University of Illinois at Chicago, Electrical and Computer Engineering Department
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Subsurface Sensing and Super-Resolution Imaging: Application of Computational Acoustics and Electromagnetics

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IEEE Antennas and Propagation Society Distinguished Lecturer

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Lecture Center F6
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Abstract: Acoustic/seismic and electromagnetic waves have widespread applications in geophysical subsurface sensing and imaging. In these applications, often the problems of understanding the underlying wave phenomena, designing the sensing and imaging measurement systems, and performing data processing and image reconstruction require large-scale computation in acoustics and electromagnetics. It is very challenging to solve such problems with the traditional finite difference and finite element methods. In this presentation, several high-performance computational methods and super-resolution imaging in acoustics and electromagnetics will be discussed along with their applications in oil exploration and subsurface imaging.

BIOGRAPHY

Qing Huo Liu (S'88-M'89-SM'94-F'05) received his B.S. and M.S. degrees in physics from Xiamen University in 1983 and 1986, respectively, and Ph.D. degree in electrical engineering from the University of Illinois at Urbana-Champaign in 1989. His research interests include computational electromagnetics and acoustics, inverse problems, and their applications in geophysics, nanophotonics, and biomedical imaging. He has published over 300 refereed journal papers and 450 conference papers in conference proceedings, and his H-index is 45 (Google Scholar). He was with the Electromagnetics Laboratory at the University of Illinois at Urbana-Champaign as a Research Assistant from September 1986 to December 1988, and as a Postdoctoral Research Associate from January 1989 to February 1990. He was a Research Scientist and Program Leader with Schlumberger-Doll Research, Ridgefield, CT from 1990 to 1995. From 1996 to May 1999 he was an Associate Professor with New Mexico State University. Since June 1999 he has been with Duke University where he is now a Professor of Electrical and Computer Engineering.

Dr. Liu is a Fellow of the IEEE, a Fellow of the Acoustical Society of America. Currently he serves as the inaugural Editor in Chief of the *IEEE Journal on Multiscale and Multiphysics Computational Techniques*, the Deputy Editor in Chief of *Progress in Electromagnetics Research*, an Associate Editor for *IEEE Transactions on Geoscience and Remote Sensing*, and an Editor for the *Journal of Computational Acoustics*. He was recently a Guest Editor in Chief of *the Proceedings of the IEEE* for a 2013 special issue on large-scale electromagnetics computation and applications. He received the 1996 Presidential Early Career Award for Scientists and Engineers (PECASE) from the White House, the 1996 Early Career Research Award from the Environmental Protection Agency, and the 1997 CAREER Award from the National Science Foundation. He serves as an IEEE Antennas and Propagation Society Distinguished Lecturer for 2014-2016.