



Report to Unidata Policy Committee

September 7, 2006

Clifford Jacobs
Division of Atmospheric Sciences
National Science Foundation



Main Topics

- FY 2007 and FY 2008 Budgets
- Update on NSF Strategic Plan for CI
- Management Review of NCAR



President's American Competitiveness Initiative

2007
BUDGET
REQUEST

Double the
NSF budget
over 10 years

National Science Foundation

FY 2007 BUDGET REQUEST TO CONGRESS

NSF FY 2007

Budget Request Total



2007

BUDGET
REQUEST

\$6.02 billion

(Increase from FY 2006: \$439 million, 7.9%)

NSF FY 2007

Budget by Account (millions)



2007

BUDGET REQUEST

Appropriations Account	FY 2007 Request	Change over FY 2006	
Research & Related Activities	\$4,666	\$334	7.7%
Education & Human Resources	\$ 816	\$ 20	2.5%
Major Research Equipment & Facilities Construction	\$ 240	\$ 50	26.0%
Salaries & Expenses	\$ 282	\$ 35	14.2%
National Science Board	\$ 4	(\$.04)	(1.0%)
Inspector General	\$ 12	\$.5	4.4%
TOTAL, NSF	\$6,020	\$439	7.9%

Status of Budget for FY 2007 by Account

NSF ACCT	<u>C.P. FY06</u>	<u>Req. FY07</u>	<u>House</u>	<u>% Chg/ FY 06</u>	<u>Senate</u>	<u>% Chg/ FY 06</u>
R&RA	\$4,331	\$4,666	\$4,666	7.72%	\$4646	7.27%
EHR	\$797	\$816	\$832	4.48%	\$836	4.90%
MRE	\$191	\$240	\$237	24.40%	\$237	24.40%
S&E	\$247	\$282	\$268	8.67%	\$257	3.93%
OIG	\$11.4	\$11.9	\$11.9	4.40%	\$11.9	4.40%
NSB	\$3.95	\$3.91	\$3.91	-1.01%	\$3.91	-1.01%
TOTAL	\$5,581	\$6,020	\$6,020	7.86%	\$5,992	7.36%

FY 2008 Budget Preparation

- OMB guidance positive for FY 2008
Guidance and Request Level
- NSF is preparing budget request under positive guidance

Several initiatives will be of direct benefit to GEO.



Status Report on CI Vision Document and Petascale System Acquisition

Presented to Committee on Programs and
Plans of NSB

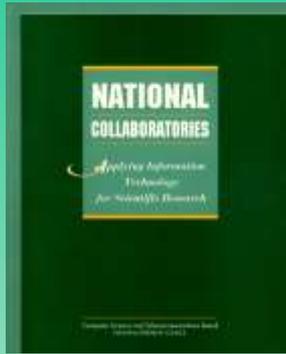
August 9, 2006

by

Dan Atkins

Director, Office of Cyberinfrastructure

CI Genealogy & Movement



Collaboratories

KDI

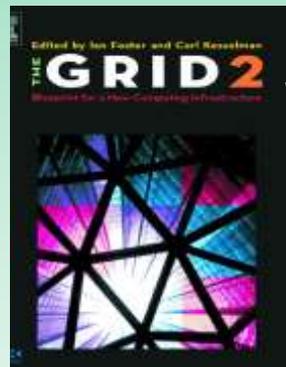
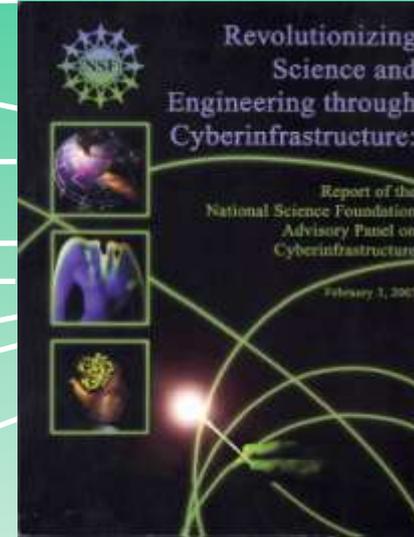
PACI

