Software Working Group Session: Introduction

N. Baltzell

CLAS Collaboration Meeting

November 17, 2026

Weekly Meetings, Thursdays @ 11, on Zoom and in F226 or L210A

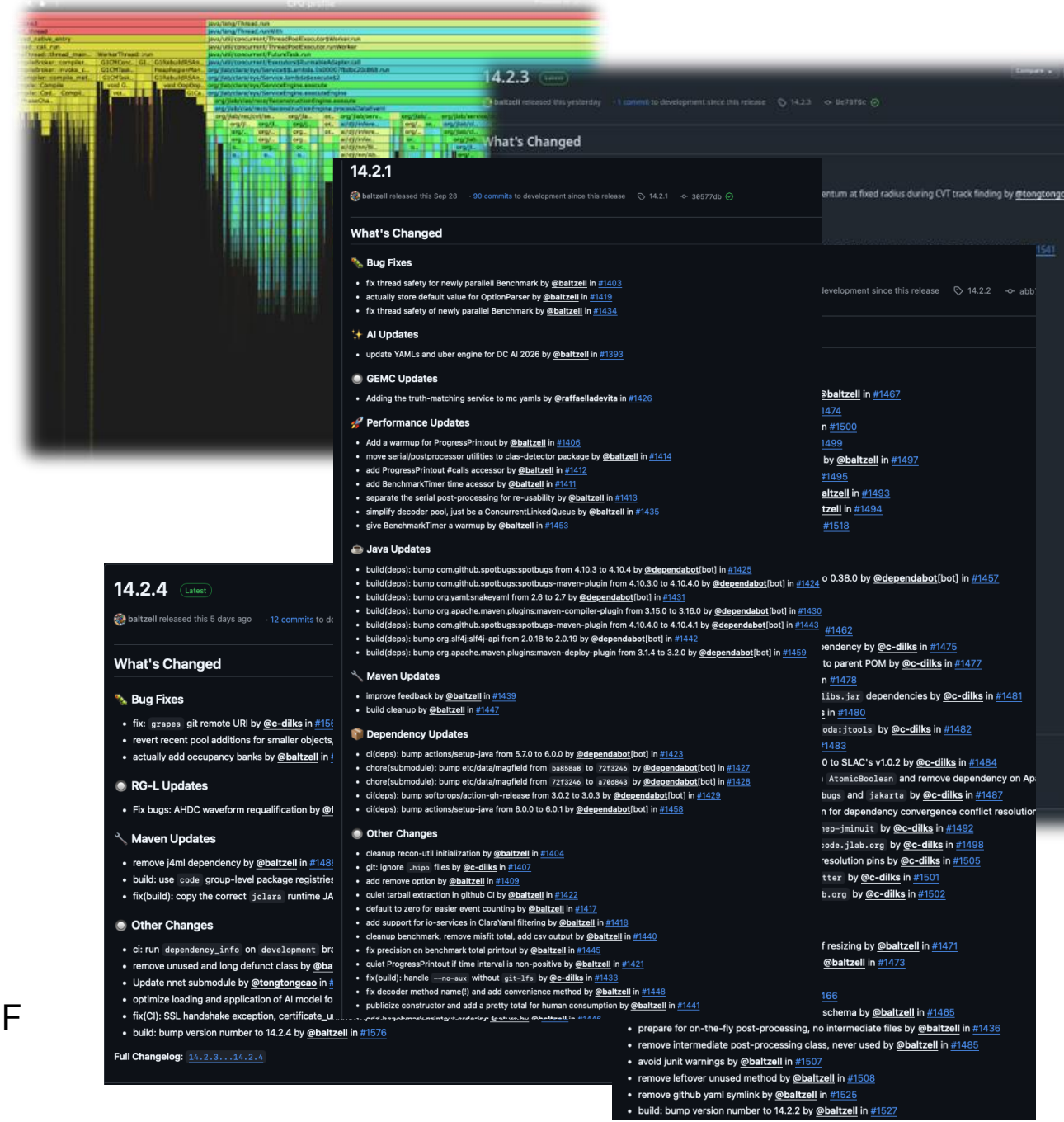
Office Hours, Tuesdays @ 9

For more info:

