



## WILLIAM T. PECORA AWARD

**Leung Tsang**

**For his sustained contributions to the theory of microwave remote sensing**

Professor Leung Tsang is the world's leading expert on the theory of microwave remote sensing for geophysical environments. His contributions to the theory of microwave remote sensing have laid the groundwork for analyses of remote-sensing data and designs of new measurements and satellite observational systems with numerous societal benefits, including monitoring climate change, improving hydrological predictions, and managing water and agricultural resources. His original and pioneering discoveries have culminated in the publication of more than 260 journal articles and four classic books.

Professor Tsang's pioneering research has laid the theoretical foundation for the significant advances of Earth Remote Sensing over the past few decades. The depth and richness of the mathematics in the book Theory of Microwave Remote Sensing and his later research articles provided a solid foundation for passive and active microwave remote sensing of snow, ice, soil moisture, and ocean surfaces, which are the key products from the Advanced Microwave Scanning Radiometer-Earth Observing System, WindSat, and future Soil Moisture Active Passive, Microwave Imager/Sounder, and Cold Land Processes missions.

In recent years, Professor Tsang has made major advancements in rough surface-scattering theory and applications to microwave remote sensing of soil and vegetated surfaces. Professor Tsang developed a superior and more accurate modeling framework for rough surface and vegetation scattering based on numerical solutions of Maxwell equations through 3 dimensional simulations with fast computational methods that can be directly applied to both active and passive microwave remote sensing of soil moisture.

Professor Tsang revolutionized the fundamental approach to analyzing dense media, one of the most challenging theoretical problems in wave propagation and scattering. His approach, known as dense media radiative transfer theory, has become the state of the art in microwave remote sensing of terrestrial snow and snow on polar ice sheets and is used for model and algorithm development for existing and future satellite instruments. Professor Tsang's work demonstrates an exceptionally distinguished record of sustained career achievements in microwave remote sensing through research, applications, teaching, and mentorship, as well as professional service as an active and committed member of the global geosciences community.

In recognition of his sustained contributions to the theory of microwave remote sensing and to the global geosciences community, the Department of the Interior and the National Aeronautics and Space Administration take great pleasure in presenting the 2012 William T. Pecora Award to Professor Leung Tsang.

Secretary  
Department of the Interior

Administrator  
National Aeronautics and Space Administration