HPCC

Digital Libraries

GRIDS

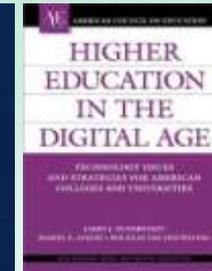
ITR



E-science



Cyberscience

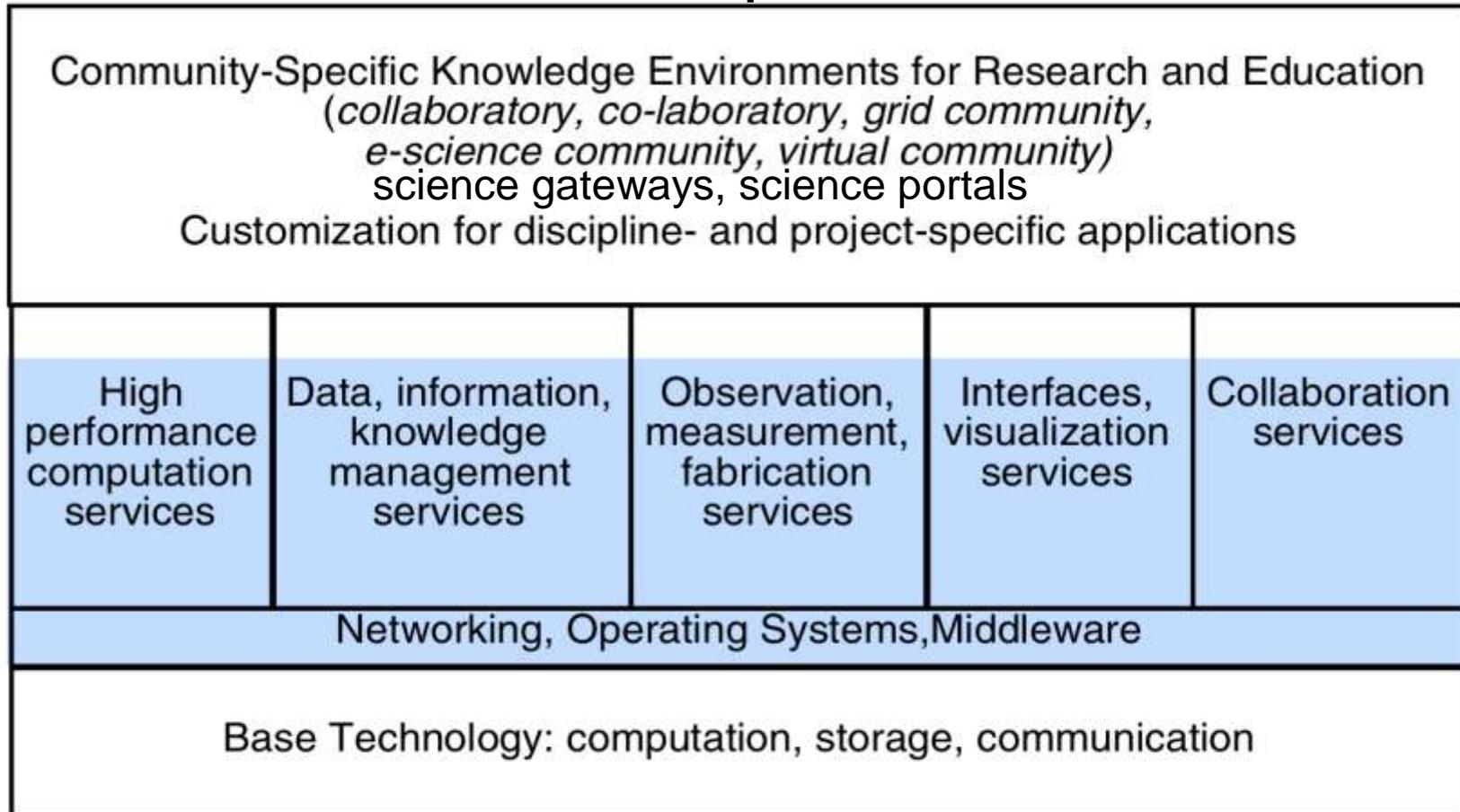


IT & Future of Higher Education

2nd Edition

www.mkp.com/grid2

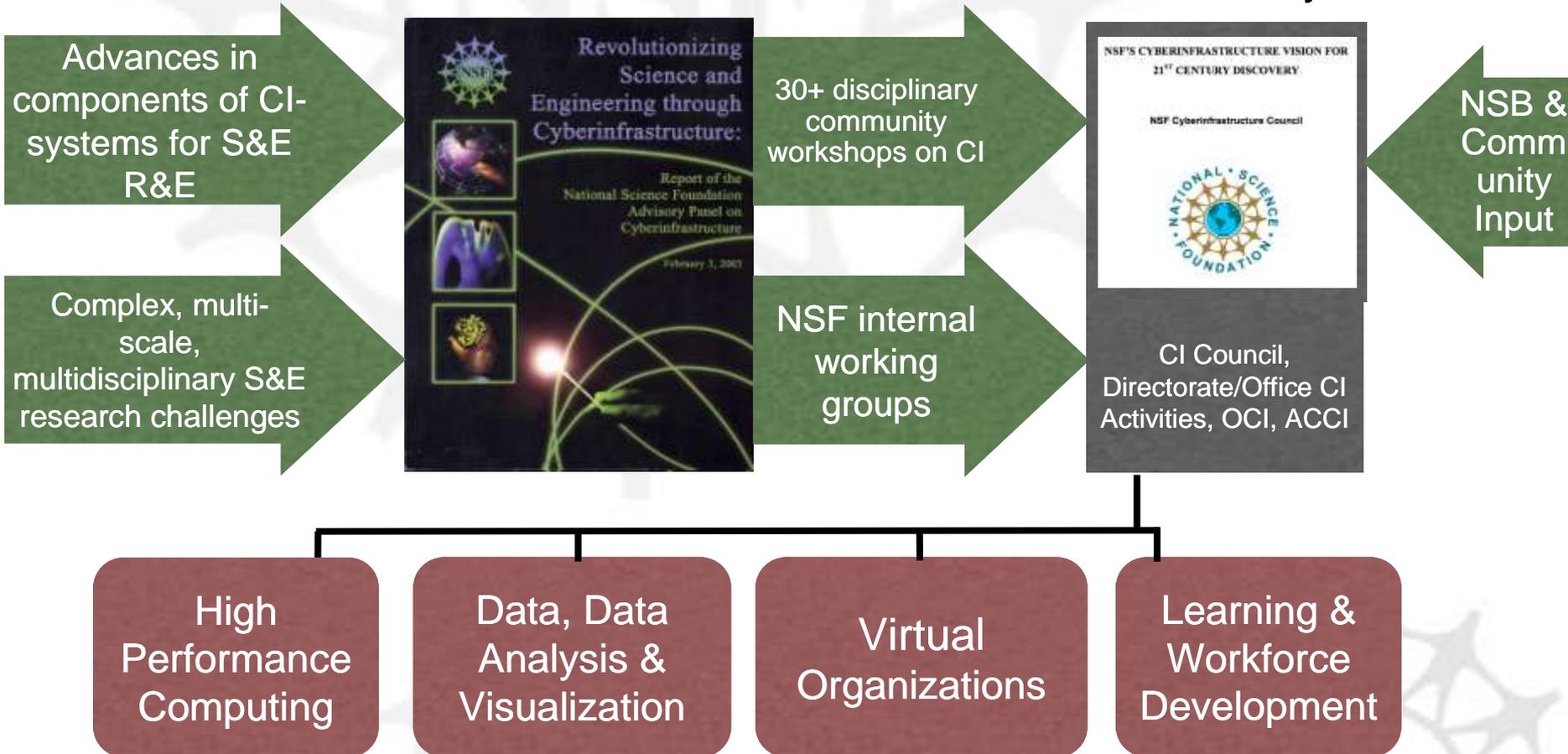
From the CI Advisory Panel Report



 = *cyberinfrastructure: hardware, software, services, personnel, organizations*

Background

NSF's Cyberinfrastructure Vision for 21st Century Discovery



CI Vision Document Status

