



INSTITUTE FOR FUSION STUDIES
THE UNIVERSITY OF TEXAS AT AUSTIN

Robert Lee Moore Hall · Austin, Texas 78712-1060 · (512) 471-1322 · fax (512) 471-6715

April 24, 1992

Professor Robert W. Conn, Chairman
Fusion Energy Advisory Committee
University of California, Los Angeles
Department of Nuclear Engineering
6291 Boelter Hall
Los Angeles, CA 90024

Dear Bob,

On 20 February 1992 William Happer was asked by the House Subcommittee on Energy in what areas the US program leads international fusion research. His answer was the theory program.

Theory is the only area in which the US has a manifestly dominant position in the world program. Consuming less than 6% of the fusion budget, it is also the only area in which the US can afford to remain dominant. But funding for the US theory program has been almost constant *in dollars* for the last decade. During the same time, the demands on the theory program for detailed applications of successful codes has increased enormously. Theory now plays a reliable, crucial role in many aspects of machine design. Yet direct funding of theory now supports only about 2/3 (or fewer) of the theorists at the national laboratories, with the rest supported by experimental projects, design efforts, or non-MFE sources. However well intended, such split support can create management distortions that endanger theory creativity and quality. Support for theory programs at universities has suffered proportionately, except that funds from other programs can rarely be used to support university theorists.

Although still the most productive in the world, the US theory program is in a clear decline. If the US is to make its greatest contribution as an international partner in fusion development, this decline must be reversed. We ask FEAC to endorse a policy for maintaining the intellectual strength of the US fusion theory program. This policy should include adequate funding of theoretical efforts at the national laboratories and universities. Individuals who provide the intellectual leadership in fusion theory should be fully supported by the program. Sufficient resources should be available to develop new computational codes and techniques, so that fusion theory can compete successfully with other disciplines for support from the High Performance Computing Initiative. Finally, since the US theory program is rapidly aging, adequate funding should be supplied to attract and retain creative younger theorists. It is particularly painful to deny postdoctoral positions to outstanding applicants who earned their PhD's through DoE programs; the postdoctoral program would be relatively simple to expand and is very cost effective.

The US should not sacrifice its world leadership in fusion theory. Once intellectual leadership is lost, it is not easily regained.

Yours truly,

Theory Coordinating Committee

Richard D. Hazeltine, Chairman

Daniel C. Barnes

Allen H. Boozer

Vincent Chan

Ronald H. Cohen

Robert A. Dory

George J. Morales

Dieter J. Sigmar

Roscoe B. White

R D Hazeltine

Daniel C. Barnes

Allen H. Boozer

Vincent Chan

Ronald H Cohen

Bob Dory

George Morales

D. J. Sigmar

Roscoe White