Inside the AMS

Eisenbud Presents Testimony

On April 9, 2003, AMS president David Eisenbud presented testimony in support of the fiscal year 2004 appropriations for the National Science Foundation (NSF). The testimony was given before the Subcommittee on Veterans' Affairs, Housing and Urban Development, and Independent Agencies of the House Committee on Appropriations. The NSF falls under the aegis of this subcommittee. What follows is the full text of the testimony.

Mr. Chairman and members of the committee, I am David Eisenbud, president of the American Mathematical Society, representing more than 27,000 mathematical scientists in academia, industry, and the national laboratories. I am here today to testify on behalf of the National Science Foundation (NSF).

Let me begin by expressing my thanks for the strong commitment this committee has made to the NSF. I believe that this support is very much in the public interest and that your vision will pay extraordinary dividends in the years to come. I am also grateful to the 107th Congress for passing the NSF Authorization Act, which suggests an FY 2004 budget of $6.39 billion for the NSF, as part of a program of substantially increasing NSF support. This is a direction we wholeheartedly support.

The NSF is crucial in maintaining the nation's scientific leadership and in continuing our nation's fantastic technological progress. Dividends from past investments in the NSF are manifest in the development of individual scientific disciplines and the development of interdisciplinary research needed to meet today's and tomorrow's scientific challenges. Research supported through the NSF has led to profound advancement in science, mathematics, and engineering and has time and again underpinned new products, methods, technologies—even new industries.

Work the NSF supports in cellular biology has the potential of shedding light on Alzheimer's disease, Lou Gehrig's disease, and cancer. NSF support of computing research may lead to collision warning, smart lane merging, and rear impact avoidance systems for automobiles. An effort in engineering has led to a "pharmacy-on-a-chip" implant that monitors a patient's blood chemistry and will deliver accurate and timely doses of medicine. Materials research has derived techniques for making composite materials that can potentially be used for constructing artificial bone and repairing nerve fibers.

Today, when national security and pressing needs are of great concern to America, we should not forget that our progress in these areas rests squarely on fundamental research. For example, the cryptography that makes it possible for banks to transact their business on the Internet or for our military commanders to have secure communications in the field depends on fundamental advances in number theory that just a few years ago were touted as the sort of pure science that would never be applied. Future progress in this seemingly abstract area, by us or by hostile forces, could threaten the security of all these communications and would require fundamental new science to repair the damage. If the past is any guide, the applications of science that we already see will be dwarfed in importance by those of which we still have no idea. Thus, it is critical to our nation that U.S. fundamental science and mathematics remain at the highest level, and the NSF is the leading agency promoting such fundamental research.

A strength of the NSF is that it supports the best research, regardless of its potential use, and good research often finds its way into innovations. The NSF peer-review system has an excellent track record of choosing the best science and the best investigators to perform the research. The number of Nobel Prize winners who were supported by the NSF is one measure of this.

As a mathematician and as director of the NSF-supported Mathematical Sciences Research Institute in Berkeley, California, I have intimate knowledge of how the health of the NSF affects a discipline. Approximately 68 percent of federal support for academic mathematics research comes from the NSF. Continued advancement in the subfields of the mathematical sciences depends critically on healthy NSF budgets. Unfortunately, many grant proposals that are deemed of very high quality are underfunded or not funded

AMS president David Eisenbud (right) testifying in Washington, D.C., in support of FY 2004 appropriations for the National Science Foundation. Subcommittee members shown are (left to right) Congressman Sanford D. Bishop Jr. (D-GA), (obscured person unknown), Congressman Robert B. Aderholt (R-AL), Congressman Michael K. Simpson (R-ID).

at all. This funding situation has a very negative affect on U.S. students when they consider mathematical research as a career path. The pipeline issue, getting enough young people into the discipline, is one of the main thrusts in the use of new funding at the NSF and one on which we have a long way to go. Adequate support also for midcareer scientists is a crucial part of this. Other science and engineering fields experience many of the same tensions exhibited in the mathematical sciences.

This state of affairs is serious, because the need for mathematics in scientific discovery is accelerating. I have already mentioned how theoretical advances in number theory affect our most sensitive communications networks. Mathematical theory and modeling will contribute to a better understanding of the spread of epidemics, of DNA, of brain function, and of three-dimensional interactions of proteins—an enormous, complex problem of biology. The understanding of uncertainty, of large data sets and their uses, will need new mathematical theories. The modeling, simulation, control, and manufacturing of nano and quantum molecular devices will require advances in mathematics.

The U.S. leads the world in science and in its many technological applications; our economy and our culture depend on this leadership. All disciplines of science and engineering depend on a strong NSF.

Again, Mr. Chairman, thank you for your leadership and thank you and the committee for your efforts on behalf of the National Science Foundation. I encourage you to continue your generous support of the NSF in your FY 2004 appropriations.

—AMS Washington office

Epsilon Awards for 2003

The AMS Epsilon Fund for Young Scholars was established in 1999 to provide financial assistance to summer programs for mathematically talented high-school students in the United States. For many years these programs have provided mathematically talented youngsters with their first serious mathematical experiences. The name for the fund was chosen in remembrance of the late Paul Erdős, who was fond of calling children "epsilons".

