



### TABLE OF CONTENTS

---

●	<b>Description</b>	<b>p.1</b>
●	<b>Impact Factor</b>	<b>p.1</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.3</b>



ISSN: 2213-1337

### DESCRIPTION

---

*Astronomy and Computing* is a peer-reviewed journal that focuses on the broad area between astronomy, computer science and information technology. The journal aims to publish the work of scientists and (software) engineers in all aspects of astronomical computing, including the collection, analysis, reduction, visualisation, preservation and dissemination of data, and the development of astronomical software and simulations. The journal covers applications for academic computer science techniques to astronomy, as well as novel applications of information technologies within astronomy.

The journal is open to a broad range of contributions about the use of computing used in astronomy. It accepts regular scientific articles and review articles, but will also consider manuscripts on new software and data releases of astronomical surveys, and "reports on practice" which describe the outcomes (positive and negative) of the practical application of informatics techniques within astronomy research and operations. In general, manuscripts should make a valuable contribution to the field and should display an appropriate familiarity with previous work in the area and alternative approaches to the same problem. Providing a sustainable link to data or source code is strongly encouraged. All manuscripts are subject to peer-review. The journal welcomes contributions on a variety of topics including:

- Scientific software engineering
- Computational infrastructure
- Computational techniques used for astrophysical simulations
- Visualization
- Data management, archives, and virtual observatory
- Data analysis, data mining and statistics
- Data processing pipeline and automated systems
- Semantics, data citation and data preservation

[Why publish in Astronomy and Computing](#)

### IMPACT FACTOR

---

2018: 2.760 © Clarivate Analytics Journal Citation Reports 2019

## ABSTRACTING AND INDEXING

---

Scopus  
Astrophysics Data System  
INSPEC

## EDITORIAL BOARD

---

### *Editor-in-Chief*

**Robert Mann**, The University of Edinburgh Institute for Astronomy, Edinburgh, United Kingdom

### *Editors*

**Alberto Accomazzi**, Harvard-Smithsonian Center for Astrophysics, Cambridge, United States

**Tamas Budavari**, Johns Hopkins University, Baltimore, United States

**Jessi Cisewski**, Yale University, New Haven, United States

**Norman Gray**, University of Glasgow, Glasgow, Scotland, United Kingdom

**Michelle Kuttel**, University of Cape Town Department of Computer Science, Rondebosch, South Africa

**Joeri van Leeuwen**, Netherlands Institute for Radio Astronomy, Dwingeloo, Netherlands

**William O'Mullane**, Large Synoptic Survey Telescope, Tucson, United States

**Stefanie Walch-Gassner**, University of Cologne, Cologne, Germany

**Andreas Wicenec**, University of Western Australia, International Centre for Radio Astronomy Research, Crawley, Australia

### *Scientific Advisory Board*

**Kirk Borne**, George Mason University, Fairfax, United States

**Sarah Bridle**, The University of Manchester, Manchester, United Kingdom

**Andrew Connolly**, University of Washington, Seattle, United States

**André Csillaghy**, University of Applied Sciences Northwestern Switzerland, Windisch, Switzerland

**Daniel Durand**, National Research Council Canada Herzberg Astronomy and Astrophysics Research Centre, Victoria, Canada

**Christopher Fluke**, Swinburne University of Technology, Hawthorn, Australia

**Robert Hanisch**, National Institute of Standards and Technology, Gaithersburg, United States

**Andy Lawrence**, The University of Edinburgh, Edinburgh, United Kingdom

**Masatoshi Ohishi**, National Astronomical Observatory of Japan Astronomy Data Center, Mitaka, Japan

**Fabio Pasian**, Astronomical Observatory of Trieste, Trieste, Italy

**Michèle Peron**, European Southern Observatory, Garching bei München, Germany

**Raymond Plante**, University of Illinois at Urbana-Champaign, Champaign, United States

**Peter Quinn**, University of Western Australia, International Centre for Radio Astronomy Research, Crawley, Australia

**Arnold Rots**, Harvard-Smithsonian Center for Astrophysics, Cambridge, United States

**Michael Wise**, Netherlands Institute for Radio Astronomy, Dwingeloo, Netherlands

## GUIDE FOR AUTHORS

---

### *Types of article*

The journal will publish papers covering all aspects of astronomical computing that make a valuable contribution to the field and that display an appropriate familiarity with previous work in the area and alternative approaches to the same problem. A variety of classes of article may satisfy these general requirements, and for some there will be additional criteria to be applied in considering whether an article is suitable for publication in the journal.

