Discussions will take place on our discord channel
“how-to-better-describe-software-for-discovery-and-citation”
Where you can also find a link to the slides

Peter Teuben (UMD)
Alice Allen (UMD)
Bruce Berriman (Caltech)

B10-129

How to better describe software for discovery and citation

“Software Metadata”

Discussion Items "how to better describe..."

1. Why this session? (Peter) [5 min]
2. Citing Montage (Bruce) [10 min]
3. Generating codemeta.json and CITATION.cff files from ASCL (Alice) [10 min]
4. Licensing metadata: B10-133 summary (Yan) [5 min]
5. New metadata items? (Peter) [5 min]
6. UAT to describe software (Peter/Katie) [5 min]
7. Use a niche science meeting to do a software census (Peter) [5 min]

8. AOB - open floor (All) [45 min]

Discussion in Discord after each item

1. Why this session?

- How can you - software writers - ensure your software is found and properly cited?
- Rely on registry in ASCL and/or Zenodo? [**P9-103** Mavuram poster]
- Find in ADS?
- Rely on a noisy google?
- Spaans presentation https://zenodo.org/record/2558482 “making software findable….”
- Example: Citing Montage

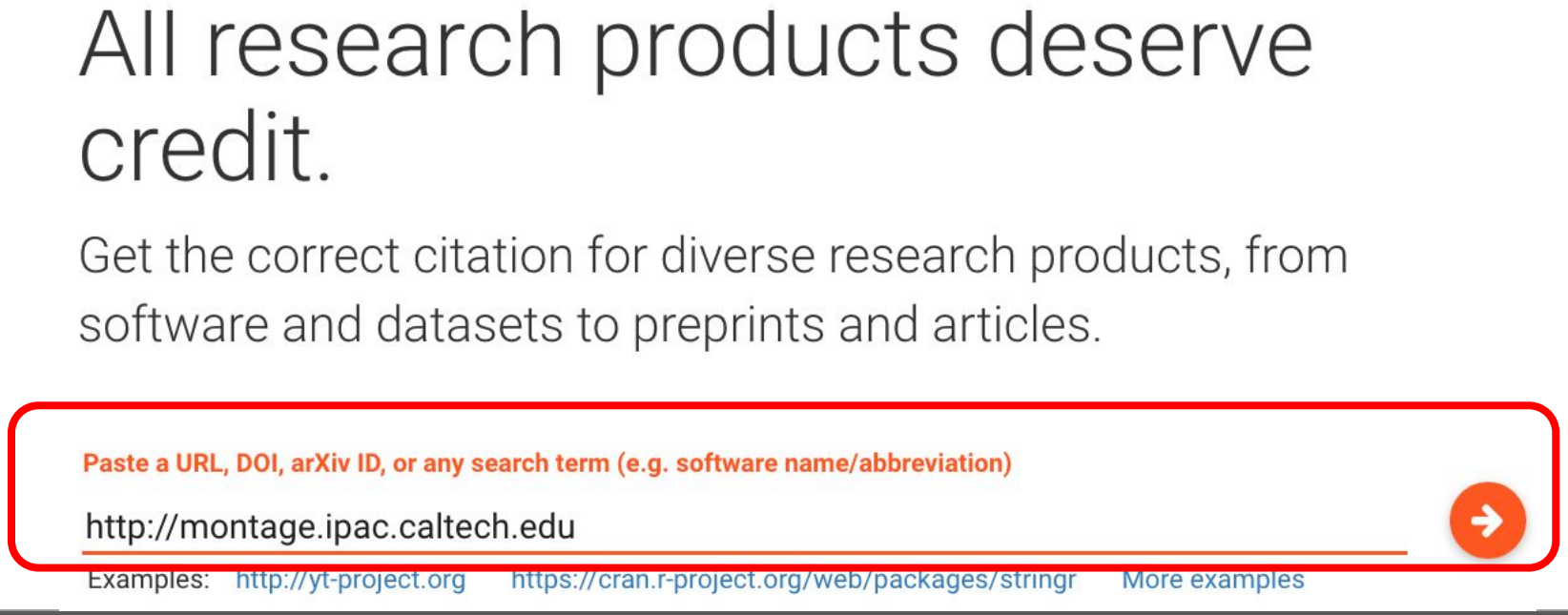
2. Citing Montage
http://montage.ipac.caltech.edu

G. Bruce Berriman

(Caltech/IPAC-NExScI)

Using the CiteAs tool

https://citeas.org



What It Returned...