https://pages.jlab.org/hallb/clas12/swwg

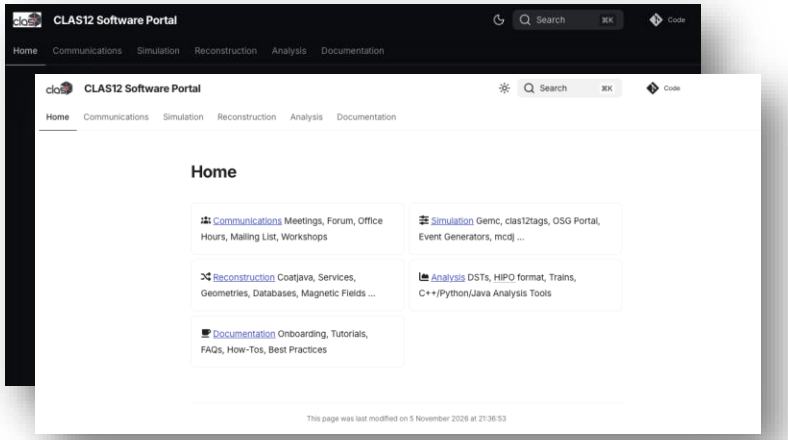
Summary of Recents

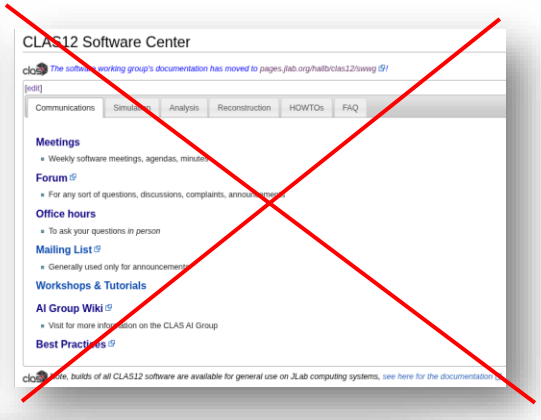
- Coatjava software optimizations targeting speed and efficiency, e.g., reducing memory allocation(s) and garbage collection CPU, 10x decoding speedup
- Component integration for workflow streamlining and portability, e.g., Clara-fication, parallel decoding, occupancy banks, calibration automation
- Java software independence from clasweb.jlab.org, undoing a decade of maven repository layers and leveraging GitLab code.jlab.org, including et, evio, xmsg, groot, java-hipo …
- AI expediting bug-finding and fixing and code improvements; collaboration formalizing AI best-practices and analysis review guidelines
- Documentation upgrade, onboarding, migration from JLab's MediaWiki to static HTML and GitLab, pages.jlab.org
- New https://code.jlab.org/hallb/clas12/mcgen event generators
- Exploratory NERSC allocation for CLAS12 simulations granted; prepared for CLAS12 event streaming to OLCF and back w/ EPSCI
- Work with others: InvenioRDM and RUCIO adoption, ASC and FAIR