- This version (7.0) was shared with the new Advisory Committee for CI in June.
- Version 7.1 (with small editorial changes) was posted for public comment at end of July and sent to the NSB.
- Atkins has now taken on leadership of the CI vision process

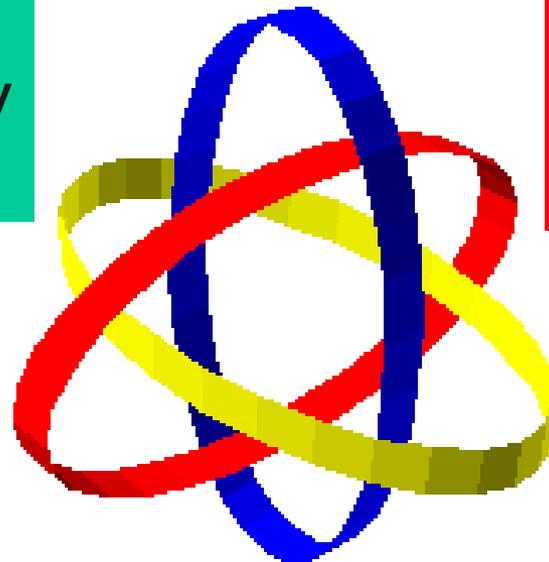
Further input from NSB is welcome

Focus now on developing further implementation plans

Achieving the CI Vision requires synergy between 3 types of Foundation-wide activities

