



U.S. DEPARTMENT OF
ENERGY

Office of
Science

Charge to HEPAP on “International Benchmarking”

March 7th, 2022

Office of High Energy Physics

Presenter: Glen Crawford

Background : International Benchmarking

- ▶ A recent BESAC report on international benchmarking of scientific resources and capabilities was viewed as a successful exercise that examined the U.S. Basic Energy Sciences program in a global context
- ▶ This report identified critical research areas where competition from other major players in the international community may threaten to eclipse U.S. scientific and technological leadership, and recommended strategies to address these challenges.
- ▶ DOE and NSF have developed a charge which addresses similar issues for the particle physics program that takes account the very different international context of this program.

CAN THE U.S. COMPETE *in Basic Energy Sciences?*

CRITICAL RESEARCH FRONTIERS AND STRATEGIES

A report by the BESAC Subcommittee on International Benchmarking



International Context

▶ In particle physics, much of the scientific research is globalized, highly collaborative and concentrated in a small number of very large facilities. Scientific cooperation and in-kind contributions by partners to the construction and operation of these facilities and supporting technology R&D is common.

▶ This is explicitly recognized in the Charge letter:

“A core tenet of the P5 Report is that particle physics is fundamentally a global enterprise. The close connections of U.S.-based researchers to major international facilities, as well as the many international scientists conducting their research in the U.S., speak to how the enterprise of particle physics is tightly interwoven across multiple borders and time zones.”

Planning Context

- ▶ This subpanel follows-on the mid-term assessment of the implementation of the 2014 P5 strategic plan which HEPAP completed in 2019 and complements the community-led Snowmass planning process currently underway.
- ▶ A recently launched National Academy study will survey recent progress, promising future directions and broader impacts for particle physics.
- ▶ These various studies and independent assessments will form the basis for a strong case to the Administration and other stakeholders about the continued relevance and international importance of the U.S. HEP program, and set the stage for the next P5 strategic plan to be delivered in 2023:

“...we want to ensure that the United States continues to be a leader in particle physics internationally and remains one of the best places to conduct research, as well as preserving its ability to collaborate effectively at leading facilities hosted elsewhere. We want to be the best partner we can be for the international scientific community.”

Elements of the Charge. I

How can the U.S. particle physics program maintain critical international cooperation in an increasingly competitive environment for both talent and resources? In areas where the U.S. is leading, how can we sustain our roles and attract the best international partners? In other areas, how can the U.S. build and maintain its reputation as a “partner of choice”? In general, are there barriers that can hinder our ability to form effective and enduring international partnerships?

Comments:

- ▶ The subpanel will need to assess what “leadership” means in the international context of particle physics and our many partnerships.
- ▶ There are clearly areas where the U.S. program leads world-wide, others where we compete among peers, and others where we don’t play at all. The strategic approach is inherently different in these different cases.

Elements of the Charge. II

Identify key areas where the U.S. currently has, or could aspire to, leadership roles in HEP via its unique or world-leading capabilities (i.e., advanced scientific facilities and tools), or leading scientific and technical resources, including highly trained personnel and supporting infrastructure. This may include emerging areas or opportunities that offer significant promise for leadership. To preserve and foster U.S. leadership roles within reasonable resource constraints, are there particular technical areas or capabilities that should be prioritized? Are there other technical resources and capabilities that could be leveraged in to achieve these goals, possibly through collaborations within and beyond the HEP community?

Comments:

- ▶ The distinction between capabilities and resources is intentional.
- ▶ This element does NOT supersede upcoming P5 study but rather opens the door to consider other approaches which may prove fruitful.

Elements of the Charge. III

How can programs and facilities be structured to attract and retain talented people? What are the barriers to successfully advancing careers of scientific and technical personnel in particle physics and related fields, and how can U.S. funding agencies address those barriers? A complete answer to these questions must address how we can ensure that we are recruiting, training, mentoring, and retaining the best talent from all over the world, including among traditionally underrepresented groups within the United States.

Comments:

- ▶ Particle physics has much work to do in this space. We appreciate input from HEPAP on these issues, not only in terms of policy approaches to address barriers, but also how we can better engage with communities and institutions that have been underserved.