Committee on Advanced Research Instrumentation
Committee on Science, Engineering, and Public Policy
The National Academies
Martha Krebs
January 5, 2006
<table>
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<th>Name</th>
<th>Role/Institution</th>
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Congressional Language

Assess the need for an interagency program to establish and support fully equipped, state-of-the-art university-based centers for interdisciplinary research and advanced instrumentation development.
Charge to Committee

1. What are the current programs and policies of the major federal research agencies for advanced research instrumentation?

2. What is the current status of advanced mid-sized research instrumentation on university campuses? How are such instruments currently designed, built, funded, operated, and maintained?

3. What challenges do federal agencies and universities identify regarding such instruments?
4. Would an interagency program to fund mid-size advanced research instruments that are used by researchers funded by many agencies help respond to these challenges? If so, what should be the components of such a program?

5. Are sufficient federal programs available to provide the intellectual and financial resources necessary to develop new mid-sized instruments that respond to research community needs?

6. What federal policies could be put into place to enhance the design, building, funding, sharing, operations and maintenance of mid-sized advanced research instruments?
Method

- **Survey**
  - University Administrators
  - Disciplinary Societies
  - Independent Research Institutes
  - Researchers

- Literature Search and Scholar Presentations

- Presentations from NSF, NSB, NIH, DOE, NOAA, DHS, USDA, OSTP, NSTC, COGR

- Public Comment Session
Institutional Survey Questions

n Does your institution have any instruments whose capital cost at the time of purchase was greater than $2M and less than $100M?

n If no additional federal funding were available, do you think the need for instrumentation in this range is sufficient that funding should be diverted from research grants to instruments? What new kinds of instrumentation in the $2-100M price range do you think your institution will be interested in five years from now?

n Do you have any additional thoughts regarding advanced research instrumentation which you would like to share with the Committee?
Report Addresses Four Major Issues

- Defining Advanced Research Instrumentation and Facilities (ARIF)
- Status of Federal Agency Funding for ARIF
- Improvements in Federal Agency Processes for ARIF
- Improvements in University Sponsorship and Operation of ARIF
Defining ARIF

Instrumentation and facilities that house collections of closely related or interacting instruments used for research and includes networks of sensors, data collections, and cyberinfrastructure

- Acquired by large scale centers or research programs rather than individual investigators
- Requires substantial institutional commitment and high level decision-making
- Requires expert research-support staff for operation and maintenance
- Generally in the few to tens of millions of dollars in cost
Federal Agency Funding for ARIF

- Agencies have programs for million dollar class facilities
  - Generally not sufficient for total purchase
  - Generally do not provide for operation, maintenance or appropriate upgrades

- No agency has a specific category for ARIF scale activities

- When ARIF is funded within an agency, neither the planning nor funding process is apparent outside the agency
Improvements in Federal Agency Processes

- **Establish centralized programs for ARIF**
  - NSF MRI program should expand to include ARIF
  - NIH should eliminate the capital cost limit of the HEI program and substantially increase its instrumentation investment

- **Planning and Evaluation of Proposals**
  - Require business and management plans that include information on space, technical staff, and O&M funding
  - Include selection criteria that respond to agency goals such as sharing instrumentation, supporting diversity with regard to research field. Geographic and institutional diversity
Improvements in Federal Agency Processes

- Fund O&M Costs
- Sustain proportional support for ARIF when budgets are stagnant or declining
- Coordinate ARIF programs on an interagency basis
- Elevate ARIF as a topic for NSTC coordination and cooperation
- A specific interagency ARIF program is not needed
Improvements in University Sponsorship and Operation

- Operations & Maintenance
- Space
- Research Support Staffing
- Availability to Researchers
- Oversight
- Instrumentation Development
For More Information

- Go to [www.nationalacademies.org/instrumentation](http://www.nationalacademies.org/instrumentation)
- Email [instrumentation@nas.edu](mailto:instrumentation@nas.edu) or [dstine@nas.edu](mailto:dstine@nas.edu)
- Call 202-334-3239
- COSEPUP Webpage [www.nationalacademies.org/cosepup](http://www.nationalacademies.org/cosepup)