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Open Science Days - Berlin 2019

# The Experience of the Software Sustainability Institute and an overview of Mechanisms and Practices for the Publication of Research Software

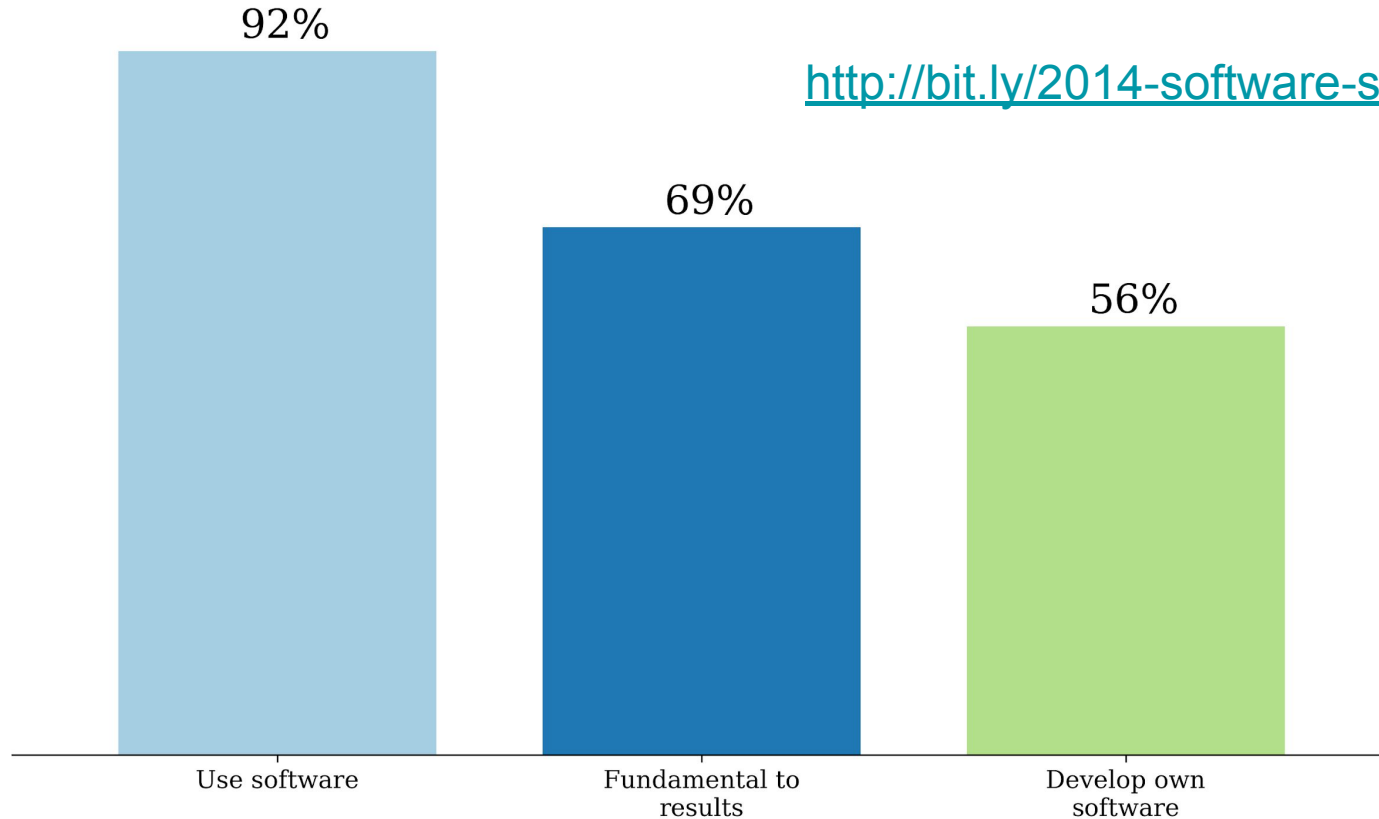
*Giacomo Peru (g.peru@epcc.ed.ac.uk) @SoftwareSaved  
University of Edinburgh | Software Sustainability Institute*



