

SciDAC strategy

ANL-FNAL collaboration meeting

Panagiotis Spentzouris

5/18/2007

SciDAC: Scientific Discovery through
Advanced Computing.

SciDAC1: 2001-2006

SciDAC2: 2007-2012

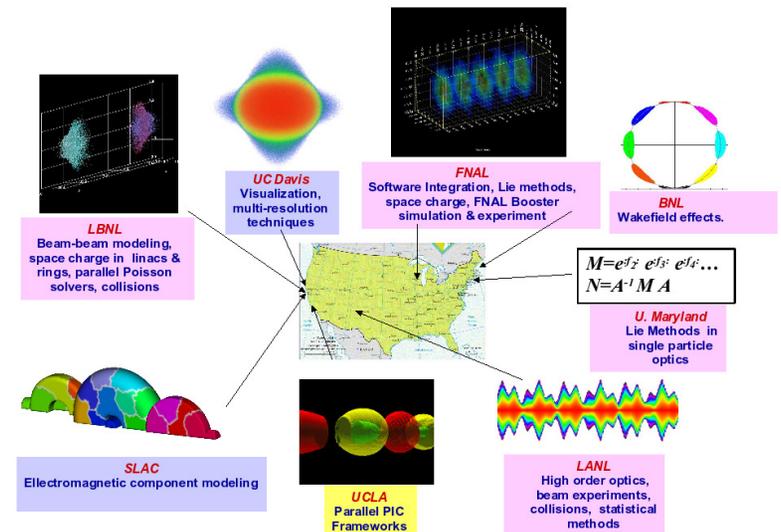
The SciDAC1 program

- Develop scientific applications to *effectively* take advantage of terascale computing, by creating
 - a new generation of scientific simulation codes
 - the mathematical and computing systems software to enable these scientific simulation codes to use terascale computers
 - a distributed science software infrastructure to enable scientists to effectively utilize these codes.

Accelerator modeling: emphasis on building teams of computer scientists, and computational and machine physicists

Project lead by LBNL and SLAC.

Fermilab funding share very small in the beginning (fraction of an FTE); successful involvement in framework development and hands on applications lead to increase in funding and visibility.



SciDAC1 Participants:

- **Labs**: LBNL, SLAC, FNAL, LANL, BNL, SNL
- **Universities**: Stanford, UCLA, USC, UCD, UMd
- **Small business**: Tech-X
- Collaborations w/ applied math and CS researchers (strong ANL participation)

Sponsors: DOE/SC HEP (formerly HENP) in collaboration with ASCR

SciDAC2

COMPASS

- Utilize petascale computing
- Emphasis on target applications (work with application researchers)
- For accelerators, explicitly asked to include **HEP**, **NP**, and **BES** applications

Community Petascale Project for Accelerator Science and Simulation

A Proposal Submitted to the DOE Office of Science

Program Announcements: DE-PS02-07ER07-09 and LAB 07-09

Program Area: Accelerator Science and Simulation

Program Offices: Offices of High Energy Physics, Nuclear Physics, and Basic Energy Sciences and the Computational Science Research and Partnerships (SciDAC) Division

Technical Contacts: Glen Crawford, Craig Tull, Sidney A. Coon, Roger Klafky, and Walter Polansky

Lead Institution: Fermi National Accelerator Laboratory.

Coordinating Principal Investigator and DOE Contact: Panagiotis Spentzouris
Fermi National Accelerator Laboratory
P.O. Box 500; Batavia, IL 60510-500
phone: 630-840-4342; FAX: 630-840-2783; spentz@fnal.gov

Participating Institutions and Principal Investigators

Argonne National Laboratory:	Michael Borland*, Lois Curfman McInnes* [‡]
Brookhaven National Laboratory:	Wolfram Fischer*
Fermi National Accelerator Laboratory:	James Amundson, Panagiotis Spentzouris* [‡]
Lawrence Berkeley National Laboratory:	William Fawley*, Esmond Ng* [‡] , Ji Qiang*, Robert Rynne* [‡]
Los Alamos National Laboratory:	Peter Walstrom*
Oak Ridge National Laboratory:	Richard Barrett*
Stanford Linear Accelerator Center:	Lie-Quan Lee, Cho Ng* [‡]
Stony Brook University:	James Glimm*
Tech-X Corporation:	David L. Bruhwiler, John R. Cary* [‡]
Thomas Jefferson National Accelerator Facility:	Rui Li*, Haipeng Wang
University of California, Davis:	Kwan-Liu Ma*
University of California, Los Angeles:	Viktor Decyk, Warren Mori* [‡] , Sven Reiche*
University of Maryland:	Tom Antonsen*
University of Southern California:	Tom Katsouleas*

* Institutional Principal Investigator

[‡] Management Committee

In addition, Kwang-Je member of our Advisory Committee.

COMPASS focus

- Multi-physics modeling by further developing and utilizing parallel frameworks
 - Move from accelerator **component** to accelerator **system** modeling
 - Development started at Fermilab during SciDAC1, in close collaboration with ANL MCS division personnel
 - Applications to “real” machines and design efforts, in close collaboration with our users.

ANL-FNAL collaboration

- There is (truly!) great potential, with expertise that is
 - Complementary (augments capabilities)
 - electrons vs protons, advanced parallel computing vs broad physics & design experience
 - Overlapping (provides base for collaboration)
 - Hands on applications, framework development, user oriented codes
- Already some activity (outside SciDAC2)
 - ILC, work with MCS

Strategy

- Continue/enhance work on joint applications and code development
 - ILC-DR, RIA EM design, parallelization of codes, incorporation of new physics modules
 - Interaction essential for new ideas that will lead to new projects (and new funding opportunities)
- Unified front/strategy in dealing with DOE SciDAC program managers
 - be involved (and coordinate!) in selecting program managers

But of course ...

- Practical issues
 - How to maximize SciDAC benefits to our institutions
 - Why aren't our budgets bigger?
- We have to accept that SciDAC promotes collaboration.
 - We will take advantage of the collective expertise, and co-exist in “friendly competition” with our collaborators.



The chicken and egg problem: in order to get more funding you need to have expertise and demonstrate results. To do so, you need funding. Support of the parent-Lab is essential, especially for a new group.

FY07 (a comment)

- Our SciDAC2 project is not funded yet
 - Partially due to the delay from the DOE request to merge 2 proposals (which both reviewed very well)
 - Partially due to the overall budget situation
 - The participating offices are negotiating their respective contribution for this year
 - We might end up with a “more-than-anticipated” reduced budget for FY07; this does not mean that our program was not well received by DOE.

Other possibilities

- Cornel test facility