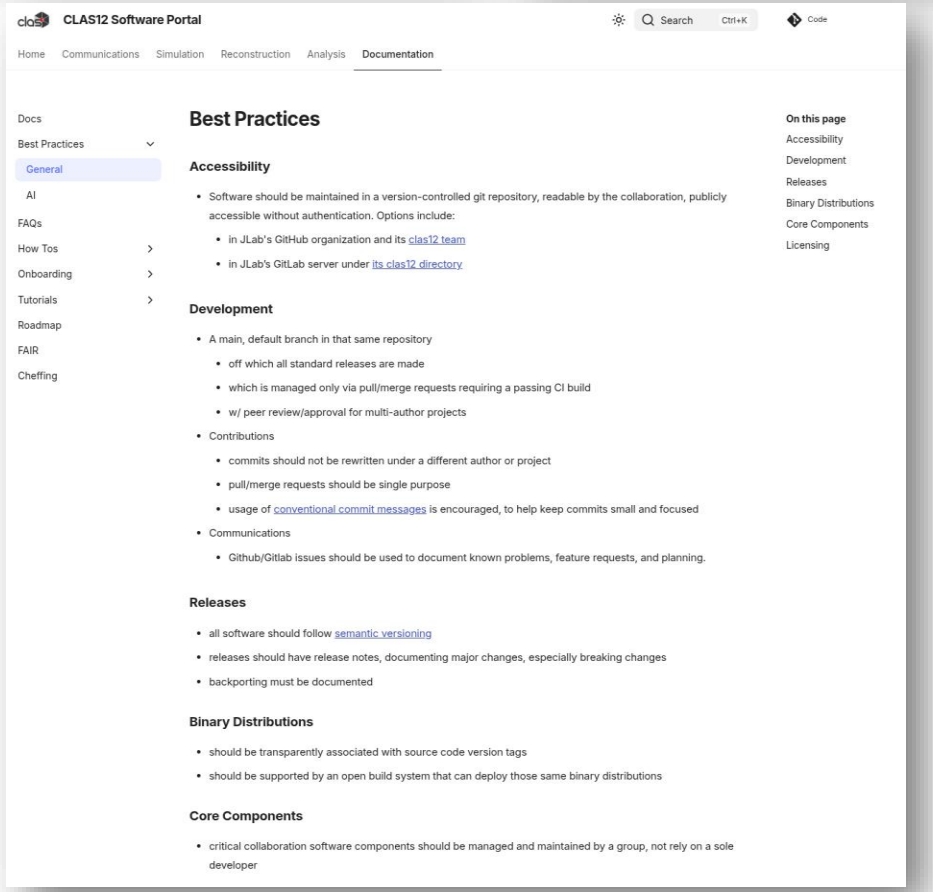


A couple recent highlights …

SWWG Website



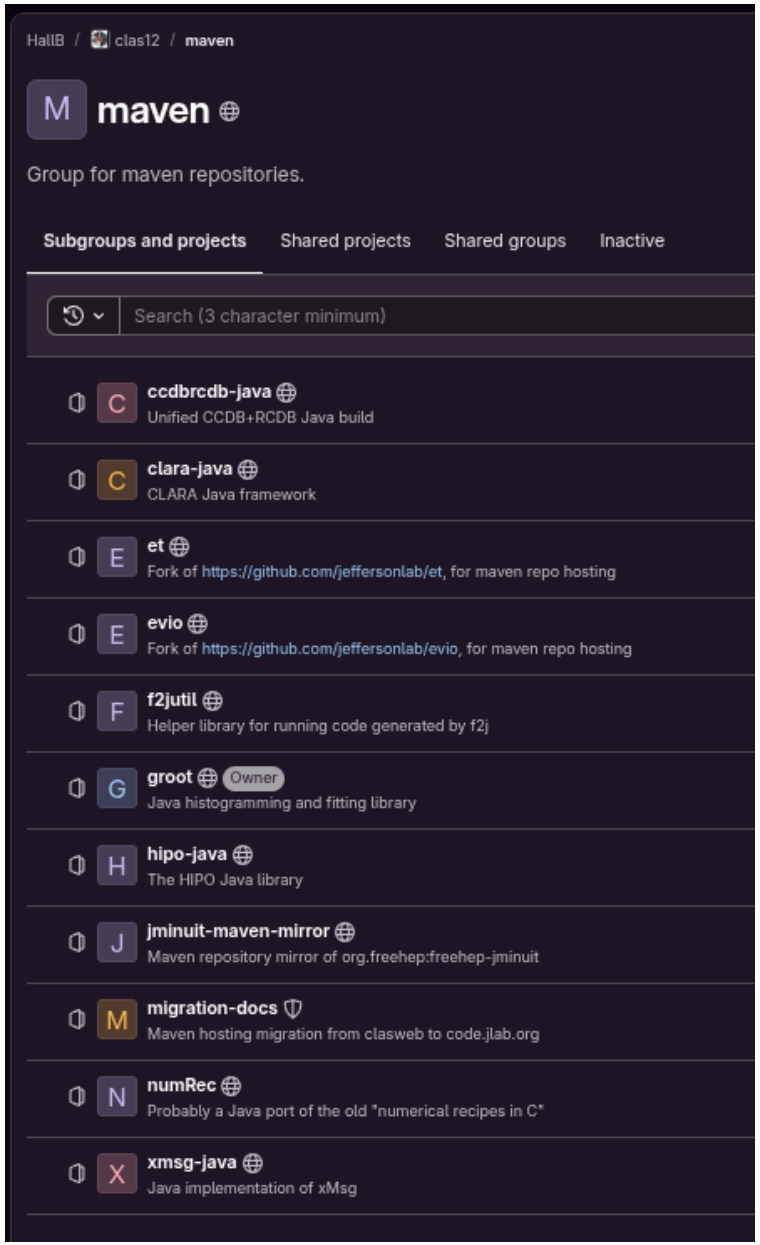




- The software wiki has been replaced with a static website, generated automatically from markdown
  - https://pages.jlab.org/hallb/clas12/swwg (website, in the cloud)
  - https://code.jlab.org/hallb/clas12/swwg (git repo, at JLab)
  - Need to update CLAS's main landing pages still ...
  - Weekly meetings, agendas, minutes are still on the wiki for now, probably move to Indico in '27
- In progress before the surge in SI started overwhelming the lab's IT services
- Not as easy to edit as the wiki (when it worked!), but can still do it in a web browser, with a merge request, and more portable
- *Probably still a few links that point to the wiki and need porting, but already 99% independent of the old wiki*
- *The Documentation tab has grown, with Onboarding in place and needing work*
- *Needs a nice background; no one liked my SVG animation:) And a new name ...*
- Opportunities for '27 service work

Clasweb, Maven, GitLab, yuk …

- Clas12's Java ecosystem (coatjava, mon12, timelines, ced, etc) was supported by maven repositories hosted by clasweb
    - Never officially supported by JLab/IT
    - Allowed easy publication and distribution of pre-built Java binaries
        - But also hand-made ones with no provenance, no reproducibility, no code
