

Update from the ASCAC Subcommittee on Transitioning from the Exascale Project

Presentation to BESAC 7/11/19
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Charge: Subcommittee Charge Elements

- **Examine:**

- ECP lessons learned for **managing large collaborations**,
- ASCR's historic **fundamental research investments** in applied mathematics, computer science and computational partnerships at the National Labs,
- **new Research and Development priorities** in artificial intelligence, quantum information systems and strategic computing.

- **Recommendations (R):**

- for **capturing the lessons learned** from ECP
- **supporting** the software and hardware technologies and application development from ECP activities
- informing ASCR's **future investment strategy** for its basic research programs

Subcommittee Members

Jay Bardhan, Glaxo Smith Kline	Richard Lethin, Reservoir Labs (ASCAC)
Alan Edelman, MIT	David Levermore, UMD, (ASCAC)
Roscoe Giles, Boston U. (chair)	Juan Meza, NSF (UC Merced)
Fred Johnson, DOE/Retired	Dan Reed, U. Utah (ASCAC)
Alexandra Landsberg, DoD HPCMP	

Status

- Information Gathering
 - ECP Leadership and teams
 - ASCR Reports (Heterogeneity, Futures, Sci Mach Learn)
- Discussions with Stakeholders:
 - ECP leadership and teams
 - Applied math researchers inside and outside of ECP
 - Computer Science researchers inside and outside ECP
 - SC AD's and select teams
 - Workshops being planned
- Report update at Sept ASCAC meeting
- (Final report in December)

Some Key Issues

- ASCR support for medium and long term research
 - Basic research in Applied Math and Computer Science
- Sustain and build on benefits of ECP
 - Software, Hardware, Applications
 - Effective ASCR collaboration with SC offices and stakeholders
- Workforce impact - ECP and facilities
 - People, knowledge, and skills
 - Education Pipeline
 - Diversity
- Incorporation of management lessons for large projects
 - Models for large scale accountable development
 - Relation with ASC
 - Relations with Industry

Sample Interview Questions: General

- What are the critical issues you see coming from the end of ECP?
- What aspects of ECP should be sustained in some fashion after the project?
- What has the impact of ECP been for your community?

Questions: Near Future after ECP

- What is the best model to bring the benefits of advanced computing to your community?
- What new science do you foresee being enabled by the transition to exascale? Will there be any paradigm shifts?
- How should DOE exascale computing in your area interact with other national and international computing efforts.

Questions: Longer Term Future

- What are your hopes for the impact of post-exascale computing in your field?
- How would you engage with ASCR as we explore post-exascale computing paradigms?
- What algorithmic/computing barriers would you hope can be transcended?

Questions: Organization and Workforce

- What is needed to enable scientists in your area to take advantage of emerging and future computing?
- How can we guarantee that crosscutting themes and interactions between the SC offices (and especially ASCR) are developed and grow where appropriate?
- How do young scientists in your fields develop the required computational skills?
- Who else should our committee talk with as we consider the ECP transition?

Future Activities

- Continued interviews of small groups
- Planning 2 workshops likely co-located with ASCR Town Halls in August and October

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