The following types of article are currently identified within the submission and refereeing process.

#### *Standard Article*

*Standard Article:* This is the most general category of paper and the one into which most papers published in the journal will fall. Articles are expected to describe an innovative piece of work in astronomical computing. This could relate to either a discrete project - a new algorithm, system or application of technique or technology - or a substantial change to an established system, such as the restructuring of a major pipeline. Examples of types of article within this category are:

(i) Software Release Papers. To be suitable for publication in the journal, these should do more than just describe a new or updated software package. They should emphasize innovative factors like the intellectual contribution represented by a new algorithm or the use of a new technology, and should make clear the ways in which the software is of significant value to the community. The editors anticipate that software releases that merit a journal publication will be professionally packaged and documented, and made available from a stable URL, preferably with the source code available in a public repository: (see section below on "Source code repositories").

(ii) Data Release Papers. These should emphasize the technical aspects of the design, development and delivery of a new dataset, and will be naturally complementary to an astronomy-focused data-release paper in another journal. As with the release of an update to a software package, it will not always be true that papers detailing subsequent data releases from a project will merit publication in the journal even if the first release did. Similarly, authors should describe the releases' value to the community and the ways in which they will adopt community standards (e.g. those of the International Virtual Observatory Alliance) for the description and publication of the data.

#### *Notes on Practice*

These articles will focus on the lessons learned in the course of an astronomical computing project, often the first (or an early) application of a particular approach or technology within the field. Their value will not rely on the project having been scientifically or technically successful, but, rather, on the usefulness to the community of the analysis of the project presented in the paper: for example, an unsuccessful project may yield a very valuable paper if it convincingly explains why a seemingly attractive choice of technology proved to be inappropriate and if it clearly identifies the characteristics of possible future projects in which the same choice is likely to prove unwise.

#### *Review Paper*

In common with review papers in existing journals, these are expected to provide a comprehensive, possibly chronological, overview of a topic in astronomical computing or of a subject from computer science or the commercial IT sector with clear applicability to astronomy. Review papers will be pedagogical in tone, and not required to present new material of their own.

Normally, unsolicited review articles will not be considered for publication in the journal. Authors with the intention to write a review article are encouraged to contact the appropriate Editor directly with a comprehensive review proposal containing the following information: proposed title, (co)-authors, abstract, concise article outline and tentative reference list. Once a review proposal is accepted, completed review articles can be submitted to the Elsevier Electronic Submission system by selecting the Article Type "Review article" on the first submission page.

#### *White Paper*

The journal may occasionally publish White Papers, which will summarise some aspect of the state of the domain or present ideas for its future. Like all other papers, these must be authoritative and well grounded in relevant expertise, but they may be expressed in a more partial, possibly even polemical, tone than would be appropriate for a Review Paper.

### *Target Article*

Over time, the literature provides a discussion of a topic, through a series of papers with differing views, but sometimes it is desirable to accelerate that debate by seeking contrasting contributions that are then published together and that thereby present a fuller coverage of an issue than would be possible in a single paper. The journal will adopt this practice by occasionally identifying a Target Article (often a paper submitted to the journal as a Standard Article, and only after consultation with the article's author) and soliciting related papers, to be published alongside. These responding papers will be shorter than usual, but must satisfy the same quality criteria as all other articles appearing in the journal.

### *Special Issues*

The journal will publish Special Issues that collect together papers resulting from a specific conference, relating to a particular major project, marking some substantial milestone or event, or which, through some other connection, comprise a coherent whole that is greater than the sum of its parts.

The editors encourage unsolicited submission of Standard Articles and Notes on Practice, but authors wishing to submit a Review Paper, a White Paper or to propose a Special Issue should contact one of the Editors of the journal or its Publisher in the first instance, as these classes of paper will only be accepted in response to an invitation from the Editorial Board. Potential Target Articles will generally be identified by the Editorial Board and related contributions solicited by them, but the board encourages authors to draw their attention to potential Target Articles, during the submission process.

### **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 conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors should complete the declaration of interest statement using [this template](#) and upload to the submission system at the Attach/Upload Files step. If there are no interests to declare, please choose: 'Declarations of interest: none' in the template. This statement will be published within the article if accepted. [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').

## Author contributions

For transparency, we encourage authors to submit an author statement file outlining their individual contributions to the paper using the relevant CRediT roles: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review & editing. Authorship statements should be formatted with the names of authors first and CRediT role(s) following. [More details and an example](#)

## 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.

## Open access

Please visit our [Open Access page](#) for more information.

*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 (American or British usage is accepted, but not a mixture of these). Authors who feel their English language 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 Author Services.

