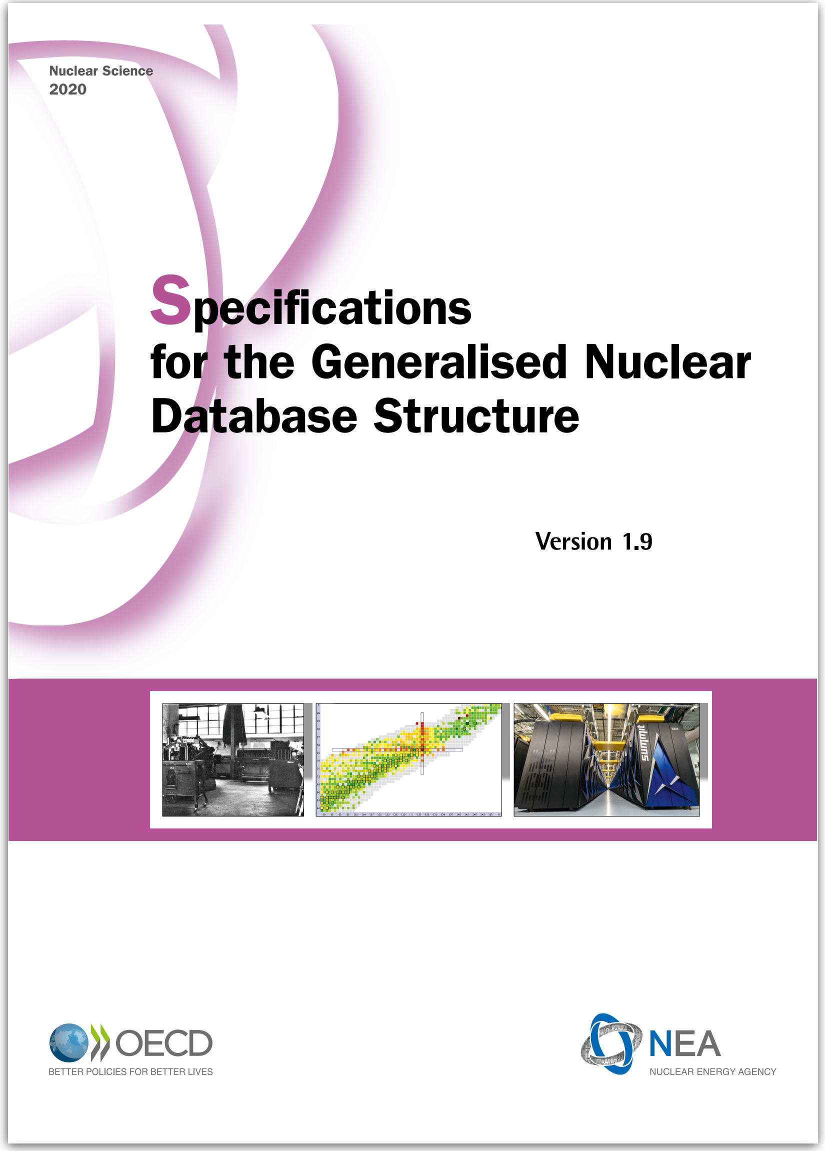
David Brown (BNL)

GNDS Expert Group Report

CSEWG Meeting, Virtual Nuclear Data Week 2020
30 Nov. 2020

GNDS-1.9 specifications published Summer 2020

- Specifications: https://oecd-nea.org/download/wpec/documents/7519-GNDS.pdf
- XML Schema for GNDS-1.9: https://www.oecd-nea.org/download/wpec/gnds/gnds.xsd
- GNDS Webinar: https://www.youtube.com/watch?v=h9Byrkxr8LE&feature=youtu.be