Transformative Application - to enhance discovery & learning

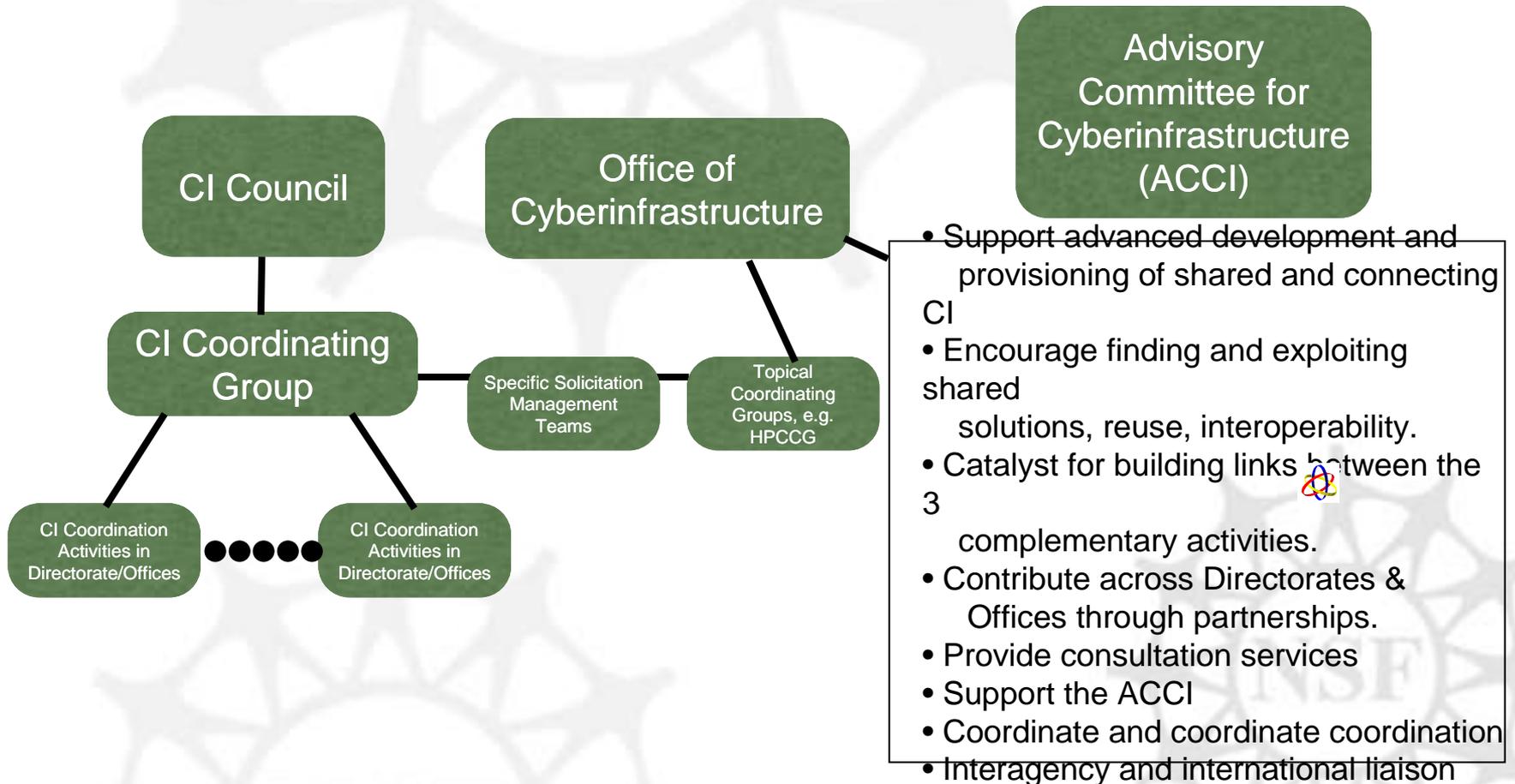
Provisioning - Creation, deployment and operation of advanced CI