CiteAs[1] alpha

About API

Montage

view website

American Psychological Association 6th edition

Software, C. (2014). Montage. GitHub repository. Retrieved from https://github.com/Caltech-IPAC/Montage

COPY DOWNLOAD

Modify view in API Results not as expected?

Citation Provenance (learn more)

✔ Looking in the user input, we found a link to a webpage
http://montage.ipac.caltech.edu

✖ Looking in the webpage, we didn't find a link to a cite-as relation header

✖ Looking in the webpage, we didn't find a DOI.
DOI API response

✖ Looking in the webpage, we didn't find ArXiv page

Looking in the webpage, we found a link to a

✔ GitHub repository main page

https://github.com/Caltech-IPAC/Montage

✖ Looking in the GitHub repository main page, we didn't find a DOI.

DOI API response

✖ Looking in the GitHub repository main page, we didn't find

CodeMeta file

✖ Looking in the GitHub repository main page, we didn't find a link to a

CITATION file

Looking in the GitHub repository main page, we found a link to a

✔ README file

https://raw.githubusercontent.com/Caltech-IPAC/Montage/master/README.md

✖ Looking in the README file, we didn't find a DOI.
DOI API response

✖ Looking in the GitHub repository main page, we didn't find a link to a
R DESCRIPTION file

✔ Looking in the GitHub repository main page, we found a link to a
GitHub repository API response
https://api.github.com/repos/Caltech-IPAC/Montage (primary source), https://api.github.com/users/Caltech-IPAC (author source)

✔ Parsing the GitHub repository API response, we found
The citation metadata

… and so

What are the recommended best practices for software providers?

3. Creating software metadata files from ASCL entries

Alice Allen

Astrophysics Source Code Library (ascl.net)

Metadata files

codemeta.json

CITATION.cff

Metadata files on demand!

