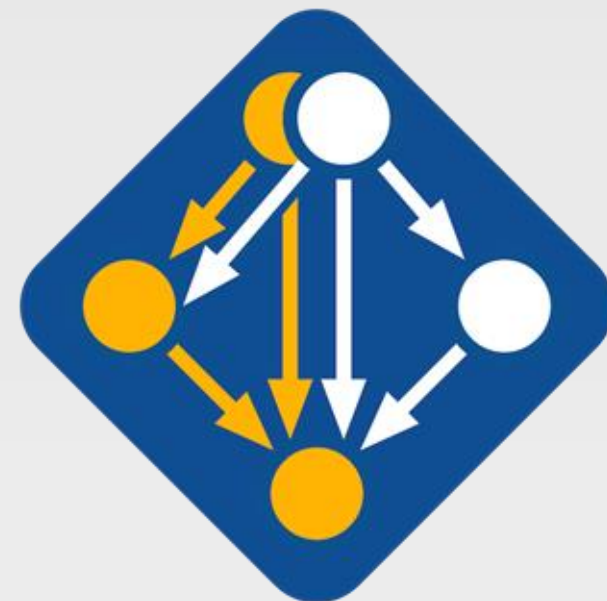


PESO: Partnering for Scientific-Software Ecosystem Opportunities

Are these challenges familiar?

- Installing 3rd party libs and tools
- Managing library version updates
- Adopting new libraries and tools
- Managing portability across CPUs/GPUs
- Long build times
- Out-of-date algorithms
- Awareness of latest SW practices
- Opportunities to improve your software



Spack: What and Why

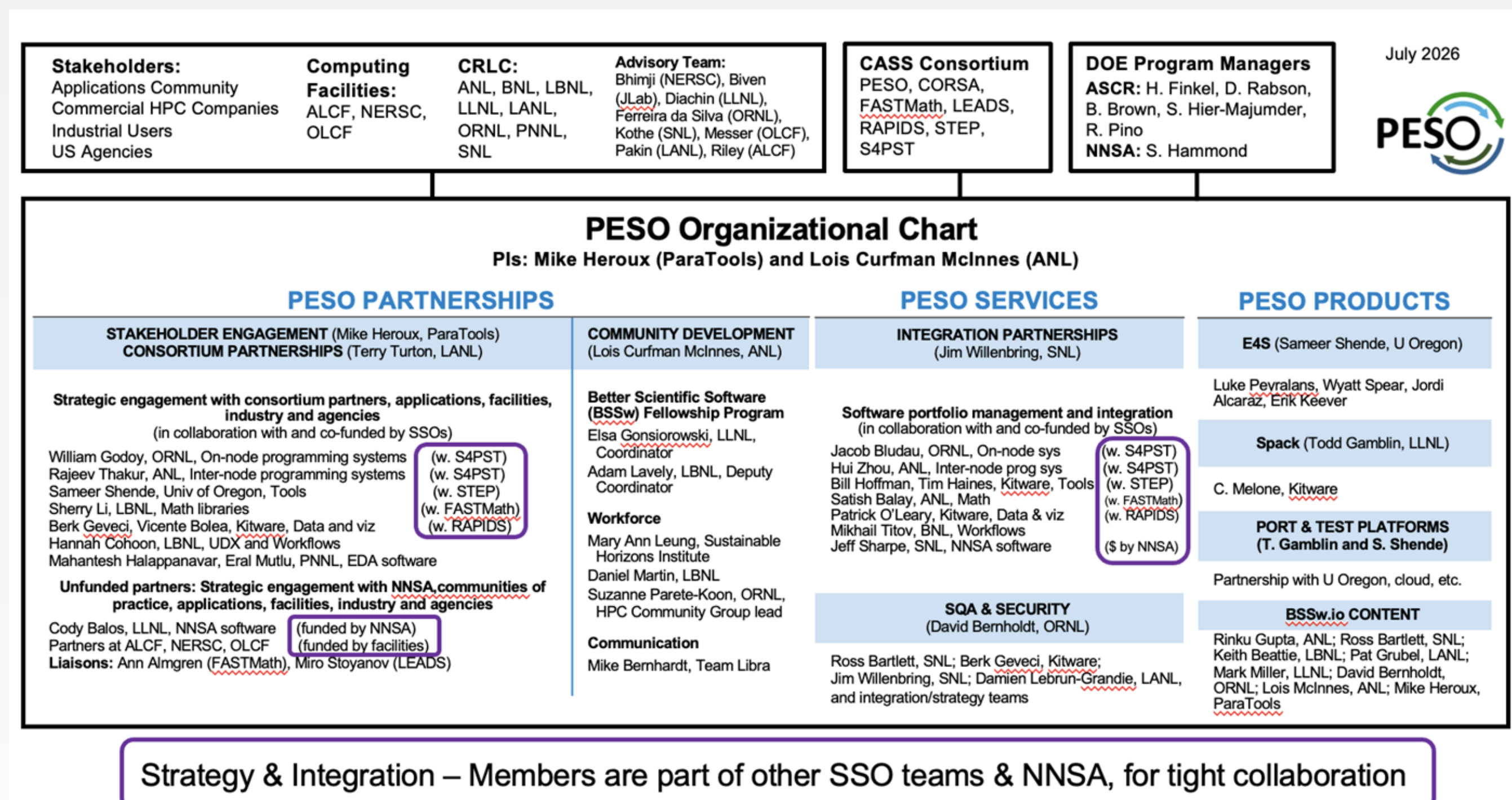
Spack supports teams managing an evolving set of libraries and tools across various HPC systems, ensuring consistent, reliable, and reproducible software environments.

