



**Dr. Markus Testorf**

Assistant Professor of Engineering  
Thayer School of Engineering, Dartmouth College  
8000 Cummings Hall, Hanover NH 03755 U.S.A.

Phone: (603) 646 2610

[Markus.Testorf@osa.org](mailto:Markus.Testorf@osa.org)



## Abstract

**Title:** *Resonating Microstructures: a Fourier optics perspective*

Many interesting effects are based on the interaction between an incident wave and a resonating structure. In this context the ability to control the structure of materials at the micro and nano scale has dramatically expanded the variety of functions which can be implemented.

For the purpose of this presentation, a resonance is defined as the self-referencing interference effect, where the resonating structure creates multiple copies of the incident signal and the output signal is the result of adding these copies, where each is time delayed with respect to any another. This perspective turns out to be advantageous in separating the response of the resonator from its physical implementation. It also expands the class of resonating structures including a number of systems typically not regarded as resonators.

Describing resonators in terms of linear systems theory provides a rather intuitive way to model, design, and detect resonating structures. The presentation will equally focus on a discussion of fundamental concepts as well as on results obtained in the context of specific applications, including matched spectroscopy, modeling of plasmonic nanoparticles, and the detection of micro-resonators with ultrasound.

## Biography

**DR. TESTORF** received his Ph.D. in physics from the University of Erlangen-Nuremberg, Germany in 1994. He has worked at the INAOE, Mexico, the University of Hagen, Germany, and the University of Massachusetts-Lowell. Since 2003 he is with the Thayer School of Engineering at Dartmouth College. His research interests include inverse problems, optical imaging as well as the design and application of diffractive optics and nano-optics. Dr. Testorf has authored or co-authored one book publication, 50 journal papers and about 100 conference papers. He is member of OSA, SPIE, EOS, and the German Optical Society (DGaO). He is currently chair of the OSA technical group "Diffractive Optics and Holography" and serves as topical editor of *Applied Optics*. He is also program chair of the OSA Topical Meeting on Signal Recovery and Synthesis 2007.