

# Integrating Materials and Manufacturing Innovation

## Instructions for Authors

All submissions should use American English. As appropriate, authors are strongly encouraged to separately publish the data and code supporting their articles whenever possible. Data should be published in a publicly accessible data repository that is committed to archiving data sets indefinitely, assigns a unique and persistent digital identifier, and allows bi-directional linking between the paper and dataset. The dataset(s) are to be cited, where appropriate in the manuscript, and included in the reference list following the guidelines below. Data citation should be consistent with the Joint Declaration of Data Citation Principles (Data Citation Synthesis Group: Joint Declaration of Data Citation Principles. Martone M. (ed.) San Diego CA: FORCE11; 2014 <https://doi.org/10.25490/a97f-egyk>).

### Article Types

The journal publishes four classes of articles: Technical Articles, Brief Communications, Review Articles, and Thematic Articles.

### Technical Articles

Manuscripts should represent completed, original work embodying the tools, application, and impact of integrated computational materials engineering. Materials must be considered to have significant permanent value. In addition to technical acceptability, material should be presented clearly and concisely, and the article should not exceed 8,000 words. There are three sub-classes of Technical Publications: Case studies, Data descriptor articles, and Tools and methods articles.

*Case studies* should describe and explore the novel application of ICME tools and methodologies to a specific scientific or engineering problem. An analysis of the impact of the case study in terms of time, cost, or technological advance is highly desirable.

*Data descriptor* articles are standalone records of scientific work that present a detailed account of the methodology used to collect experimental or simulation data, a thorough description of the resulting data, and a brief discussion of the anticipated value of the data if accurately modeled, analyzed, or used in some other fashion. However, they are not intended to assess new hypotheses, provide extensive analyses of physical phenomena, or descriptions of new experimental or computational methods.

As appropriate, the authors should endeavor to address the following attributes of data quality:

- Verification – Accuracy of the computation in solving the underlying equations of the model for the quantities of interest (Applies to computational data only)
- Validation – Agreement between realizations of a model in experimental and computational or analytic results
- Uncertainty – Quantitative level of confidence in the experimental results or computational predictions
- Sensitivity – Effect of changes in inputs or assumed boundary conditions on data (Applies primarily to computational data)

Example activities that may be employed to address data quality include:

- Presentation of protocols and standards employed to ensure reliable and unbiased data production
- Experiments that support or validate the data-collection procedure

- Statistical analyses of experimental error and variation
- Characterization of the system that can link the measured data to prior studies
- Any other information needed for the peer-reviewers to assess technical rigor

*Integrating Materials and Manufacturing Innovation* requires authors to deposit the data set(s) supporting *Data descriptor* articles in a publicly-accessible data repository that is committed to archiving data sets indefinitely, assigns a unique and persistent digital identifier, and allows bi-directional linking between the paper and dataset. The dataset(s) are to be cited, where appropriate in the manuscript, and included in the reference list following the guidelines below.

**Tools and methods** articles provide a detailed record of a novel tool or method developed to enable the application of ICME to a scientific and/or engineering problem. Examples include simulation software, novel experimental techniques, software platforms for collaboration, and tools for materials data management. For simulation software, essential information to be provided includes required computational environment, steps taken for verification and validation, and protocols for interfacing with the code. Software should have a mature interface and be useable by more than experts in a specific programming language.

As appropriate, the tools and methods presented must be publicly accessible. Additionally, the data used to validate software or experimental tools should be published in a publicly accessible data repository that is committed to archiving data sets indefinitely, assigns a unique and persistent digital identifier, and allows bi-directional linking between the paper and dataset. The dataset(s) are to be cited, where appropriate in the manuscript, and included in the reference list following the guidelines below.

### **Brief Communications**

Brief communications generally take one of the following forms:

- A brief report of findings or tools that is in line with the journal's scope and of particular interest to the community.
- A substantial re-analysis of a previously published article in *Integrating Materials and Manufacturing Innovation* or in another journal.
- An article that may not cover 'standard research' but that is of general interest to the broad readership of *Integrating Materials and Manufacturing Innovation*.

