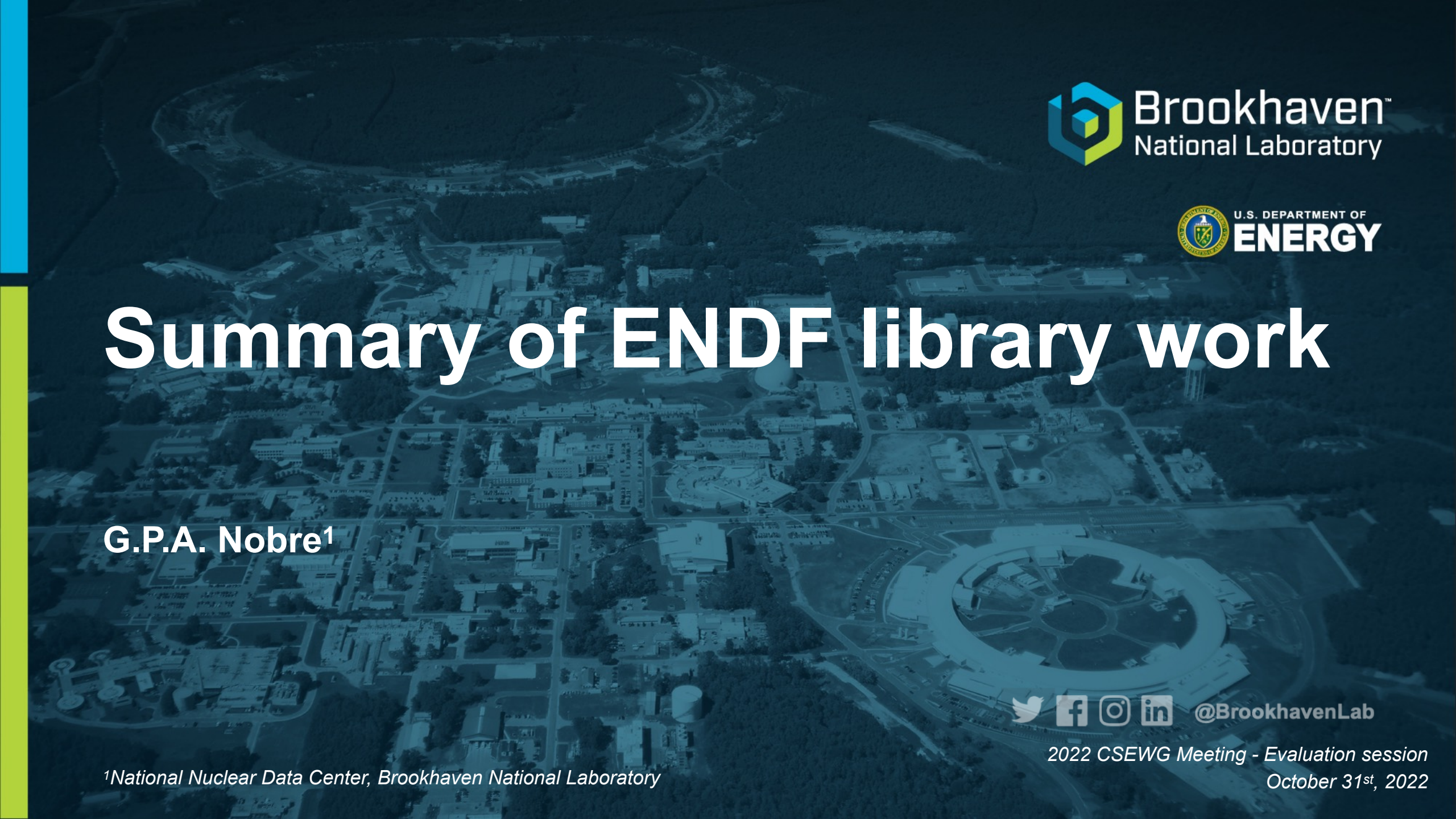

Summary of ENDF library work

G.P.A. Nobre[1]

[1]National Nuclear Data Center, Brookhaven National Laboratory

2022 CSEWG Meeting - Evaluation session
October 31st, 2022

Topics

- Release Timeline
- 2022 Hackathon
- ENDF/B-VIII.1-Beta0
- Review status for neutron sub library
- A few words on reproducibility
- A couple of things to keep in mind
- Reviewers wanted