# UK software survey 2014



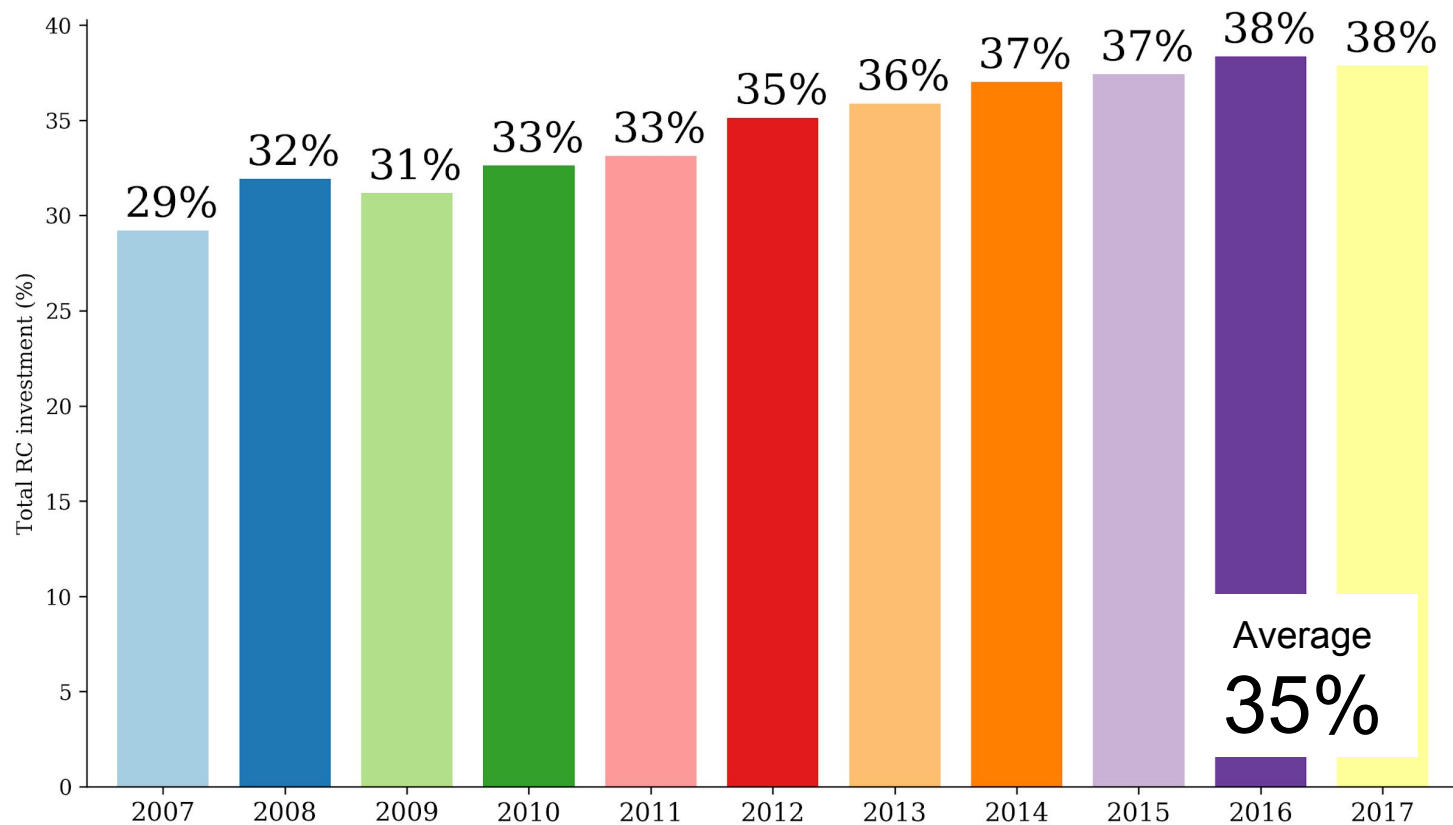
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# public investment software use



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# The Software Sustainability Institute

cultivating better, more sustainable,  
research software  
to enable world-class research

*“better software, better research”*

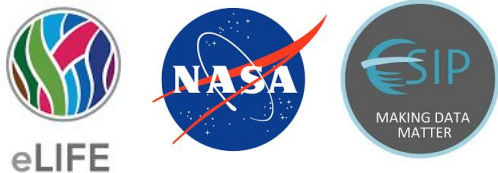


# standing and international collaborations



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## Software Policies for Research



## Software Preservation



## Improving Software Practice



## Software Citation and Credit



RESEARCH DATA ALLIANCE





# International collaboration on citation



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About Blog Community Policy Software Training Resources

## How to cite and describe software

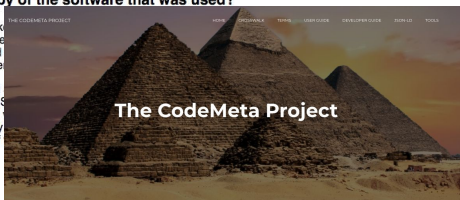
By Mike Jackson.

