

SOFTWARE PUBLICATION, SOFTWARE CITATION, AND OPEN SCIENCE

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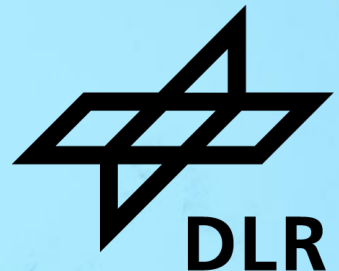
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Stephan Druskat, Workshop "Open science, a landscape under construction with a horizon of possibilities", 2022-11-12,
Centro Internacional de Encuentros Matemáticos (CIEM), Castro Urdiales, Spain



Research software in Open Science



- **Baseline:** Software is a legitimate product of research
- **Foundation:** Openness in production, dissemination and reception

Open production of research software



- **Open licensing:** Free/Libre Open Source Software
- **Open communities:**
 - Governance model: research software commons, community participation
 - Rules of play: e.g., code of conduct, contribution guidelines
 - Open communities: diversity, inclusion, equity

Open dissemination of research software



- **FAIR for Research Software**

📄 Chue Hong, N. P., Katz, D. S., Barker, M., Lamprecht, A-L, Martinez, C., Psomopoulos, F. E., Harrow, J., Castro, L. J., Gruenpeter, M., Martinez, P. A., Honeyman, T., et al. (2022). **FAIR Principles for Research Software version 1.0**. (FAIR4RS Principles v1.0). Research Data Alliance. DOI: <https://doi.org/10.15497/RDA00068>

- **Open licensing:** Free/Libre Open Source Software
- **Documentation:** enable reuse
- **Publication**
- **Metadata**

Open reception of research software



- **Software citation**

- **Software is made citable**
 - **Software is cited ...**
 - ... by human users
 - ... by software that depends on other software
-  Smith AM, Katz DS, Niemeyer KE, FORCE11 Software Citation Working Group. (2016) **Software Citation Principles**. PeerJ Computer Science 2:e86. DOI: <https://doi.org/10.7717/peerj-cs.86>

SOFTWARE PUBLICATION AND CITATION IN PRACTICE

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Software publication in practice

- **Software publication:**

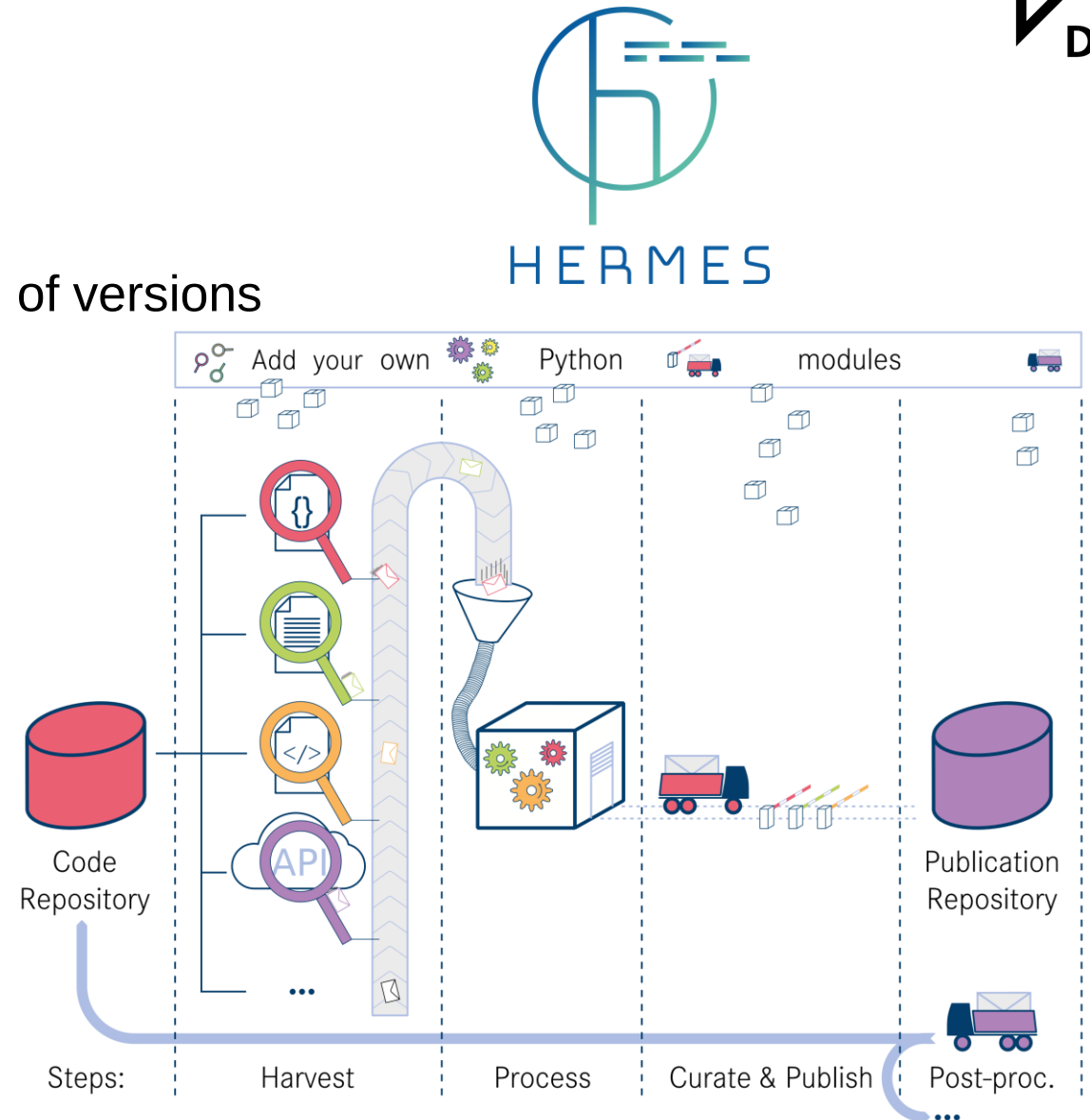
- Relation to software **releases**: publication of versions
- Persistence, unique identification: e.g., Zenodo, Software Heritage

