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Questions Raised About DOE High Energy Physics and Nuclear Physics Programs

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"We may be going toward the spices in India, but we may run into America," said Fermi National Accelerator Laboratory Director Pier Oddone about future research results from the Large Hadron Collider (LHC). Oddone was one of four witnesses testifying earlier this month at a hearing of the Subcommittee on Energy and the Environment of the House Science and Technology Committee.

Oddone's comment came at the end of the hearing in response to a series of pointed questions from subcommittee chairman Brian Baird (D-WA) at a hearing on the DOE's Office of Science programs in high energy physics and nuclear physics. Other witnesses were Lisa Randall, Professor of Physics at Harvard University; Dennis Kovar, the Director of the DOE High Energy Physics Program; and Hugh Montgomery, Director of the Thomas Jefferson National Accelerator Facility.

Chairman Baird is a strong supporter of science. His candid remarks offered insight into the thinking of a Member of Congress. With some frustration, Baird spoke of the money spent on the Superconducting Super Collider, saying the taxpayer had "got nothing really out of it." Baird then described the "tremendous" amount of money contributed to the LHC and how it failed to operate properly, saying "we put a hell of a lot of money into this thing on the promise that certain things would be achieved and now it's not going to be achieved." Baird predicted that investigations would have been undertaken and oversight hearings convened if this had occurred in another government program. Baird continued: "You get to skate, partially because you know stuff that we don't have a clue what you are doing. And I think that's neat. I admire your knowledge, I admire your intellect." Baird said it was a Member's responsibility to ensure that federal revenue is well spent, saying that constituents' taxes allocated to research facilities like the LHC could have been used for a child's education, a new car, or to repair a roof. Baird spoke of the thousands of societal problems needing attention, and how money used on "big gizmos" could be spent on programs with a more immediate and a more direct benefit to a society. Besides curiosity, how can this spending be rationalized, Baird asked the witnesses.

Kovar responded that the U.S. LHC contribution was working as designed, and under the Office of Science's project management practices, was on cost and on schedule. He said the LHC was a very complicated machine that is defining the state of the art, and as such is a "high risk." While acknowledging that it is "not good right now," Kovar said "the expectation is that it is going to run at some point." A larger problem, he stated, was the difficulty of better documenting and communicating the value of highly technical research performed at facilities such as the LHC to the larger public. People need to better experience science, he said. Among immediate gains from U.S. participation in the LHC are American advances in technology, the training of a workforce that goes on to work in many areas, and the appeal of cutting-edge discoveries to the American public.

Montgomery described how metrics have measured the success of accelerator performance at Jefferson National Laboratory, Fermilab's Tevatron, SLAC's B Factory, and Brookhaven's Relativistic Heavy Ion Collider. "You are getting real scientific measurements and return on your dollars in general," he told Baird.

Randall expressed disappointment that the SSC was not completed, and assured Baird that it was only a question of time before the LHC would be operating. Governments, she said, were the only source of funding for cutting-edge basic research of this type.

"In the end, it really has to be justified by the results" Oddone told the subcommittee. "I completely agree with you that our field is in deep, deep trouble globally if we do not deliver on the Large Hadron Collider," he said, adding "our intent is absolutely to deliver." It was at this point that Oddone commented about the discovery of America while looking for spices.

Earlier in the hearing, the witnesses discussed the likelihood of profound consequences from future discoveries in high energy and nuclear physics research, concern about how U.S. high energy physics facilities were closing, and the necessity of maintaining American leadership. In response to Rep. Daniel Lipinski's (D-IL) observation that research in these fields is expensive and that more needs to be done to better communicate its results, the witnesses spoke of the importance of the media and other programs to engage the public. Oddone and Montgomery described the public's enthusiastic response to outreach and teacher education programs at their laboratories.

Kovar expressed concern that advances in accelerator technology have moved overseas, and with it the vendors who provide it. It was, he said, extremely important for the U.S. to maintain its leadership in these fields. Other witnesses explained how the construction of accelerators in the United States has strengthened domestic technologies leading to advances in areas such as the web and medicine. Laboratories serve as "the great attractors" Montgomery said, drawing the world's scientists.

This hearing was one in a series that has been held on the programs of the DOE Office of Science. A hearing on the fusion energy sciences program will be held next week. The subcommittee is working on a reauthorization bill for DOE's science programs.

READERS NOTE: The 17-minute exchange between Chairman Baird and the four witnesses is very insightful, and is well worth viewing. An archived webcast of this hearing is available [here \(http://science.house.gov/publications/hearings_markup_details.aspx?NewsID=2615\)](http://science.house.gov/publications/hearings_markup_details.aspx?NewsID=2615). Using the blue sliding button on the bottom of the screen, scroll ahead to the exchange at 1:15:00 (75 minutes.)

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