The AMS has chosen eight summer mathematics programs to receive Epsilon grants for activities in the summer of 2003. The grants will support program expenses and student scholarships and, in some cases, scholarships only. The programs were chosen on the basis of mathematical excellence and enthusiasm. The selection committee consisted of Lenore Cowen, Tufts University; Alan Edelman, Massachusetts Institute of Technology; Joseph Gallian, University of Minnesota, Duluth; and Joel Spencer, Courant Institute of Mathematical Sciences, New York University (chair). Award amounts were governed by the varying financial needs of each program and totaled $80,000.

The programs receiving grants are: All Girls/All Math, University of Nebraska; Canada/USA Mathcamp, Mathematics Foundation of America; Hampshire College Summer Studies in Mathematics, Amherst, Massachusetts; PROMYS, Boston University; Ross Mathematics Program, The Ohio State University; Stanford University Mathematics Camp, Stanford University; SWT Honors Summer Math Camp, Southwest Texas State University; and University of Chicago Young Scholars Program.

The grants for summer 2003 are paid for by the AMS Epsilon Fund for Young Scholars (supplemented by the AMS Program Development Fund). The AMS is continuing to build the endowment for the Epsilon Fund, with a goal of raising $2 million through individual donations and grants. Once the Epsilon Fund endowment has reached the targeted amount, the AMS intends to award a total of $100,000 in Epsilon grants each year.

For further information about the Epsilon Fund for Young Scholars, visit the website `http://www.ams.org/giving-to-ams/`, or contact `development@ams.org`; telephone 800-321-4267, extension 4111, or 401-455-4111. Information about how to apply for Epsilon grants is available at `http://www.ams.org/careers-edu/epsilon.html`. A fairly comprehensive listing of summer programs for mathematically talented high school students (including those with and without Epsilon grants) is available at `http://www.ams.org/careers-edu/mathcamps.html`.

—Elaine Kehoe

AMS Book Prize Established

At its meeting in January 2003, the AMS Council approved the establishment of the AMS Book Prize. The prize will recognize a single, relatively recent, outstanding research book that makes a seminal contribution to the research literature, reflects the highest standards of research exposition, and promises to have a deep and long-term impact in its area. The prize will be given once every three years and will carry a cash award of $5,000.

Books may be nominated by members of the Society, by members of the selection committee, by members of AMS editorial committees, or by publishers. Current plans call for the initial award to be made at the January 2005 Joint Mathematics Meetings. Nominations for the initial award are due by **April 1, 2004**. Information about AMS prizes may be found on the Web at `http://www.ams.org/prizes-awards`.

—Allyn Jackson

Michael Downes (1958–2003)

Michael John Downes, the principal author of the $\mathcal{A}_{\mathcal{M}}$S-LaTeX packages and an employee of the American Mathematical Society since 1985, passed away on March 8, 2003. He had been diagnosed with an aggressive form of brain cancer in December 2002.

Michael was born August 2, 1958; grew up in Lansing, Michigan; and attended Michigan State University, graduating

from the university's honors program with a degree in Russian and a minor in mathematics. After graduation Michael moved to Rhode Island, where he worked for seventeen years as an editor and a publications technical specialist.

Members of the AMS may have seen Michael at several annual meetings, where he presented sessions for AMS authors in the use of *AMS*-LaTeX; he also wrote an article on this topic for the *Notices* ("TeX and LaTeX 2e", December 2002, pp. 1384–91). He was a member of the LaTeX team, helping to plan its future direction; this involvement led to the acceptance of *AMS*-LaTeX as a "required" component of LaTeX.

Michael was active in his church and community, and looked for opportunities to help others. He leaves three daughters, his former wife, his mother, four brothers, three sisters, and many nieces, nephews, aunts, uncles, and cousins. He will be greatly missed.

—Barbara Beeton, AMS

Deaths of AMS Members

Erik Sparre Andersen, of Hellerup, Denmark, died on March 8, 2003. He was a member of the Society for 49 years.

Robert P. Eddy, of Colorado Springs, CO, died on July 14, 2002. Born on November 19, 1919, he was a member of the Society for 60 years.

Bertram J. Eisenstadt, professor emeritus, Wayne State University, died on February 16, 2003. Born on March 28, 1923, he was a member of the Society for 55 years.

Dieter Gaier, Justus-Liebig University, Giessen, Germany, died on December 15, 2002. He was a member of the Society for 48 years.

Elizabeth S. Hirschfelder, of Mt. Horeb, WI, died on September 29, 2002. She was a member of the Society for 75 years.

Lee Katz, of Commack, NY, died on October 22, 2002. Born on January 29, 1936, he was a member of the Society for 13 years.

Semen Yakovlevich Khavinson, professor, Moscow State Civil Engineering University, Russia, died on January 30, 2003. Born on May 17, 1927, he was a member of the Society for 9 years.

Howard Levi, professor emeritus, Herbert H. Lehman College, CUNY, died on September 11, 2002. Born on November 9, 1916, he was a member of the Society for 64 years.

Gordon MacDonald, of Cambridge, MA, died on May 14, 2002. He was a member of the Society for 31 years.

George P. McCrevan Jr., of Randolph, MA, died on August 17, 2002. He was a member of the Society for 9 years.

Werner M. Meyer-Koenig, professor emeritus, University of Stuttgart, Germany, died on December 26, 2002. Born on May 26, 1912, he was a member of the Society for 45 years.