A brief communication should not exceed 3,000 words, may be edited for clarity or length, and may be subject to peer review at the editors' discretion.

### **Review Articles**

Review articles are summaries of recent insights in specific research areas within the scope of *Integrating Materials and Manufacturing Innovation*. Key aims of Review articles are to provide systematic and substantial coverage of mature subjects, evaluations of progress in specified areas, and/or critical assessments of emerging technologies. Review articles should not be longer than 12,000 words.

### **Thematic Articles**

Thematic articles generally fall into the Technical Articles category but are specifically part of a named thematic collection.

## **Manuscript Submission**

Submission of a manuscript implies that the work described has not been published before; that it is not under consideration for publication anywhere else; that its publication has been approved by all co-authors, if any, as well as by the responsible authorities – tacitly or explicitly – at the institution where the work has been carried out. The publisher will not be held legally responsible should there be any claims for compensation.

## **English Language Support**

For editors and reviewers to accurately assess the work presented in your manuscript authors should ensure that the English language is of sufficient quality to be understood. If help is needed with writing in English, authors should consider obtaining assistance from a professional language editing service such as the following:

- <http://www.aje.com>
- <https://authorservices.springernature.com>

TMS members are entitled to a 15% discount with Springer Author Services. Members should first log in on [this page](#), at which point a link will be visible.

Use of a language editing service is not a requirement for publication in this journal and does not imply or guarantee that the article will be selected for peer review or accepted. If your manuscript is accepted it will be checked by copyeditors before publication.

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## **Online Submission**

Please follow the hyperlink “Submit online” on the right and upload all of your manuscript files following the instructions given on the screen.

## **Title Page**

The title page should include:

- The name(s) of the author(s)
- A concise and informative title
- The affiliation(s) and address(es) of the author(s)
- The e-mail address, telephone and fax numbers of the corresponding author

## **Abstract**

Please provide an abstract of 150 to 250 words. The abstract should not contain any undefined abbreviations or unspecified references. The abstract should not contain figures.

## **Keywords**

Please provide 4 to 6 keywords that can be used for indexing purposes.

## **Text**

### **Text Formatting**

Manuscripts should be submitted in Word.

- Use a normal, plain font (e.g., 10-point Times Roman) for text.
- Use italics for emphasis.
- Use the automatic page numbering function to number the pages.
- Do not use field functions.
- Use tab stops or other commands for indents, not the space bar.
- Use the table function, not spreadsheets, to make tables.
- Use the equation editor or MathType for equations.
- Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

Manuscripts with mathematical content can also be submitted in LaTeX format. See [here](#) for information on creating and uploading LaTeX documents. Templates are available at [LaTeX2e macro package](#). Although the full LaTeX package with source files is encouraged at the time of initial submission, the PDF file of the LaTeX submission is acceptable for peer review purposes only. LaTeX source files are required before a manuscript can be accepted.

### **Headings**

Please use no more than three levels of displayed headings.

### **Abbreviations**

Abbreviations should be defined at first mention in both the abstract and the text, and used consistently thereafter.

### **Footnotes**

Footnotes can be used to give additional information, which may include the citation of a reference included in the reference list. They should not consist solely of a reference citation, and they should never include the bibliographic details of a reference. They should also not contain any figures or tables.

Footnotes to the text are numbered consecutively; those to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data). Footnotes to the title or the authors of the article are not given reference symbols.

Always use footnotes instead of endnotes.

### **Acknowledgments**

Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be written in full.

### **Scientific style**

- Please always use internationally accepted signs and symbols for units (SI units).
- Nomenclature: Insofar as possible, authors should use systematic names similar to those used by Chemical Abstract Service or IUPAC.
- Please use the standard mathematical notation for formulae, symbols etc.:

- Italic for single letters that denote mathematical constants, variables, and unknown quantities
- Roman/upright for numerals, operators, and punctuation, and commonly defined functions or abbreviations, e.g., cos, det, e or exp, lim, log, max, min, sin, tan, d (for derivative)
- Bold for vectors, tensors, and matrices.