- **FAIR software publication:**

- Metadata
- Automation, e.g., via continuous integration (CI)

- **Project HERMES**

<https://software-metadata.pub>

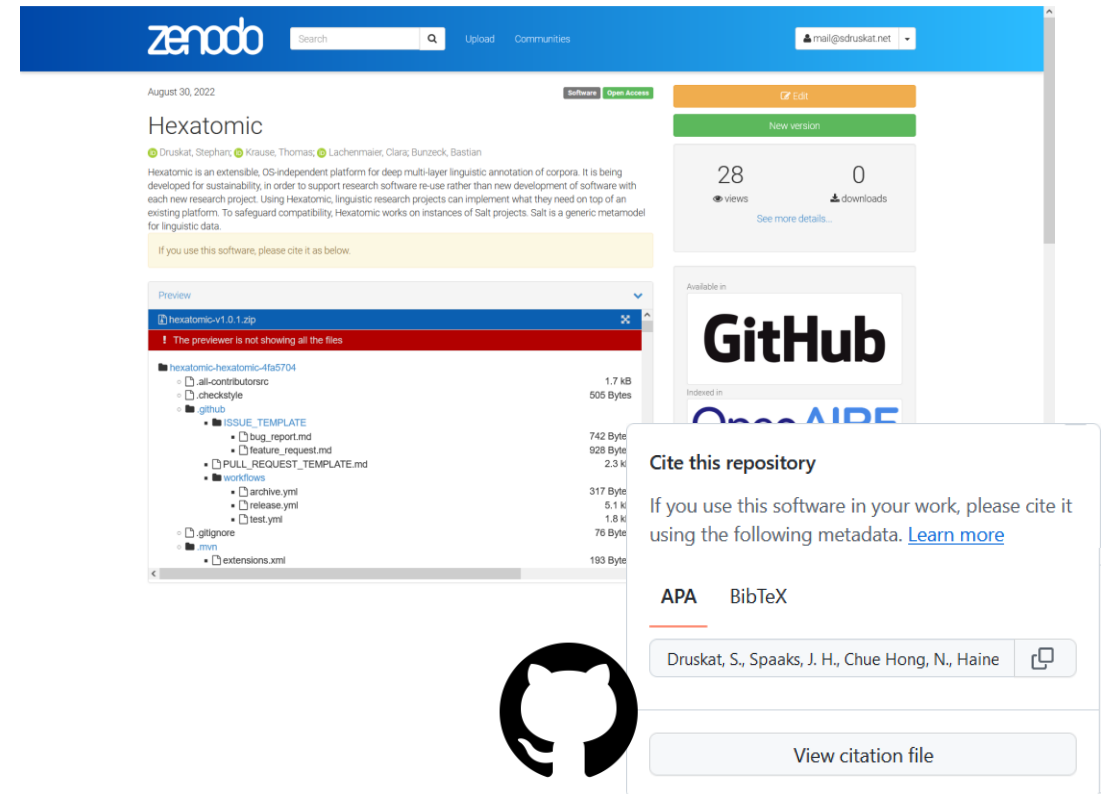


Software citation in practice



- Make software citable
Citation File Format (CFF): <https://citation-file-format.github.io>
 - Cite software ...
 - Humans: ... like you would cite a paper
- Software:** ... CFF references

```
cff-version: 1.2.0
message: "If you use this software, please cite it as below."
authors:
  - family-names: Druskat
    given-names: Stephan
    orcid: https://orcid.org/0000-0003-4925-7248
title: "My Research Software"
version: 2.0.4
doi: 10.5281/zenodo.1234
date-released: 2021-08-11
```



The screenshot shows a Zenodo repository page for a project named 'Hexatomic'. The page includes a header with the Zenodo logo, a search bar, and navigation links for 'Upload' and 'Communities'. The main content area displays the project title 'Hexatomic', the date 'August 30, 2022', and a list of authors: Druskat, Stephan; Krause, Thomas; Lachenmaier, Clara; Bunzeck, Bastian. A description of the software is provided, followed by a citation instruction: 'If you use this software, please cite it as below.' Below this is a file browser showing the repository structure, including files like 'hexatomic-v1.0.1.zip', 'hexatomic-hexatomic-4fa5704', 'all-contributorsrc', 'checkstyle', 'github', 'ISSUE_TEMPLATE', 'bug_report.md', 'feature_request.md', 'PULL_REQUEST_TEMPLATE.md', 'workflows', 'archive.yml', 'release.yml', 'test.yml', 'gitignore', 'mvn', and 'extensions.xml'. A sidebar on the right shows the number of views (28) and downloads (0), along with a 'New version' button. A 'Cite this repository' overlay is visible in the bottom right corner, featuring the GitHub logo and a text box with the citation: 'Druskat, S., Spaaks, J. H., Chue Hong, N., Haine'. The overlay also includes a 'View citation file' button.

Thank you!



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- Citation File Format: <https://citation-file-format.github.io/>
- HERMES: <https://software-metadata.pub/>