



## RESEARCH ARTICLE

# Template for AEJ Manuscript Submissions

First Author<sup>1,\*†</sup>, Second Author<sup>2,\*†</sup>, Third Author<sup>2</sup> and Fourth Author<sup>2,\*</sup>

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## Abstract

The Abstract (250 words maximum) should be structured to include the following details: **Background**, the context and purpose of the study; **Results**, the main findings; **Conclusions**, brief summary and potential implications. Please minimize the use of abbreviations and do not cite references in the abstract.

**Keywords:** Keyword1; keyword 2; keyword 3 (Three to five keywords representing the main content of the article)

## 1 Introduction to this Template

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This is the L<sup>A</sup>T<sub>E</sub>X template for Astronomy Education Journal journal manuscript submissions. **Please note that whilst this template provides a preview of the typeset manuscript for submission, it will not necessarily be the final publication layout.**

There are important commands in the preamble that you will need to modify for your own manuscript. If you are using this template on Overleaf, please switch the editor to Source code mode to view them; or if you prefer to stay in the Rich Text view, click on the title in the Rich Text view to display the preamble code.

Use the \journal{...} command in the preamble so that the correct journal name, logo and colours are loaded automatically. **Only certain journals and options are supported at this time;** check with your journal's editorial office if your journal is supported.

Alternatively you can re-define \jname, \jlogo and the jcolour explicitly, though check with your journal's editorial office to confirm that this is appropriate.

Specify your manuscript's category with the \papercat{...} command in the preamble.

See the sample code in the preamble for a sample of how author and affiliation information can be specified.

Use later sections starting with 'Background' on page ?? to write your manuscript. The remainder of this current section will provide some sample L<sup>A</sup>T<sub>E</sub>X code for various elements you may want to include in your manuscript.

### 1.1 Sectional Headings

You can use \section{...}, \subsection{...} commands to add more sections and subsections to your manuscript. Further sectional levels are provided by \subsubsection, \paragraph and \ subparagraph.

### 1.2 Citations and References

Use the num-refs document class option for numerical citations, and alph-refs option for author-year citations. Use the \citet command for parenthetical citations, and \citet command for text citations (when using alpha-refs). This is a citation: (?) and here are two more: (??).

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**Table 1.** An example table.

Item	Quantity	Notes
Widgets	42	Over-supplied*
Gadgets	13	Under-supplied

This is a table note.

\*Another note.

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- 48        • This is a bullet list.  
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50        • A third point.

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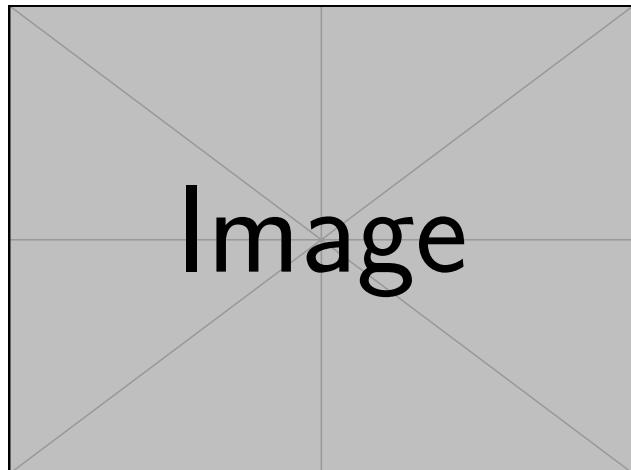
## 1.3 Figures and Tables

76        Figures and tables can be added with the usual figure and table<sup>106</sup>  
77        environments, e.g. Figure ?? and Table ?? . Use figure\* and table\*<sup>107</sup>  
78        if you need a two-column wide figure or table, as in Figure ??<sup>108</sup>  
79        and Table ?? .

80        If you have a very wide table or figure, you can use<sup>109</sup>  
81        sidewaysstable or sidewaysfigure, as in Table ?? : this will be rotated<sup>110</sup>  
82        sideways and occupy a single column on its own.

83        If your table or figure is both wide and tall (so it wouldn't<sup>111</sup>  
84        fit well in a single column with sidewaysstable or figure), you can<sup>112</sup>  
85        use table or figure inside a landscape environment for a full-page<sup>113</sup>  
86        landscaped alternative. A page break will be inserted immediately<sup>114</sup>  
87        before and after the landscape environment (Table ?? ), so<sup>115</sup>  
88        you'll need to carefully position it in a suitable location in your<sup>116</sup>  
89        manuscript.