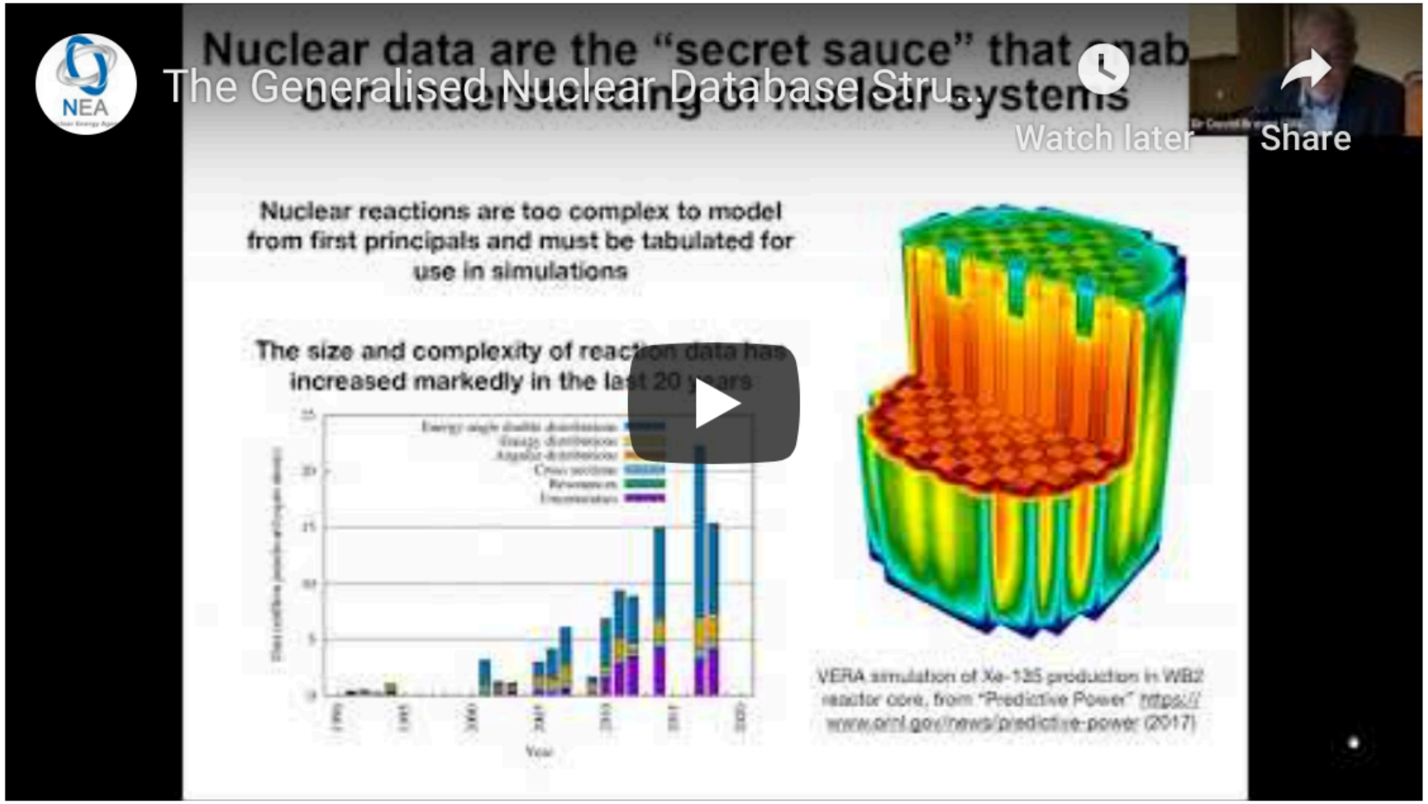


Thank you webinar participants

https://www.youtube.com/watch?v=h9Byrkxr8LE&feature=youtu.be

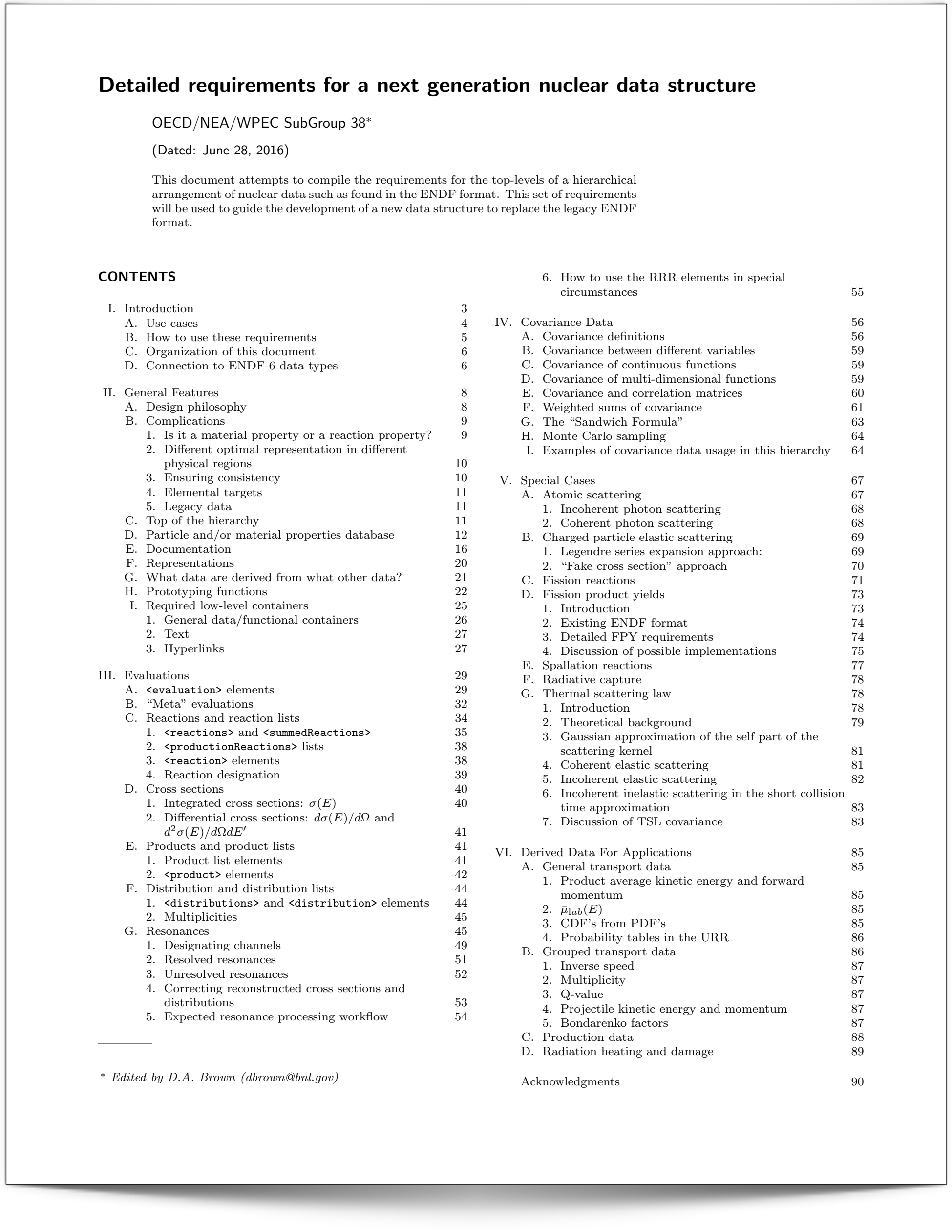
The NEA hosted an expert roundtable webinar on GNDS on 8 July 2020. The discussion was be moderated by William D. Magwood, IV, NEA Director-General and Dr David Brown (BNL), Chair of the NEA Expert Group on the Recommended Definition of a General Nuclear Database Structure (GNDS). The panellists included:

- Dr Osamu Iwamoto (JAEA)
- Dr Jean-Christophe Sublet (IAEA)
- Dr Dorothea Wiarda (ORNL)
- Dr Caleb Mattoon (LLNL)
- Dr Fausto Malvagi (CEA)



GNDS-2.0 Goals

- **Satisfy remaining SG-38 goals**
  - `<map>` format
  - `<documentation>` format (handled in May)
  - Major TNSL rewrite (handled in May)
- **Ensure “forwards compatibility” with ENDF-6**
- **Respond to user needs**
  - TNSL Covariance



Detailed requirements for a next generation nuclear data structure

OECD/NEA/WPEC SubGroup 38*

(Dated: June 28, 2016)

This document attempts to compile the requirements for the top-levels of a hierarchical arrangement of nuclear data such as found in the ENDF format. This set of requirements will be used to guide the development of a new data structure to replace the legacy ENDF format.

