DESCRIPTION

Astronomy and Computing is a peer-reviewed journal that focuses on the broad area between astronomy, computer science, software development 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 of 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 in astronomy. It encourages unsolicited submissions of regular scientific articles, of manuscripts on new software releases and data releases of astronomical surveys, and of "reports on practice" which describe the outcomes (positive and negative) of the practical application of informatics techniques within astronomy research and operations. Authors wishing instead to submit review articles, white papers and target articles, as well as ideas for special issues of the journal are expected to first contact members of the Editorial Board.

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 (and is required in the case of manuscripts on data or software releases, respectively). All manuscripts are subject to peer-review. The journal welcomes contributions on a variety of topics including:

- Astroinformatics and analytics
- Astrophysical simulations
- Astrostatistics and machine learning
- Computational infrastructure
- Data analysis and statistics
- Data curation and preservation
- Data management, archives, and virtual observatory
- Data mining
- Data processing pipelines and automated systems
- General computational techniques used for astronomy
- Scientific software engineering
- Semantics
- Visualization

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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.

Full Length Paper
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 all aspects of astronomical computing, including the collection, analysis, reduction, visualisation, preservation and dissemination of data, and the development of astronomical software and simulations. This could relate to either a discrete project - a new algorithm (if implemented in practice), a new system or application of technique or technology - or a substantial change to an established system, such as the restructuring of a major pipeline. The papers 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 impact on the community. Examples of types of article within this category are:

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 are not required to present new material of their own.

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 address a specific topic of particular interest in the target community, or collect together papers resulting from a specific conference, or relate to a particular major project, or mark 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 Full Length Papers, Software Release Papers, Data Release Papers and Notes on Practice.

Conversely, 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 are expected to be accepted in response to an invitation from the Editorial Board. In the latter case, authors are encouraged to contact the appropriate Editor directly with a comprehensive proposal containing the following information: proposed title, (co)-authors, abstract, concise article outline and tentative reference list.

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.
**Software Release Paper**

To be suitable for publication in the journal, these papers should do more than just describe a new or updated software package. They should emphasize innovative factors, and should make clear the ways in which the software is of significant value to the community. There might be a natural complementarity with symmetrical papers in a software-publishing journal. Software releases that merit a journal publication will be professionally packaged and documented, and made available from a stable URL, with the source code available in a public repository: (see section below on "Source code repositories").

**Data Release Paper**

These papers 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 value of the release to the community and the ways in which they adopt community standards (e.g. those of the International Virtual Observatory Alliance) for the description and publication of the data. Data releases that merit a journal publication will be professionally packaged and documented, and made available from a stable URL.

**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 inappropriate and if it clearly identifies the characteristics of possible future projects in which the same choice is likely to prove unwise.

**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.

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Reporting sex- and gender-based analyses

Reporting guidance

For research involving or pertaining to humans, animals or eukaryotic cells, investigators should integrate sex and gender-based analyses (SGBA) into their research design according to funder/sponsor requirements and best practices within a field. Authors should address the sex and/or gender dimensions of their research in their article. In cases where they cannot, they should discuss this as a limitation to their research's generalizability. Importantly, authors should explicitly state what definitions of sex and/or gender they are applying to enhance the precision, rigor and reproducibility of their research and to avoid ambiguity or conflation of terms and the constructs to which they refer (see Definitions section below). Authors can refer to the Sex and Gender Equity in Research (SAGER) guidelines and the SAGER guidelines checklist. These offer systematic approaches to the use and editorial review of sex and gender information in study design, data analysis, outcome reporting and research interpretation - however, please note there is no single, universally agreed-upon set of guidelines for defining sex and gender.

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4. Keep it simple. Do not define macros that accomplish complicated layout. They will also make the input process complicated.

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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.

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