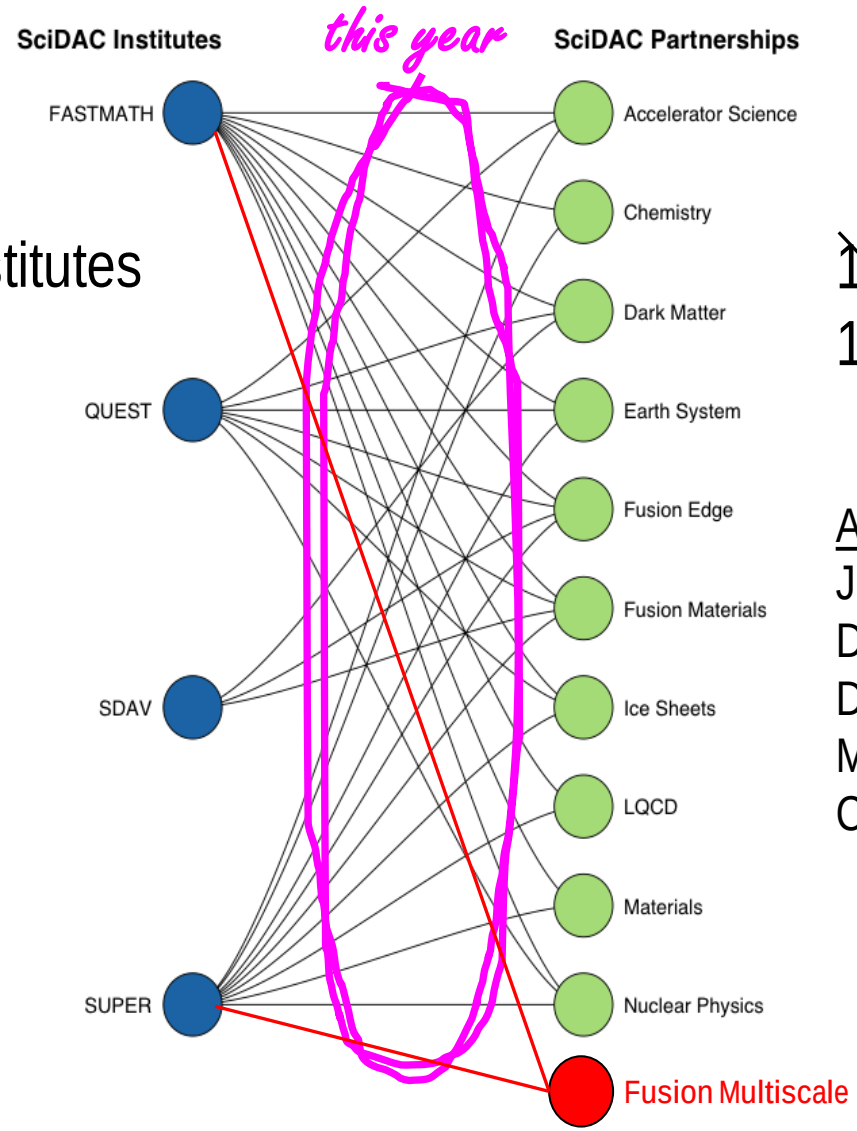
This is the third SciDAC-3 PI Meeting

4 SciDAC-3 Institutes



~~18~~ SciDAC-3 Partnerships
19

ATOM: Advanced Tokamak Modeling
Jeff Candy (GA); David Green, Don Batchelor, David Bernholdt, Ed D'Azevedo (ORNL); Mikhail Dorf, Milo Dorr (LLNL); Chris Holland (UCSD)

From *SIAM News*, Volume 47, Number 3, April 2014

SciDAC: Accelerating Scientific Discovery, Transforming Computational Science

The Office of Science at the U.S. Department of Energy created the SciDAC (Scientific Discovery through Advanced Computing) program to address challenging large-scale scientific problems that are central to the mission of DOE. Given the scale of these scientific problems, progress requires high-performance computing platforms, such as those at the National Energy Research Scientific Computing Center, the Argonne Leadership Computing Facility, and the Oak Ridge Leadership Computing Facility. Established in 2001 as a five-year program, SciDAC is now in its third five-year cycle; its longevity can be attributed to both the increasing scale of the scientific problems to be solved and the growing complexity of computer architectures.

At the time of the June 2001 launch of SciDAC, the fastest machine in the world (at Lawrence Livermore National Laboratory) attained 7.2 teraflops per second across 8192 cores. Twelve years later, the fastest machine (the Tianhe-2 in China) has achieved 33,800 teraflops per second across 3.12 million cores, representing an almost 5000-fold increase in computing power. At the same time, computer architectures have become much more elaborate, with increasingly heterogeneous design and deepening memory hierarchies. In this setting, a multidisciplinary approach is needed for solving large-scale scientific problems.