        - Also just a raw, https-accessible filesystem, sugar for SI bots
    - It "worked fine" for years
- Not reliable in many months, with symptoms varying frequently due to internal and external changes
- JLab IT provides a GitLab instance, with built-in public maven repo hosting (unlike the lab's GitHub organization), and over the last 6 months, we've gradually migrated
    - 1 remaining open pull request will make Coatjava independent of clasweb!
    - Still need to propagate downstream to mon12, ced, timelines, but that'll be easy



Disk Resources at JLab

- **`/volatile/clas12 450TB`** (auto-deletion)
  - Auto-deletion gets the oldest first
  - It's always full, so if you write 1 TB, another 1 TB gets auto-deleted, so *lifetime (normally) depends on your group's write rate, not quota!*
- **`/work/clas12(b) 170TB(150TB)`** (unmanaged)
  - Snapshots at **`/work/clas12/.zfs/snapshot`** (absorbs quota)
  - No snapshots for **`/work/clas12b`**
- **`/cache/clas12`** (read-only, auto-deletion)
  - Disk residence for data from tape, **`/mss/clas12`**
  - *See cache-pins for pinning data on the cache disk*
- **`/mss`** (metadata only)
  - Filesystem representing tape storage
  - **`/mss/clas12/rg-x/production`** - permanent, chef-managed
  - **`/mss/hallb/scratch`** - will be reclaimed, think ~year lifetime

This info will be added to the SWWG website's Onboarding!