- Flexible package management**
Install multiple versions & configs side by side without conflicts
- Cross-platform support**
Wide range of HPC architectures: laptops, clusters, supercomputers
- Dependency resolution**
Automatically handles complex dependency chains
- Customizable builds**
Modifiable build options, compiler choices, & dependency versions
- Extensive repository**
Thousands of packages: a wide range of scientific-AI software
- Reproducibility**
Reproducible builds, consistent setups across users & systems.
- Integration with CI/CD**
Integrates with CI/CD, enabling automated testing/deployment
- Community-driven**
Maintained and extended by a large and active community
- E4S integration**
Spack helps manage and deploy E4S, an HPC-AI software ecosystem for science



<https://spack.io>

Software Ecosystem Benefits (Technical and Community)



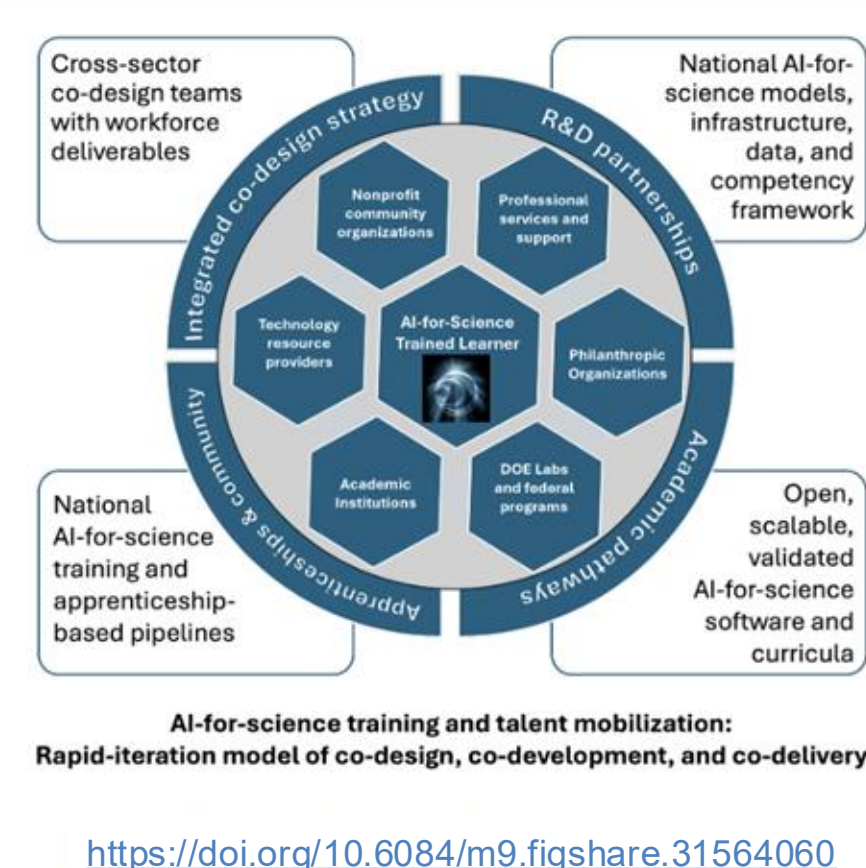
Community Development

HPSF Growth & Impact

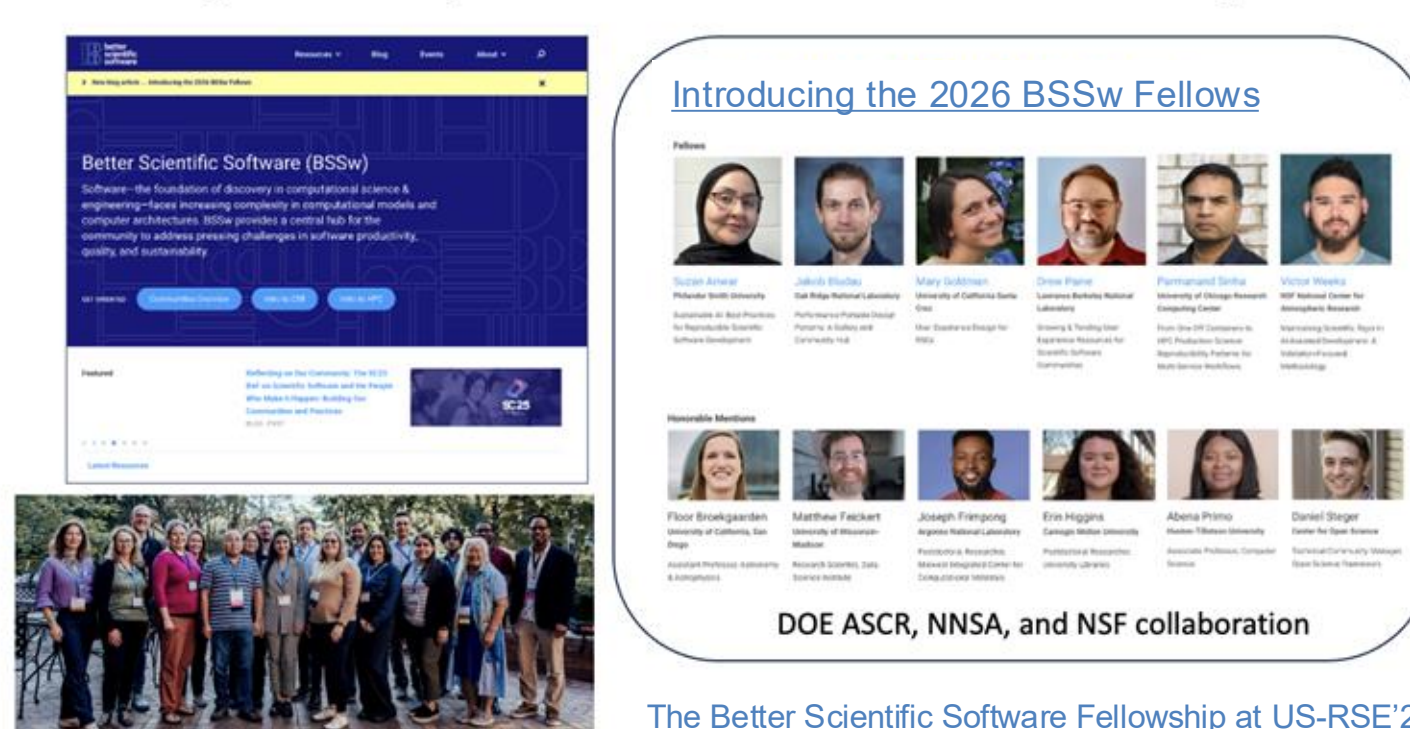


- HPSF Impact and Promise**
 - The High Performance Software Foundation (HPSF) supports use and sustainment of apps, libraries and tools for leadership scientific computing
 - HPSF promises to be the critical community element that brings together all parties with common interests in high-quality, open-source, scientific software
 - HPSF provides funding and collaboration that enable DOE, other US agencies, industry, and international groups to work together on common software interests
 - HPSF provides a key element for sustaining DOE investments in scientific software

