

# NFAC

## Neutrino Facilities Assessment Committee

for  
National Research Council

*Barry Barish*  
*Chair*  
*19-Sept-02*

EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY  
WASHINGTON, D. C. 20502

March 29, 2002

# Marburger's Letter (March 29, 2002)

Dr. Bruce Alberts  
President  
National Academy of Sciences  
2101 Constitution Avenue, N.W.  
Room 215  
Washington, DC 20418

Dear Dr. Alberts:

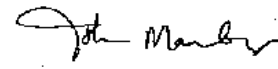
As indicated in the President's FY 2003 Budget Request for NSF under the Major Research Equipment and Facilities Construction Account, the Office of Science and Technology Policy requests that the National Research Council (NRC) review the scientific merit of IceCube, and other proposed U.S. neutrino collectors in the context of current and planned neutrino research capabilities throughout the world. The report's findings and recommendations relative to IceCube would inform a decision whether to initiate its construction in FY 2004.

In addition, I request that this review assess the merits of neutrino detectors associated with deep underground research laboratories and large volume detectors, like IceCube. Specifically, the NRC should address the unique capabilities of each class of new experiments and any possible scientific redundancy between these two types of facilities. The review should also include:

- The identification of the major science problems that could be addressed with 1-km<sup>3</sup> class neutrino observatories.
- The identification of the major science problems that could be addressed with a deep underground science laboratory neutrino detector.
- An assessment of the scientific importance of these problems and the extent to which they can be addressed with existing, soon to be completed, or planned facilities around the world.

I am requesting that such a review be carried out under the sponsorship of NSF and completed by September 1, 2002.

Sincerely,



John H. Marburger, III  
Director

# THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

1000 Lusk Center  
1015 G Street, N.W.  
Washington, D.C. 20004  
202-334-2100

April 8, 2002

The Honorable John H. Marburger, III  
Director, Office of Science and Technology Policy  
Executive Office of the President  
Eisenhower Executive Office Building, Room 424  
Washington, DC 20502

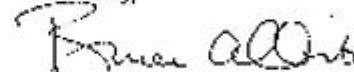
Dear Jack:

I am writing in response to your letter of March 29 requesting a review of proposed U.S. neutrino collectors and the nature and importance of the science problems that such facilities could address.

I have asked our Board on Physics and Astronomy to form a committee under the National Research Council to undertake this study. The committee will be charged to complete an approved Research Council report in accordance with your request within 6 months of conclusion of an agreement with the National Science Foundation for financial support of this work.

Thank you for this expression of confidence in the NRC's ability to provide useful and timely advice on scientific matters of importance to the nation.

Sincerely,



Bruce Alberts  
Chairman  
National Research Council

**Alberts'  
Reply  
(April 8, 2002)**

# Charge to NFAC

The Neutrino Facilities Assessment Committee will review and assess the scientific merit of IceCube and other proposed U.S. neutrino detectors—neutrino detectors associated with deep underground research laboratories and large volume detectors, such as IceCube—in the context of current and planned neutrino research capabilities throughout the world. Specifically, the study will address the unique capabilities of each class of new experiments and any possible redundancy between these two types of facilities. The review will also include: (1) the identification of the major science problems that could be addressed with cubic-kilometer-class neutrino observatories; (2) the identification of the major science problems that could be addressed with a deep underground science laboratory neutrino detector; and, (3) an assessment of the scientific importance of these problems and the extent to which they can be addressed with existing, soon to be completed, or planned facilities around the world.

# NFAC Membership

**Barry C. Barish**, California Institute of Technology, Chair

**Daniel S. Akerib**, Case Western Reserve University

**Steven R. Elliott**, Los Alamos National Laboratory

**Patrick D. Gallagher**, National Institute of Standards and Technology

**Robert E. Lanou, Jr.**, Brown University

**Peter Meszaros**, Pennsylvania State University

**Hidoshi Murayama**, University of California, Berkeley

**Angela V. Olinto**, University of Chicago

**Rene A. Ong**, University of California, Los Angeles

**R. G. Hamish Robertson**, University of Washington

**Nicholas P. Samios**, Brookhaven National Laboratory

**John P. Schiffer**, Argonne National Laboratory

**Frank J. Sciulli**, Columbia University

**Michael S. Turner**, University of Chicago

## ***NRC Staff***

**Donald C. Shapero**, Director

**Joel Parriott**, Study Director

# Meetings & Schedule

## **First meeting:**

June 24-25, 2002

National Research Council –Washington, DC

Begin data gathering

## **Second meeting**

July 25-26, 2002

O'Hare Hilton Chicago, IL

Complete data gathering

## **Third meeting**

Sept 30 - Oct 1, 2002

Caltech Pasadena, CA

Complete draft report.

## **Draft report sent for review**

October, 2002

## **Public release of report**

November, 2002

# NFAC Committee Process

- Our goal is to answer the charge by doing an assessment of the scientific merits of IceCube and a new Underground Laboratory in the U.S.
- Although the charge specifically singles out “neutrinos,” we are assessing the science more broadly
- Our meetings in June (Wash DC) and July (Chicago O’Hare) were primarily information gathering. Open sessions included invited presentations, plus some short presentations from the community.
- More individual inputs from the community are welcome and can be sent to our email address: **(NFAC@NAS.EDU)**

# NFAC Committee Process

- **Our final face-to-face meeting will be at Caltech Sept 30 – Oct 1, when we plan to formulate our report.**
- **That meeting is timed to take maximum advantage of NeSS 2002, and yet meet our deadline for the report.**
  - *Members of NFAC are participating. Talk to them!*
  - *We are soliciting short “Executive Summaries” from each working group immediately following this meeting and we intend to make good use of them at our final meeting.*
- **The NFAC study is on a very fast track! We are working very hard and intend to make a thoughtful report that is responsive to our charge.**

# NFAC – Important Considerations

- **NFAC is asked to address to what extent the science “can be addressed with existing, soon to be completed, or planned facilities around the world.”**
  - *We have had presentations at our meetings to try to understand the global context of the proposed U.S. initiatives.*
- **NFAC is asked to assess “the unique capabilities of each class of new experiments and any possible redundancy between these two types of facilities.”**
- **Our study and report is being developed with the full consideration of the recommendations in several recent reports:**
  - *The NRC Report “Connecting Quarks and the Cosmos: Eleven Science Questions for the New Century,”*
  - *The NSAC Long Range Report for Nuclear Physics*
  - *The HEPAP Long Range Report for High Energy Physics*

# Conclusions

- **NFAC and NeSS 2002 are obviously very closely related**
- **We welcome, encourage and look forward to the best possible inputs from this exciting workshop**

**GOOD LUCK !**