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**Figure 1.** An example figure

## 1.4 Some Mathematics Sample

91        Let  $X_1, X_2, \dots, X_n$  be a sequence of independent and identically  
92        distributed random variables with  $E[X_i] = \mu$  and  $\text{Var}[X_i] = \sigma^2 < \infty$ ,  
93        and let

$$S_n = \frac{X_1 + X_2 + \dots + X_n}{n} = \frac{1}{n} \sum_i^n X_i \quad (1)$$

94        denote their mean. Then as  $n$  approaches infinity, the random  
95        variables  $\sqrt{n}(S_n - \mu)$  converge in distribution to a normal  $\mathcal{N}(0, \sigma^2)$ .

## 2 Background

96        The background section should be written in a way that is accessible  
97        to researchers without specialist knowledge in that area and  
98        must clearly state—and, if helpful, illustrate—the background to  
99        the research and its aims. The section should end with a brief  
100        statement of what is being reported in the article.

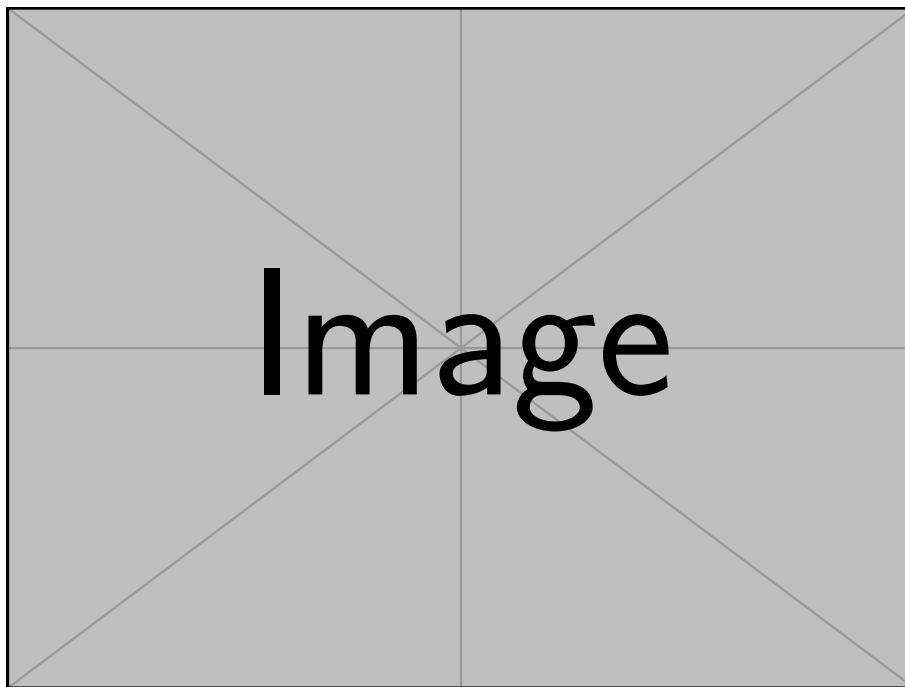
## 3 Theory

101        The theory section should highlight the underlying theoretical  
102        frameworks used in the study, and it should help guide the  
103        research design, analysis and the discussion.

## 4 Methods

104        The methods section should include the design of the study,  
105        the type of materials involved, a clear description of all comparisons,  
106        and the type of analysis used, to enable replication of the  
107        work. Ease of reproducibility is one of the key criteria on which  
108        reviewers will be asked to comment, so we strongly advocate the  
109        use of the reporting checklists recommended by the BioSharing  
110        network and workflow management systems such as Galaxy  
111        and MyExperiment and container systems such as Docker, to  
112        save the details of the methods to encourage reproducibility as  
113        well as conciseness, is also strongly encouraged. Our GigaDB  
114        repository and GigaGalaxy server can also be used to archive  
115        data, workflows and snapshots of the code with an accompanying  
116        DOI. Our GitHub page can also be used to host a dynamic  
117        forkable version of the code if the authors have not used a code  
118        repository themselves.

119        *Astronomy Education Journal* encourages and assists with  
120        the submission of detailed protocols to the open access reposi-



**Figure 2.** An example wide figure. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

124 tory [protocols.io](#). Please enter the details into protocols.io, issue<sup>154</sup>  
125 a DOI, and cite the protocols.io record from the Methods section.

126 Authors benefit greatly by posting their methods in proto<sup>155</sup>  
127 cols.io as these are in a formatted form, allow inclusion of all the<sup>156</sup>  
128 details, are fully searchable unlike supplementary files, and can<sup>157</sup>  
129 be updated to new versions as basic methodology changes over<sup>158</sup>  
130 time. Doing this saves authors extensive time in the future as<sup>159</sup>  
131 the methods do not need to be rewritten in future manuscripts<sup>160</sup>  
132 as they need only be cited.

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## 8 Potential implications

Authors should provide some additional comments about potential, more broad-ranging implications of their work that are not directly related to the current focus of their manuscript. This section is meant to promote discussion on possible ways the findings or data presented might be used in or have a relationship with other areas of research that may not be directly apparent in the work. It is not meant to provide 'proof of importance' of the work. Only to engender expansion of use to other areas.

