

**Evidence of Lack of Balance in the Selection of Committee Members  
on the  
National Research Council's  
Committee for the Review of the DOE Inertial Confinement Fusion Program**

by  
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**DRAFT**  
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There are 16 members of the NRC's ICF Committee. The committee has been charged by the Department of Energy (DOE) to conduct an initial review to determine the scientific and technological readiness of the National Ignition Facility (NIF), pending a decision by DOE to begin construction of NIF. To be located at the Lawrence Livermore National Laboratory (LLNL), NIF is estimated to cost \$1.073 billion to construct, and the annual operating cost is estimated to be \$115.7 million (\$1.736 billion over 15 years). Ten members of the NRC ICF Committee have ties to DOE's fusion program or to LLNL, or have already voiced very positive views regarding NIF. All of the committee members are distinguished scientists and honorable men. The issue is not that any one member should not serve on the committee; rather, it is that the committee as a whole is not perceived to be balanced with respect to a judgment as to whether DOE's ICF program is scientifically and technical ready to begin construction of NIF at LLNL. The ten member are:

1. **Dr. Steven E. Koonin, *Chair***  
Provost,  
California Institute of Technology  
Pasadena, California  
Tele: 818-395-6336

Dr. Koonin reportedly is a consultant to the LLNL. He has served as a member of several previous reviews of the DOE's ICF Program, including:

- 1) National Academy of Sciences' Review of Department of Energy's Inertial Confinement Fusion Program, 1990;
- 2) DOE's Inertial Confinement Fusion Advisory Committee (ICFAC), 1992-1996;
- 3) JASON's "Science Based Stockpile Stewardship" study, November 1994.

The NAS's 1990 review of DOE's ICF program was chaired by Dr. Koonin, and Dr. Rosenbluth (listed below) was a member of the same committee. The committee's report significantly altered DOE's ICF program. The NAS Committee judged the Laboratory Microfusion Facility (LMF) to be too ambitious, and thus, recommended that DOE abandon LMF in favor of a more modest goal, the "expeditious demonstration of ignition and gain in the laboratory" as the highest priority ICF program. In the JASON's Science Based Stockpile Stewardship study of November 1994, which Drs. Koonin and Rosenbluth also co-authored, the following glowing statements related to NIF are made:

The NIF is without question the most scientifically valuable of the programs proposed for SBSS, particularly in regard to ICF research and "proof-of-principle" for ignition, but also more generally for fundamental science. [p. 5]

As the most scientifically exciting program proposed by the national laboratories for Science Based Stockpile Stewardship (SBSS), we feel that NIF has an essential role to play in maintaining "the core intellectual competency" mandated by the 1994 National Defense Authorization Act (PL103-160). [p. 37]

We believe there is strong evidence that NIF can achieve ignition (probably about as much evidence as existing facilities like NOVA can provide), nonetheless, the NIF will be exploring uncharted regions of high compression, and energy densities unique for a laboratory experiment. Unpleasant surprises cannot be ruled out. In the worse case scenario, NIF will come close to ignition with adequate diagnostics to determine accurately what would be the best design and critical minimum size pellet for both direct and indirect drive. Tests of such advanced ideas as the fast ignitor could also be made. Many defense and other science applications would be largely accessible even on a sub-ignited NIF. Naturally we expect continued progress in further evaluating ignition prospects from experiments on NOVA and on OMEGA upgrade, a direct-drive laser facility at the University of Rochester, and particularly from the ever more sophisticated computations in the coming years. [pp. 41-42]

2. **Dr. W. David Arnett**  
Stewart Observatory  
University of Arizona  
Tucson, Arizona  
Tele: 520-621-9587

Dr. Arnett has been given free time on Nova, the largest ICF machine at LLNL. He co-authored with LLNL scientists:

J.Kane, D. Arnett, B.A. Remington [at LLNL], D. Dearborn [at LLNL], A. Rubenchik, J. Castor [at LLNL], S. Woosley, M. Wood-Vasey, E.P. Liang, and R. London [at LLNL],

"Simulations of a supernova-relevant hydrodynamic instability experiment on the Nova laser:" J. Kane, et al., abstract in the *Bulletin of the American Physical Society*, Vol. 40, No. 11, (1995), p. 1841.