Researchers face significant challenges when trying to understand, reproduce or reuse research in which software has played an integral part. In this [green paper](#), I give examples of the problems that can arise when reproducing someone else's research, and propose some practical approaches to resolving, or at least reducing, them. I also look at the important distinction between describing the software that was used, and citing it.

### 1 Can I get a copy of the software that was used?

For many years I work (management), and I re researcher who would been used in the paper

The authors had cited software between OGS specific to OGS (JAN) toolkit, which was only detailed knowledge of was used.



About Blog Community Policy Software Training Resources

## Encouraging citation of software – introducing CITATION files

By Robin Wilson, Fellow and postgraduate at the University of Southampton.

Put a plaintext file named CITATION in the root directory of your code, and put information in it about how to cite your software. Go on, do it now: it'll only take two minutes!

Software is very important in science – but good software takes time and effort that could be used to do other work instead. I believe that it is important to do this work, but to make it worthwhile, people need to get credit for their work, and in academia that means citations. However, it is often very difficult to find out how to cite a piece of software – sometimes it is hidden away somewhere in the manual or on the webpage, but often it requires sending an email to the author asking them how they want it cited. The effort that this requires means that many people don't bother to cite the software they use, and thus the authors don't get the credit that they need. We need to change this, so that software – which underlies a huge amount of important scientific work – gets the recognition it deserves.



✓ PEER-REVIEWED

## Software citation principles

Research article Digital Libraries Software Engineering

Aron M. Smith\*<sup>1</sup>, Daniel S. Katz\*\*<sup>2</sup>, Kyle E. Niemeyer\*\*<sup>3</sup>, FORCE11 Software Citation Working Group

September 19, 2016

Note that a [Preprint of this article](#) also exists, first published June 27, 2016.

Author and article information

Abstract

Software is a critical part of modern research and yet there is little support across the scholarly ecosystem for its acknowledgement and citation. Inspired by the activities of the FORCE11 working group focused on data

## Software Credit Workshop

Blog post about the workshop and the topic of Software and Credit

The workshop (19 October 2015 at the National History Museum, London) explored what contribution software can and should make for academic reputational credit; i.e. how the production of software tools and applications contributes to career advancement in the academic research setting for both researchers who build software as part of their research and developers who build tools and support research.



## Citation File Format (CFF)

CFF is a human- and machine-readable file format in YAML 1.2 which provides citation metadata for software. It is maintained openly on GitHub: <https://github.com/citation->