Explicit personal opinions by the authors are permitted, but they should be made clear as such. References or related information to support the propositions should be included. These section should focus on work that can be done within the foreseeable future and specifically using the information within the manuscript, not provide speculation on how it will relate to far-reaching goals of the research area.

## 133 5 Data Description

134 A statement providing background and purpose for collection<sup>163</sup>  
135 of these data should be presented for readers without special-<sup>164</sup>  
136 ist knowledge in that area. A brief description of the protocol<sup>165</sup>  
137 for data collection, data curation and quality control, as well as<sup>166</sup>  
138 potential uses should be included, as well as outlining how the<sup>167</sup>  
139 data can be accessed if it is not deposited in our repository.

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## 170 9 Availability of source code and require- 171 ments (optional, if code is present)

Lists the following:

- Project name: e.g. My bioinformatics project
- Project home page: e.g. <http://sourceforge.net/projects/mged>
- Operating system(s): e.g. Platform independent
- Programming language: e.g. Java
- Other requirements: e.g. Java 1.3.1 or higher, Tomcat 4.0 or higher
- License: e.g. GNU GPL, FreeBSD etc. Any restrictions to use by non-academics: e.g. licence needed

This needs to be under an [Open Source Initiative](#) approved license where practicable compiled running software is made available. If the code is not hosted in a repository the [Astronomy Education Journal GitHub repository](#) is also available for this purpose.

## 140 6 Analyses

141 This section should provide details of all of the experiments and<sup>172</sup>  
142 analyses that are required to support the conclusions of the<sup>173</sup>  
143 paper. The authors should make clear the goal of each analysis<sup>174</sup>  
144 and state the basic findings.

## 145 7 Discussion

146 The discussion should spell out the major conclusions and inter-<sup>179</sup>  
147 pretations of the work, including some explanation on the im-<sup>180</sup>  
148 portance and relevance of the dataset and analysis. It should not  
149 be restatement of the analyses done and their basic conclusions.<sup>181</sup>  
150 The discussion section can end with a concluding paragraph<sup>182</sup>  
151 that clearly states the main conclusions of the research along<sup>183</sup>  
152 with directions for future work. Summary illustrations can be<sup>184</sup>  
153 included.

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**Table 2.** Automobile land speed records (GR 5-10)

Speed (mph)	Driver	Car	Engine	Date	Extra comments
407.447	Craig Breedlove	Spirit of America	GE J47	8/5/63	(Just to demo a full-width table with auto-wrapping long lines)
413.199	Tom Green	Wingfoot Express	WE J46	10/2/64	
434.22	Art Arfons	Green Monster	GE J79	10/5/64	
468.719	Craig Breedlove	Spirit of America	GE J79	10/13/64	
526.277	Craig Breedlove	Spirit of America	GE J79	10/15/65	
536.712	Art Arfons	Green Monster	GE J79	10/27/65	
555.127	Craig Breedlove	Spirit of America, Sonic 1	GE J79	11/2/65	
576.553	Art Arfons	Green Monster	GE J79	11/7/65	
600.601	Craig Breedlove	Spirit of America, Sonic 1	GE J79	11/15/65	
622.407	Gary Gabelich	Blue Flame	Rocket	10/23/70	
633.468	Richard Noble	Thrust 2	RR RG 146	10/4/83	
763.035	Andy Green	Thrust SSC	RR Spey	10/15/97	

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## 10 Availability of supporting data and materials

Astronomy Education Journal requires authors to deposit the data set(s) supporting the results reported in submitted manuscripts in a publicly-accessible data repository such as *GigaDB* (see *GigaDB* database terms of use for complete details). This section should be included when supporting data are available and must include the name of the repository and the permanent identifier or accession number and persistent hyperlinks for the data sets (if appropriate). The following format is recommended:

"The data set(s) supporting the results of this article is(are) available in the [repository name] repository, [cite unique persistent identifier]."

Following the [Joint Declaration of Data Citation Principles](#), where appropriate we ask that the data sets be cited where it is first mentioned in the manuscript, and included in the reference list. If a DOI has been issued to a dataset please always cite it using the DOI rather than the less stable URL the DOI resolves to (e.g. <http://dx.doi.org/10.5524/100044> rather than <http://gigadb.org/dataset/100044>). For more see:

Data Citation Synthesis Group: Joint Declaration of Data Citation Principles. Martone M. (ed.) San Diego CA: FORCE11; 2014 [<https://www.force11.org/datacitation>]

A list of available scientific research data repositories can be found in [res3data](#) and [BioSharing](#).

approval and have been treated in a humane manner in line with the [ARRIVE guidelines](#).

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If your manuscript does not report on or involve the use of any animal or human data or tissue, this section is not applicable to your submission. Please state "Not applicable" in this section.