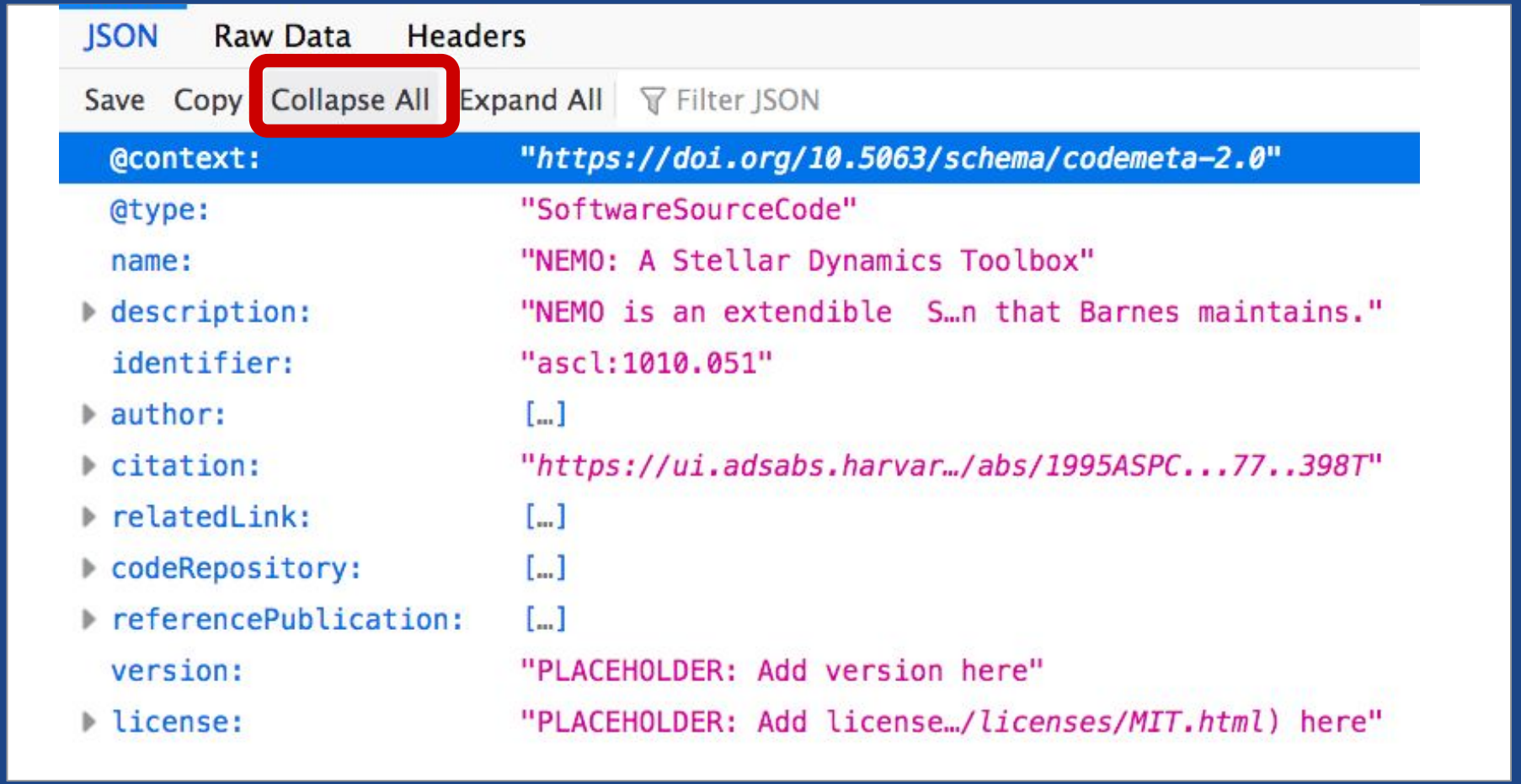
Add */codemeta.json* or */CITATION.cff* to ASCL entry URL