Release timeline

ENDF/B VIII.1

Jan - Mar 2023
- Collect feedback from the community on the beta version
- Wrap up "lesser impactful" files

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June 2023
- Release second beta
- First complete draft of Big Paper

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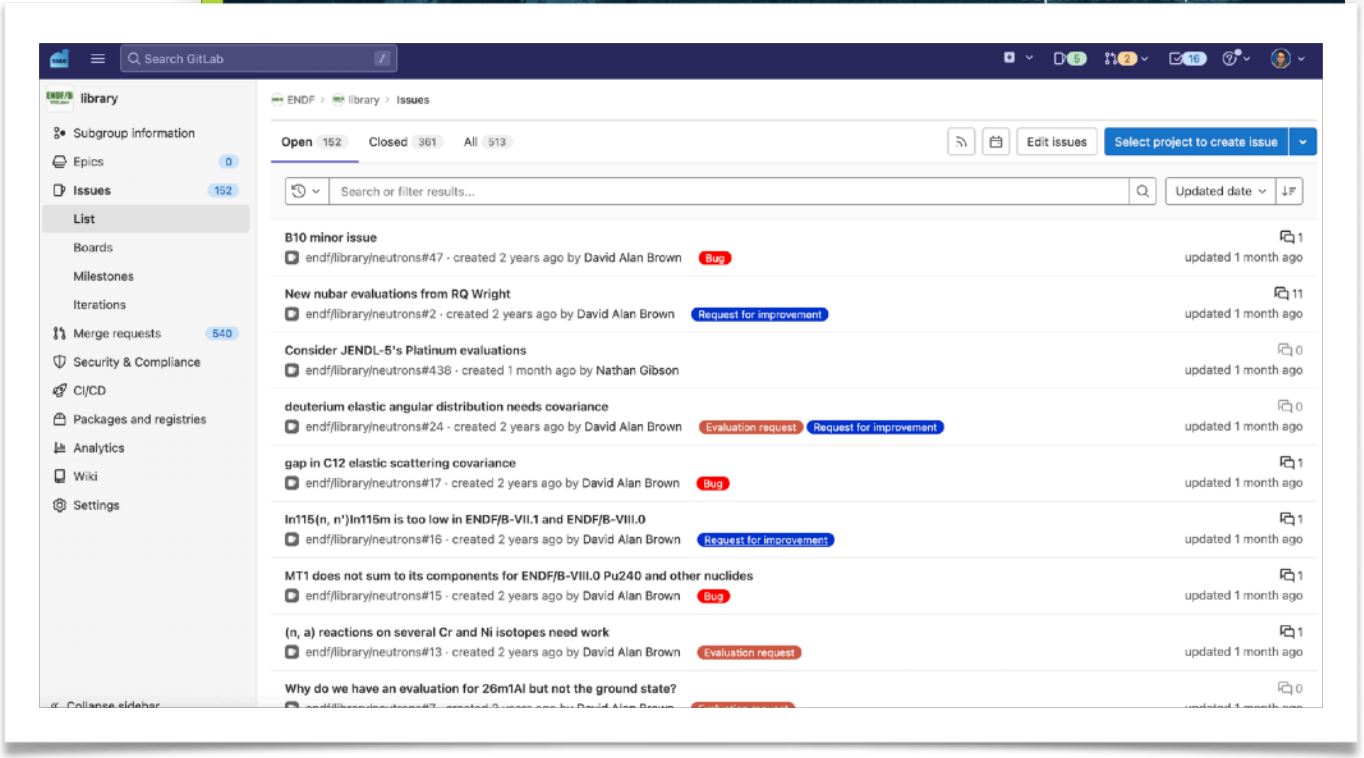
2022 Hackathon

- Held on September 19-23, 2022 at BNL
- About 10 participants in person and ~5 remote
- Tracked issues resolved:
  - 22 issues for neutrons
  - 7 in decay
- More issues were found and logged
  - ~55 issues updated/opened
- Exit distributions: see Ian/Hye Young's talk
- We will plan one for 2023
  - After Beta1, before Beta2
  - Before mini-CSEWG?



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ENDF/B-VIII.1 Beta0 released (Plural!)