R&D to enhance technical and social dimensions of future CI systems

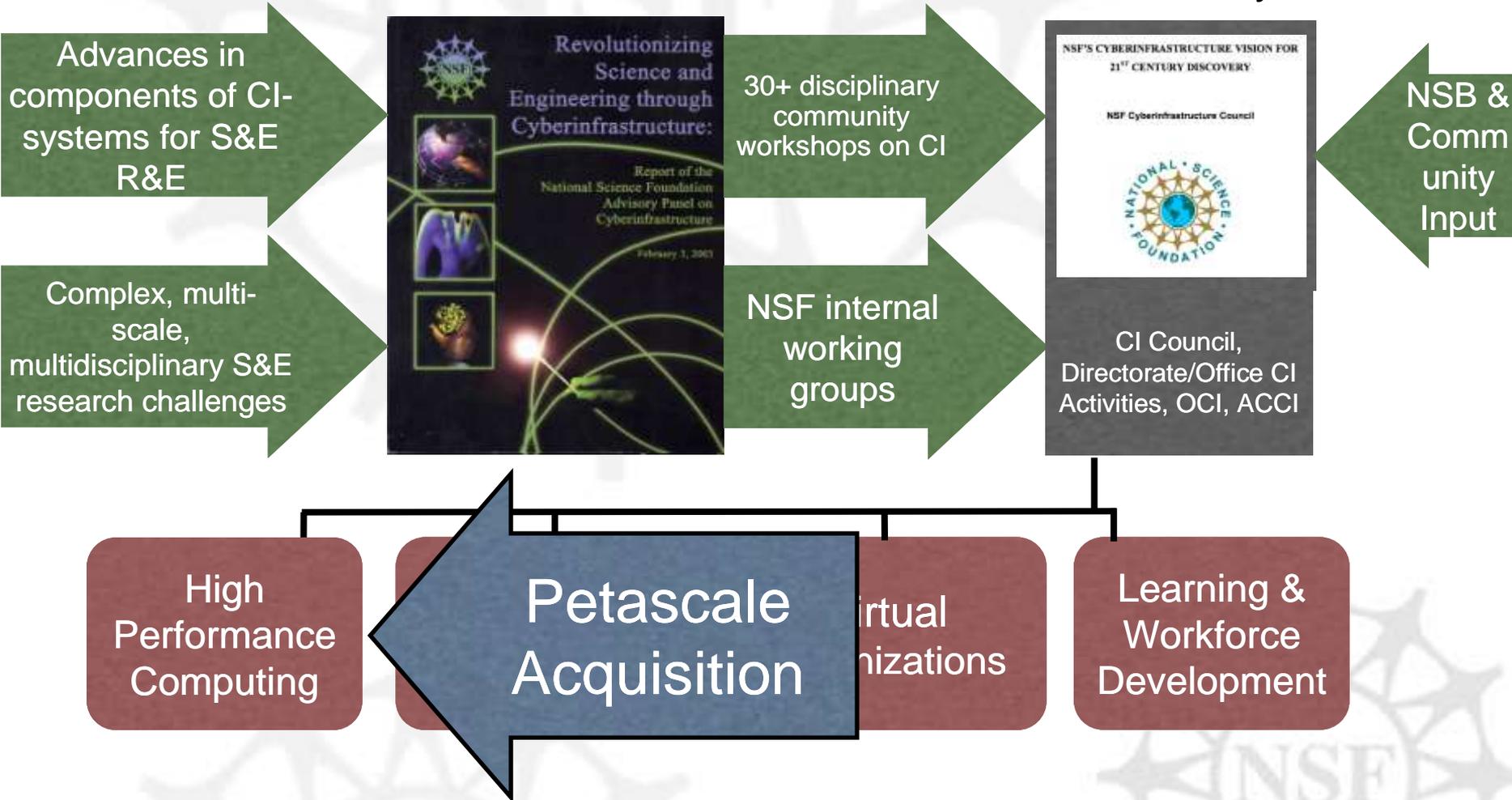
NSF

Organizational Components



Background

NSF's Cyberinfrastructure Vision for 21st Century Discovery



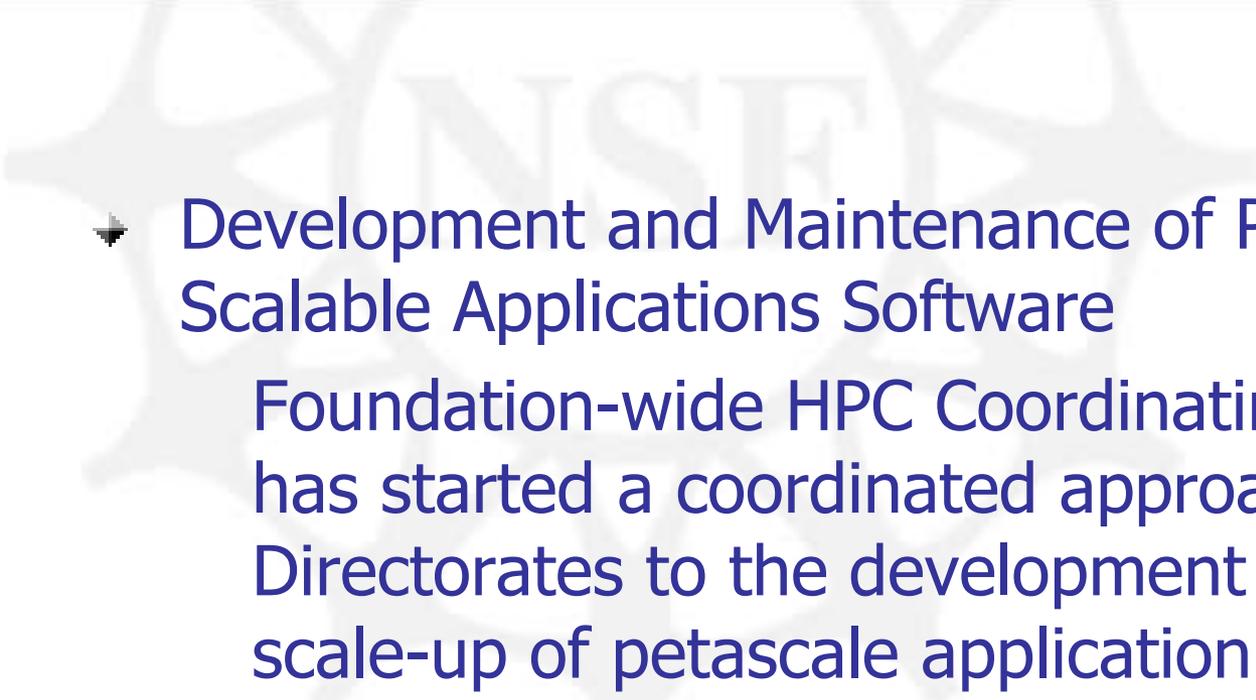
HPC Strategy

- Specification, Acquisition, Deployment and Operation of Science-Driven HPC Systems Architectures