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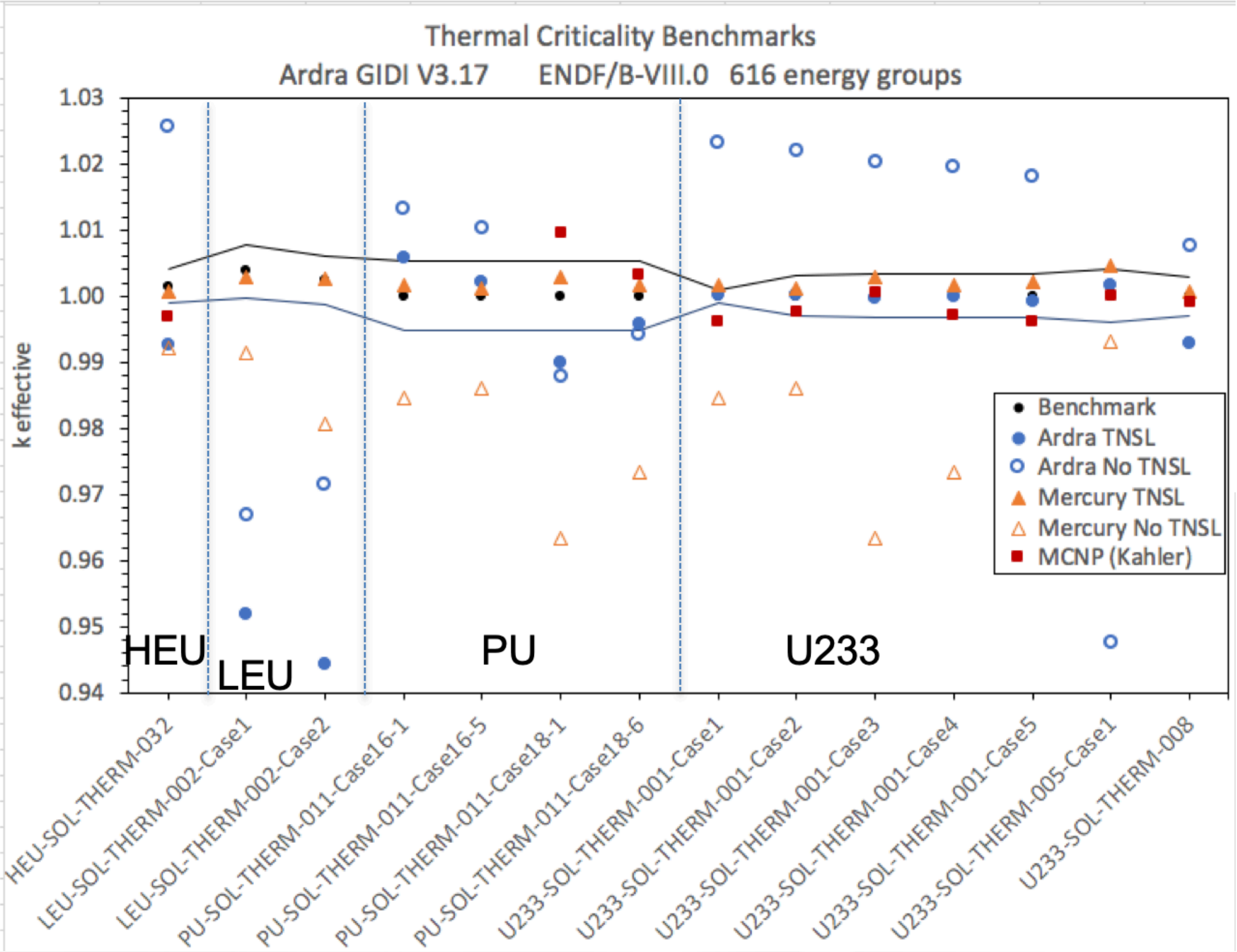
* *Edited by D.A. Brown (dbrown@bnl.gov)*

