For Your Information

McArdy Appointed AWM Executive Director

Maeve Lewis McCarthy of Murray State University has been named executive director of the Association for Women in Mathematics (AWM). She received both her B.Sc. in mathematical physics and her M.Sc. in mathematical sciences from the National University of Ireland, Galway. She earned her master’s and doctoral degrees in computational and applied mathematics from Rice University. She was a 1998 Project NeXT fellow and has served on the editorial boards of *Focus*, the newsletter of the Mathematical Association of America, and *MAA Online*. She is a member of the Education Committee of the Society for Industrial and Applied Mathematics and an associate editor of *SIAM Undergraduate Research Online*.

Her research interests include the application of eigenvalues to population dynamics and mechanical design. Her work in differential equations and inverse problems focuses on the identification of parameters in biological and physical applications. In 2006 she received a Presidential Research Fellowship from Murray State and an Academic Achievement Award from the Commonwealth of Kentucky for her research. She was instrumental in the development of BioMaPS (Biology and Mathematics in Population Studies), an undergraduate research program at Murray State, where her primary focus is teaching and mentoring undergraduates.

—from an AWM announcement

DoE Report on Applied Mathematics

In May 2008 an independent panel from the applied mathematics research community issued a report called “Applied Mathematics at the U.S. Department of Energy: Past, Present and a View to the Future”. Focusing on the Applied Mathematics Program at the Department of Energy (DOE), the report takes a look back at the program’s impact and a look forward at its potential to help the department tackle science and engineering challenges of the future. The chair of the panel was David L. Brown of Lawrence Livermore National Laboratory.

One of the functions of the DOE is to provide science-based solutions to important science and engineering problems, particularly those connected to energy, the environment, and national security. To this end, the department runs a system of national laboratories and also funds research in universities through disciplinary programs, one of which is the Applied Mathematics Program (AMP).

According to the report, the AMP has had a significant impact in computational science by funding research in areas such as mathematical modeling, numerical analysis of differential equations, optimization theory, mesh generation for complex geometries, and adaptive algorithms. “High-performance mathematical software libraries developed through [the AMP] have contributed as much or more to the performance of modern scientific computer codes as the high-performance computers on which these codes run,” the report states.

In August 2007 the panel, consisting of ten experts in applied, computational, and statistical mathematics, met for a day and a half in Berkeley, California. “[T]he panelists were not asked to speculate only on advances that might
be made in their own research specialties,” the report says. “Instead, the guidance this panel was given was to consider the broad science and engineering challenges that the DOE faces and identify the corresponding advances that must occur across the field of mathematics for these challenges to be successfully addressed.”

The panel concluded that one of the greatest needs was to develop mathematical understanding of increasingly complex physical and engineered systems. One goal is to produce effective ways to simulate and model such systems so that their behavior can be predicted. The report points out that it is not enough to simply break such systems down into smaller parts; what is needed is a focus on the “end goal” of developing mathematical approaches to understanding the systems themselves in all their complexity. Creating new mathematical ways to analyze large data sets is also a critical need. These data sets must be integrated into simulation and modeling in an essential way, a process the report calls “data-model fusion”.

The report sets out three “high-level strategies” for filling the gaps in the mathematical understanding needed to meet DOE challenges:

• Predictive modeling and simulation of complex systems: Advance the fidelity, predictability, and sophistication of modeling and simulation methodologies for complex systems.

• Mathematical analysis of the behavior of complex systems: Address the challenges of analyzing and understanding the behavior of mathematical models for complex scientific and engineering systems.

• Using models of complex systems to inform policymakers: Develop the mathematics needed to inform policymakers based on the prediction, optimization, and understanding of complex systems.

The report recommends that the AMP encourage high-risk research by awarding long-term grants to researchers with proven track records, enhance the introduction of new ideas by supporting young researchers and providing ways for established researchers to interact in intensive environments such as workshops and summer schools, and promote exchange of ideas between mathematicians and colleagues in other areas of science and engineering.

The report is available on the website of the Society for Industrial and Applied Mathematics, [http://www.siam.org/](http://www.siam.org/). SIAM has created a place where readers can contribute comments about the report.

—Allyn Jackson

**Professor in Computational Mathematics**

The Department of Mathematics at the University of Basel invites applications for a professorship in computational mathematics, preferably starting 1st August 2009. Candidates must hold a Ph.D. degree in some aspect of mathematics, and some postdoctoral teaching experience is preferred. The successful candidate is expected to perform independent research in areas related, for example, to partial differential equations, numerical analysis, stochastic processes or multiscale methods. A strong commitment to excellence in teaching and research is essential.

Applicants should provide a curriculum vitae, a publication list indicating five significant papers (with links for downloading), a statement of current and future research plans, and reports on teaching experience, together with the names and addresses of five potential referees. As the University of Basel would like to increase its female staff, women are strongly encouraged to apply. Applications should be sent to Prof. Dr. E. Parlow, Dean, Faculty of Science, Klingelbergstrasse 50, 4056 Basel, Switzerland with an electronic copy (pdf or zip) to Dekanat-Philnat@unibas.ch.

The deadline for receipt is 31st October 2008. For additional information please contact Prof. H. Kraft, Mathematisches Institut, Rheinsprung 21, 4051 Basel, Switzerland. Hanspeter.Kraft@unibas.ch or [http://www.math.unibas.ch](http://www.math.unibas.ch)