

The Department of Mechanical Engineering/College of Engineering and Applied Sciences
Stony Brook University

TOPICS IN MECHANICAL ENGINEERING
THE FRANK W. OTTO DISTINGUISHED LECTURE SERIES



Robert Parker

Distinguished Professor Chair and Executive Dean
University of Michigan-Shanghai Jiao Tong University Joint Institute

Lecture Title: **Nonlinear Gear Dynamics in Practice and Theory**

Friday, September 2, 2011, 2PM, Brook Alumni Room, 4th fl Charles B. Wang Center

Abstract

Gear vibration is a major concern in helicopters, wind turbines, cars, and other applications. Despite their long history, scientific study of gear dynamics has been concentrated in the last 50 years, and the pervasive impact of nonlinearities has been realized only recently. Tooth contact loss and dynamic forces from varying contact conditions as the gears rotate are essential features of nonlinear phenomena observed in practice. The first part of the presentation will discuss several industrial examples motivating the work. The presentation will then describe modeling, analysis, and experiments of planetary gear dynamics. The goal is to illustrate and explain the range of dynamics that occur and how the analytical findings generate results with useful practical implications.

Biography

Since 2008, Prof. Parker is the Executive Dean and a Distinguished Professor Chair at the University of Michigan-Shanghai Jiao Tong University Joint Institute in Shanghai. This is a US-style academic engineering institute offering BS, MS, and PhD degrees. Previously, he was a Professor at Ohio State University where he served on the faculty since 1995. He received his B.E. in Mechanical Engineering from SUNY Stony Brook and his M.S. and Ph.D. degrees from the University of California, Berkeley. His research examines the dynamics and vibration of mechanical systems.

Prof. Parker is a Fellow of ASME and the American Association for the Advancement of Science. The Chinese government selected him as an inaugural awardee for its 1000 Person Plan. He has received the Presidential Early Career Award for Scientists and Engineers (PECASE), NSF CAREER, and Army Young Investigator Awards, as well as the ASME Gustus Larson Award, Ford Chief Engineer Award, French government *Poste Rouge* Award, SAE Ralph Teetor Educational Award, and ASEE Outstanding Faculty Award. He was invited by the US National Academy of Engineering to four Frontiers of Engineering Symposia in the US, China, Japan, and Germany, which are invited events for leading engineers less than 45 years of age. He is an Associate Editor for the ASME J. of Vibration and Acoustics.

Prof. Parker has been a Visiting Fellow at Risoe National Lab (Denmark), the University of New South Wales, the University of Sydney, Tokyo University, NASA Glenn, and INSA Lyon. He worked at The Aerospace Corporation for two years.