Status 2020

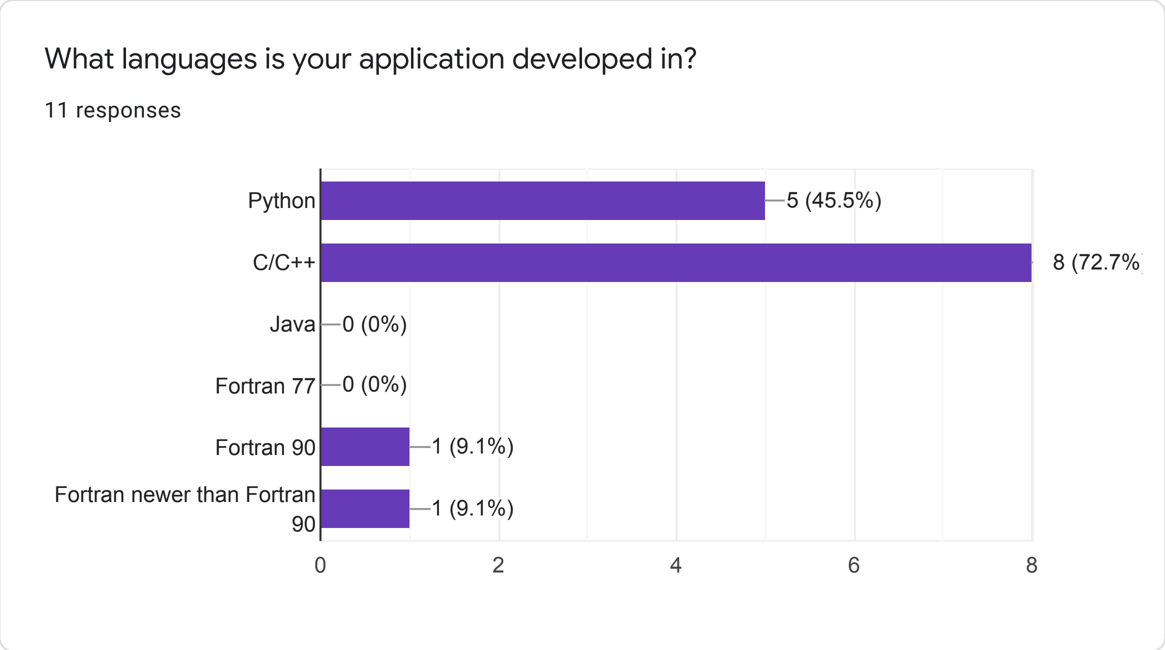
Demonstration of capability

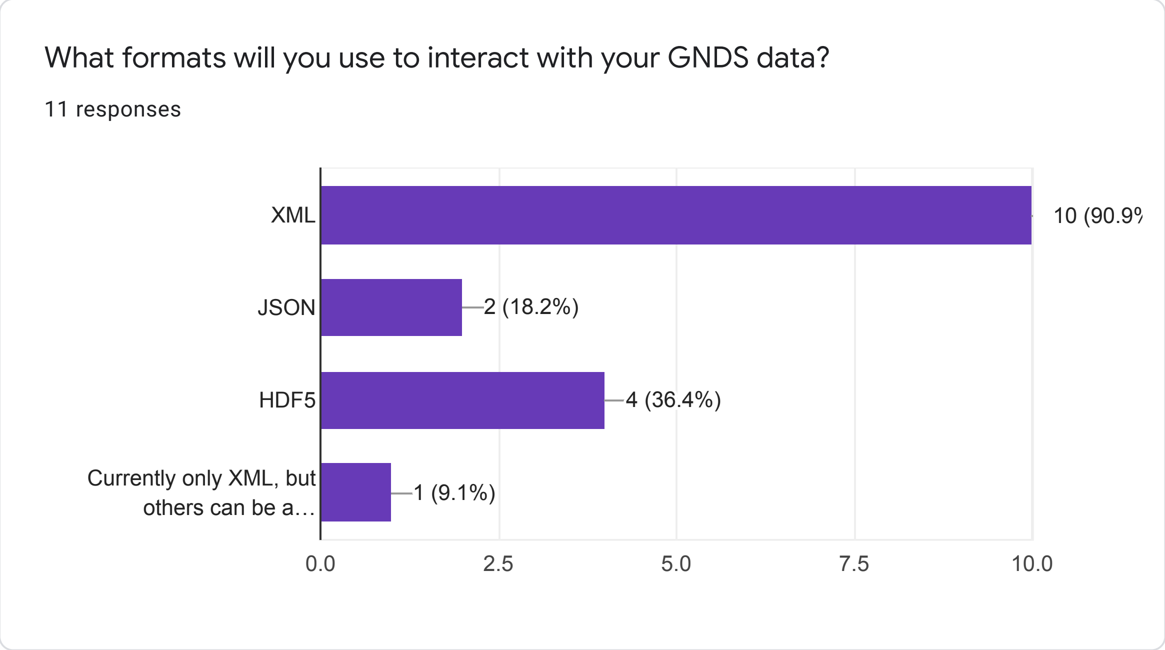
LLNL transport codes have been updated to run problems using GNDS data via GIDI API