More follows

- Development and Maintenance of Supporting Software: New Design Tools, Performance Modeling Tools, Systems Software, and Fundamental Algorithms

Foundation wide activities



➤ Development and Maintenance of Portable, Scalable Applications Software

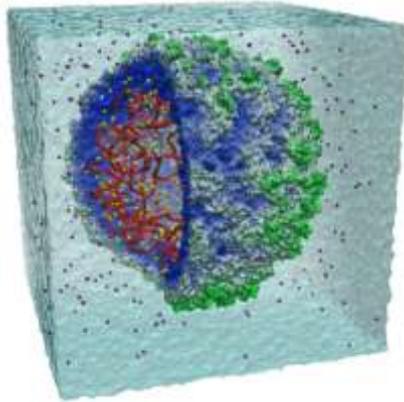
Foundation-wide HPC Coordinating Group has started a coordinated approach in the Directorates to the development and scale-up of petascale application codes.

Awardee will be expected to support this soon after Petascale award begins.

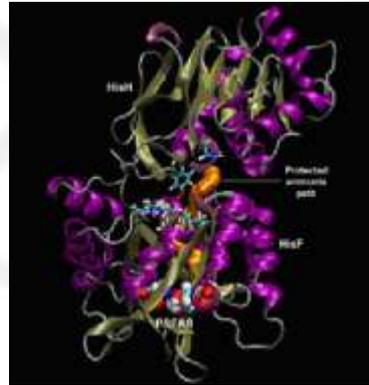
- early access to architecture and application expertise
 - to tools and smaller scale machines of similar architecture
- 

Science driven -HPC is an increasingly important tool for understanding:

Life

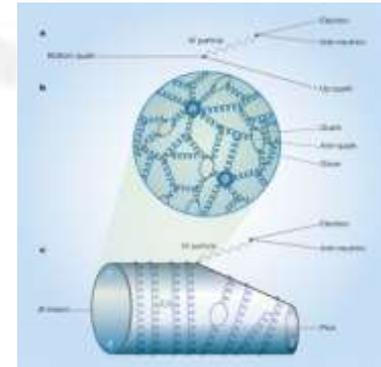


Satellite tobacco mosaic virus, P. Freddolino et al.



