

Massachusetts Institute of Technology

77 Massachusetts Avenue
Building 6-215
Cambridge, Massachusetts 02139

John Deutch Institute Professor

Department of Chemistry

Tel: 617 253 1479
Fax: 617 258 6700
Email: jmd@mit.edu

Secretary Ernest J. Moniz
Department of Energy
1000 Independence Avenue S.W.
Washington D.C. 20550

June 19, 2015

To Secretary Ernest Moniz,

Your Secretary of Energy Advisory Board has suggested I write to you to underscore three different points made at this week's meeting at the Savannah River National Laboratory.

(1) SEAB has reviewed the report of the Office of Science *Working Group to Study Modifications to Laboratory M&O Contracts for Single-Program Laboratories*. The Working Group was charged to analyze options and propose specific changes that could be made to the M&O contract management process, which are within the Secretary's existing authorities. These changes would be implemented as measureable experiments that should deliver results within one year.

The study is thorough but we suggest the areas where the recommendations should be more aggressive. These recommendations would improve the probability of greater efficiency and better outcomes at Office of Science Single Program Labs.

The study recommends nine experiments, each of which is to be implemented at one single program lab. First we suggest doubling the categories of experiments. The Working Group did not compare DOE Office of Science FFRDC practice with the FFRDCs of other agencies, for example JPL and Lincoln Lab, and so has no benchmarks for the recommended changes.

Second, we recommend that each experiment be performed at several labs simultaneously, perhaps four, both as good experimental practice and with the expectations that benefits will accrue sooner throughout the Office of Science laboratory system.

Third, the "transactional" metrics the Study proposes to evaluate each experiment should be augmented by measures that evaluated the impact on improving lab productivity both with regard to better outcomes and reduced cost.

SEAB urges that the Study recommendations, once amended to include the three recommendations above, be adopted and implemented as quickly as possible. SEAB looks forward to an update on the progress of these experiments later in the year.

(2) Dr. Jennifer Chayes, an external member of SEAB's National Laboratory Task Force, has made the interesting "unconventional" suggestion that DOE becomes the sponsor of

the University of Minnesota's Institute for Mathematics and its Applications (IMS) and pivot the IMA to be an institute to be shared among all (or a good fraction of) the National Labs.

Creation of a DOE National Laboratory Institute would address several of the issues that the SEAB National Laboratory heard during its visits and interviews.

Recruitment DOE national lab directors stress the importance of attracting high quality PhDs. and many of their hires come through their post-doc programs. However, many new PhDs who might be appropriate for the national labs are reluctant to take a post-doc at one of the labs without prior exposure to that lab. If the IMA became the "DOE National Laboratory IMA Institute" the institute would probably be able to attract fantastic post-docs who could learn about DOE mission problems during their first year and then spend their second year at one of the National Laboratories. This could be a very effective recruitment tool, especially given the IMA's stellar reputation as a place for applied mathematics post-docs.

Facilitating knowledge and technology exchange between DOE national laboratories and between these laboratories and industry. Applied mathematic is needed in almost all DOE mission activities and the applied mathematics community is an ideal vehicle to exchange information on a person-to-person basis about different approaches, tools, and opportunities. An institute at which national laboratories, academic and industrial researchers come together, in focused research groups and on focused problems, could provide a good pathway to have preliminary interactions which could then turn into conventional WFH and other laboratory-industry-university collaborations.

Easing the process for DOE researchers to host and attend workshops with participants from different communities. Lab directors and researchers point out how difficult it has become for national laboratories researchers to attend workshops in areas of interest to them. Indeed, this reason is cited in retention cases. Due to the paucity of funding in mathematics, the way the IMA (and many other NSF math institutes) run their workshops is that the institute pays for the travel and lodging of many of the participants to its programs.

The IMA was founded 32 years ago as a math institute by the NSF has recently been informed that NSF funding will be winding down over the next two years. Of the eight NSF math institutes, the IMA is by far the most applied; it's the institute at which the SIAM (Society of Industrial and Applied Mathematics) community holds many of its workshops. The IMA has strong connections to industry, with a long-standing joint IMA-industry post-doc program in which post-docs spend one year at the IMA and one year in an industrial lab, working much of the full two years on industry-related problems. A few additional facts: The IMA budget is currently \$5.5M annually, with \$4M coming from the NSF. Currently, there are 12 industrial and 3 National Lab partners (including Los Alamos and Sandia). The IMA runs thematic programs September – June, with a good number of workshops, and hosts about 1200 visitors a year. It currently has 15 post-docs, with 3 – 4 of them specifically designated as industrial post-docs.

SEAB recommends that DOE evaluate this interesting opportunity.

Best regards,

A handwritten signature in black ink that reads "John Deutch". The signature is written in a cursive, flowing style with a large initial "J" and "D".

John Deutch

CC: SEAB members
SEAB National Laboratory Task Force members