to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.

You can also [check the status of your submitted article](#) or find out [when your accepted article will be published](#).

© Copyright 2018 Elsevier | <https://www.elsevier.com>