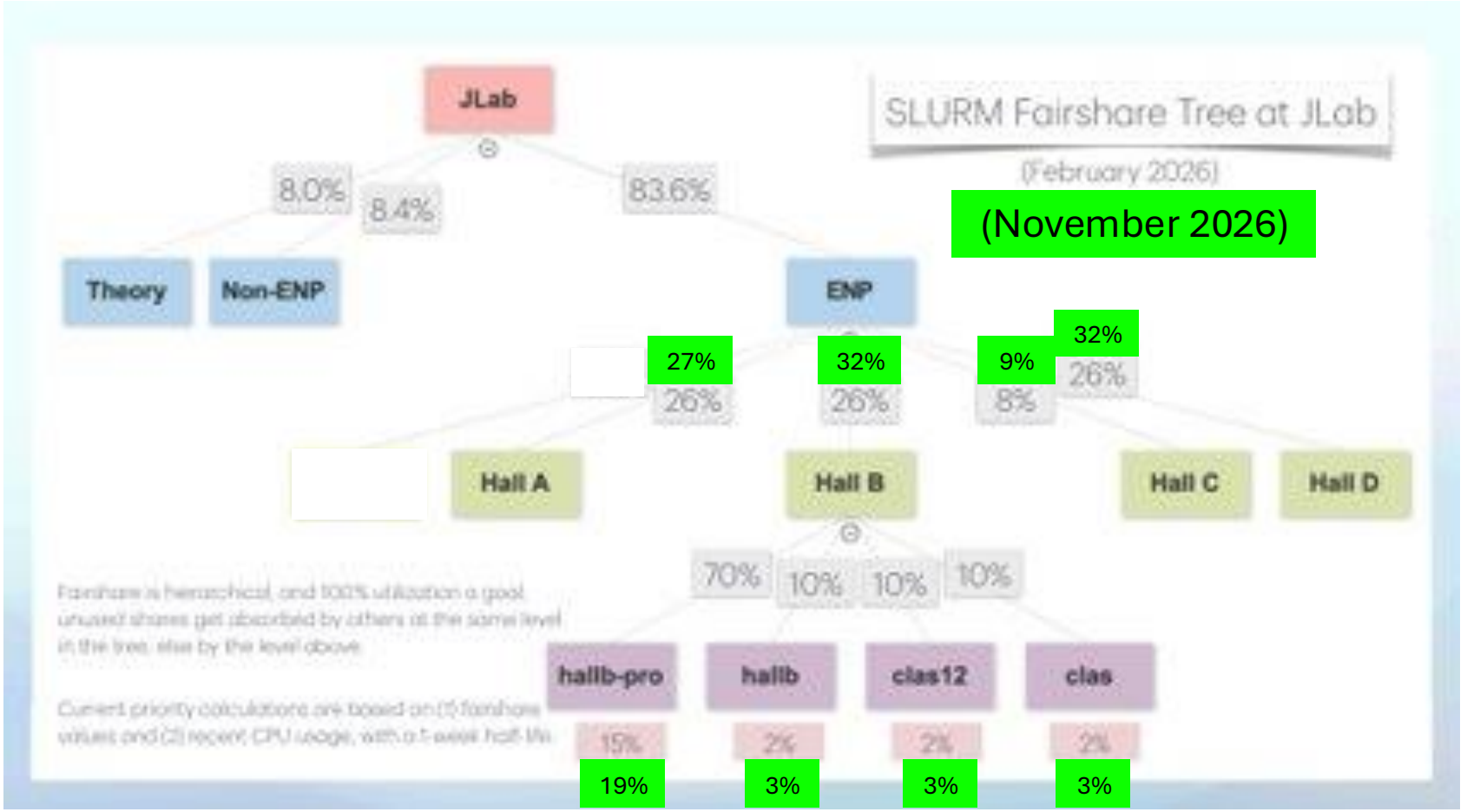
Guidance Examples

- **`/volatile`** for calibration/software iterations & data quality checks (1%, many times)
- **`/mss/hallb/scratch`** for partial data processing for medium-term, preliminary physics analysis, longish term simulation storage (1%)
- **`/mss`** for full data quality check (1%)
- **`/mss`** for final processing for physics analysis (10%)
- **`/mss`** for rare trigger skims (1%)
- **`/mss`** for official simulation samples (10%)
- **`/volatile`** or **`/mss/hallb/scratch`** for simulations, onsite and offsite
- **`/work`** for small, trimmed physics ntuples, small standard data samples, databases, software, development, etc.
- **`/farm_out`** for logs and **`/scratch`** for local temporary storage, and **`/scratch/slurm/$SLURM_JOBID`**

- *Use* **`swif2`** *and its I/O directives for reading and writing to tape (and /volatile) from batch jobs.*

  Automatically retrieves data from tape IF necessary, pins it on disk for the duration of your job and then submits to SLURM, and releases it only after your job completes, with optimizations for frequently read data. Staging also helps isolate your job from system problems.
- *Use* **`jcache/jput`** *for interactively reading/writing to tape.*
- *Use Globus for transferring data offsite.*

