

December 13, 2017

Professor Michael E. Mauel
Co-Chairman National Academy of Sciences Panel: A Strategic Plan for U.S. Burning Plasma
Research
Mauel@columbia.edu

Dear Mike:

Thank you for our conversation at the APS meeting. I have, after some thought, decided to write you, in your role as co-Chairman of the National Academy of Sciences Fusion panel, a letter about what I think should be an exciting opportunity for the US fusion program – a collaboration between the US and Italy on a high field, liquid lithium wall, Ignitor experiment.

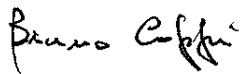
The US fusion program needs to live up to its name of being the fusion energy science program. A fusion program without fusion is difficult to understand or support. The US program has been trying since the early 80s to do a burning plasma experiment, and we should continue to strive to doing fusion science experiments and not assume that one experiment will yield all fusion science. The new, unique physics associated with plasmas surrounded by liquid lithium walls hold out the promise of very high levels of performance. PPPL has been doing research on these plasmas. A parallel significant research program is underway with the Frascati Torus machine. Early results look promising enough that we should consider designing burning plasma experiments using liquid lithium walls. In fact this option has been considered seriously as the most important activity for an advanced design of the plasma chamber and the associated first wall system for the Ignitor machine.

These experiments, if carried out in a compact Ignitor system that has been designed and prototyped in Italy, offers a modest cost way for the US to give a strong contribution to fusion research. Further, I am confident that if the Italian government were approached about the possibility of doing a joint liquid wall burning plasma Ignitor that it would be willing to join

the US in building and operating such a machine. Because of the low cost of the project, and the advanced stage of design, R&D, and prototyping that Italy has done for Ignitor, this experiment could be put together relatively quickly. Further, I am sure that the US could choose the high quality scientists and engineers who would be interested in participating in and making the experiment a success. The opportunity exists for the US fusion program to do fusion in the near term, and to expand the collaboration that has been established between Italy and Russia, with the blessing of the past White House, on compact high field burning plasma experiments.

As a suggestion, you might propose that US and Italian fusion scientists hold a workshop on the latest liquid lithium results, and their possible use in an Ignitor experiment.

Thank you for your attention

A handwritten signature in black ink, appearing to read "Bruno Coppi". The signature is written in a cursive, slightly slanted style.

Bruno Coppi
Principal Investigator, Ignitor Program