About AGU

Larson Receives Geodesy Section Award

Kristine M. Larson received the Geodesy Section Award on 23 May 2006 at the 2006 Joint Assembly in Baltimore, Md. The award is given in recognition of major advances in geodesy.

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Citation

For the past 15 years, Kristine Larson has been at the forefront of research in the development and application of high-precision Global Positioning System (GPS) techniques to geophysical problems.

Kristine received her bachelor's degree in engineering sciences from Harvard University [Cambridge, Mass.] in 1985. She subsequently entered the Ph.D. program in geophysics at the Scripps Institution of Oceanography [La Jolla, Calif.]. Working with Duncan Agnew, her dissertation was one of the first to evaluate GPS accuracy and use it for geophysical studies.

From 1988 to 1990, she was also a member of the technical staff at the Jet Propulsion Laboratory (JPL) [Pasadena, Calif.] where she worked with the team that developed the GIPSY [GPS Inferred Positioning System] software. In 1990, she joined the faculty at the University of Colorado, Boulder, where she is now a professor of Aerospace Engineering Sciences.

Kristine's science research focuses on measuring and interpreting crustal deformation with GPS. She published some of the first plate velocities based solely on GPS. She has also studied plate boundary zone deformation in Alaska, Nepal, Tibet, Ethiopia, California, and Mexico. In the latter collaboration with UNAM [Universidad Nacional Autónoma de México], episodic slip was first reported in Guerrero [Mexico].

Kristine's research has also emphasized engineering development by pushing the temporal sampling of GPS to subdaily intervals. She has worked on problems as diverse as measuring ice sheet motion in Greenland, comparing atomic frequency standards, and volcanic inflation on Kilauea [Hawaii]. In 2003, she and her colleagues extended GPS into seismic frequencies with the first observations of seismic waves. These data were subsequently used to evaluate triggering of earthquakes outside the Denali rupture zone [Alaska]. Her group has more recently improved high-rate GPS analysis techniques for source studies of the San Simeon [California], Tokachi-Oki [Japan], and Parkfield [California] earthquakes.

Larson has clearly established herself as a leader in the field of GPS geodesy. Her research program is extremely vibrant and has brought much benefit to the community. Her unique expertise is an outgrowth of exceptional engineering and scientific skill combined with great intellectual curiosity, creativity, and persistence. I am very grateful to Tim Dixon [University of Miami, Fla.] and Paul Segall [Stanford University, Palo Alto, Calif.], who strongly supported her nomination, and to the AGU Geodesy Section selection committee for making such an excellent choice.

—Penina Axelrad, University of Colorado, Boulder

Response

I would like to thank everyone involved in nominating me for this award. As Penny says, my research program includes both science and engineering. Combining the efforts has forced me to continually challenge myself. Understanding the intricacies of GPS has helped me do better science; conversely, understanding the underlying physics of the problem I am trying to solve has motivated me to think of ways to improve the accuracy of GPS. The reward has come from working on so many interesting problems with a diverse cast of colleagues.

In the mid-1980s, I went to graduate school convinced that I wanted to become a seismologist. Instead, I became involved

with one of the first geophysics experiments designed with GPS. At this juncture there were very few classes on GPS, and there was no 'how-to' book. I was fortunate to be able to learn both from the strong GPS group at JPL and the engineers who developed VLBI (Very Long Baseline Interferometry) and SLR (Satellite Laser Ranging) for the Crustal Dynamics Project. I also had the good luck to work with many geodesists outside the United States on collaborative research projects.

Today the use of GPS has become commonplace in geophysics, to the extent that a colleague of mine recently complained that his incoming students think plate tectonics was discovered by GPS. My own work on measuring plate tectonics with GPS always reminds me of my father's stories about working as an engineer for the Deep Sea Drilling Project in the 1970s. In both cases, scientists and engineers worked together to build new tools for geophysics. I am grateful to many colleagues and cannot properly thank everyone in this short note, but I do want to especially acknowledge my family and Jim Rice [Harvard University, Cambridge, Mass.], Charbel Farhat [Stanford University, Calif.], Bob Miller, and George Rosborough.

—Kristine M. Larson, University of Colorado, Boulder