## References

### Citations

Reference citations in the text should be identified by numbers in square brackets. Some examples:

1. This result was later contradicted by Becker and Seligman [5].
2. This effect has been widely studied [1-3, 7].

### Reference list

The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications and unpublished works should only be mentioned in the text. Do not use footnotes or endnotes as a substitute for a reference list. The entries in the list should be numbered consecutively.

#### • Journal article

Boyce DE, Dawson PR, Miller MP (2009) The design of a software environment for organizing, sharing, and archiving materials data. *Metall Mater Trans A* 40:2301-2318.  
<https://doi.org/10.1007/s11661-009-9889-y>

Ideally, the names of all authors should be provided but the usage of “et al” in lists with more than five authors also will be accepted:

Klimeck G, McLennan M, Brophy SP et al (2008) nanoHUB.org: advancing education and research in nanotechnology. *Comput. Sci. Eng.* 10:17-23. <https://doi.org/10.1109/MCSE.2008.120>

#### • Article by DOI (before issue publication with page numbers)

Cowles B, Backman D, Dutton R (2012) Verification and validation of ICME methods and models for aerospace applications. *Integ Mater Manuf Innov.* <https://doi.org/10.1186/2193-9772-1-2>

#### • Book

Horstemeyer MF (2012) *Integrated computational materials engineering (ICME) for metals: using multiscale modeling to invigorate engineering design with science.* John Wiley & Sons, Hoboken.

#### • Book Chapter

Uchic M (2011) Serial sectioning methods for generating 3D characterization data of grain- and precipitate-scale microstructures. In: Ghosh S, Dimiduk D (eds) *Computational methods for microstructure-property relationships.* Springer, New York, pp 31-52

#### • Online document

Warren JA, Boisvert RF (2012) *Building the materials innovation infrastructure: data and standards.* National Institute of Standards and Technology, Gaithersburg, MD.  
<http://nvlpubs.nist.gov/nistpubs/ir/2012/NIST.IR.7898.pdf>. Accessed 11 February 2015

- Online dataset

Shade PA, Groeber MA, Schuren JC, Uchic MD (2013) 3D microstructure reconstruction of polycrystalline nickel micro-tension test. <http://hdl.handle.net/11115/152>. Accessed 14 May 2014

- Online database where individual datasets are not citable

American mineralogist crystal structure database (2014) Mineralogical Society of America, Chantilly, VA and the Mineralogical Association of Canada, Québec.

<http://rruff.geo.arizona.edu/AMS/amcsd.php>. Accessed 14 May 2014

- ISSN.org LTWA

If you are unsure, please use the full journal title.

For authors using EndNote, Springer provides an output style that supports the formatting of in-text citations and reference list. See link below

[ISSN.org](http://www.issn.org)

endnote style

## Tables

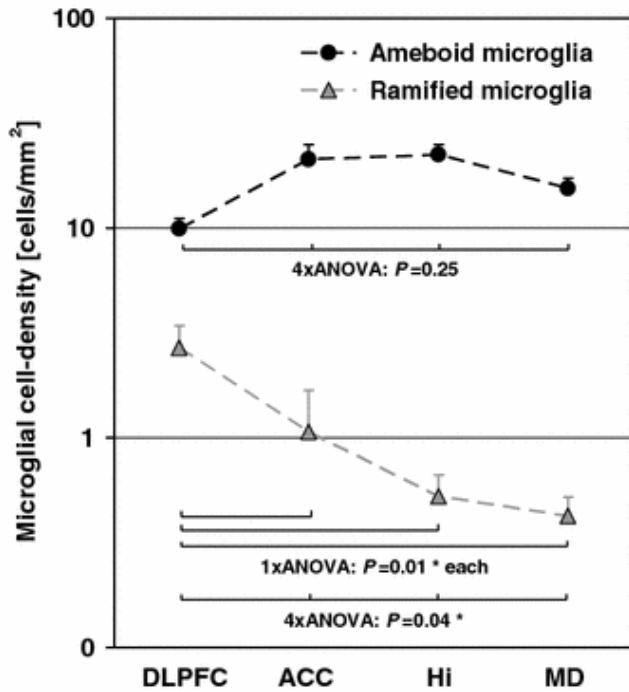
- All tables are to be numbered using Arabic numerals.
- Tables should always be cited in text in consecutive numerical order.
- For each table, please supply a table caption (title) explaining the components of the table.
- Identify any previously published material by giving the original source in the form of a reference at the end of the table caption.
- Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body.