This research work performed under the auspices of the DOE by LLNL under contract W-7405-ENG-48.

3. **Dr. Robert W. Conn**  
 Dean, School of Engineering  
 University of California at San Diego  
 La Jolla, California  
 Tele: 619-534-6237

Dean Conn is also one of the "deans" of fusion energy community. His past fusion research has been limited to magnetic confinement fusion. His strong pro-fusion views are well known. Dean Conn has served as a member of numerous previous reviews of the DOE's Magnetic and ICF Programs, including:

- 1) DOE's Fusion Review Panel of the Energy Research Advisory Board, August 1980;
- 2) National Academy of Sciences, Review of Department of Energy's Inertial Confinement Fusion Program, 1990;
- 3) DOE's Fusion Policy Advisory Committee, 1990;
- 4) Chairman, DOE's Fusion Energy Advisory Committee, 1994-1996;
- 5) DOE's Fusion Energy Science Advisory Committee (FESAC), from its inception in July 1996-present.

4. **Dr. Paul E. Dimotakis**  
 John K. Northrop Professor of Aeronautics  
 and Professor of Applied Physics  
 California Institute of Technology  
 Pasadena, California  
 Tele: 818-395-4456

Dr. Dimotakis co-authored with LLNL scientists:

Louis, A. Demiris, K.S. Budil, P.L. Miller, T.A. Peyser, P.E. Stry, D.A. Wojtowicz [all at LLNL], and P.E. Dimotakis, "Miniature Targets for Hydrodynamic Instability Experiments on Nova," *Fusion Technology*, Vol. 28, December 1995, pp. 1833-

This research work was performed under the auspices of DOE by LLNL under contract W-7405-ENG-48.

5. **Dr. Roger W. Falcone**  
 Chairman, Physics Department  
 University of California at Berkeley  
 Berkeley, California  
 Tele: 510-642-3316

Some of Dr. Falcone's research is funded by LLNL through the Physics Division. In the recent past one of Dr. Falcone's graduate students, T.D. Donnelly, spent two months at LLNL on a laser research project. Donnelly and Falcone published with LLNL scientists:

T.D. Donnelly, T. Ditmire, [at LLNL], K. Neuman, M.D. Perry [at LLNL], and R.W. Falcone, "High-Order Harmonic Generation in Atom Clusters," *Physical Review Letters*, Vol. 76, No. 14, April 1, 1996, pp. 2472-2474.

This work was supported by the U.S. Air Force Office of Scientific Research and through a collaboration with LLNL under contract No, W-7405-ENG-48.

6. **Dr. Henry W. Kendall**  
 Massachusetts Institutes of Technology  
 Cambridge, Massachusetts  
 Tele: 617-253-7584

Before joining the NRC ICF Committee, Drs. Kendall, Hans A. Bethe and Herbert F. York wrote Congressman John T. Myers on May 8, 1996, stating:

"We would like to urge your support of Science-Based Stockpile Stewardship (SBSS), a program proposed by the Department of Energy (DOE) as part of its Stockpile Stewardship and Management Program (SSMP)..."

Last year two of us sent a letter to Congress expressing our strong support for the NIF as a part of the science-based stewardship program. The reasons we gave then remain true today. NIF will be important to the SSMP because its experiments will fill the experimental gap described above. Its scientific investigations will also be important to fusion energy and basic science. Such opportunities will help attract and maintain the scientific and technical talent that the nation will need in the future as we continue all aspects of the program to reduce the worldwide nuclear threat. The same expertise is needed to support further nonproliferation efforts. Ambassador Holum often uses the NIF as one of the new technologies that has enabled the U.S. to seek a true CTBT. These new elements—advanced computer capabilities and new experimental facilities—do not

detract from the core weapons science capabilities, they strengthen and sustain them.

We voice out urgent support for science-based stewardship—as defined above. If we can be of further assistance, please call upon us.”