The Future of Research Communications and e-Scholarship





# Publication of Research Software: Mechanisms and Practices



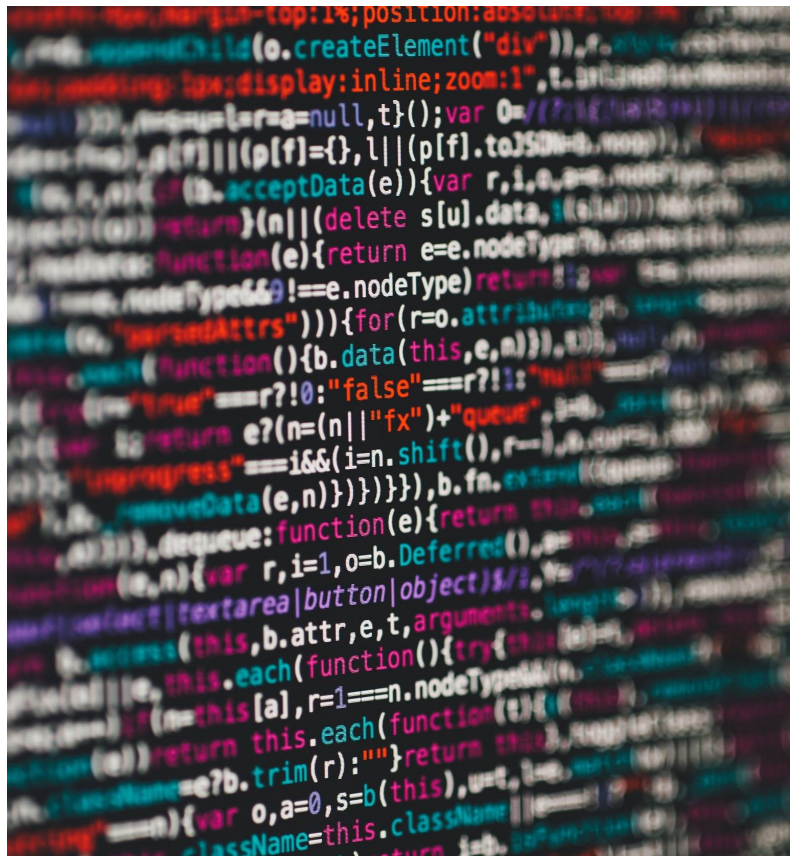


## scholarly record

credit

reproducibility

improving software quality



# benefits of publication



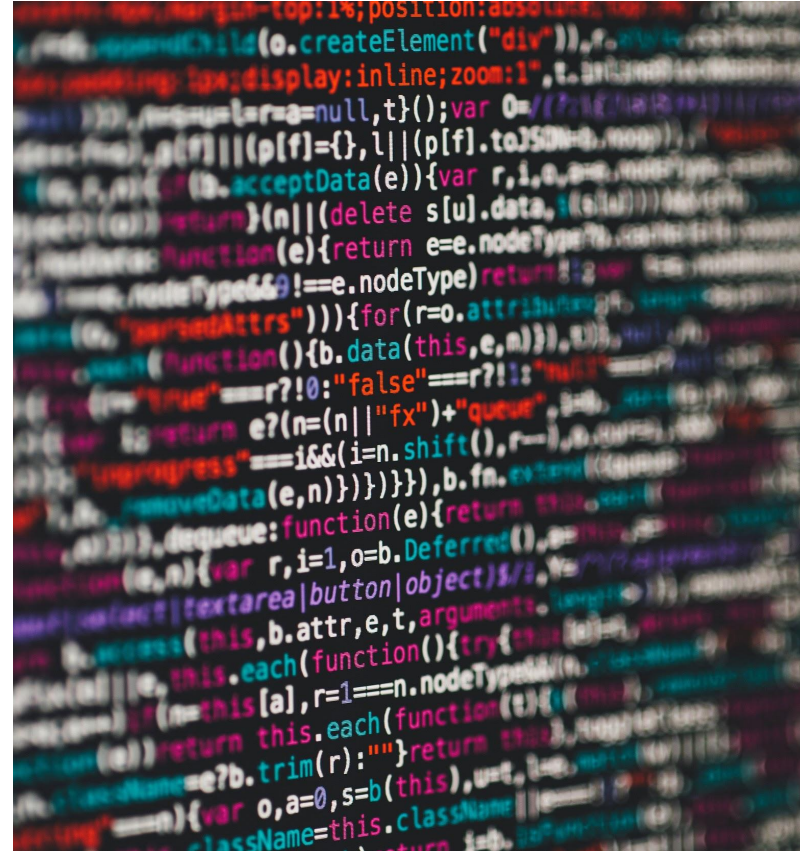
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scholarly record