Aldehyde dehydrogenase, T. Wymore and S. Brown

Matter

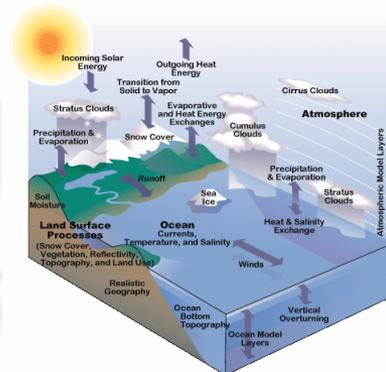


I. Shipsey

The Environment

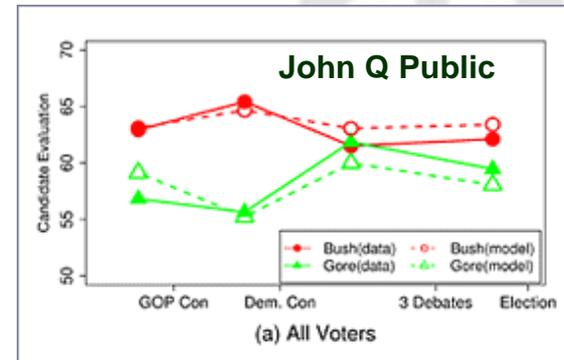


K. Droegemeier et al.



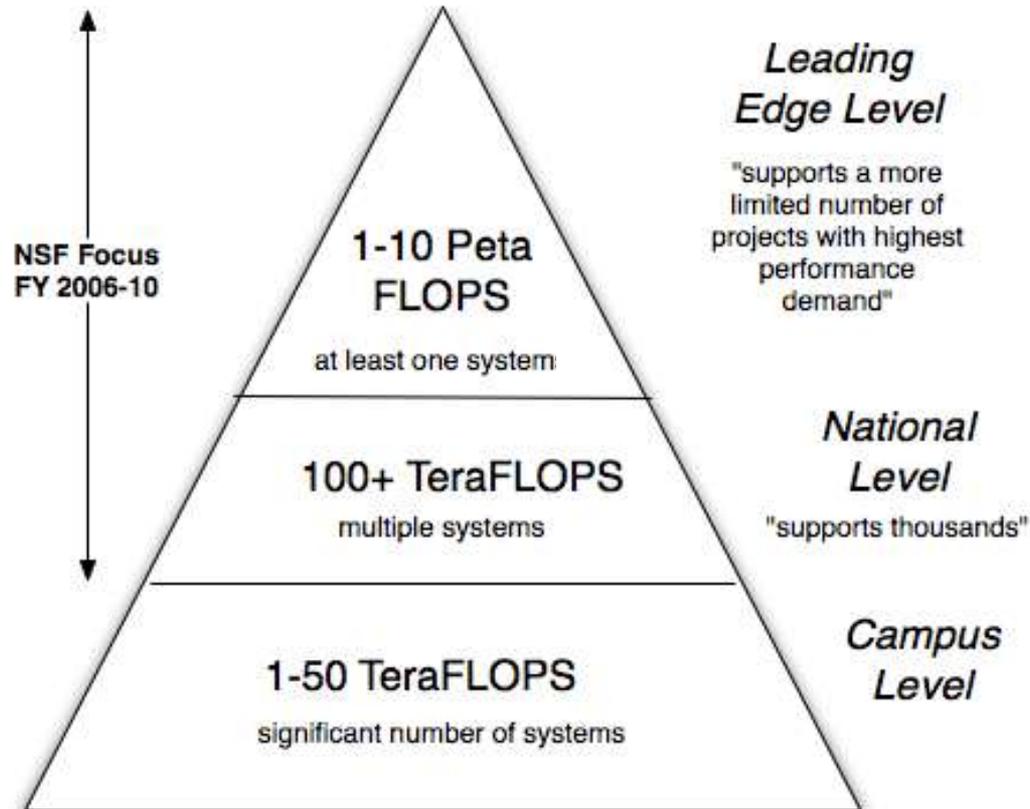
Community Climate System Model

Society



S.-Y. Kim, M. Lodge, C. Taber.

➤ Three tracks: leading edge, national (mid-range), campus



Track 1: One solicitation funded over 4 years: \$200M acquisition + additional O&M cost.

Track 2: Four solicitations over 4 years: \$30M/yr acquisition + additional O&M cost. First track 2 award pending NSB approval 8-07

✦ Distributed and Connected



➤ **Architectural and functional diversity**

a range of machines for computation (multiple architectures), as well as high-end visualization and data management services.

