2016 AMS Mass Media Fellow Selected

Kelsey Houston-Edwards, a PhD student at Cornell University, has been awarded the 2016 AMS-AAAS Mass Media Fellowship. She will spend the summer working at the PBS program NOVA.

The AAAS Mass Media Science and Engineering Fellows program is organized by the American Association for the Advancement of Science (AAAS). This competitive program is designed to improve public understanding of science and technology by placing graduate and postgraduate science, mathematics, and engineering students in media outlets nationwide. The fellows work for ten weeks each summer as reporters, researchers, and production assistants alongside media professionals to sharpen their communication skills and increase their understanding of the editorial process by which events and ideas become news.

The program is available to enrolled college or university students (graduate, doctoral, or upper-level undergraduates) in the physical, biological, geological, health, engineering, computer, social sciences, or mathematics with outstanding written and oral communication skills and a strong interest in learning about the media.

In its forty-second year, this fellowship program has placed over 655 science, mathematics, and engineering scholars in media organizations nationwide as they research, write, and report today’s headlines.

For more information on the AAAS Mass Media Science and Engineering Fellows Program, visit the website www.aaas.org/mmfellowship.

AMS Sponsors Exhibit on Capitol Hill

The AMS sponsored an exhibit at the twenty-second annual Coalition for National Science Funding (CNSF) exhibition and reception on Capitol Hill held on April 26, 2016. Konstantina Trivisa, University of Maryland, presented her work “On the Movement of Cells, Birds, Fish and Other Agents: Mathematical Modeling in Biology and Ecology.”

Nature and biological systems offer many examples of collective self-organized behavior: ants build colonies, birds fly in flocks, fish swim in schools. Bacteria can behave either as individual single-cell organisms or as multicellular populations. Bacteria exhibit this behavior by chemically “talking” to one another through a process called quorum sensing. Using principles of self-organized dynamics, Trivisa, in collaboration with the lab of W. Bentley at the University of Maryland and PhD student H. Ueda, has constructed a new model of Cucker-Smale type that exhibits such behavior.

Quorum sensing involves the production, release, and community-wide sensing of molecules called autoinducers that modulate gene expression and ultimately bacterial behavior in response to the density of a bacterial population. The phenomenon of bioluminescence (the production and emission of light by a living organism which occurs widely in marine life) and the construction of antibiotics and proteins are intimately connected to this process. When the number of particles is sufficiently large, it is not economical to keep track of the motion of each particle through a particle system. Instead, one is forced to study the mean field limit of the particle system introducing a kinetic description for flocking analogous to the Vlasov equation in plasma and astrophysics. By taking into consideration random effects, this kinetic
description yields in certain regimes a macroscopic description governed by Euler-type systems, which are in general more cost effective for computational purposes.

One of the goals of Trivisa’s research is the construction of numerical algorithms for the approximation of such systems which govern the motion of cells. Numerical algorithms complement the analysis and inform the experiments, providing valuable insight into the evolution of cells. Such numerical algorithms have been constructed by Trivisa (in collaboration with Weber), providing information on the effect of drug application on cancerous cells and tumor growth. This research, which aims at the prediction of cancer progression based on imaging analysis, is in collaboration with S. Lockett and B. Kinders at the National Cancer Institute. Similar analysis is currently under way in the context of models exhibiting quorum sensing.

The CNSF Exhibition was attended by over 250 people viewing thirty-five exhibits. Trivisa and the other exhibitors were able to present their work, funded by the National Science Foundation, and explain the critical importance of increased, sustained federal investments in basic scientific research.

—AMS Washington Office

Deaths of AMS Members

GERALD W. JOHNSON, professor, University of Nebraska-Lincoln, died on April 27, 2015. Born on April 20, 1939, he was a member of the Society for 49 years.

MARIO LEON JUNCOSA, of Walnut Creek, died on August 12, 2015. Born on September 18, 1921, he was a member of the Society for 67 years.

MURRAY MARSHALL, professor, University of Saskatchewan, died on May 1, 2015. Born on March 24, 1940, he was a member of the Society for 34 years.

CZESLAW OLECH, professor, Polish Academy of Sciences, died on July 1, 2015. Born on May 22, 1931, he was a member of the Society for 47 years.

RAYMOND E. OZIMKOSKI, of New City, New York, died on July 19, 2015. Born on July 3, 1927, he was a member of the Society for 63 years.

LYLE E. PURSELL, of Rolla, Missouri, died on June 6, 2015. Born on April 23, 1926, he was a member of the Society for 66 years.

GEORGE N. RANLEY, of Connecticut, died September 13, 2015. Born on October 14, 1922, he was a member of the Society for 71 years.

HARTLEY ROGERS JR., of Winchester, Massachusetts, died on July 17, 2015. Born on July 6, 1926, he was a member of the Society for 63 years.

STEFAN ROLEWICZ, of Warsaw, Poland, died on July 9, 2015. Born on March 15, 1932, he was a member of the Society for 41 years.

F. A. SHERK, of Canada, died on September 23, 2015. Born on May 20, 1932, he was a member of the Society for 59 years.

GEORGE R. SELL, professor, University of Minnesota, died on May 29, 2015. Born on February 7, 1937, he was a member of the Society for 54 years.

J. F. TRAUB, of New York, NY, died on August 24, 2015. Born on June 24, 1932, he was a member of the Society for 54 years.

TAMOTSU TSUCHIKURA, of Japan, died on August 29, 2015. Born on October 7, 1922, he was a member of the Society for 54 years.

Rainer Vogt, of Germany, died on August 12, 2015. Born on July 23, 1942, he was a member of the Society for 17 years.

HANNS JOACHIM WEINERT, of Germany, died on September 22, 2015. Born on January 26, 1927, he was a member of the Society for 47 years.

DONALD F. YOUNG, of Smyrna, Georgia, died on June 25, 2015. Born on October 26, 1944, he was a member of the Society for 42 years.

HERMANN ZAPP, of Germany, died on June 4, 2015. Born on November 8, 1918, he was a member of the Society for 32 years.

DANIEL ZELINSKY, of Chevy Chase, Maryland, died on September 16, 2015. Born on November 22, 1922, he was a member of the Society for 72 years.

From the AMS Public Awareness Office

AMS for Students: News and information for high school and undergraduate students in the mathematical sciences.

This site features math videos, mathematicians in the media and math news, as well as a collection of links to math programs, information about grad schools, career advice, and recreational math. We encourage faculty and mentors to point students to this central source of information at www.ams.org/students

AMS Blogs: Ben Braun (University of Kentucky) and colleagues post helpful and thought-provoking topics on the On Teaching and Learning Mathematics Blog; Anna Haensch (Duquesne University) and Evelyn Lamb (Math Writer) cover the math blogosphere on the Blog on Math Blogs; John Baez (UC Riverside) explains the mathematics behind the images on the Visual Insight Blog; Sara Malec (Hood College) and Beth Malmskog (Villanova University) share their experiences as early-career mathematicians, teaching and doing research. We invite AMS members to explore all the AMS Blogs at blogs.ams.org; subscribe to get e-mail notifications of new posts on the blogs of interest, and comment (ask questions, share advice) on the posts.

—Annette Emerson and Mike Breen

AMS Public Awareness Officers