## 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.

*Submit your article*

Please submit your article via <https://www.evise.com/profile/api/navigate/ASCOM>.

*Referees*

Please submit the names and institutional e-mail addresses of several potential referees. For more details, visit our [Support site](#). Note that the editor retains the sole right to decide whether or not the suggested reviewers are used.

## 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 wordprocessing software*

A&C will also accept submissions formatted using a word-processor. It is important that the file be saved in the native format of the wordprocessor 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.

### *LaTeX*

Articles should generally be formatted in LaTeX, using the `elsarticle.cls` class with the `5p` documentclass option (in most circumstances this will allow proofs to be produced without rekeying the text), but the article submission system can cope with some other classes. The `elsarticle-template-2-harv.tex` template illustrates the use of the class in this mode. This class may already be available in your LaTeX distribution, but if not, it may be obtained, along with its documentation, at <https://www.elsevier.com/latex>, where you can also find further details about using LaTeX with Elsevier journals.

### *General advice:*

1. Figures may be inserted in the usual way using an `\includegraphics` command, at the position in the article where they are cited.
2. Be consistent. If you use a macro for a phrase, use it throughout.
3. Use standard LaTeX mark-up. Do not hardcode your own layout for e.g. section headings, but use the usual LaTeX macro for this purpose.
4. Keep it simple. Do not define macros that accomplish complicated layout. They will also make the input process complicated.

To avoid referencing errors, you should usually prepare your bibliography using BibTeX. Use the `model2-names` bibliography style; this is an author-date style, so use `\citet` for 'textual' citations (where the citation is of the form "Jones et al (2000)") and `\citep` for 'parenthetical' citations (of the form "(Jones et al, 2000)"). See the documentation of the `natbib` package for more details. Ideally, you should upload your `.bib` file as part of the article submission (note that many BibTeX reference managers allow you to extract a subset of your `.bib` file based on the article's `.aux` file). Note that this bibliography style supports both the `eprints={}` field for referring to arXiv IDs, and the `doi={}` field for citing article DOIs.

### *Article structure*

#### *Subdivision - numbered sections*

Subdivision: Divide your article into clearly defined sections and subsections using the standard `\section` and `\subsection` commands, and make cross references using `\label` and `\ref` (or the equivalent document styles and cross-referencing methods if using a word processor). Any appendices should be separated from the main body text using the `\appendix` command.

## 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.

### Highlights

Highlights are optional yet highly encouraged for this journal, as they increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: [example Highlights](#).

Highlights 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).

### Abstract

A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). 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.

### Keywords

Immediately after the abstract, provide a maximum of 6 keywords, using American 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. The journal intends to use the forthcoming [Unified Astronomy Thesaurus](#) when it is released, but until then authors should choose astronomical keywords from the [astronomy journal keywords](#) list and select computing keywords from the [ACM Computing Classification System](#). These keywords will be used for indexing purposes.

#### Abbreviations

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

#### 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.

### **Units**

Follow internationally accepted rules and conventions: use the international system of units (SI) or those recognised astronomical units recommended for use by the [IAU](#).

#### *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.

### **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.
- Ensure that color images are accessible to all, including those with impaired color vision.

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**

Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

#### **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.

##### *Reference links*

Increased discoverability of research and high quality peer review are ensured by online links to the sources cited. In order to allow us to create links to abstracting and indexing services, such as Scopus, CrossRef and PubMed, please ensure that data provided in the references are correct. Please note that incorrect surnames, journal/book titles, publication year and pagination may prevent link creation. When copying references, please be careful as they may already contain errors. Use of the DOI is highly encouraged.

A DOI is guaranteed never to change, so you can use it as a permanent link to any electronic article. An example of a citation using DOI for an article not yet in an issue is: VanDecar J.C., Russo R.M., James D.E., Ambeh W.B., Franke M. (2003). Aseismic continuation of the Lesser Antilles slab beneath northeastern Venezuela. *Journal of Geophysical Research*, <https://doi.org/10.1029/2001JB000884>. Please note the format of such citations should be in the same style as all other references in the paper.

##### *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.

##### *Source code references*

In support of transparency and reproducibility, the journal strongly encourages authors to make source code available where appropriate, especially in the case of Software Release Papers. Code should be released with an open-source licence where appropriate. A rationale should be given in the paper in cases where one or other of these is not appropriate, and should be commented on by the referee. Ideally, the code should be curated in a public source-code repository such as [bitbucket.org](https://bitbucket.org), [github.com](https://github.com), or [SourceForge](https://sourceforge.net), and the particular version described in the paper should be identifiable, and readily available for download. If no repository is available, authors should make code available through a long-term stable URL (for example using [purl.org](https://purl.org) or an institutional data repository).

