COSPAR William Nordberg Medal – 2010

Kuo-Nan Liou

For the past 30 years through personal research, teaching and professional commitment, Professor Kuo-Nan Liou has been an unrivaled and truly peerless intellectual leader in improving the theory and application of the Earth’s remote sensing from space, the concomitant radiative transport in the atmosphere and its interaction with clouds. Starting in the early seventies, he originated the theoretical foundation of backscattering depolarization from nonspherical ice crystals, a powerful lidar technique for distinguishing between ice and water clouds and for determining ice crystal orientation. Dr. Liou was the first to deduce the theoretical basis and numerical feasibility of inversions leading to the retrieval of atmospheric heating rates using the rotational band of water vapor directly from satellite measurements and demonstrated effectively how surface radiative fluxes can be inferred directly from radiation observations. Following these theoretical advances, along with his associates he developed novel techniques for detection of the thickness, optical depth and composition, such as nonspherical ice crystal size, of ubiquitous cirrus clouds from satellites, which even today form the baseline design for the NPOESS VIIRS cloud remote sensing program. In addition, Dr. Liou’s insight into 3-D radiative transfer led him to pioneer a remote sensing approach for the mapping and imaging of 3-D inhomogeneous clouds, critical to analysis of the atmospheric heating profile for weather and climate models. Finally, in a broader context and for the first time in this field, Professor Liou incorporated the subject of remote sensing into a reference and textbook (1980, 2002), in which he unified the topic and made it an integral part of all other aspects of the fundamentals of atmospheric radiation.

For these distinguished contributions to the application of space science, it is a pleasure to award the COSPAR Nordberg Medal to Dr. Liou.

Bremen, Germany
July 2010

Prof. R.M. Bonnet
President of COSPAR
President Bonnet and COSPA officials, it is with great pleasure and sincere appreciation that I accept the 2010 COSPAR William Nordberg Medal. Actually, I was quite surprised to have been notified that I had received this prized award in recognition of my “outstanding contribution to the application of space science.” I would first like to extend my gratitude to the selection committee for recognizing my contributions to radiative transfer and remote sensing, and to thank Professor Wilfried Brutsaert of Cornell University for his unwavering encouragement and support in my pursuit of academic and research excellence. Over the past 30 years, I have had the privilege of working with a number of bright and talented graduate students at the University of Utah and UCLA who complemented my strengths in research. They deserve to share, in equal measure, any recognition I have received. It is in this spirit that I accept this great honor. Thank you very much, indeed.

Professor Dr. Kuo-Nan Liou
Distinguished Professor of Atmospheric Sciences and Director
Joint Institute for Regional Earth System Science and Engineering
University of California, Los Angeles