



Mechanical Engineering
Academy of Distinguished Alumni

Byron D. Tapley, Ph.D.

Charter Member

BSME, The University of Texas at Austin, 1956
MS, Engineering Mechanics, The University of Texas at Austin, 1958

Ph.D., Engineering Mechanics, The University of Texas at Austin, 1960

Professor and Director

Center for Space Research, Cockrell School of Engineering

Dr. Byron Tapley joined the faculty of The University of Texas at Austin in 1959 and served as the Chairman of the combined Aerospace Engineering and Engineering Mechanics (ASE-EM) Department from 1966 through 1977. He occupied the Woolrich Professorship from 1975 through 1984 and the the Clare Cockrell Williams Centennial Chair from 1985 through 2015. He established the orbit mechanics program in the ASE-EM Department in 1961 and the Center for Space Research in 1981.

His research interests include the theory of satellite motion, precision orbit determination, and nonlinear parameter estimation. He applies these and other computational methods to satellite remote-sensed observations in addressing problems in oceanography, geodesy and navigation. He was instrumental in establishing the field of Satellite Altimetry in 1980 as a method for monitoring ocean circulation and sea level rise. Since 1997, he has served as Mission Principal Investigator for the Gravity Recovery and Climate Experiment (GRACE), which is the first Earth System Pathfinder Mission to become operational, and which has established the concept of using gravity variations to monitor global and regional Earth system mass change.

One of the primary signals observed by the GRACE mission is that of water movement. The 15-year GRACE measurement record provides a paradigm-shifting view of the interactions of the Earth's oceans, atmosphere, cryosphere and solid earth, and is a resource for current studies of global water movement and availability. Observing data such as changes in global subsurface aquifers, the change in polar ice mass, and the mass displacement, GRACE provides

a global perspective that allows separation of the temperature and mass-induced components of global sea level change and enables the determination of the heat absorbed by the oceans. Other significant applications include enabling the monitoring of the draw down in large continental aquifers and the monitoring of regional drought incidence and recovery.

Dr. Tapley is a Distinguished Graduate of the Cockrell School of Engineering, a member of the National Academy of Engineering, and a fellow member of the AIAA, AGU and AAAS. His awards include the NASA Medal for Exceptional Scientific Achievement, NASA Exceptional Public Service Medal, American Astronomical Society Brouwer Award, AIAA Mechanics and Control of Flight Award, University of Texas Hocott Distinguished Engineering Research Award, AGU Charles A. Whitten Medal and The University of Texas Joe J. King Award for Engineering Excellence.

Dr. Tapley has published over 300 articles in refereed journals. He co-authored the textbook, "Statistical Orbit Determination Theory" and is editor of the John Wiley "Handbook on the Engineering Fundamentals." He has served on numerous government and National Research Council advisory panels, including the Science Steering Groups for SEASAT, TOPEX, the Earth Observing System, GRAVSAT, and the LAGEOS-II and LAGEOS-III missions. He served as a member of the National Research Council Space Studies Board and NRC Aeronautics and Space Engineering Board. He served as a member of the NASA Advisory Committee, as Vice Chair of the NASA NAC Science Committee and as Chair of the NASA Earth Science Subcommittee.