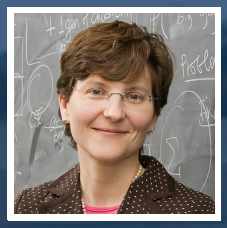
The Algorithms Behind Engineerings' Greatest Challenges



Anna Gilbert
Herman H. Goldstine Collegiate Professor, Mathematics

CURRENT RESEARCH

Bridging engineering and science questions with mathematics

When you think of mathematical analyses and algorithms, the first image that comes to mind is probably a chalkboard with numbers, squiggles, and letters. However, some of the most applicable science for future technologies, health-related breakthroughs, and engineering endeavors is a product of sophisticated mathematics. Dr. Anna Gilbert, Herman H. Goldstine Collegiate Professor of Mathematics at the University of Michigan is a testament to such science. Her research starts with a scientific or engineering problem on which she and a scientist or engineer work closely, until together, they can formulate an approachable, succinct mathematical problem that captures the essence of the fundamental science problem. Then, Dr. Gilbert goes to work on the math problem, alongside her team, to find a solution that can be implemented in real settings. Thus, her research plays an important role in bridging engineering and science questions with mathematics to establish new areas of applied math that have an impact on scientific and technological applications.

Dr. Gilbert is the rare mathematician who builds devices, writes software, instruments bridges, and proves theorems. Her holistic approach to mathematics allows her and her team to approach problems that many times are left unanswered by mathematicians. Apart from the important implications of her research, much of her work is also basic in nature. Therefore, although it may not have an immediate impact on society, it does reveal new challenging problems that help build knowledge for future questions. Dr. Gilbert believes that "a society which fosters creativity and curiosity, even if those endeavors are not directly 'applicable,' is a richer one." Therefore, with...

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AFFILIATION

University of Michigan

EDUCATION

- Ph.D., in Mathematics, 1997 , Princeton University

AWARDS

- Sloan Research Fellowship, 2006
- NSF CAREER award, 2006
- National Academy of Sciences Award for Initiatives in Research, 2008
- SIAM Ralph E. Kleinman Prize, 2013
- International Congress of Mathematicians invited speaker, 2014

RESEARCH AREAS

Technology, Computational Sciences / Mathematics, Electronics / Sensors, Informational Sciences / Internet

FUNDING REQUEST

Your contributions will support the continued research of Dr. Anna Gilbert, of the University of Michigan, as she bridges questions in science, engineering and mathematics. Donations will fund the necessary $75K/year for each graduate student, $100K/year for each postdoctoral fellow, and $10-$20K/year required for travel, resources, and hardware. Help establish new areas of applied math while having an impact on scientific and technological applications; support Dr. Gilbert and her team.