Community Updates

Congressional Briefing Examines Threats and Vulnerabilities of Interconnected Systems

Jon Kleinberg

On June 13, 2019, the American Mathematical Society (AMS) and the Mathematical Sciences Research Institute (MSRI) held a joint congressional briefing titled "Addressing Threats and Vulnerabilities in Critical Interconnected Systems: Common Principles in Disease Outbreaks, Internet Malware, and Bank Failures." This Capitol Hill briefing was given by **Jon M. Kleinberg** of Cornell University.

Kleinberg explained to congressional staff and other attendees that a vital feature of many critical systems in society is their connectivity; they are built from large numbers of components linked together in a network. This structure makes it possible to build them at large scales, but it also puts them at risk of cascading breakdowns when a problem in one component spreads to others. We can look at mathematical models originally developed for epidemic diseases in which a small change in the connectivity of the population or the infectiousness of the disease can lead to large changes in the reach of the outbreak. We then can consider how these models apply when developing detection techniques and countermeasures for risks to highly interconnected systems, including malware on the Internet and failures in banking systems.

Jon Kleinberg is the Tisch University Professor in the Departments of Computer Science and Information Science at Cornell University. His research focuses on the interaction of algorithms and networks and the roles they play in large-scale social and information systems. He is a member of the National Academy of Sciences and the National Academy of Engineering and has served on the Computer Science and Telecommunications Board (CSTB) of the National Research Council and the Computer and Information Science and Engineering (CISE) Advisory Committee of the National Science Foundation. He is the recipient of the ACM Prize in Computing and the Nevanlinna Prize from the International Mathematical Union.

For more information, see www.ams.org/government/dc-outreach/CongressBriefingAMSMSRIjune2019.

—*AMS Office of Government Relations*

Tondeur Gift Furthers BIG Math Network Activity

Philippe Tondeur

Philippe Tondeur continues to be a force in supporting rising mathematicians. In 2018 he and his wife Claire-Lise Tondeur made three simultaneous gifts to the American Mathematical Society (AMS), the Mathematical Association of America (MAA), and the Society for Industrial and Applied Mathematics (SIAM), all to support the BIG Math Network's mission to cultivate mathematicians' employment opportunities in business, industry, government, and other work domains beyond academia ("BIG").

The BIG Math Network (BMN) brings together mathematical scientists from many disciplines and work environments, including pure and applied mathematics, statistics, operations research, and data science. The BMN serves as an information source for mathematicians seeking jobs in BIG, connecting BIG employers with these mathematicians,

and generating support to prepare students for employment in BIG workplaces. Several mathematics associations and societies participate avidly in the BIG Math Network.

Here at the AMS we are working on some exciting things to contribute to the BIG Math Network's offerings, thanks to the support of the Tondeurs. First is gathering data on the career arcs of PhD mathematicians who graduated ten years ago. Preliminary data shows that out of roughly 1,300 PhDs from this time, some 300 are now in BIG jobs in such work environments as pharmaceuticals, financial services, research, computer software, Internet and information technology, and biotechnology. Study results are expected to be available by early 2020. Second, we are collaborating with SIAM to produce a series of webinars for graduate students. The webinars will feature interviews with people in BIG professions and will be hosted by graduate students. The first webinars are being planned for late fall 2019 or early 2020. A third project includes organizing professional development activities at sectional meetings and the Joint Mathematics Meetings, such as career panels, networking events, and job search workshops.

Philippe Tondeur has long worked to improve the standing of the mathematics community. As director of the Division of Mathematical Sciences at the National Science Foundation from 1999–2002, he was strategic in increasing NSF budgets for mathematics research and overseeing the VIGRE program (Vertical Integration of Research and Education in the Mathematical Sciences). He also served as a member of the National Committee on Mathematics of the US National Research Council, on the Scientific Advisory Board of the Canadian Mathematics of Information Technology and Complex Systems Centre of Excellence (now Mitacs), and on the Scientific Advisory Board of the Mathematics of Climate Research Network (MCRN). He routinely advocated for rising mathematicians in his many appointments. As he said in a September 2002 *Notices* article, "I cannot believe in doing science without the next generation being sufficiently attended to."

Thank you, Philippe and Claire-Lise Tondeur, for your vision, guidance, and generosity.

To learn more visit `bigmathnetwork.org`.

—Thomas H. Barr, AMS Special Projects Officer,
BIG Math Network Steering Committee;
Louise Jakobson, AMS Development Office

From the AMS Public Awareness Office
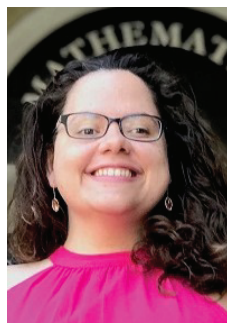
Vanessa Rivera Quiñones

AMS Blog on Math Blogs. Vanessa Rivera Quiñones (University of Illinois at Urbana-Champaign) is the new coeditor of the Blog on Math Blogs, along with **Rachel Crowell**. **Anna Haensch** (Duquesne University) stepped down as coeditor after about four years of covering the math blogs "beat," and we thank her for bringing attention to and providing her unique take on all the fascinating topics. We encourage readers to subscribe to this and other AMS blogs to follow posts on topics of interest. Go to `https://blogs.ams.org`, link to the blogs of interest, and input your email in the *Subscribe to Blog via Email* box to receive notifications of each new post. We also invite you to share your feedback and experiences after each post by using the Comments feature.

AMS Exhibits at the SACNAS and AMATYC Conferences. This fall the AMS will host exhibits at 2019 SACNAS: The National Diversity in STEM Conference (in Honolulu, Hawaii, October 31–November 2) and at the AMATYC (American Mathematical Association of Two-Year Colleges) Annual Conference (in Milwaukee, Wisconsin, November 14–17). We invite you to stop by the exhibits to see selected books and information on MathSciNet, professional programs, and services and to pick up free posters and other resources.

—Annette Emerson and Mike Breen
AMS Public Awareness Officers
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Credits

Photo of Jon Kleinberg is courtesy of Scavone Photography.
Photo of Tondeur is by Rachel Levy.