### 11.3 Consent for publication

If your manuscript contains any individual person's data in any form, consent to publish must be obtained from that person, or in the case of children, their parent or legal guardian. All presentations of case reports must have consent to publish. You can use your institutional consent form. You should not send the form to us on submission, but we may request to see a copy at any stage (including after publication). Please also confirm you have followed national guidelines on data collection and release in the place the research was carried out, for example confirming you have Ministry of Science and Technology (MOST) approval in China.

If your manuscript does not contain any individual person's data, please state "Not applicable" in this section.

### 11.4 Competing Interests

All financial and non-financial competing interests must be declared in this section. See our [editorial policies](#) for a full explanation of competing interests. Where an author gives no competing interests, the listing will read 'The author(s) declare that they have no competing interests'. If you are unsure whether you or any of your co-authors have a competing interest please contact the editorial office.

### 11.5 Funding

All sources of funding for the research reported should be declared. The role of the funding body in the design of the study and collection, analysis, and interpretation of data and in writing the manuscript should be declared. Please use [FundRef](#) to report funding sources and include the award/grant number, and the name of the Principal Investigator of the grant.

## 11 Declarations

### 11.1 List of abbreviations

If abbreviations are used in the text they should be defined in the text at first use, and a list of abbreviations should be provided in alphabetical order.

### 11.2 Ethical Approval (optional)

Manuscripts reporting studies involving human participants, human data or human tissue must:

- include a statement on ethics approval and consent (even where the need for approval was waived)
- include the name of the ethics committee that approved the study and the committee's reference number if appropriate

Studies involving animals must include a statement on ethics

### 11.6 Author's Contributions

The individual contributions of authors to the manuscript should be specified in this section. Guidance and criteria for authorship

**Table 3.** Automobile land speed records (GR 5-10). This is the same table as before, but rotated sideways.

Speed (mph)	Driver	Car	Engine	Date	Extra comments
407.447	Craig Breedlove	Spirit of America	GE J47	8/5/63	(Just to demo a full-width table with auto-wrapping long lines)
413.199	Tom Green	Wingfoot Express	WE J46	10/2/64	
434.22	Art Arfons	Green Monster	GE J79	10/5/64	
468.719	Craig Breedlove	Spirit of America	GE J79	10/13/64	
526.277	Craig Breedlove	Spirit of America	GE J79	10/15/65	
536.712	Art Arfons	Green Monster	GE J79	10/27/65	
555.127	Craig Breedlove	Spirit of America, Sonic 1	GE J79	11/2/65	
576.553	Art Arfons	Green Monster	GE J79	11/7/65	
600.601	Craig Breedlove	Spirit of America, Sonic 1	GE J79	11/15/65	
622.407	Gary Gabelich	Blue Flame	Rocket	10/23/70	
633.468	Richard Noble	Thrust 2	RR RG 146	10/4/83	
763.035	Andy Green	Thrust SSC	RR Spey	10/15/97	

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can be found in our editorial policies. We would recommend you follow some kind of standardised taxonomy like the CASRAI CRediT (Contributor Roles Taxonomy).

## 12 Acknowledgements

Please acknowledge anyone who contributed towards the article who does not meet the criteria for authorship including anyone who provided professional writing services or materials.

Authors should obtain permission to acknowledge from all those mentioned in the Acknowledgements section. If you do not have anyone to acknowledge, please write "Not applicable" in this section.

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You may choose to use this section to include any relevant information about the author(s) that may aid the reader's interpretation of the article, and understand the standpoint of the author(s). This may include details about the authors' qualifications, current positions they hold at institutions or societies, or any other relevant background information. Please refer to authors using their initials. Note this section should not be used to describe any competing interests.

**Table 4.** Automobile land speed records (CR 5-10). This is again the same table as before, but on a landscaped page. Note that a hard page break is inserted immediately before and after 1 landscape, so you'll need to carefully position such an environment at a suitable location in your manuscript!

Speed (mph)	Driver	Car	Engine	Date	Extra comments
407.447	Craig Breedlove	Spirit of America	GE J47	8/5/63	
413.199	Tom Green	Wingfoot Express	WE J46	10/2/64	(Just to demo a full-width table with auto-wrapping long lines)
434.22	Art Arfons	Green Monster	GE J79	10/5/64	
468.719	Craig Breedlove	Spirit of America	GE J79	10/13/64	
526.277	Craig Breedlove	Spirit of America	GE J79	10/15/65	
536.712	Art Arfons	Green Monster	CE J79	10/27/65	
555.127	Craig Breedlove	Spirit of America, Sonic 1	GE J79	11/2/65	
576.553	Art Arfons	Green Monster	GE J79	11/7/65	
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633.468	Richard Noble	Thrust 2	RR RG 146	10/4/83	
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