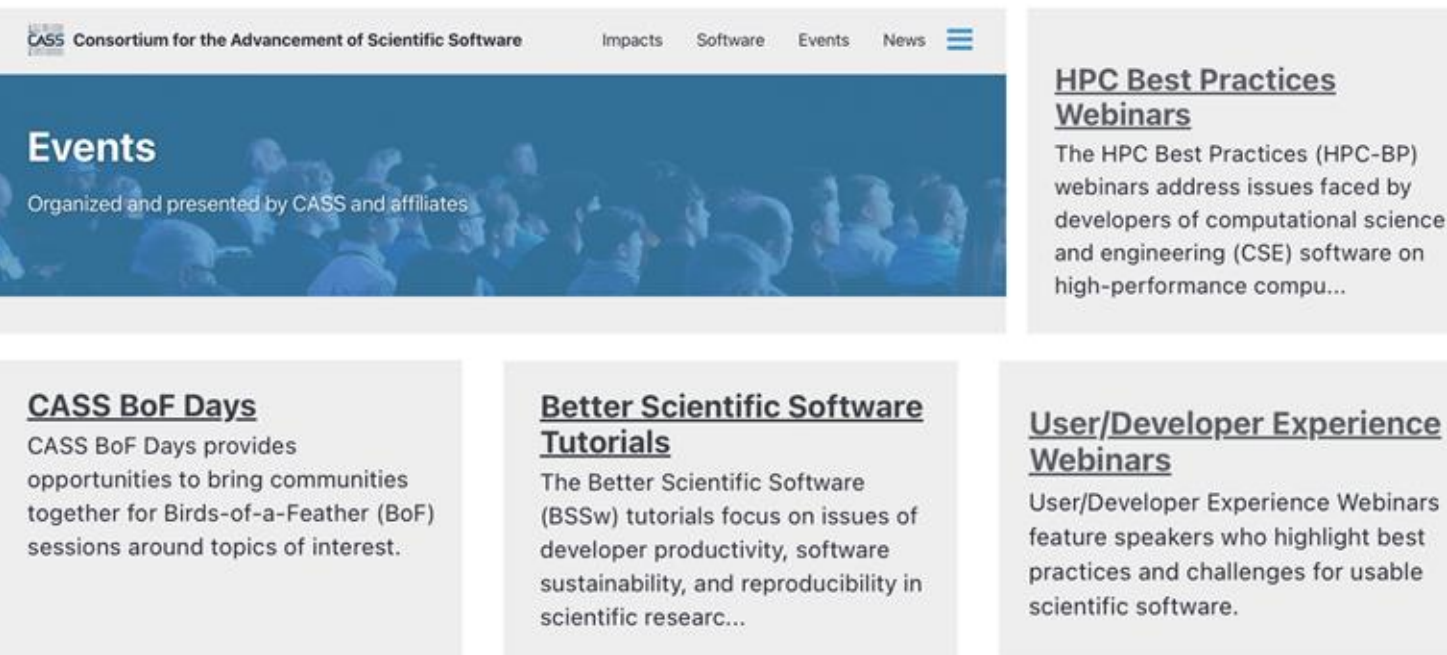
CASS Workforce Working Group



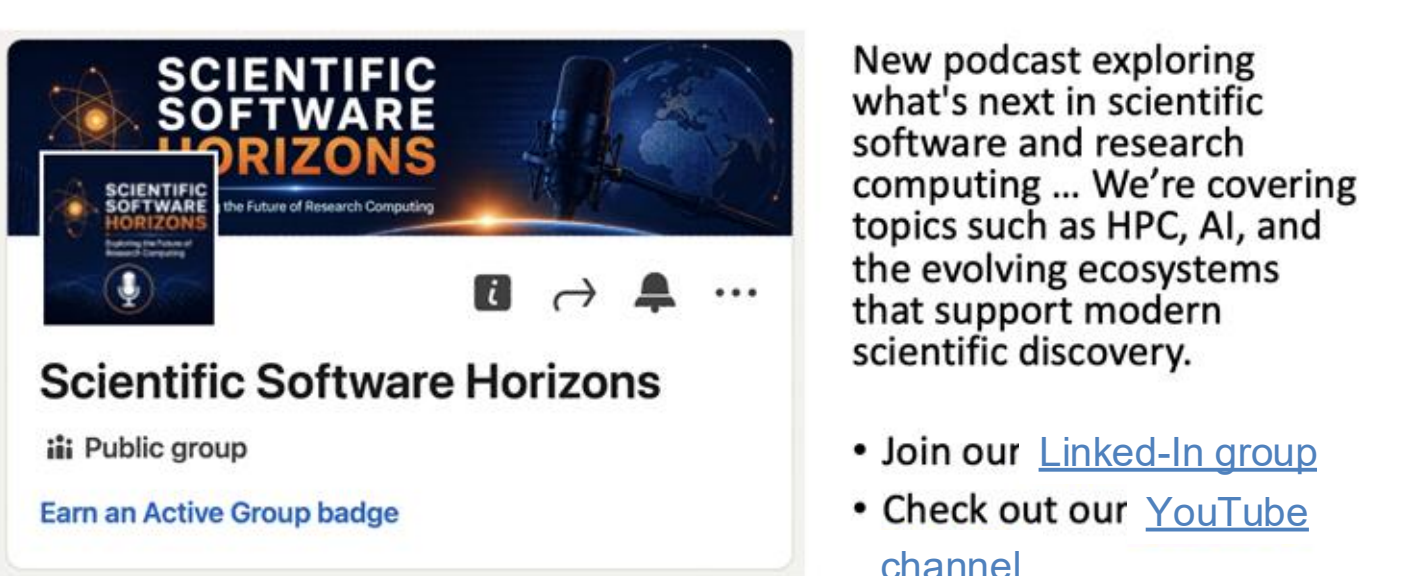
BSSw.io and BSSw Fellowship Program: Fostering community and info on scientific software best practices



HPC Best Practices Webinars ... and more!