We encourage authors to register their software with the Astronomy Source Code Library ASCL, which they are allowed to do pre-acceptance, i.e. when they have submitted a paper to the journal. Authors may refer to other ASCL-registered software by quoting its ASCL identifier in the run of text (for example, by writing "...this was done using Aladin ascl:1112.019, which we have used ..."). Such references are detected during the production process, and are extracted and stored with the

paper's metadata. This turns into a convenient in-text link to the software description, but does not substitute for a reference to the software in the paper's reference. Formal Citations to ASCL records are supported using the traditional reference formatting conventions and are described below in the "Source code references" section.

If there is a small amount of code associated with a paper -- perhaps because it illustrates an algorithm or demonstrates the use of a system -- then it may make little sense to create a full-scale distribution just for this purpose. In this case, code can be included inline within an article (up to a few hundred lines), or can be attached to the article as supplementary material, in the same category as additional tables, videos and images.

#### *Source code repositories*

When appropriate, authors are encouraged to cite a software package or system by adding a formal reference to the corresponding ASCL entry in the paper's reference list. This can be accomplished by using the corresponding BibTeX record for an ASCL entry in ADS or formatting the reference as described in this page: <http://ascl.net/home/getwp/351>. Please note that this provides a formal citation to the software package, in contrast to the an in-line mention of the software (for example, the text "...using the Aladin package (ascl:1112.019) ...") described above. Both techniques are supported by the journal's editorial style and the choice between a mention and a citation is left to the author.

#### *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](#). Using citation 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 from different reference management software](#).

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/astronomy-and-computing>

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

#### *Reference formatting*

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct. If you do wish to format the references yourself they should be arranged according to the following examples:

#### *Reference style*

*Text:* All citations in the text should refer to:

1. *Single author:* the author's name (without initials, unless there is ambiguity) and the year of publication;
2. *Two authors:* both authors' names and the year of publication;
3. *Three or more authors:* first author's name followed by 'et al.' and the year of publication.

Citations may be made directly (or parenthetically). Groups of references can be listed either first alphabetically, then chronologically, or vice versa.

Examples: 'as demonstrated (Allan, 2000a, 2000b, 1999; Allan and Jones, 1999).... Or, as demonstrated (Jones, 1999; Allan, 2000)... Kramer et al. (2010) have recently shown ...'

*List:* References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication.

*Examples:*

Reference to a journal publication:

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

Reference to a journal publication with an article number:

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:

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

Reference to a chapter in an edited book:

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

Reference to a website:

Cancer Research UK, 1975. Cancer statistics reports for the UK. <http://www.cancerresearchuk.org/aboutcancer/statistics/cancerstatsreport/> (accessed 13 March 2003).

Reference to a dataset:

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

*Journal abbreviations source*

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

*arXiv and NASA ADS*

Authors are allowed to upload a pre-print version of their article to arXiv and this will be linked to the record for the published journal version of the paper within NASA ADS and on ScienceDirect. All papers published in the journal will be indexed by ADS and will be findable through the traditional ADS metadata search ('Abstract Search'). Additionally, the full content of the papers will be indexed in ADS's new full-text search service, as part of ADS's ongoing collaboration with Elsevier.

Authors can submit the pre-print version of their article from arXiv, by following the standard article submission process and providing an arXiv identifier (such as 1210.8030) on the final 'attach files' page in EVISE.

## **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.

### **Inline supplementary computer code**

Elsevier now offers you the possibility to place supplementary computer code, data snippets, algorithms and other machine readable structures at the right place in your online article in reusable .txt format. This will allow readers to easily view this material in the appropriate context, and to directly copy it to the clipboard or download the original source file for testing or re-use. If you would like to have reusable "computer code" inserted into the body of your online article please indicate in your manuscript where they should be placed and number them in order of appearance, e.g. "Insert Inline Supplementary Computer Code 1 here". To support discoverability and reusability please submit these items in \*.txt format and make sure to include a descriptive title and caption that references the characteristics and the appropriate environment of this material , e.g. 'An algorithm for filtering text files in R' . For more information please visit <https://www.elsevier.com/ism>.

### **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 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](#).

### **AFTER ACCEPTANCE**

### **Online proof correction**

To ensure a fast publication process of the article, we kindly ask authors to provide us with their proof corrections within two days. 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 [Author Services](#). 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.

### **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>