



National Science Foundation

4201 Wilson Boulevard
Arlington, Virginia 22230

Dear Colleague,

The National Science Foundation employs two criteria in the merit review of proposals: What is the intellectual merit of the proposed activity? What are the broader impacts of the proposed activity? While most researchers know what is meant by Intellectual Merit, experience shows that many researchers have a less than clear understanding of the meaning of Broader Impacts.

The [NSF Grant Proposal Guide](#) uses a series of questions to illustrate the Broader Impacts criterion: "How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society? "

These questions help to assess the potential of the proposed activity - beyond the research, *per se* - to benefit the Nation. Thus, the Broader Impacts criterion speaks directly to the mission of the National Science Foundation, "To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense." (NSF Act of 1950).

It may be helpful to illustrate the kinds of activity that are appropriate to each of the questions above. *Caveat lector* - the following list is neither prescriptive nor exhaustive and should not be read in ways that constrain the creativity of researchers in proposing activities with broader impact. However, in all instances a proposal must be specific in how it addresses the Broader Impacts criterion.

Advance discovery and understanding while promoting teaching, training, and learning, for example, by training graduate students, mentoring postdoctoral researchers and junior faculty, involving undergraduates in research experiences, and participating in the recruitment, training, and professional development of K-12 mathematics and science teachers.

Broaden participation of under-represented groups, for example, by establishing collaborations with students and faculty from institutions and organizations serving women, minorities, and other groups under-represented in the mathematical sciences.

Enhance infrastructure for research and education, for example, by establishing collaborations with researchers in industry and government laboratories, developing partnerships with international academic institutions and organizations, and building networks of U.S. colleges and universities.

Broaden dissemination to enhance scientific and technological understanding, for example, by presenting results of research and education projects in formats useful to students, scientists and engineers, members of Congress, teachers, and the general public.

Benefits to society may occur, for example, when results of research and education projects are applied to other fields of science and technology to create startup companies, to improve commercial technology, to inform public policy, and to enhance national security.

Further examples of broader impacts can be found in the NSF document [Merit Review Broader Impacts Criterion: Representative Activities](#). Of course, not every proposal must demonstrate impact in each of these pre-defined areas. Rather, activities with significant broader impact will emerge from the nature of the proposal and the authentic interests of the proposer.

Sincerely,

Peter March
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National Science Foundation