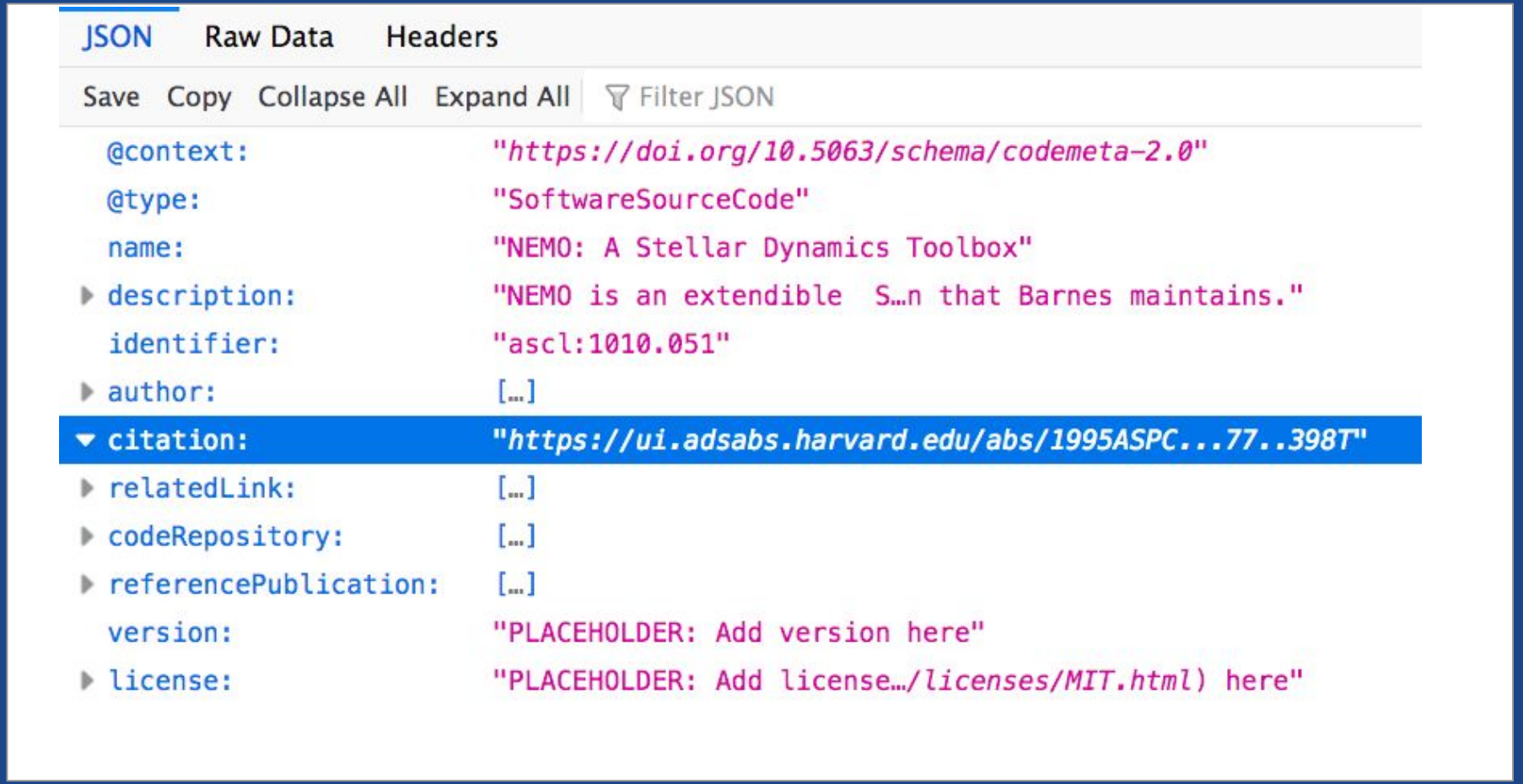
Works only for codes with ASCL IDs

Are a starting point; please edit as needed!

Example: codemeta.json

https://ascl.net/1010.051/codemeta.json


JSON
Raw Data
Headers
Save
Copy
Collapse All
Expand All
Filter JSON
@context: "https://doi.org/10.5063/schema/codemeta-2.0"
@type: "SoftwareSourceCode"
name: "NEMO: A Stellar Dynamics Toolbox"
description: "NEMO is an extendible S…n that Barnes maintains."
identifier: "ascl:1010.051"
author: […]
citation: "https://ui.adsabs.harvar…/abs/1995ASPC...77..398T"
relatedLink: […]
codeRepository: […]
referencePublication: […]
version: "PLACEHOLDER: Add version here"
license: "PLACEHOLDER: Add license…/licenses/MIT.html) here"


JSON
Raw Data
Headers
Save
Copy
Collapse All
Expand All
Filter JSON
@context: "https://doi.org/10.5063/schema/codemeta-2.0"
@type: "SoftwareSourceCode"
name: "NEMO: A Stellar Dynamics Toolbox"
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identifier: "ascl:1010.051"
author: […]
citation: "https://ui.adsabs.harvard.edu/abs/1995ASPC...77..398T"
relatedLink: […]
codeRepository: […]
referencePublication: […]
version: "PLACEHOLDER: Add version here"
license: "PLACEHOLDER: Add license…/licenses/MIT.html) here"

Example: CITATION.cff

https://ascl.net/1010.051/CITATION.cff

```
cff-version: 1.1.0
message: "Please cite the following works when using this software:
https://ui.adsabs.harvard.edu/abs/1995ASPC...77..398T"
authors:
- family-names: Barnes
  given-names: Joshua
- family-names: Hut
  given-names: Piet
- family-names: Teuben
  given-names: Peter
title: "NEMO: A Stellar Dynamics Toolbox"
version: PLACEHOLDER
date-released: PLACEHOLDER
identifiers:
 - type: "ascl-id"
   value: "1010.051"
 - type: "doi"
   value: PLACEHOLDER
 - type: "bibcode"
   value: "2010ascl.soft10051B"
abstract: "NEMO is an extendible  Stellar Dynamics Toolbox, following an Open-
model. It has various programs to create, integrate, analyze and visualize N-b
like systems, following the pipe and filter architecture. In addition there ar
```

Why have these?
(not an exhaustive list)

Preferred citation information lets people know how to cite your software

Ingestion into other systems (CiteAs, Zenodo, etc.)

