

The Integrated Manufacturing Engineering Program

Seminar

NDE AND ADVANCED ACTUATORS AT JPL

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ABSTRACT

The Jet Propulsion Laboratory (JPL), an operating division of Caltech, is responsible for deep space exploration using spacecraft and TeleRobotic technologies. Since all JPL's missions are one of a kind and hardware dependent, the requirements for nondestructive evaluation (NDE) of the materials and structures that are employed are significantly more stringent than the ones for conventional aerospace needs. Further, the test structures can be complex (in geometry and construction material) and can be beyond the inspection capability of the standard NDE techniques. The multidisciplinary technologies that are developed at JPL, particularly the ones for the exploration of Mars, are finding applications to a wide variety of NDE applications. Further, technology spin-offs are enabling the development of advanced actuators that are being used to drive various types of telebot devices. A review will be given of the recent JPL NDE and Advanced Actuators activity and it will include several short Videos.

BIOGRAPHY

Dr. Yoseph Bar-Cohen is the NDE & Advanced Actuators Principal Investigator at the Jet Propulsion Laboratory. Dr. Bar-Cohen received his Ph.D. in 1979 from the Hebrew University at Jerusalem in Israel. He has more than 25 years experience in NDE, sensors and electroactive materials technologies including his positions at the Israel Aircraft Industry, Air Force Materials Laboratory and McDonnell Douglas Corporation. Dr. Bar-Cohen has been a pioneer in developing new experimental techniques for composite materials including the leaky Lamb waves and the polar backscattering. Currently, he is developing ultrasonic methods of measuring the elastic properties of composites, electroactive polymers for muscle actuators, space-worthy high-torque piezoelectric motors, piezoelectric pumps, ultrasonic techniques for medical applications and he is involved in the NASA efforts to form NASA wide M&P Standards. He is the author of more than 120 publications, made numerous presentations at national and international symposia and holds many patents. Dr. Bar-Cohen is a Fellow of the American Society for Nondestructive Testing (ASNT), an Adjunct Professor at the Dept. of the Mechanical and Aerospace Engineering, UCLA, the Editor of the NASA NDE Working Group (NNWG) Newsletter and the Emeritus Chair of NNWG.