

# UFA News

## University Fusion Association

- **Draft Report of NRC Assessment of Fusion Energy Science Released**

The review by the National Research Council (NRC) of the National Academies of the quality of the U. S. fusion science program has been released as an "Unedited Prepublication Copy," dated October 19, 2000 and released by the NRC on October 24. The report is not yet available for direct quote, since the exact wording may be changed in the final edited report.

The study was performed by a panel chaired by Dr. Charles Kennel, Director of the Scripps Institute of Oceanography and former deputy administrator of NASA. The purpose of the assessment was to evaluate the quality of the fusion research program and to provide guidance for future program strategy aimed at strengthening the research component of the program. In general, the committee restricted its review to the magnetic confinement plasma science portion of the program.

The report notes that the fusion research program has made remarkable strides over the years. It points out: progress in understanding and controlling instabilities and turbulence leading to improved plasma confinement; theory and modeling are now able to provide useful insight to guide experiments; and experimental capabilities can now gain enough information to drive further developments in theory. This mutual interplay of theory and experiment is noted as a central feature of a scientific enterprise, and the committee thus concludes *that*

*the quality of the science that has been deployed in pursuit of the fusion energy goal is easily on a par with other leading areas of contemporary physical science*

In spite of the high quality of the science being carried out in the program, the committee noted some severe demographic problems that must be addressed. The fusion program has become too intellectually isolated from the rest of the science community, and this isolation has helped color perceptions of the field and narrow the demographic base to a degree that the future of the field of plasma science is endangered.

To correct these problems, seven primary recommendations are made. They include recommendations on: making scientific understanding a goal of the fusion program on a par with the goal of developing fusion energy; broadening the base and reducing the scientific isolation of the program; promoting new fusion science frontier research centers; developing support for a fusion burning plasma experiment; increased involvement of the NSF; and the desirability of periodic program reviews.

The report can be viewed at <http://fire.pppl.gov> and is available on the UFA web site at <http://plasma.ep.wisc.edu/UFA/Download.html>. Additional information on the study can be found at the National Research Council Web site at: <http://www.nas.edu/bpa/projects/fusac/>.

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• **UFA Sponsors Workshop on Burning Plasma Science**

Stimulated by the growing interest in the science of burning plasmas coming out of discussions at the 1999 Fusion Summer Study at Snowmass and the recent charge to FESAC by the DOE Office of Science to "...address the scientific issues of burning plasma physics," the University Fusion Association (UFA) is sponsoring a Workshop on Burning Plasma Science, 11-13 December 2000, in Austin, TX, to provide a forum for in-depth community discussion of the critical scientific issues connected with burning plasmas. Based on progress achieved at this December workshop (which focuses on scientific issues), a follow-on workshop focusing on the technology of burning plasmas will be held next year.

The workshop is being organized to be one of the primary sources of community input to the assessments of burning plasma science being carried out in the next year by FESAC and the Virtual Laboratory for Technology Next Step Options Advisory Committee. The emphasis of the workshop will be on burning plasma science issues in tokamak configurations, but discussion of burning plasma issues as they relate to other fusion concepts and more broadly to scientific areas outside of fusion energy will be strongly encouraged. Building on the progress made in discussing these issues at Snowmass 1999 as summarized in the report of the Burning Plasma Physics Working Group [<http://www.ap.columbia.edu/Smproceedings> or <http://plasma.ep.wisc.edu/UFA/Download.html> ], the key questions which speakers and discussion leaders are asked to address are:

1. What are the compelling scientific issues which could be addressed by a burning plasma experimental facility?
2. Identify those burning plasma scientific issues which are inaccessible for study in

existing or near-term non-burning plasma experiments.

3. What is the present physics basis and confidence level in achieving burning plasma conditions? In particular, how have recent developments in theory and experiment affected our confidence in achieving burning plasma conditions?
4. How comprehensively can these burning plasma science issues be addressed establishing a firm basis for extrapolation in scale and magnetic configuration?
5. Are there compelling scientific issues outside of fusion energy which can be addressed by a burning plasma experimental facility?

The workshop will be organized to provide time for in-depth discussion of proposed answers to these questions. A report summarizing the range of views and degree of consensus reached will be prepared. Details of the workshop can be found at its web site: <http://w3fusion.ph.utexas.edu/bpsworkshop/>.

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• **OFES Announces Awards for New Programs in Fusion Energy Sciences**

The DOE Office of Fusion Energy Science announced the results of the solicitation for New Programs in Fusion Energy Sciences (Notice 00-07) which OFES sponsored this past year.

This solicitation covered 5 subtopics:

1. Magnetic Fusion Concept Exploration Experiments
2. Inertial Fusion Energy Concept Exploration Research
3. Inertial Fusion Energy Chamber and Target Research
4. Magnetic Fusion Liquid Wall Experiments
5. Fusion Materials Modeling.

There was also a simultaneous solicitation for

Basic & Applied Plasma Science programs at National Laboratories that was completed this year.

