



# SAVE THE CODE?

## WHAT TO DO WITH SHORT RESEARCH CODES

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# ABSTRACT

Many codes used for astronomy research are short -- less than 200 lines. They are typically developed, initially, by a single scientist for a single paper, and are not considered to be part of a larger software development project. Should these codes be kept private? Should they be developed with version control? Should they be explicitly cited in papers? Should they be made available to referees, readers, granting organizations, the public that paid to have the code developed, or publicly released? Should they be licensed? Should they be archived in the interest transparency or future use? Potential answers to these questions are discussed, in particular as they relate to the Astrophysics Source Code Library (ASCL; [ascl.net](http://ascl.net)).

# WHAT IS A SHORT CODE?

- Project Code
  - Write a separate paper about them
  - Create a web site or publicize GitHub repo's
  - Submit them to the ASCL
- Long Code ( $> 200$  lines)
  - Mention in the paper, submit them to the ASCL, make them available
- Short Code ( $< 200$  lines)
  - Pretend they don't exist?

# WHAT IS A SHORT CODE?

- Less than 200 lines
- You wrote it
- It significantly enabled the publication of a refereed paper
  - Might be a subroutine
- It is novel and might enable the publications of other papers

# WHAT IS **NOT** A SHORT CODE?

- 10 lines or less
  - Or its just infrastructure
- Does not directly support a paper
- Straightforward test of public knowledge
- Straightforward test of an equation in the paper
- Straightforward plotting routine of an equation in the paper

# WHY SAVE A SHORT CODE?

- Falsifiability
- Transparency
- Reproducibility
- Enabling future research
- Getting credit for your own work products
  - Sometimes intermediate methods are more important than final results



# WHY SAVE A SHORT CODE?

- Papers typically do not have a venue for all important details
  - Scientific details
  - Numerical details
- Scientists forget these details
  - In time
  - With death

## HOW SAVE A SHORT CODE?

- **Best:** Submitted like a Figure, published like an appendix (example)
- **Good:** By making it available as a paper supplement (e.g. Nature)
- **Good:** By submitting it to the ASCL
- **OK:** By including a link to a development page (like GitHub)
- **OK:** By creating a local web page
  - And documenting where they can be found
- **Minimal:** By not deleting them
  - Example: copy to Google Drive and share with a co-worker



## WHEN SHOULD I SAVE A SHORT CODE?

- As you code, keep track of important versions
- Prepare final version just before paper submission
- Note the version number and save date
- Submit it to the journal with your paper

## QUESTIONS: SHORT CODES AND IDEAL SCIENCE

- Should I generate a DOI for each short code?
  - Our answer: no.
- As referee, should I demand to see short codes?
  - Our answer: yes.
- As an editor, should I demand that short codes be submitted like Figures?
  - Our answer: yes.
- Should I make my short code available to the ASCL or the ADS?
  - Our answer: typically, yes.

# COMPLAINTS DEPARTMENT

- “I write messy code and don’t have time to beautify it.”
- “I don’t have time to put in comments .”
- “Nobody does this.”
- “This short code won’t run on its own.”
- “My co-authors don’t want the bother.”
- “The journal editor says that this is not necessary.”

SAVE SHORT CODES: EWASS 2017

# SUMMARY & KEY POINTS

- Short codes can be vitally important
  - Yet we never see them -> science is less falsifiable
  - **Let's reverse this**
- Submit your important short codes
  - With your papers like Figures /OR/
  - To the ASCL (at [ascl.net](http://ascl.net))
  - **Science, as a whole, will be stronger**