ENDF/B VIII.1

- Needed a Beta version for preliminary validation ahead of 2022 CSEWG
- No time yet for full review: Focused on neutron sub library and materials from INDEN collaboration (some degree of internal review)
- Indicate what should be the general trend of the VIII.1 release
- 3 “sub-releases”: Different ^{239}Pu candidates
- Planned Beta1: December 2022
  - Single Pu file
  - Fully reviewed files
  - All sub libraries
  - Substantial testing
    - CSEWG
    - Internal validation
- Beta2: tested against crits, LPS, by LANL and LLNL users, to ensure performance is as expected.

Changes* in VIII.1 Beta0 from VIII.0:

- ^{28,29,30}Si
- ^{50,52,53,54}Cr
- ^{54,56,57}Fe
- ^{63,65}Cu
- ^{233,235,238}U
- ^{239}Pu
  - Beta0a: INDEN
  - Beta0b: LANL
  - Beta0c: LLNL

Small fixes in Beta0.1:

- Release readme and change log
- ^{239}Pu MF1/MT458
  - Beta0a.1: INDEN
  - Beta0b.1: LANL

Changes* in VIII.1 Beta0.2 from VIII.0:

= Changed from Beta0.1

- ^{19}F
- ^{28,29,30}Si
- ^{50,52,53,54}Cr
- ^{54,56,57}Fe
- ^{63,65}Cu
- ^{233,235,238}U
- ^{239}Pu
  - Beta0a.2: INDEN
  - Beta0b.2: LANL (10/17)
  - Beta0c.2: LLNL

**There were additional changes done shortly after the VIII.0 release, but before the whole evaluated file repository was migrated to GitLab, which are now part of ENDF/B-VIII.1Beta0:*

- ^{10}B: ENDF/B-VIII.0 errata
- ^{156,158,160,161,162,163,164}Dy: Set of ORNL evaluations
- ^{192}Pt: Tweaked energy of first resonance
- ^{240}Pu: Fix of unitarity issue by LANL

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Review status - neutron sub library

Actinides

- ^{239}Pu
  - On-going collaborative process
  - Multiple evaluations are converging
  - CSEWG Executive Committee should decide the best course of action towards Beta1
  - Recommended evaluation in Beta1 should be better than when process started
- ^{235,238}U: waiting for reviewer assignment
- ^{233}U: new INDEN file is expected soon

Main updates for VIII.1 - neutron sub library

INDEN

- ^{235}U
- ^{239}Pu
- ^{238}U
- ^{233}U
- ^{54,56,57}Fe
- ^{28,29,30}Si
- ^{55}Mn
- ^{50,52,53,54}Cr
- ^{63,65}Cu
- ^{18}O - ^{16}O not ready for submission
- ^{10,11}B - not ready for submission
- ^{139}La

= Submitted
= Under review
= Not submitted yet
= Approved

Non-INDEN

- ^{140,142}Ce (ORNL)
- ^{103}Rh (RPI/IRSN)
- ^{86}Kr (BNL)
- ^{6}Li (LANL)
- ^{106,108,110,111,112,114,116}Cd (LANL)
- ^{6}Li, ^{234}U (LANL)
- ^{181}Ta (RPI/ORNL/ LANL)
- Fission products (RQW+BNL): ^{78}Se, ^{84}Kr, ^{85}Rb, ^{97}Mo, ^{99}Tc, ^{102}Pd, ^{109}Ag, ^{113,115}In, ^{115,119}Sn, ^{127}I, ^{122,124}Te, ^{133,134}Cs, ^{130,134,137}Ba, ^{138}La, ^{143}Pr, ^{147}Pm, ^{148,150}Nd, ^{153}Sm, ^{155}Eu, ^{160}Gd, ^{159}Tb, ^{166,168,170}Er, ^{175,176}Lu, ^{168,176}Yb, ^{174,176,177,178,179,180}Hf
- Other small fixes

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So we don't have to reverse engineer the baking of a cake…

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- Many applications are particularly sensitive to that
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- Many evaluators, for good reasons, will keep on working on their files before the next release
- Beware, though, that there may have been small fixes or corrections to your evaluation after it has been sent.
- It's worth checking the **history** of your file in phase1/phase2 branches so you don't accidentally overwrite an eventual correction or format fix, forcing it to be done again.

Pardon my recruiting…

- We need volunteer reviewers!
- Specially for the decay, fission, and **neutron**
- The number of reviewers has been the main bottleneck
- To have a major portion of submitted evaluations included in Beta1, we have to move fast

… to be a volunteer reviewer!