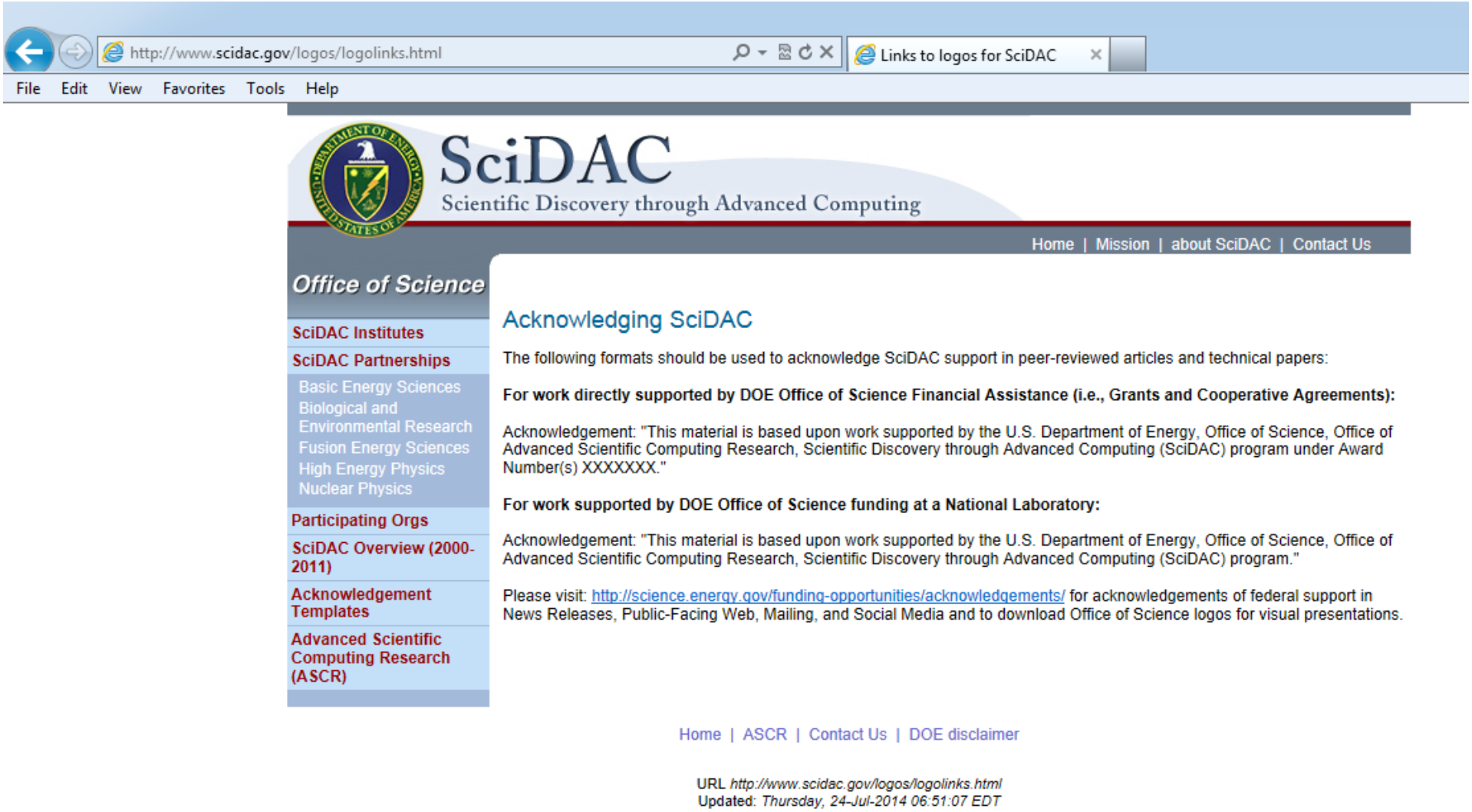
A defining aspect of the SciDAC program has been its strong emphasis on partnerships among domain scientists, applied mathematicians, and computer scientists; a reorganization of the program at the beginning of its current cycle reinforces the importance of partnerships. The goal is to leverage expertise in computer science and mathematics, as well as state-of-the-art mathematical algorithms and software libraries for advanced computing, in solving large-scale scientific problems and thus making possible and accelerating scientific discoveries. Understanding the current SciDAC program

Without these improvements, our understanding of carbon-14 would not be as [illegible] the Technical University of Munich, in an article in *New Scientist*, "One can now say confidently that the problem is solved."—*Eduardo D'Azevedo, Oak Ridge National Laboratory; Esmond G. Ng, Lawrence Berkeley National Laboratory; and Stefan M. Wild, Argonne National Laboratory.*

Further information on the SciDAC program can be found at http://www.scidac.gov.

U.S. DEPARTMENT OF ENERGY

SciDAC Website



Logistics: Talks, Posters, Lunch, Panel

- Talks are projected from the meeting PC
  - Please mail or share: matthew.tran@g.ascr.doe.gov
  - Moderators: 20' 24' 30' & announce breaks

- Poster session (Lenny Oliker): Today at 3:45-5:30 PM.
  - Please have all of the posters up by 3:45 pm today and collect them by Friday.
- Working lunch: Tomorrow at 12:00-1:30 PM in Palladian room.
  - "The NERSC-8 System: Cori" by Sudip Dosanjh
  - Please purchase lunch TODAY.
- Panel (R. Brower, E. Ng, R. Ross): On Friday at 11:00 AM-12:00 PM here
  - "Computer Science, Math and Science: Harnessing the Troika", Phil Colella, Anshu Dubey, Salman Habib