**credit**

reproducibility

improving software quality



# benefits of publication



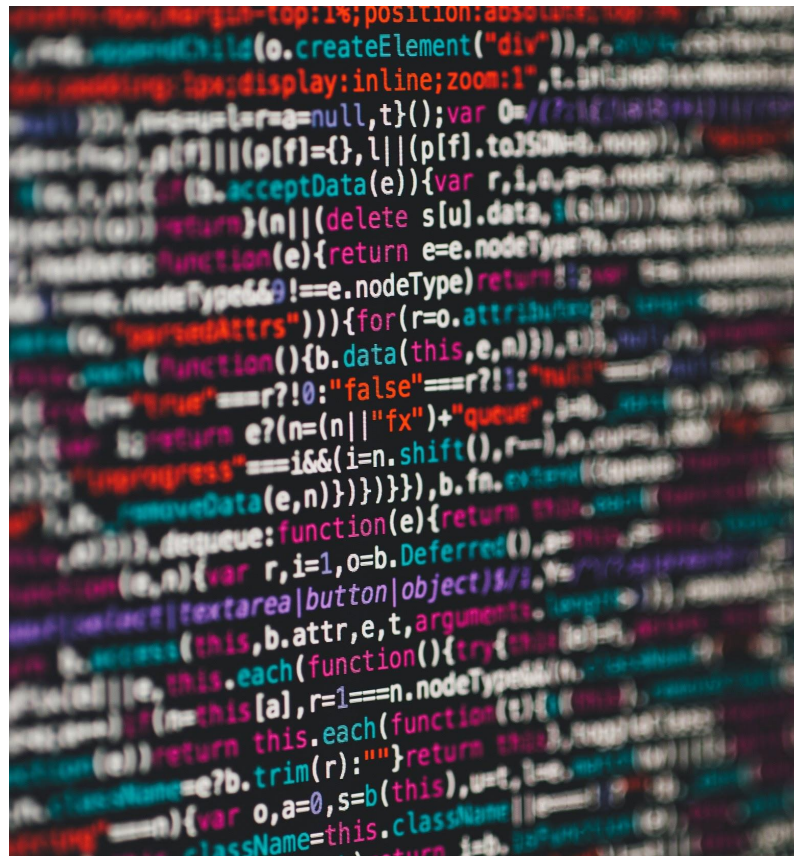
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scholarly record

credit

**reproducibility**

improving software quality





# benefits of publication



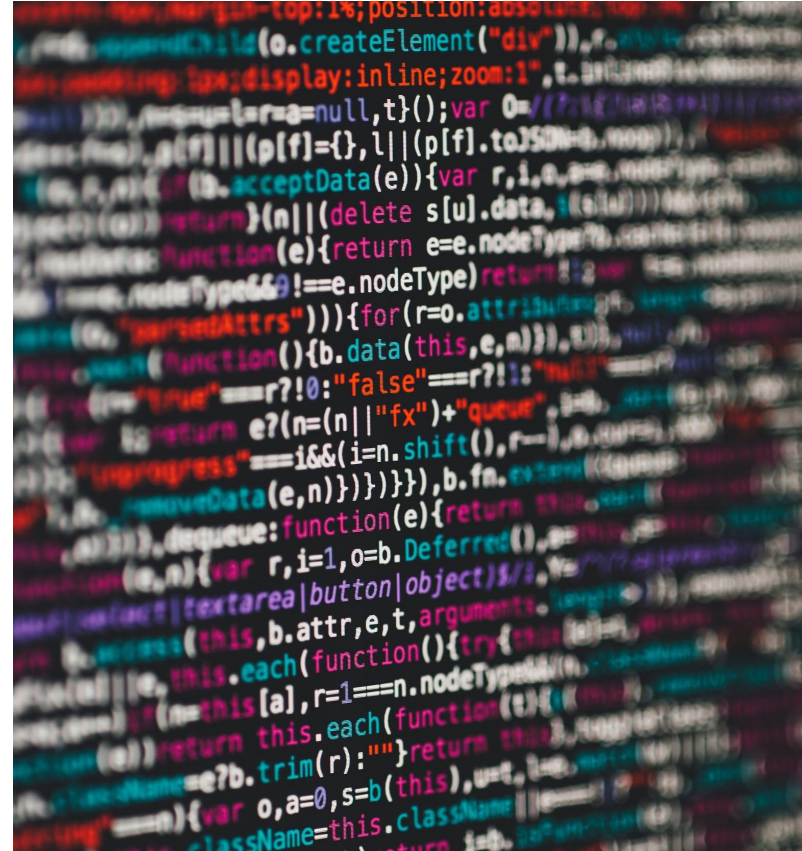
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scholarly record

credit

reproducibility

**software quality**



# options for publications



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REPOSITORY	REPOSITORY & ARCHIVE	TRADITIONAL JOURNAL	SOFTWARE JOURNAL
<i>pros?</i>	<i>pros?</i>	<i>pros?</i>	<i>pros?</i>
<i>cons?</i>	<i>cons?</i>	<i>cons?</i>	<i>cons?</i>