With uptake, searchable Ring for/of software

Outstanding issues

Competing formats

Uptake: Getting people to use a standard format

Ingestion into other systems (CiteAs, Zenodo, etc.)

4. Licensing metadata

Yan Grange

(Science Data Center, ASTRON)

Jutta Schnabel, Thomas Jürges, Mattias Füßling, Nuria Lorente

4. Licensing metadata (Yan Grange)

1. Attendance was very high (>120 people interested in software licensing)!
2. It is widely accepted that nowadays source code licenses are a must.
3. Main conclusion is that the main issue is not whether or not to choose a license, but that what license to pick can be a complex discussion because it depends also on external constraints
4. In the community, permissive licenses tend to be more used than non-permissive ones.
5. One should keep in mind that relicensing is very tricky
6. There is a clear wish from the community to share best practices, ;earn from each other and exchange guidelines and knowledge

What is the default license of your institute/collaboration with respect to software licenses:

48 antwoorden

What license do you use for your (work related) software? (NB: you may be aware of a policy but still chose not to follow it)

48 antwoorden

Potential for follow-up discussions (next year's ADASS?):

1. Data licensing
2. Dealing with contributions
3. establishing and enforcing guidelines in your work environment
4. collaboration on a community-based approach

https://jschnabel.pages.in2p3.fr/licensing-bof/session/

5. Expand/deepen codemeta file with “API” information

Peter Teuben

University of Maryland

How deep should we go?

1. How deep should we go? cf. the old (now defunct) code.google.com/archive
2. Keywords describing the API and its one liners - great for searching , for example which functions or programs in a package deal with deconvolution
3. An example of one level deep is automated in NEMO's *mktasklist* script
4. Is this something for schema.org https://schema.org/SoftwareApplication

codemeta.json

```
"version": "4.0.1",
 "license": "PLACEHOLDER: Add license (e.g. https://spdx.org/licenses/MIT.html) here",
 "tasklist": [
     { "name" : "snapplot",  "description" : "plot particle positions from a snapshot file" },
     { "name" : "snapprint", "description" : "tabulate a snapplot" }
 ],
```

6. Unified Astronomy Thesaurus (UAT)

Peter Teuben

University of Maryland

1. Thesaurus: (noun)
   A list of words in groups of synonyms and related concepts
   A registry of terms you can use
2. http://astrothesaurus.org/ (adopted by AAS)
   a. Maintained in github
   b. example
3. Can we use it to describe software via keywords and thus improve discovery?
   a. Codemeta keywords?
4. Do we need more coverage for software and algorithms in UAT?
5. Examples (or see next slide on Software Sensus)
6. Astronomy & Computing

Galaxy classification systems ; Convolutional neural networks ; Galaxy structure
Computational astronomy ; Computational methods
Milky Way, galaxies, stellar dynamics, stellar populations

Keywords

AAS: (from UAT)
Galaxy classification systems ; Convolutional neural networks ; Galaxy structure
Computational astronomy ; Computational methods
Milky Way, galaxies, stellar dynamics, stellar populations

A&C: (from ???)
Photoionisation modelling; Scientific visualisation; Cloudy; Planetary nebula; (PN)Novae
Galaxies: photometry; Methods: data analysis; Machine learning; Techniques: image processing; Galaxies: GeneralCatalogs
FITS; File formats; Standards; World coordinate system

7. Software census at a niche science meeting?

Peter Teuben

University of Maryland

7. Software census - at a niche science meeting?

1. Find a nice meeting with well defined science goals and do a software census
    a. Have all the domain experts in a room
    b. https://extragalactic-milkyways.org/
    c. … Stellar Dynamics & Stellar Populations ...
    d. This meeting is in two stages, even more ideal for this idea, since they reconvene next year (Dec 2020, Nov 2021)
    e.
2.

8. AOB / Open Floor

1. Expand this BoF into a post-ADASS White Paper ?
    a. Should this include licensing from B10-133 ?
2. IVOA next week
3.