## Artwork and Illustration Guidelines

### Electronic Figure Submission

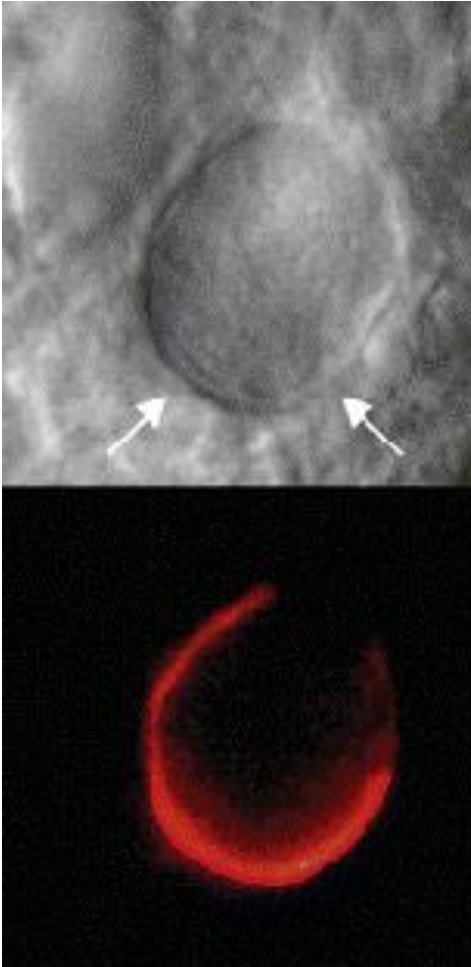
- Supply all figures electronically.
- Indicate what graphics program was used to create the artwork.
- For vector graphics, the preferred format is EPS; for halftones, please use TIFF format. MSOffice files are also acceptable.
- Vector graphics containing fonts must have the fonts embedded in the files.
- Name your figure files with "Fig" and the figure number, e.g., Fig1.eps.

## Line Art



- Definition: Black and white graphic with no shading.
- Do not use faint lines and/or lettering and check that all lines and lettering within the figures are legible at final size.
- All lines should be at least 0.1 mm (0.3 pt) wide.
- Scanned line drawings and line drawings in bitmap format should have a minimum resolution of 1200 dpi.
- Vector graphics containing fonts must have the fonts embedded in the files.

