



Presenter

**Dr. Andrey B. Matsko**

Jet Propulsion Laboratory  
California Institute of Technology  
MS 298-100, Pasadena, California 91109-8099, USA  
Phone: (818) 393-7781  
FAX: (818) 393-6773  
Andrey.Matsko@jpl.nasa.gov



### Abstract

**Title:** *Applications of crystalline WGM resonators in microwave photonics*

Whispering gallery mode resonators (WGRs) are widely used in fundamental and applied optics, and the range of their applications is already comparable with that of Fabry-Perot and other conventional resonators. For instance, WGRs made of electro-optic crystals are suitable for realization of widely tunable microwave photonic filters as well as electro-optic modulators. This presentation summarizes recent progress in the field and discusses possible solutions of problems related to design and fabrication of narrow-band widely tunable high-order filters based on high-Q  $\text{LiNbO}_3$  WGRs and describes recent demonstration of fifth-order filter function realized with the resonators.

### Biography

***DR. MATSKO** has joined Jet Propulsion Laboratory more than five years ago. He has initiated, participated, and led the theoretical investigations in several projects involving applications of whispering gallery dielectric optical resonators, which enable realization of sensitive receivers of microwave radiation, efficient miniature electro-optical modulators, and a tunable narrowband filters. Dr. Matsko has also studied and developed new theoretical models based on which novel types of whispering gallery mode resonators with novel functionalities have been produced. He has investigated and developed models for noise and stability parameters of novel oscillators based on linear and nonlinear properties of whispering gallery mode resonators. He has also pursued R&D studies in metrology that involve atomic clocks and quantum gravity gradiometers, and in some other applied as well as fundamental branches of modern physics, such the investigation of slow light in atomic vapors and in Bose-Einstein Condensates, based on which novel delay lines have been demonstrated for applications in communications and signal processing. Dr. Matsko received JPL's Lew Allen Award for Excellence. He has 7 patents and more than 100 publications. He is a member of the Optical Society of America. He also served on several program committees for SPIE and IEEE conferences.*