2019 IRIS/SSA Distinguished Lecture Series

The Incorporated Research Institutions for Seismology (https://www.iris.edu) and the Seismological Society of America (https://www.seismosoc.org) are pleased to present two experienced speakers from the Earth Science research community for the 2019 IRIS/SSA Distinguished Lecture Series.

Dr. Susan Hough
Research Geophysicist
US Geological Survey
Pasadena, California


AND

Dr. Arthur Rodgers
Seismologist
Atmospheric, Earth & Energy Division,
Lawrence Livermore National Laboratory
Livermore, California

Forecasting Ground Shaking from Earthquakes Using Supercomputers

Our speakers are chosen each year for their interesting subject matter as well as their ability to convey scientific ideas to general public audiences. IRIS and SSA will cover the speaker’s travel and lodging costs for large public venues and can also provide free seismology outreach materials. Please visit the IRIS website for more information about the 2019 series and the IRIS/SSA Distinguished Lectureship program: https://www.iris.edu/hq/programs/education_and_outreach/distinguished_lectureship

If you are interested in scheduling a speaker, please contact: Perle Dorr, lecture@iris.edu, 202-407-7004
LECTURE ABSTRACT

Seismologists spend their lives working to understand earthquakes, including earthquakes caused by human activities, so that we can understand and mitigate the hazard they pose. Fortunately for us all, large earthquakes do not strike frequently in any one place. Many of the most important past earthquakes occurred before the invention of modern seismometers. To understand these events, scientists draw on sleuthing skills to explore all available sources of data. In this talk, I describe some of the ingenious work that has been done to understand past earthquakes, and the lessons they can teach us about present-day earthquake hazard. I also discuss evidence that, while earthquakes induced by wastewater injection appeared to be a new phenomenon, there is evidence that humans caused earthquakes in a number of places, including Oklahoma and Texas, as far back as the early 20th century.

SPEAKER BIO

Susan Hough graduated from the University of California, Berkeley with a degree in geophysics in 1982 and received a PhD in Earth sciences from the University of California, San Diego in 1988. Since 1992 she has worked as a research geophysicist at the US Geological Survey in Pasadena. Her research interests include earthquake ground motions, induced earthquakes, historical earthquakes, and seismic hazard. She led deployments of portable seismometers following a number of damaging earthquakes, including the 1989 Loma Prieta, California, and 2010 Haiti earthquakes. She has co-authored over 120 articles, and was elected Fellow of the American Geophysical Union in 2009. She is now serving as President-Elect of the Seismological Society of America. In addition to technical articles, she has a long-standing interest in science communication, having authored five books on earthquake science for a non-specialist audience as well as numerous popular articles. She has further led USAID-supported capacity development projects in a number of countries including Nepal, Haiti, and Myanmar.

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Computer simulations of earthquakes can be performed to understand the expected level and character of shaking for possible future events. Advances in numerical methods and the ever growing power of parallel processing supercomputers enable ever more realistic modeling of earthquake shaking, including geology and topography. I’ll describe how computer simulations are enabled by world-class supercomputers and how these simulations are generating ever more realistic motions for hazard and risk studies. This lecture will describe supercomputer modeling of earthquake ground motions with a focus on large Hayward Fault ruptures. The last major earthquake on the Hayward Fault, with magnitude 6.5-7.0, occurred on October 21, 1868. This earthquake caused significant damage to structures for the few thousands of people living in the “East Bay” at that time. Geologic evidence strongly suggests major earthquakes on the Hayward Fault occur about every 140-160 years. It has been 150 years since the 1868 event, but today approximately 2.5 million people live near the Hayward Fault. Therefore, simulations like the one on the Hayward Fault can help inform policy makers and the general public about seismic hazard and risk.

SPEAKER BIO

Arthur Rodgers joined Lawrence Livermore National Laboratory (LLNL) as a seismologist in 1997. He has worked on high-performance computing and computational seismology since 2004. This work involved modeling of seismic waves from earthquakes and explosions. Dr. Rodgers has worked with teams on modeling earthquakes in the San Francisco Bay Area, as well as educational outreach with the California Academy of Sciences (2012), LLNL’s Science on Saturday (2015) and the American Museum of Natural History (2018). He obtained a B.S. in Physics from Northeastern University and a Ph.D. from the University of Colorado in 1993. He was a postdoctoral scholar at New Mexico State University (1994) and the University of California Santa Cruz (1994-1996). In 2010, he was a Fulbright Scholar to Grenoble France. He is currently a Visiting Researcher at Lawrence Berkeley National Laboratory and the University of California Berkeley Seismology Laboratory.

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