

Adding Up Mathematics in Industry

Mathematics lives—even flourishes—beyond the halls of academia, according to the Society for Industrial and Applied Mathematics (SIAM). The SIAM Report on Mathematics in Industry, released last November, indicates that mathematicians play fundamental, often indispensable, roles in business, government, and industry. At the same time, the report also reveals areas where nonacademic mathematicians could use some improvement.

SIAM's study examined the role of mathematics and mathematicians in nonacademic environments, by interviewing mathematicians and their supervisors at businesses, industrial companies, and federal laboratories. In all, this study compiled comments from about 500 mathematicians, scientists, and engineers, including more than 175 who are also managers.

The site-visit interviews turned up mathematics in many applications, including cryptography, finance, and signal analysis. Like-

wise, managers expect their mathematicians to provide a variety of capabilities, including modeling and simulation, mathematical formulation of problems, algorithm and software development, problem solving, statistical analysis, verifying correctness, and analysis of accuracy and reliability.

Meeting those expectations requires a broadly educated mathematician. As the SIAM study says, "Knowledge of technical areas outside mathematics is regarded as extremely helpful in nonacademic positions." For example, most of the mathematicians in the survey cited computer science as a primary technical requirement in their jobs. "It's hard to envision a pencil-and-paper mathematician here," one manager was quoted as saying.

Room for improvement

Do mathematicians possess all the required skills? Not always. When the managers were asked where their mathemati-

cians could improve, the top three areas were: understanding of and interest in practical applications; communication skills, interaction with others; and breadth of knowledge of other areas.

SIAM's study suggests that educators could help combat these weaknesses by encouraging more contact between mathematics students and mathematicians who are working outside of academia. To increase students' exposure to how mathematics can be applied, for instance, the study suggests that academic departments should "incorporate nonacademic internships or other on-site problem-solving experiences into degree requirements."

So if you are an industrial mathematician invited to develop an internship, consider donating your time and experience to the next generation. The process may improve your skills as well. (SIAM's report can be found on the World Wide Web at <http://www.siam.org/miirep.htm>.)

U.S.–Korea Science/Technology Summit

On December 12–13, 1995, forward-thinking leaders met at the Third U.S.–Korea Science and Technology Forum in Washington, D.C. The Science and Technology Policy Institute of Seoul, and George Mason University's Center for Science, Trade, and Technology Policy co-sponsored the forum, which "addresses scientific, engineering, and policy issues of common interest to the research communities of the two countries." The forum pursues four objectives: (1) promoting scientific and technological interactions, (2) exploring desirable areas of cooperation, (3) assisting scientists and engineers in forming networks for collaboration, and (4) enhancing mutual understanding based on institutions, practices, and policy environments.

Meeting such diverse objectives demands speakers from many arenas, and this session easily met that demand. The forum attracted many government officials, including

Bohn-Young Koo (Korea's vice minister of science and technology) and Jane Wales (associate director for national security and international affairs in the U.S. Office of Science and Technology Policy).

The participants also heard comments from industrial leaders, including John P. McTague (vice president of technical affairs, Ford Motor Company), Praveen Chaudhari (staff member in the research division of IBM Corporation and recent recipient of a National Medal of Technology), and Kyu Chang Park (executive vice president of LG Electronics Ltd.).

The academic participants included Lewis M. Branscomb (director of Harvard University's Center for Science and International Affairs) and Byong-hun Ahn (dean of the Seoul campus of the Korea Advanced Institute of Science and Technology).

According to J. Thomas Ratchford, director of the Center for Science, Trade, and

Technology Policy, "This year's forum demonstrated not only the remarkable growth of science and engineering in Korea, but also the maturing relationship between American and Korean researchers and research institutions. We were especially pleased with the caliber of the technical and policy speakers and participants from both sides, with their focus on fields of research that are world-class in both countries. Physicists from industry were especially prominent. In the future, I see many opportunities for expanding these industry ties."

The center plans to publish a proceedings volume from this forum, but availability and pricing information was not available at press time. For more information about the proceedings or advance registration for this year's Fourth U.S.–Korea Science and Technology Forum, contact Virginia M. Rosell (telephone: 703-993-8200; Internet: vrosell@gmu.edu.)