

## The Culture of Federal Support for Academic Research in Mathematics

Academic research in mathematics, like research in engineering and the life, physical, and computer sciences, is financially supported by foundations, industry, and the Federal government.

Approximately 65% of the external funding available for academic research in these fields comes from the Federal government, down somewhat from 80% thirty-five years ago. Most Federal funding for mathematical research comes from the National Science Foundation (NSF), the Department of Defense, the Department of Energy, and the National Institutes of Health. The NSF accounts for nearly 55% of the Federal support for academic research in the mathematics, and is the only agency that supports all branches of the mathematical sciences.

Amongst doctorate holders employed in academia, 66% of mathematicians describe research as a primary or secondary activity, quite like the 68% of physical scientists, and the 70% of computer and life scientists who make such a report. Nonetheless, a much smaller proportion of academic mathematicians are supported by the Federal government. In 2010, across all fields of science, 45.1% of those employed in academia received Federal support for their research: 54% of physical scientists, 50.7% of computer scientists and 59.6% of life scientists, as compared to 34.2% of mathematicians.

As compared to other natural sciences, there is also a large disparity in the per capita level of funding available to mathematicians. In FY2010, across all fields of science and engineering, the Federal government provided about \$250,000 per academic researcher. By field, this breaks down to \$320,000 per academic researcher in Computer Science, \$160,000 per academic researcher in the Physical Sciences, and \$490,000 per academic researcher in the Life Sciences. By contrast, in 2010 the Federal government provided about \$48,000 per academic researcher in Mathematics.<sup>1</sup>

When compared to other fields of science and engineering, opportunities for external funding in mathematical sciences are very limited. The vast majority of mathematicians receiving Federal support have just one, single investigator, NSF grant. These grants typically provide salary support for one or two summer months and some funds for travel. Almost no support is available for course release time, and there is limited support for graduate students, post-docs or equipment. Many well respected, productive mathematicians receive little or no external support for their research.

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In these calculations the numerator comes from Appendix table 5-1: **Higher education R & D expenditures , by R & field FYs 2005-2012**, and the denominator from the "Research as primary or secondary activity" section of Appendix table 5-19: **SEH doctorate holders employed in academia, by research priority, type of position and degree field: 1973-2010**. Both tables are part of the NSF report: Science and Engineering Indicators 2014, and can be found online at <http://www.nsf.gov/statistics/seind14/index.cfm/appendix/tables.htm#c5>