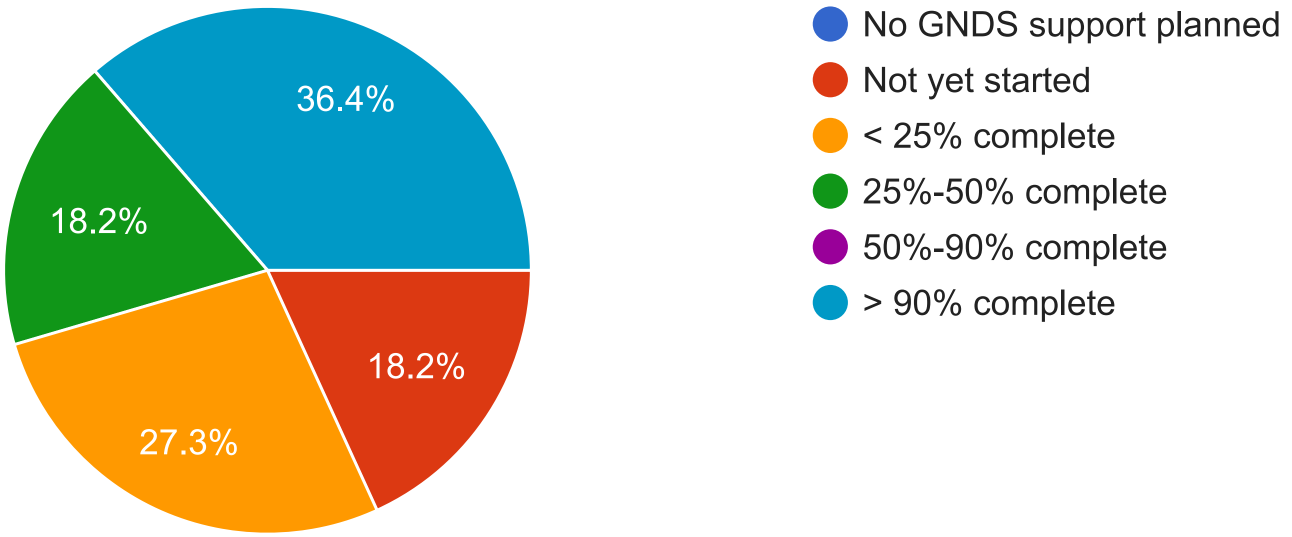
We did a little poll to find out more about how GNDS is being implemented

- AMPX
- SAMMY
- brownies (FUDGE extensions)
- FRENDY
- GIDI+
- OpenMC
- GALILEE
- TAGNDS (TALYS to GNDS)
- FUDGE
- NJOY