## Publishing on a public platform for software source code (e.g. GitHub)

Deposit + basic documentation (README) + licence : minimum acceptable level of publishing software

**Pros:** discoverable with chances of reuse

**Cons:** 1) not archived; 2) not citable; 3) no quality control





## GitHub + Archiving

Deposit + archive in e.g. Zenodo, figshare

**Pros:** 1) referenceable (DOI); 2) archived (long term)

**Cons:** citation to DOIs are not always supported by indexers



## Software papers in traditional domain-specific journals

Many journals now accept papers *about* software (= where the primary goal of the paper is to describe a research software package and not to publish novel research results).

**Pros:** 1) reach the intended audience; 2) citable

**Cons:** no review of the software

<http://bit.ly/software-journals>



## Software papers in software-specific journals

These journals offer a venue for submitting papers describing their research software and may be domain specific or not.

**Pros:** 1) dedicated venue; 2) citable; 3) review of the software

**Cons:** software-focused, loss in domain knowledge prestige

<http://bit.ly/software-journals>

# options for publications



REPOSITORY	REPOSITORY + ARCHIVE	TRADITIONAL JOURNAL	SOFTWARE JOURNAL
<i>discoverable</i>	<i>discoverable</i> <i>referenceable</i> <i>archived</i>	<i>reach target audience</i>  <i>archived</i>	<i>dedicated venue</i>  <i>citable</i>  <i>review of software</i>
<i>not archived</i>  <i>not citable</i>  <i>no quality control</i>	<i>citation not always possible</i>	<i>no review of software</i>	<i>loss in domain prestige</i>

# why software papers?



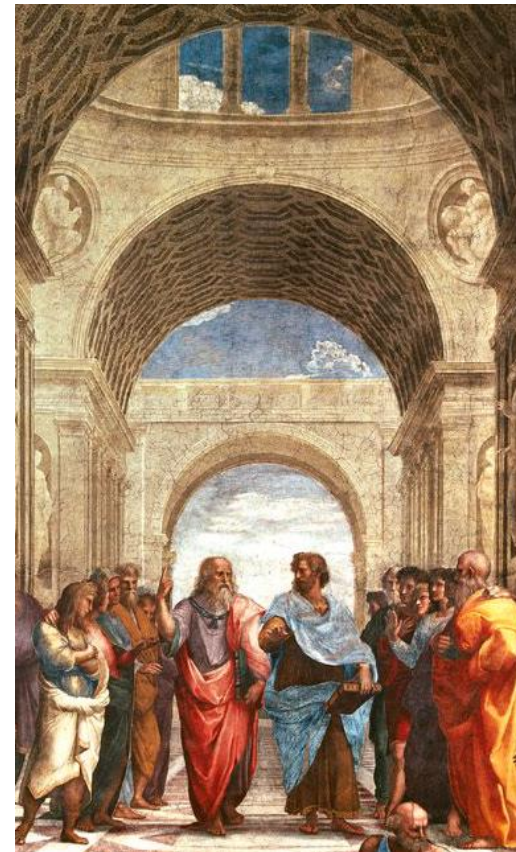
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## **‘native’ software citation**

not currently possible = not supported  
by indexers

(work is ongoing to make this possible)

citation of papers is the only currency  
therefore software papers are the most  
reliable mechanism for credit



# software specific journals



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<b>JORS</b>	<b>JOSS</b>	<b>SoftwareX</b>
focus on metaper aims at reuse checklist-based review of software	focus on software deep review of software minimal paper	aims at high impact review of both software and paper





## **journal of open research software (JORS)** **openresearchsoftware.metajnl.com**

Ubiquity Press

peer reviewed software meta-papers describing research software with high reuse potential

focus on the metadata with basic checklist-based review of the software



## journal of open source software (JOSS) joss.theoj.org

NumFOCUS

“an open source developer-friendly journal for research software packages, designed to make it as easy as possible to create a software paper for a developer’s work”

focus on the software -- papers are very short



## **softwareX**

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software with high impact track-record or potential in a field

review of the paper and of the software

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- growth in open source software
- call for transparency
- research ever more computational

are **all drivers** for the increase of research software publication

**bright future** for the publication of research software

groups and communities are addressing current **challenges**



# thank you!

*Mahlzeit!*