Argonne
NATIONAL LABORATORY

UPDATE ON ASCAC SUBCOMMITTEE DOCUMENTING ASCR IMPACTS

PAUL MESSINA
Argonne National Laboratory

April 17, 2018
Arlington, VA

CHARGE LETTER: HIGH-LEVEL OBJECTIVES

- Steve Binkley charged the ASCAC with producing a report that assesses and documents the historical accomplishments of the Advanced Scientific Computing (ASCR) program and its predecessors over the past four decades.
  - Highlight outstanding examples of major scientific accomplishments that have shaped the fields of ASCR research
  - Identify the lessons learned from these examples to motivate ASCR investment strategies in the future
  - Illuminate the guiding strategies and approaches that will be key to ensuring future U.S. leadership in the full range of disciplines stewarded by ASCR
  - Inform the future investment strategy of the Office of Science
- The report should provide technical details as needed for context but should be primarily concerned with the essence of each story as it relates to the larger progress of science
- Report is due December 31, 2018

Argonne
NATIONAL LABORATORY

CHARGE LETTER: QUESTIONS TO CONSIDER

- What are the major scientific accomplishments that have shaped the ASCR-supported disciplines in the last 40 years? How has ASCR contributed to those advances?

- What impacts have those accomplishments had on the Department's missions in energy, environment, or security?

- What are the key aspects of the ASCR's investment strategy that have had the greatest impacts?

- Looking to the future, and building on the ASCAC reports, what research areas and funding strategies to pursue those areas could further strengthen ASCR in serving the DOE missions?

SUBCOMMITTEE MEMBERS

- Buddy Bland, ORNL
- Jackie Chen, SNL
- Phil Colella, LBNL
- Jack Dongarra, University of Tennessee and ORNL
- Thom Dunning, PNNL
- Wendy Huntoon, KINBER
- Bill Johnston, LBNL (ret.)
- Paul Messina, ANL, Chair
- Jim Pool, Caltech (ret.)
- Dan Reed, University of Iowa
- John Sarrao, LANL

ELEMENTS OF ACCOMPLISHMENTS

- What is the accomplishment?
- What is the significance of the accomplishment?
    - E.g., standards, widely used software
- What impact did the accomplishment have on the Department of Energy mission in science, computing, energy, environment, or security?
- What impact did the accomplishment have on industry, workforce or education
    - E.g., software taken up by ISVs or widely used
- What resources and approaches (e.g., computing resources, codes) were used?
- What role did collaborations with other Federal agencies, universities and laboratories play?
- What funding sources and computing programs supported this work?
- What important publications resulted?
- What future research is planned as a result of the accomplishment?

DRAFT OUTLINE OF REPORT (1)

- Executive summary

- 1.0 Introduction

- 2.0 Criteria for selection of accomplishments to highlight

- 3.0 Accomplishments
  - 3.1 Computational science
  - 3.2 Applied mathematics (numerical algorithms, applied analysis, …)
  - 3.3 Mathematical software
  - 3.4 Computer science (System software, libraries, tools, …)
  - 3.5 Computer architecture
  - 3.6 Facilities (NERSC, ALCF, OLCF, ESnet, ACRF, …)

Argonne
NATIONAL LABORATORY

DRAFT OUTLINE OF REPORT (2)

- 4.0 Impact on industry

- 5.0 Impact on workforce

- 6.0 Impact on education

- 7.0 Other achievements and contributions
  - 7.1 High-impact workshops and reports sponsored by ASCR

- 8.0 Lessons learned from different modes of funding and recommendations for the future

- 9.0 Summary

- Appendix A. Compelling stories on achievements and their genealogy

- Appendix B. Charge letter

- Appendix C. Members of the subcommittee

- Appendix D. People contacted

- Appendix E. Archival sources of information

Argonne ◢◣
NATIONAL LABORATORY

SOURCES OF INFORMATION

- Reports on achievements, research projects funded
- Solicit input from community
- Lists of funding awards
- Contact current and former program managers
- Contact participants in ASCR-supported research
- CSGF Fellows
- Reports from workshops, symposia
- Recipients of major awards
- Annual and major anniversary reports from facilities

Argonne
NATIONAL LABORATORY

EXAMPLES OF SOURCES

- 1991 The DOE Program Component of the Federal HPCC Program (DOE/ER-0498P)

- 1993 The DOE Program in HPCC (DOE/ER-0536)

- 1993 Requirements for Supercomputing in Energy Research: The Transition to Massively Parallel Computing (DOE/ER-0587)

- 1996 Mathematical, Information, and Computational Sciences Division (MICS) HPCC program (OSTI-392846)

- 2008 Breakthroughs, report of The Panel on Recent Significant Advancements in Computational Science

- 2011 INCITE in Review

YOUR INPUT IS SOLICITED

- Please suggest accomplishments to highlight, people to contact

- Your input on future directions

- Especially answers to these questions:

  - **What are the key aspects of the ASCR's investment strategy that have had the greatest impacts?**
  - **Looking to the future, and building on the ASCAC reports, what research areas and funding strategies to pursue those areas could further strengthen ASCR in serving the DOE missions?**

- Contact any subcommittee member to provide your input

THANK YOU!

Argonne
NATIONAL LABORATORY