➤ **Open competition**

A series of four Track 2 competitions

- 13 proposals on first round

One Track 1 competition

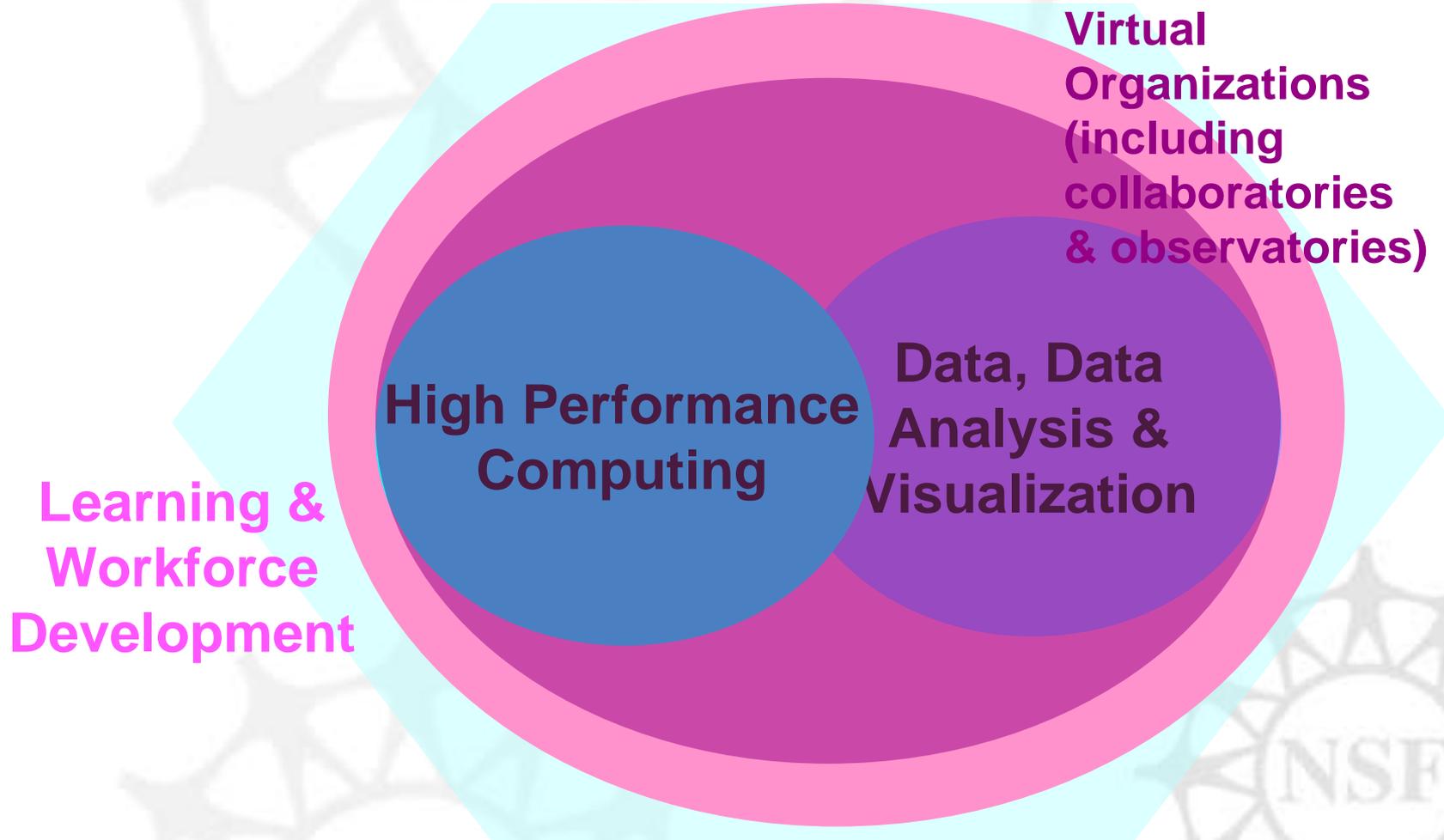
✦ **Cooperation with other agencies**

Federal High-End Computing
Interagency Working Group (part of the
National Science and Technology
Council coordination infrastructure.)

- share benchmarks
- fund research on performance modeling and new benchmark development
- participate in each others reviews
- coordinate procurement processes

- DARPA High Productivity Computing Systems (HPCS) Initiative
 - Indirect benefit from HPC developed for classified environments
- Ad hoc interaction with petascale projects in other countries
 - Europe
 - Japan
 - (China has announced intention)

Part of a larger CI vision



Petascale Solicitation Highlights

- Up to \$200M over four years through acceptance testing. (O&M after acceptance is separate)
- To enter production mode by mid-2011
- Architecture neutral but science-driven and balanced across broad range of problems;

single geographic site but broad network access;

resources allocated via the NSF peer-reviewed allocation process;

early petascale machine but expected to be robust, stable, usable;

active engagement of petascale R&E communities.

✦ Federally-Funded R&D Centers (FFRDC) eligible, if they

conform to NSF user access policies

provide reasonable physical access

✦ Timeline

June 5, 2006 - Solicitation
Released

Sept. 8, 2006 - Preliminary
Proposals Due

Feb. 2, 2007 - Full Proposals
Due

Spring 2007 - Site Visits

Aug. 2007 - Recommendations
to NSB



Review of NCAR Management

On Site Review
March 20-22, 2006



Panel Membership

- **Dr Mary L. Good**, University of Arkansas, Chair
- **Charles Kennel**, Scripps Institution of Oceanography, UCSD
- **Charles Vernon Shank (Chuck)**, University of California, Berkeley
- **Diane L. Evans**, Jet Propulsion Laboratory
- **Chester S. Gardner (Chet)**, University of Illinois System
- **Norine E. Noonan**, College of Charleston
- **John E. Jones, Jr.**, National Weather Service
- **Michel Béland**, Meteorological Service of Canada

Charge to the Panel

- ✦ **The objective of the review is to assess the quality and effectiveness of NCAR's performance as managers of an NSF and Division of Atmospheric Science funded Federally Funded Research and Development Center.**

In considering this objective, the panel may examine the following questions:

Has the management of NCAR encouraged and facilitated a National Center which is able to perform as a strategic partner of the NSF and to fulfill the NCAR mission defined in the 2003 Cooperative Agreement: *support, enhance and extend the capabilities of the university community, nationally and internationally; understand the behavior of the atmospheric sciences and related systems and the global environment; foster the transfer of knowledge and technology for the betterment of life on Earth.*

Has NCAR demonstrated clear leadership in science and management, and an effective process for cultivating a long-term vision, mission and strategy?

Has NCAR developed a robust process for planning and review that engages the community?

Has NCAR been effective in promoting and sustaining cross-divisional and interdisciplinary programs?

Has NCAR established productive national and international scientific links with Federal agencies, international institutions, NGOs, and the global research community

Has NCAR encouraged and facilitated the participation of underrepresented groups (gender, ethnicity, disability, etc.)?

Summary of Recommendation

- Metrics to assess NCAR's: output, leadership, engaging the community, and interdisciplinary programs
- Partnerships
- Leadership in the provision of computer resources
- Focus of people
- Providing more control to NCAR management wrt strategic services



Questions and Discussion