

Bio: Dr. Joanne Wellman received a B.S. in Physics and Mathematics from Indiana University in 1991 and an M.S. and Ph.D. in Applied Physics from The University of Michigan, Ann Arbor, in 1998. She has published on adatom diffusion dynamics on homoepitaxial metal thin films and has research experience in several microscopy techniques, including Scanning Tunneling Microscopy and Transmission Electron Microscopy. Dr. Wellman joined the Jet Propulsion Laboratory in 1998 as a Cal Tech post-doctoral scholar in the Electronic Parts Engineering Office, where she is now a Parts Engineer, focusing her research interests in MEMS reliability issues for space application.

Title: A general approach to MEMS performance assurance

Abstract:

The current state of MEMS reliability assessment is somewhat fragmented and limited. In general, reliability data cannot be correlated between foundries or to device design. Most reliability analyses ignore defects and nonlinearities and assume the material is homogeneous and isotropic (which is not the case in many instances). Furthermore, fabrication process parameters drift over time, and little attempt has been made to fully characterize and quantify these changes or record the history of any particular process. In an effort to tie together MEMS design, fabrication, and reliability concerns, we are currently operating within a MEMS Reliability Alliance, whose members work together to bring performance assurance to all levels of MEMS production. We are currently expanding our library of test structures, which we are using to provide critical feedback into MEMS design software development and multi-user fabrication process verification. We report on the status of this effort, including preliminary test results, and expanding our efforts beyond test structure studies to device-level reliability.