Scientific Software Horizons Podcast



PESO is part of CASS <https://cass.community>

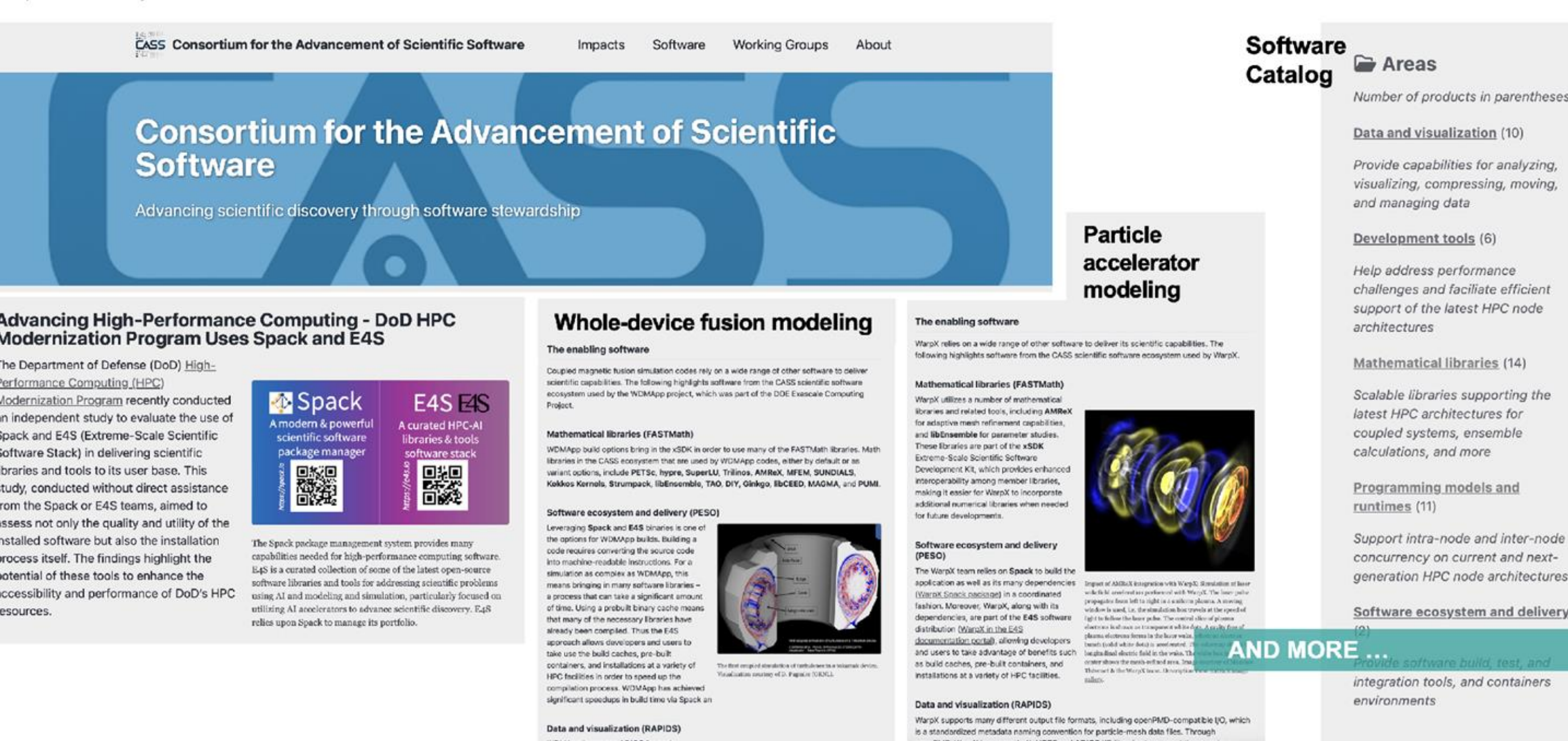


CASS and its member organizations work with our software product teams to improve the quality, sustainability, and interoperability of the software products in our ecosystem.

Join us!



CONSORTIUM FOR THE ADVANCEMENT OF SCIENTIFIC SOFTWARE



The PESO project can help!

PESO is a five-year software-ecosystem stewardship and advancement project. PESO's vision is that DOE software investments will have maximum impact by providing a scientific software ecosystem via Spack and E4S, consisting of high-quality libraries and tools that deliver the latest high-performance algorithms and capabilities to applications at DOE and beyond.

E4S: What and Why Ecosystem for Science

E4S provides 140 HPC-AI libraries and tools, easing deployment, management, and reproducibility of complex scientific workflows.



<https://e4s.io>



E4S Product list
Don't have what you need? Ask for it!

- Comprehensive software portfolio**
Curated collection of HPC and AI libraries & tools
- Cross-platform compatibility**
All major & emerging HPC platforms, desktops to supercomputers
- Ease of installation via curated Spack configuration**
Spack with ensured compatibility, tested, and optimize environment
- Focus on reproducibility**
Standardized deployment on many systems, for validation & collaboration
- Continuous integration & testing**
On many platforms including latest CPUs, APUs, and GPUs
- Support for modern workflows**
Support for parallel, GPU acceleration, and cloud-native apps
- Community and industry collaboration**
Maintained via national labs, academia, industry, collaborations
- Documentation and support**
Comprehensive resources, aiding effective deployment & utilization

E4S	Too Many?	Too Few?	But
Products	Yes	Yes	E4S provides a <i>lattice</i> (products x builds x platforms)
Builds	Yes	Yes	that reduces your challenge from managing <i>everything</i> to managing the <i>difference</i> between what you need and what E4S provides. Big win!
Platforms	Yes	Yes	

E4S – Too much, too little, just right!

Explore more details: Related posters

- CASS
- E4S
- Spack
- User-Developer Experience (UDX)
- Advances in software practices and impact



CASS Software Stewardship Organizations

- STEP, S4PST
- FASTMath, LEADS, RAPIDS (SciDAC)

Engage with PESO