7. **Dr. Arthur K. Kerman**  
 Massachusetts Institute of Technology  
 Cambridge, Massachusetts  
 Tele: 617-253-7072

Dr. Kerman has been a paid consultant to LLNL since 1964, and to LANL since 1961. He is on a board overseeing LLNL that reports to the University of California Board of Regents. He just returned from his second one year sabbatical at LLNL. He spent so much time at LLNL that he kept a car and an apartment in California. He frequently attends internal meetings on ICF and NIF matters at LLNL. Dr. Kerman co-authored, F.V. Hartemann and A.K. Kerman, “Classical Theory of Nonlinear Compton Scattering,” *Physical Review Letters*, Vol. 76, No. 4, 22 January 1996, pp. 624-627. Dr. Hartemann, who is on the faculty at the University of California at Davis, works out of UC Davis’s facilities LLNL. Hartemann’s work with Kerman was supported by LLNL through LLNL/LDRD Contract No. W-7405-ENG-48.

Dr. Kerman was not involved in fusion work until he was appointed by Admiral Watkins to serve on DOE’s Fusion Policy Advisory Committee in 1990. This committee operated from March-September 1990, about six months. Dr. Kerman subsequently was appointed to DOE’s Inertial Confinement Fusion Advisory Committee (ICFAC), when it was formed in late-1992, and served as a member until the committee was abolished in 1996.

8. **Dr. Steven A. Orszag**  
 Department of Mechanical and Aerospace Engineering  
 Princeton University  
 Princeton, New Jersey  
 Tele: 609-258-6206

Dr. Orszag is reportedly a joint owner of a commercial firm with someone from at the University of Rochester’s Laboratory for Laser Energetics. He co-authored with Dr. McCory, of the Laboratory for Laser Energetics, University of Rochester:

J.Hecht, D. Ofer, U. Alon, D. Shvarts, S.A. Orszag, and R.L. McCory, “Three-dimensional Simulations and Analysis of the Nonlinear Stage of the Rayleigh-Taylor Instability,” *Laser and Particle Beams*, Vol. 13, No. 3., 1995, pp. 423-440.

9. **Dr. Marshall N. Rosenbluth**  
 University of California at San Diego  
 La Jolla, California  
 Tele: 619-534-3790

Dr. Rosenbluth, a fusion theorist, is another of the "deans" of the fusion energy community and a former designer of thermonuclear weapons. He has served as a member of numerous reviews of the DOE's Magnetic and Inertial Confinement Fusion Programs, including:

- 1) DOE's Fusion Review Panel of the Energy Research Advisory Board, August 1980;
- 2) National Academy of Sciences, Review of Department of Energy's Inertial Confinement Fusion Program, January 1990;
- 3) DOE's Fusion Policy Advisory Committee, 1990;
- 4) DOE's Inertial Confinement Fusion Advisory Committee (ICFAC), 1992-1996;
- 5) JASON's "Science Based Stockpile Stewardship" study, November 1994;
- 6) JASON's "Inertial Confinement Fusion (ICF) Review," March 1996;
- 7) DOE's Fusion Energy Science Advisory Committee (FESAC), from its inception in July 1996-present.

For quotes from the JASON's "Science Based Stockpile Stewardship" study, which Dr. Rosenbluth and Dr. Koonin co-authored, see discussion under Dr. Koonin, above. In the more recent JASON's "Inertial Confinement Fusion (ICF) Review," which Rosenbluth also co-authored, we find:

In the context of the situation described in the last paragraph, we are convinced that the present ICF program *does* make an important contribution to SBSS, and that NIF will *substantially* increase this contribution. Therefore we believe the ICF program, including the NIF, should be supported as part of the present Stockpile Stewardship and Management Program. [p. 3]

... Therefore, on balance, we find the case for supporting NIF together with the base ICF program as a component of SBSS as compelling as it was in the summer of 1994. We are aided in reaching this conclusion by the considerable progress made by the ICF program in the last 18 months toward increasing confidence that ignition will be achieved in NIF experiments. [p. 11]

10. **Dr. J. Pace VanDevender**  
 President, Prosperity Institute  
 Albuquerque, New Mexico  
 505-843-4282

Dr. VanDevender is on leave from Sandia Laboratories. While at Sandia he was in charge of ICF work funded by DOE's Defense Program.