

**Put your title here—the whole long thing; short title goes in square brackets and is a shortened version**

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## ABSTRACT

WRITE THIS LAST This example manuscript is intended to serve as a tutorial and template for authors to use when writing their own APJ Journal articles. The manuscript includes a history of AASTeX and includes figure and table examples to illustrate these features. Information on features not explicitly mentioned in the article can be viewed in the manuscript comments or more extensive online documentation. Authors are welcome to replace the text, tables, figures, and bibliography with their own and submit the resulting manuscript to the AAS Journals peer review system. The first lesson in the tutorial is to remind authors that the AAS Journals, the Astrophysical Journal (ApJ), the Astrophysical Journal Letters (ApJL), the Astronomical Journal (AJ), and the Planetary Science Journal (PSJ) all have a 250 word limit for the abstract<sup>a)</sup>. If you exceed this length the Editorial office will ask you to shorten it.

**Keywords:** Example: planets and satellites: detection, – stars: low-mass – techniques: image processing, photometric – methods: data analysis

## 1. INTRODUCTION

Write this almost last—just before the abstract.

What goes here? The overall background situation in the field BEFORE your results. You can put dummy text in here as you're inspired to do so—for example:

[Here is a paragraph on what accretion disks are!]

[Don't forget to write something about white dwarfs!]

[Write something about LSST/Rubin here!]

Once you actually have an introduction (late in the paper writing process!!), make sure you have all the important citations in here. Check with your advisor(s), and previous papers from the group, besides the few papers you probably know well. See below for how to insert citations in LaTeX.

All papers should start with an Introduction section, which sets the work in context, cites relevant earlier studies in the field by Fournier (1901), and describes the problem the authors aim to solve (e.g. Van Dijk 1902). Multiple citations can be joined in a simple way like De Laguarde (1903); De la Guarde (1904).

## 2. METHODS, OBSERVATIONS, SIMULATIONS ETC.

You might write this section first, if, for example, you are waiting for results to finish from a large scale simulation—if you are in that situation, start by writing what you did. How did you set up your simulations? Or what observations did you make? How did you select the observations you are using (especially if archival)? You might need to write a bunch of equations in here, so see the subsection Section 2.1 below for how to LaTeX that up. You will often want to split this part up into subsections.

BUT: if you can, write your results section (next) FIRST. It makes it easier to write your methods, since that means you can target what you need to write based on what results you've decided are important to include.

### 2.1. Math

Simple mathematics can be inserted into the flow of the text e.g.  $2 \times 3 = 6$  or  $v = 220 \text{ km s}^{-1}$ , but more complicated expressions should be entered as a numbered equation:

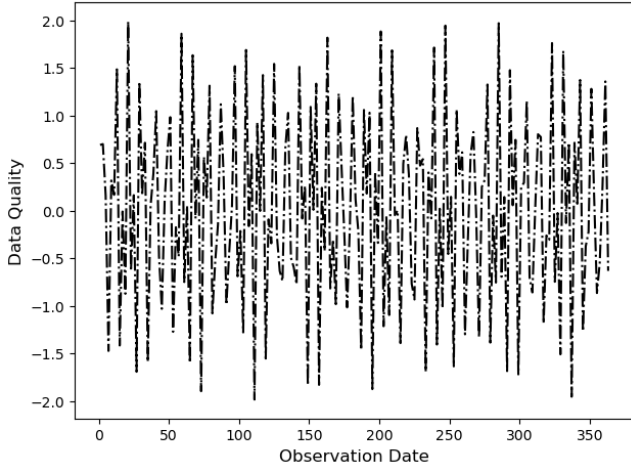
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}. \quad (1)$$

Refer back to them as e.g. equation (1).

## 3. RESULTS

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<sup>a)</sup> Abstracts for Research Notes of the American Astronomical Society (RNAAS) are limited to 150 words



**Figure 1.** This is an example figure. Captions appear below each figure. Give enough detail for the reader to understand what they’re looking at, but leave detailed discussion to the main body of the text.

**Table 1.** This is an example table. Captions appear above each table. Remember to define the quantities, symbols and units used.

A	B	C	D
1	2	3	4
2	4	6	8
3	5	7	9

WRITE THIS FIRST (unless you’re waiting on simulation outputs, then go up to Methods first)!

What did you find? Ideally, start with your figures (probably graphs, possibly images). What is on the horizontal axis? What is on the vertical axis? What patterns do you see in your plots? Are there particular values ( $1 M_{\odot}$ ) or clusters of points you want to highlight? Those are probably your captions.

Then, you have to write about the big picture of your results. Look, I found 10 flaring AGN! Or I found a new torque formula! Or... what did you FIND? That goes here, supplemented with Figures & Tables.

### 3.1. Figures and tables

Figures and tables should be placed at logical positions in the text. Don’t worry about the exact layout, which will be handled by the publishers.

Figures are referred to as e.g. Fig. 1, and tables as e.g. Table 1.

## 4. DISCUSSION

Write this after Results and usually after Methods, but BEFORE the Introduction and Conclusions (if applicable): What does it mean that you found a new torque formula, or 10 flaring AGN? Why do we care? What are the caveats?

What are some implications for this field and others? What might you do next?

## 5. CONCLUSIONS

The last numbered section should briefly summarise what has been done, and describe the final conclusions which the authors draw from their work.

The MNRAS template says it all for this section—write this before the Introduction & Abstract, but after everything else. Sometimes it’s appropriate to combine this section with Discussion and it doesn’t need to be broken out separately.

## ACKNOWLEDGMENTS

*Science is cool, here’s how we funded it...*

*Software Used:* This research made use of Python (van Rossum 1995), Astroquery (Ginsburg et al. 2019), Scipy (Virtanen et al. 2020), Numpy (Oliphant 2006), Matplotlib (Hunter 2007), and Astropy (Price-Whelan et al. 2018).

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