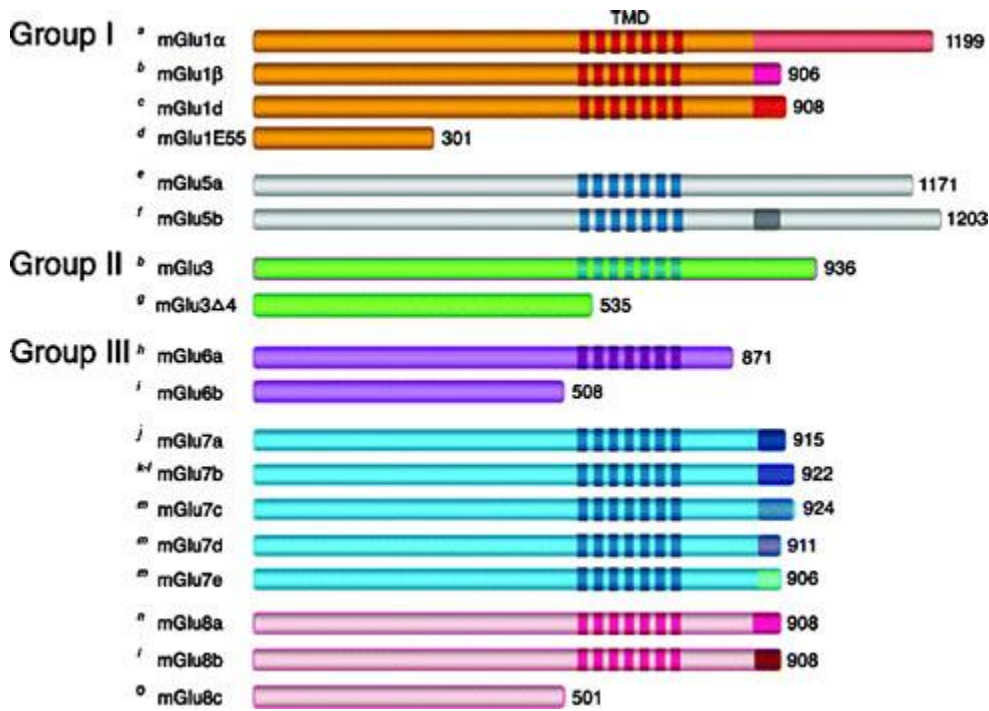
## Halftone Art



- Definition: Photographs, drawings, or paintings with fine shading, etc.
- If any magnification is used in the photographs, indicate this by using scale bars within the figures themselves.
- Halftones should have a minimum resolution of 300 dpi.



## Combination Art



- Definition: a combination of halftone and line art, e.g., halftones containing line drawing, extensive lettering, color diagrams, etc.
- Combination artwork should have a minimum resolution of 600 dpi.

## Color Art

- Color art is free of charge for online publication.
- Because only black and white will be shown in the print version, make sure that the main information will still be visible. Many colors are not distinguishable from one another when converted to black and white. A simple way to check this is to make a xerographic copy to see if the necessary distinctions between the different colors are still apparent.
- If the figures will be printed in black and white, do not refer to color in the captions.
- Color illustrations should be submitted as RGB (8 bits per channel).

## Figure Lettering

- To add lettering, it is best to use Helvetica or Arial (sans serif fonts).
- Keep lettering consistently sized throughout your final-sized artwork, usually about 2–3 mm (8–12 pt).
- Variance of type size within an illustration should be minimal, e.g., do not use 8-pt type on an axis and 20-pt type for the axis label.
- Avoid effects such as shading, outline letters, etc.
- Do not include titles or captions within your illustrations.

## Figure Numbering

- All figures are to be numbered using Arabic numerals.
- Figures should always be cited in text in consecutive numerical order.
- Figure parts should be denoted by lowercase letters (a, b, c, etc.).

- If an appendix appears in your article and it contains one or more figures, continue the consecutive numbering of the main text. Do not number the appendix figures, "A1, A2, A3, etc." Figures in online appendices (Electronic Supplementary Material) should, however, be numbered separately.

### **Figure Captions**

- Each figure should have a concise caption describing accurately what the figure depicts. Include the captions in the text file of the manuscript, not in the figure file.
- Figure captions begin with the term Fig. in bold type, followed by the figure number, also in bold type.
- No punctuation is to be included after the number, nor is any punctuation to be placed at the end of the caption.
- Identify all elements found in the figure in the figure caption; and use boxes, circles, etc., as coordinate points in graphs.
- Identify previously published material by giving the original source in the form of a reference citation at the end of the figure caption.

### **Figure Placement and Size**

- Figures should be submitted separately from the text
- When preparing your figures, size figures to fit in the column width.
- For most journals the figures should be 39 mm, 84 mm, 129 mm, or 174 mm wide and not higher than 234 mm.
- Authors can estimate an equivalent of about 100 words for each average-sized (8.5 cm wide by 8.0 cm deep) figure or table. For multi-part figures, each part should be counted as 100 words.

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If you include figures that have already been published elsewhere, you must obtain permission from the copyright owner(s) for both the print and online format. Please be aware that some publishers do not grant electronic rights for free and that Springer will not be able to refund any costs that may have occurred to receive these permissions. In such cases, material from other sources should be used.

