DOE/NSF Nuclear Science Advisory Committee
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William Zajc

NSAC Activities—2003/2004

CHARGES (short titles)	CHAIRS	STATUS
Nuclear Theory	Berndt Mueller Duke	Completed
Education	Joe Cerny U.C. Berkeley	Deadline extended to Fall 2004
Performance Measures/ Milestones	Don Geesaman ANL	Completed
Committee of Visitors	John Cameron Indiana	Completed
RIA/GSI	Peter Bond BNL	Completed
RHI	Peter Barnes LANL	Due Sept. 30, 2004 *

Next NSAC Meeting: July—August, 2004

* To be discussed at upcoming July-August NSAC meeting

(1) NSAC is asked to do an assessment of how the present NSF and DOE educational investments relevant to nuclear science are being made and to identify key strategies for preparing future generations of nuclear physicists and chemists.

Education of young scientists is integral to any vision of the future of the scientific field and the nation's nuclear-related activities. It is an important responsibility for both agencies. A substantial fraction of the agencies' research funds is used for support of students at the undergraduate and graduate levels and junior scientists at the postdoctoral level. It is important that these investments be made in an optimal way. Your assessment should take into account such factors as: the necessary qualifications and skills of nuclear scientists and their roles in the public and private sectors; the annual number of Ph.D. degrees presently awarded; the number projected as needed in the future to maintain a world-leadership role in fundamental research and also to meet the nation's needs in applied areas such as nuclear medicine and national security; and the present and projected demographics of nuclear scientists, including the participation of women and under-represented minorities.

Your report should document the status and effectiveness of the present educational activities, articulate the projected need for trained nuclear scientists, identify strategies for meeting these needs, and recommend possible improvements or changes in NSF and DOE practices. Your report should also identify ways in which the nuclear science community can leverage its capabilities to address areas of national need regarding K-12 education and public outreach. We request that an interim report be submitted by September 2003 and a written report responsive to this charge be provided by November 2003.

NSAC Sub-Committee on Education

Joe Cerny (Chair)

Con Beausang

Jolie Cizewski

Tim Hallman

Calvin Howell

Andrea Palounek

Warren Rogers

Brad Sherrill

Bob Welsh

Sherry Yennello

Dear Professor Casten:

In its 2002 Long Range Plan, the Nuclear Science Advisory Committee (NSAC) identified the scientific opportunities offered by rare isotope beams. The proposed Rare Isotope Accelerator (RIA) facility was recommended as its highest priority for new major construction to address these opportunities. Recently, the German government has indicated that it is prepared to cover the majority of the costs of construction and operation of a new international nuclear physics facility at the Gesellschaft für Schwerionenforschung (GSI) and has invited foreign countries, including the United States, to consider participation in the development of this facility should it be funded and built. Among the capabilities of the proposed GSI facility are rare isotope beams that may address some of the opportunities identified by NSAC.

Given the international character of science and the costs of major scientific facilities today, it is important to optimize research capabilities globally with the resources available. In this context, agencies need to better understand what rare isotope beam capabilities are needed to exploit the scientific opportunities identified previously: 1) what are the capabilities that are unique to each facility, 2) what are the scientific opportunities each facility will offer, and 3) whether there are other U.S. nuclear physics program or national considerations that are relevant to these two facilities.

This letter requests NSAC to provide a comparison of the respective opportunities each facility would offer. The NSAC assessment should include an evaluation of the relative costs and benefits, both for the global scientific effort and U.S. national interest, of U.S. investments in the RIA facility and in the GSI facility, including the possibility of extensions or upgrades that extend the scientific reach of the GSI proposal. It is requested that your report be submitted by January 30, 2004.

We appreciate NSAC's willingness to take on this important task and look forward to receiving your report.

Sincerely,

Raymond L. Orbach
Director
Office of Science

Michael S. Turner
Assistant Director
Directorate for Mathematical and Physical Sciences

NSAC Sub-Committee on Scientific Opportunities and Investments in GSI

Peter Bond, Chair

Curtis Meyer, Carnegie Mellon

Jack Sandweiss, Yale

James Symons, LBL

Jim Beene, ORNL

Michael Wiescher, Notre Dame

Stan Woosley, University of California

Steve Koonin, Caltech

Rick Casten, Ex Officio

U.S. Department of Energy
and the
National Science Foundation

February 18, 2004

Professor Richard F. Casten
Chairman
DOE/NSF Nuclear Science Advisory Committee
Wright Nuclear Structure Laboratory
Yale University
New Haven, CT 06520

Dear Professor Casten:

The recent 2002 Long Range Plan (LRP) developed by the Nuclear Science Advisory Committee (NSAC) provided a set of recommendations for exploiting opportunities for research both within the United States and elsewhere. Further guidance is requested from the NSAC by the Department of Energy (DOE) at this time beyond these recommendations in the LRP in the area of heavy-ion nuclear physics. Effective use of the Relativistic Heavy Ion Collider (RHIC) and investments in new capabilities and initiatives at RHIC and elsewhere were identified as the means to exploit the potential scientific opportunities of this subprogram. The limitations on the implementation of this guidance, imposed by projected funding, make it timely for an updated assessment of the scientific priorities in this area, especially in light of new results obtained at RHIC. It is important that the available resources are directed to optimize DOE efforts, in coordination with the Nuclear Physics program at the National Science Foundation (NSF), for a strong national research program in this scientific area in the coming decade.

The NSAC is asked to examine current and proposed U.S. efforts in heavy-ion nuclear physics and identify what scientific opportunities should be pursued, in the context of U.S. and international capabilities and available resources, to ensure an optimized national research program. In your examination of these facilities and research activities, please respond to the following questions:

What scientific opportunities should be addressed and what facility and instrumentation capabilities should be used and developed, including those supported by NSF and outside the United States, in order to maintain a strong scientific program in the coming decade?

What opportunities can be pursued with funding at the FY 2005 Budget Request level ($158.9 million) and an assumed constant level of effort into the out years? What is the appropriate mix of facility operations, research, computer support, investments in instrumentation and accelerator capabilities, and detector and accelerator R&D that will be needed to optimally exploit these opportunities?

What are the priorities of the scientific opportunities that could be pursued with additional funds beyond this constant level of effort?

Your perspective should primarily focus on the 5-year period FY 2006-2010. The impacts and benefits of pursuing these prioritized activities, as well as the impact of not being able to pursue an activity, should be clearly articulated. The resulting plans should be consistent with a set of research milestones recently established for the heavy-ion subprogram and validated by NSAC, unless it can be demonstrated that new information would suggest that these milestones should be amended. We request that an interim report be submitted by July 31, 2004, and a written report responsive to this charge be provided by September 30, 2004.

Thank you very much in advance for your efforts in addressing this important issue.

Sincerely,

Raymond L. Orbach
Director
Office of Science

Michael S. Turner
Assistant Director
Directorate for Mathematical and Physical Sciences

cc:
Bradley D. Keister, NSF

NSAC Subcommittee membership on Relativistic Heavy Ions

Peter Barnes, Chair

Kees de Jager

Brad Filippone

Carl Gagliardi

Thomas Glasmacher

Hans-Ake Gufstoffson

Ulrich Heinz

Barbara Jacak

Peter Jacobs

Alfred Mueller

Urs Wiedemann

John Jowett

Richard Casten, ex officio