

MPSAC Subcommittee for the Review of the Physics Frontiers Centers Program

Donald Geesaman - Chair
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MPSAC Meeting August 15, 2018

Charge -1

National Science Foundation Directorate for Mathematical and Physical Sciences

Charge to: MPSAC Subcommittee for the Review of the Physics Frontiers Centers Program

The NSF Physics Division's Physics Frontiers Centers (PFC) program is designed to foster major breakthroughs at the intellectual frontiers of physics by providing needed resources such as combinations of talents, skills, disciplines, and/or specialized infrastructure, not usually available to individual investigators or small groups, in an environment in which the collective efforts of the larger group can be shown to be seminal to promoting significant progress in the science and the education of students. PFCs are expected to demonstrate potential for profound advances in physics; creative and substantive activities aimed at enhancing education, diversity, and public outreach; potential for broader impacts, e.g., impacts on other fields and benefits to society; and a synergy or value-added that justifies a center- or institute-like approach.

The PFC program was initiated in 2001. Over its 17-year history, 15 centers or institutes have been awarded PFC funding and, of these, 6 have been phased out. Since 2008 open competitions for new and renewing centers have been held every three years. The PFC program is open to any subfield of physics within the purview of the NSF Physics Division and PFCs have been awarded in almost all subfields: atomic, molecular, optical, plasma, elementary particle, nuclear, astro-, gravitational, and biological physics. As the PFCs address frontier science, their scope often extends beyond the programmatic boundaries of the Division and significant partnerships with other divisions have been established to support these centers.

Charge -2

The Physics Division's Committees of Visitors have recommended a review of the program: "We believe that the Center program would benefit from a dedicated comprehensive review by a high--level body with the time, access and expertise to evaluate the PFC program. One would like independent confirmation that the PFCs add value in a way that individual investigator grants do not." After nearly 2 decades of PFCs, the Physics Division agrees that this is an excellent time to evaluate the impacts and effectiveness of the program.

This MPS subcommittee is asked to assess how well the PFC program is addressing its goals of fostering profound advances in physics, enhancing education, diversity, and public outreach, and addressing broader impacts through center or institute awards. In particular, the subcommittee should assess how well the PFC program is enabling advances in the following areas in ways that are distinct or best accomplished in a center structure:

Advancing the frontiers of Physics

- a. How well is the PFC program contributing to major scientific breakthroughs?
- b. Has the PFC program had significant impacts on Physics or related fields?

Enhancing education, diversity, public outreach, and broader impacts

- a. In what ways is the program enabling unique or enhanced educational experiences for students and postdoctoral fellows?
- b. In what ways is the program contributing significantly to broadening participation of traditionally underrepresented groups?
- c. In what ways is the program enabling substantive outreach to the general public?
- d. Are there other broader impacts of the PFC program?

Charge -3

The subcommittee should conduct an independent assessment of the PFC program as a whole and not perform in--depth evaluations of each center. Rather than providing specific recommendations, the subcommittee should identify strengths and weaknesses of the PFC program and issues that the Division can address in developing and evolving the program. The subcommittee will not review the PFC proposal review and selection process or the program funding levels, which are regularly reviewed by the Division's Committee of Visitors.

Timeline: Charge Delivered to MPSAC: May 2018
Interim Report Due to MPSAC: April 2019
Final Report Due to MPSAC: June 2019

We would appreciate an interim report from the Subcommittee to the MPSAC in April of 2019, and a final report delivered to the MPSAC in June of 2019. The interim report will detail progress and interim (draft) findings. The final written report will be due no later than June 30, 2019. The Chair of the subcommittee should coordinate delivery of materials with the MPSAC Chair in advance of scheduled MPSAC meetings. Presentations to the MPSAC may be delivered remotely or in person and will be coordinated by the MPSAC.

The Subcommittee will terminate once MPSAC as accepted the final report and determined that no further edits or substantive changes need to be made by the subcommittee.

Resources

NSF will arrange for and host in--person or virtual meetings of the subcommittee as required by the Chair.

Note the charge does **not** ask us to

- Evaluate the individual centers
- Evaluate the cost-analysis of center vs individual PI grants
- Evaluate the proposal selection and review process

The charge does ask us to

- Determine how well the program is advancing the frontiers of Physics
- Determine how well the program is enhancing education, diversity, public outreach, and broader impacts
- Identify strengths and weaknesses of the program
- Identify issues that the Division can address in developing and strengthening the program

The Review will not affect the funding of any center.

The Subcommittee

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Goals of the First Organizational Meeting

Sept. 14, 2018

- Learn the background and history of the program
- Be sure we understand exactly what the charge entails
- Understand what type of input we need
- Devise a strategy to get input from the community

I anticipate there will be information gathering visits by 2-3 subcommittee members to each of the present, and perhaps former PFC's.

We would very much welcome your input and suggestions, especially on these topics

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- Understand what type of input we need
- Devise a strategy to get input from the community

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