### **Accessibility**

In order to give people of all abilities and disabilities access to the content of your figures, please make sure that

- All figures have descriptive captions (blind users could then use a text-to-speech software or a text-to-Braille hardware)
- Patterns are used instead of or in addition to colors for conveying information (colorblind users would then be able to distinguish the visual elements)
- Any figure lettering has a contrast ratio of at least 4.5:1

### **Electronic Supplementary Material**

Springer accepts electronic multimedia files (animations, movies, audio, etc.) and other supplementary files to be published online along with an article. This feature can add dimension to the author's article, as certain information cannot be printed or is more convenient in electronic form.

Submitting research datasets as electronic supplementary material is highly discouraged. Authors should read the journal's research data policy. The journal encourages research data to be archived with a persistent digital identifier in accessible data repositories wherever possible.

## **Submission**

- Supply all supplementary material in standard file formats.
- Please include in each file the following information: article title, journal name, author names; affiliation and e-mail address of the corresponding author.
- To accommodate user downloads, please keep in mind that larger-sized files may require long download times and that some users may experience other problems during downloading.

## **Audio, Video, and Animations**

- Aspect ratio: 16:9 or 4:3
- Maximum file size: 25 GB
- Minimum video duration: 1 sec
- Supported file formats: avi, wmv, mp4, mov, m2p, mp2, mpg, mpeg, flv, mxf, mts, m4v, 3gp

## **Spreadsheets**

- Spreadsheets should be converted to PDF if no interaction with the data is intended.
- If the readers should be encouraged to make their own calculations, spreadsheets should be submitted as .xls files (MS Excel).

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- Specialized format such as .pdb (chemical), .wrl (VRML), .nb (Mathematica notebook), and .tex can also be supplied.

## **Collecting Multiple Files**

- It is possible to collect multiple files in a .zip or .gz file.

## **Numbering**

- If supplying any supplementary material, the text must make specific mention of the material as a citation, similar to that of figures and tables.
- Figures with captions, tables, and text intended to publish as ESM should be identified as “Fig. S-1,” “Table S-I,” etc. and cited in the manuscript as “supplementary Fig. S-1,” “supplementary Table S-I,” etc. At first mention of the ESM within the text, include the phrase “(refer to electronic supplementary material)”.
- Name the files consecutively, e.g. “ESM\_3.mpg”, “ESM\_4.pdf”.

## **Captions**

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## **Accessibility**

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- The manuscript contains a descriptive caption for each supplementary material

- Video files do not contain anything that flashes more than three times per second (so that users prone to seizures caused by such effects are not put at risk)

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After online publication, further changes can only be made in the form of an Erratum, which will be hyperlinked to the article.

### **Online First**

The article will be published online after receipt of the corrected proofs. This is the official first publication citable with the DOI. After release of the printed version, the paper can also be cited by issue and page numbers.

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  - A single study is not split up into several parts to increase the quantity of submissions and submitted to various journals or to one journal over time (e.g. “salami-publishing”).
  - No data have been fabricated or manipulated (including images) to support your conclusions.
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  - Authors whose names appear on the submission have contributed sufficiently to the scientific work and therefore share collective responsibility and accountability for the results.

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- Requests to add or delete authors at revision stage or after publication is a serious matter and may be considered only after receipt of written approval from all authors and detailed explanation about the role/deletion of the new/deleted author. The decision on accepting the change rests with the Editor-in-Chief of the journal.
- Upon request authors should be prepared to send relevant documentation or data in order to verify the validity of the results. This could be in the form of raw data, samples, records, etc.

If there is a suspicion of misconduct, the journal will carry out an investigation following the COPE guidelines. If, after investigation, the allegation seems to raise valid concerns, the accused author will be contacted and given an opportunity to address the issue. If misconduct has been proven, this may result in the Editor-in-Chief’s implementation of the following measures, including, but not limited to:

- If the article is still under consideration, it may be rejected and returned to the author.
- If the article has already been published online, depending on the nature and severity of the infraction, either an erratum will be placed with the article or in severe cases complete retraction of the article will occur. The reason must be given in the published erratum or retraction note.
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Integrating Materials and Manufacturing Innovation

Editor-in-Chief: Ward, C.

ISSN: 2193-9764 (print version)

ISSN: 2193-9772 (electronic version)

Journal no. 40192