More fairshare changes



Service Work Advert

1241	RICH	Software	Software maintenance and development **Expertise required:**	Software	0.200	Marco Mirazita	December 22, 2027	Throughout the year	(Marco Mirazita) since Nov 10, 2026	Edit or **DELETE**
1242	RICH	Simulation	Performance MC vs real data **Expertise required:**	Software	0.200	Marco Mirazita	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1243	RICH	Reconstruction	PID studies **Expertise required:**	Software	0.100	Marco Mirazita	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1244	RICH	Reconstruction	ML/AI methodology for PID **Expertise required:**	Software	0.200	Marco Mirazita	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1281	SOFTWARE	Documentation	Wiki migration, website cleanup **Expertise required:**	Software	0.100	Nathan Baltzell	December 22, 2027	Throughout the year	none	Drop, Edit or **DELETE**
1282	SOFTWARE	Documentation	Gemc **Expertise required:**	Software	0.150	Raffaella De Vita	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1283	SOFTWARE	Documentation	Meeting minutes **Expertise required:**	Software	0.100	Nathan Baltzell	December 22, 2027	Throughout the year	none	Drop, Edit or **DELETE**
1284	SOFTWARE	Validation	Tracking covariance **Expertise required:**	Software	0.150	Tongtong Cao	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1285	SOFTWARE	Validation	Kinematic fitting **Expertise required:**	Software	0.150	Nathan Baltzell	December 22, 2027	Throughout the year	none	Drop, Edit or **DELETE**
1286	SOFTWARE	Validation	Qadb **Expertise required:**	Software	0.150	Christopher Dilks	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1287	SOFTWARE	Validation	Timeline **Expertise required:**	Software	0.150	Christopher Dilks	December 22, 2027	Throughout the year	(Sangbaek Lee) since Nov 10, 2026	Edit or **DELETE**
1288	SOFTWARE	Validation	Multi-hit fadcs **Expertise required:**	Software	0.150	Nathan Baltzell	December 22, 2027	Throughout the year	none	Drop, Edit or **DELETE**
1289	SOFTWARE	AI/ML	AI/ML tracking optimization in FD and muRWell **Expertise required:**	Software	0.250	Tongtong Cao	December 22, 2027	Throughout the year	(Noah Smith) since Nov 10, 2026	Edit or **DELETE**
1290	SOFTWARE	AI/ML	AI/ML tracking in FD validation **Expertise required:**	Software	0.250	Tongtong Cao	December 22, 2027	Throughout the year	(Alexis Osmond) since Nov 10, 2026	Edit or **DELETE**
1291	SOFTWARE	AI/ML	AI/ML denoising in CD **Expertise required:**	Software	0.250	Tongtong Cao	December 22, 2027	Throughout the year	(Mathieu Ronayette) since Nov 10, 2026	Edit or **DELETE**
1292	SOFTWARE	AI/ML	AI/ML track finding in CD **Expertise required:**	Software	0.250	Tongtong Cao	December 22, 2027	Throughout the year	(Uditha Weerasinghe) since Nov 10, 2026	Edit or **DELETE**
1293	SOFTWARE	AI/ML	ECAL Fast Simulation **Expertise required:**	Software	0.250	Maurizio Ungaro	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1294	SOFTWARE	AI/ML	Neutral ECAL Clustering **Expertise required:**	Software	0.250	Richard Tyson	December 22, 2027	Throughout the year	(Aoran Liu) since Nov 10, 2026	Edit or **DELETE**
1295	SOFTWARE	AI/ML	AI/ML reconstruction validation in CD **Expertise required:**	Software	0.200	Tongtong Cao	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1296	SOFTWARE	AI/ML	RG-H recoil tracking **Expertise required:**	Software	0.200	Tongtong Cao	December 22, 2027	Throughout the year	(Maggie Kerr) since Nov 10, 2026	Edit or **DELETE**
1297	SOFTWARE	AI/ML	AI/ML assistance for tracking in uCLAS12 **Expertise required:**	Software	0.200	Tongtong Cao	December 22, 2027	Throughout the year	(Kayleigh Gates) since Nov 10, 2026	Edit or **DELETE**
1298	SOFTWARE	AI/ML	Fast CLAS12 Simulations with Parnassus **Expertise required:**	Software	0.250	Derek Glazier	December 22, 2027	Throughout the year	(Tyler Hellstern) since Nov 10, 2026	Edit or **DELETE**
1254	SOFTWARE	Software / Computing	URWell tracker simulation and reconstruction for muCLAS12 **Expertise required:**	Software	0.200	Raffaella De Vita	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1258	SOFTWARE	Software / Computing	Iguana integration **Expertise required:**	Software	0.200	Christopher Dilks	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1263	SOFTWARE	Software / Computing	Kinematic fitting in iguana **Expertise required:**	Software	0.100	Christopher Dilks	December 22, 2027	Throughout the year	none	Edit or **DELETE**
1268	SOFTWARE	Software / Computing	Clas6 simulation workflow **Expertise required:**	Software	0.100	Nathan Baltzell	December 22, 2027	Throughout the year	(Ahmed El Alaoui) since Nov 10, 2026	Drop, Edit or **DELETE**
1273	SOFTWARE	Software / Computing	Chef **Expertise required:**	Software	0.100	Nathan Baltzell	December 22, 2027	Throughout the year	none	Drop, Edit or **DELETE**
1278	SOFTWARE	Documentation	Wiki migration, website cleanup **Expertise required:**	Software	0.100	Nathan Baltzell	December 22, 2027	Throughout the year	(Evrim Gulser) since Nov 10, 2026	Drop, Edit or **DELETE**

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