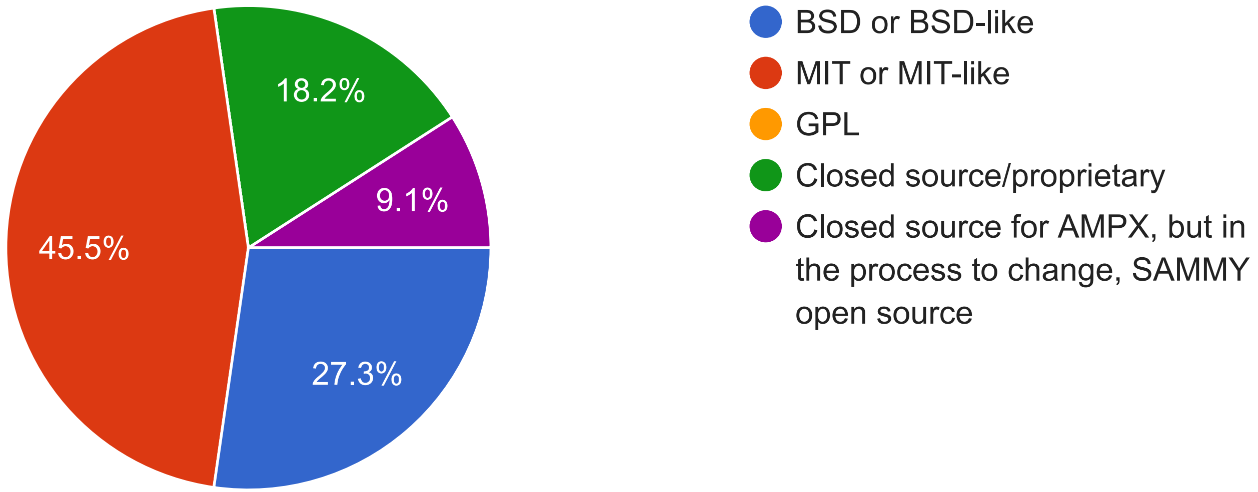


U.S. DEPARTMENT OF ENERGY

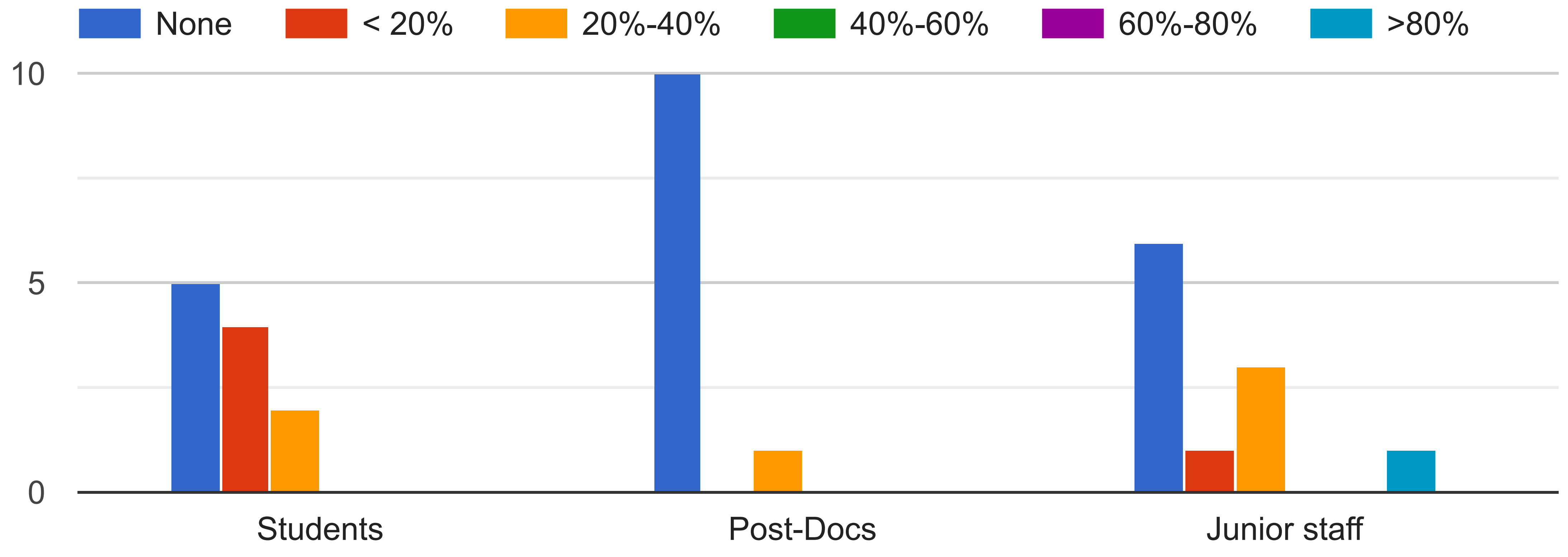


Some projects are far along in their GNDS support

Most are open source! Only ~20% of applications are closed source



Part of GNDS's purpose is inspiring younger scientists. What fraction of your developers are



What’s next

- **Expect major format changes post-GNDS-2.0:**
  - Synchronize nuclear structure formats with ENSDF as part of ENSDF modernization
  - Revamp uncertainty/covariance to make more ML friendly
  - Atomic data additions
  - FPY formats per FIRE collaboration/CSEWG recommendations

- **ENDF to GNDS transition:**
  - ENDF/B-VIII.0 released in GNDS-1.9
  - Expect at least next release to be in both ENDF-6 and GNDS formats
  - Transition is slow; we must walk together and we can only go as fast as the slowest among us