Altogether 18 proposals have been approved through an extensive series of peer reviews. Of these, 8 new grants were awarded to university-based investigators. New MFE Concept Exploration experiments have been funded at Auburn, Swarthmore, UC-Davis, Maryland, Washington, and Wisconsin. UCLA was awarded grants for IFE Chamber Research and MFE Liquid Wall Experiments. Funding of about \$2.7M is expected to be provided for all of these research activities in FY 2000. Most of the programs are planned to continue for a 3 year period as a result of this review process.

Details of the awards and solicitation results have been posted as a MS Word document on the OFES web site at: <http://www.ofe.er.doe.gov/News.html> and a pdf version can be obtained at the UFA web site download area: <http://plasma.ep.wisc.edu/UFA/Download.html>

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• **Integrated Program Planning Activity Report Finalized**

The final version of the main report of the Integrated Program Planning Activity (IPPA) that was submitted to the Office of Fusion Energy Sciences on behalf of the IPPA Steering Committee and IPPA Working Group is available. This is a five-year planning document for the Fusion Energy Science Program. The purpose of the IPPA include; 1) produce an integrated plan for use by the DOE OFES and the fusion community; 2) provide improved mechanisms for accessing key technical and management information; and 3) elucidate the inter-connectedness among the diverse parts of the national fusion energy science program. This

version of the report incorporates specific changes recommended as a result of the FESAC review over the last two months.

The original is available on the Virtual Technology Laboratory at <http://vlt.ucsd.edu/> and a copy is posted on the UFA website.

Members of the Working Group include: Charles Baker (chair), Steve Dean (Fusion Power Associates), Bill Ellis (Raytheon Engineers and Constructors), Richard Hazeltine (University of Texas), Grant Logan (LLNL), Mike Mauel (Columbia University), Ned Sauthoff (PPPL), and Tony Taylor (General Atomics).

Members of the Steering Committee include: John Lindl (chair), Stewart Prager (U. Wisconsin), Vice Chair, Steve Cowley (UCLA), Rich Hawryluk (PPPL), Tom Jarboe (U. Washington), Earl Marmor (MIT), Kathy McCarthy (INEEL), Dick Siemon (LANL), and Ron Stambaugh (General Atomics).

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• **FY2001 US Fusion Budget Provides Good News**

In late September, the House passed the conference report on the FY01 Energy and Water Development bill. The Senate passed it soon afterwards. This bill locks in next year's funding for most of the Department of Energy's programs including magnetic and inertial fusion. The news was good for both.

Here's a brief rundown of the numbers:

OFFICE OF FUSION ENERGY SCIENCES - \$255 million, same as the House recommended level (the Senate passed number was \$227 million and the Administration request was \$247 million)

HIGH AVERAGE POWER LASERS - \$25 million, same as the House recommended level (the Senate bill contained no funding for this nor

was it included in the Administration request))

INERTIAL FUSION - \$449.6 million, of which \$199.1 million is for NIF, a substantial increase over both the House and Senate bills primarily because of additional dollars added for NIF construction.

One small negative note is that there is a "general reduction" included in the bill which is likely to cost the fusion energy sciences program approximately \$3 million.

The language associated with these numbers is available in the 10/10/00 UFA e-newsletter, which can be found at [http://plasma.ep.wisc.edu/UFA/News\\_area.html](http://plasma.ep.wisc.edu/UFA/News_area.html).

This overall very positive result for fusion is a result of the efforts of the Members of the House Subcommittee on Energy and Water Development, most especially Chairman Ron Packard (R-CA), Congressman Rodney Frelinghuysen (R-NJ), Congressman Joe Knollenberg (R-MI), Congressman Chet Edwards (D-TX) and Roger Wicker (R-MS). In turn, their key support for the program was encouraged and enabled by the letters and petitions of other Members of the House who are not on the Subcommittee but who support the program. Therefore, it is clear that the fusion community's efforts to increase and maintain support for the program on the Hill is not only important but has also borne fruit.

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• **Systems Experts List Available to Community**

The Fusion Facilities Operations Committee (FFOC) (a subcommittee of the Fusion Facilities Coordinating Committee (FFCC)) has developed a list of system experts (primarily from DIII-D, CMOD and NSTX).

This provides a list of technical references at

the larger fusion laboratories who may be available for advice to the university research community. It can provide access to technical expertise not readily available at your local institution.

The list is posted at <http://d3dnff.gat.com/FusionFacilityExperts>.

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• **New UFA Officers Elected**

The UFA Executive Committee met at its annual meeting on Oct. 22, 2000 in Quebec City, during the APS/DPP meeting. At this meeting, new officers were elected for a 2-year term beginning Jan. 1, 2001. Adil Hassam of the University of Maryland will be the Vice-President of the UFA, while Steve Knowlton of Auburn University will serve as Secretary/Treasurer. The present Vice-President, Tom Jarboe of the University of Washington, will take over the office of President also on Jan. 1, 2001.

As the out-going president, I'd like to congratulate our new officers on their election, and wish them the best as they lead the organization during the next two years! (rjf)

For information on the University Fusion Association, please see the UFA Web site at <http://plasma.ep.wisc.edu/UFA/>  
Raymond Fonck - President  
Thomas Jarboe - Vice President  
Steven Knowlton - Secretary/Treasurer