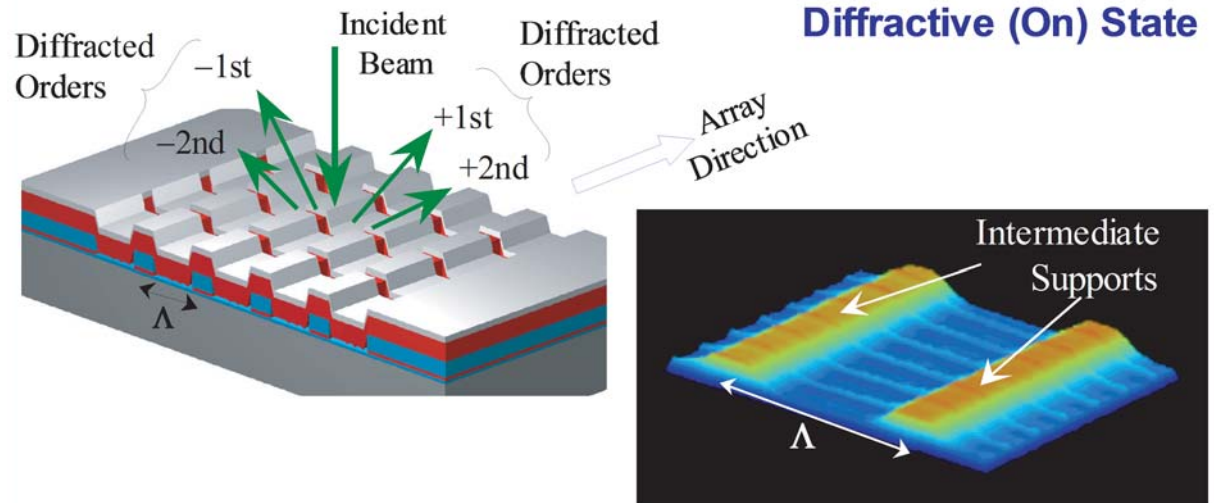


## Grating Electromechanical Systems (GEMS), Laser Displays, and Related Doodles



**Dr. Marek W. Kowarz**  
Principal Scientist  
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BS, EE and Physics, Pennsylvania 1989  
PhD, Optics, Rochester 1995

This presentation will describe GEMS technology and its applications to laser display and programmable spectral imaging.

**3:00-4:00 pm, Monday**

**April 20, 2009**

Sloan Auditorium, Goergen Building

Refreshments served

**Grating Electromechanical Systems (GEMS), Laser Displays, and Related Doodles**  
**Dr. Marek W. Kowarz**  
**Infotonics Technology Center**

**Abstract**

Diffraction optical MEMS devices combine the optical properties of traditional gratings with micro-electromechanical actuation, enabling systems to have electronically controllable optical properties. The GEMS (grating electromechanical system) device is a unique diffraction MEMS spatial light modulator that changes from a reflective mirror state to a diffraction grating state employing the principle of a hidden grating. This presentation will describe GEMS technology and its applications to laser display and programmable spectral imaging.

**Biography**

Marek W. Kowarz is Principal Scientist and a member of the leadership team at the Infotonics Technology Center. He has been involved in R&D relating to the design, fabrication and application of optical microsystems and microstructures for over fifteen years. From 1995 to 2007, he was with the Research Laboratories of Eastman Kodak Company working on optical MEMS devices, displays and optical data storage. Dr. Kowarz is the primary inventor of Kodak's GEMS technology, was responsible for device and system development activities while at Kodak, and is currently leading GEMS-related work at Infotonics. He has over 50 issued and pending patents related to optical MEMS devices and displays and has published over 20 papers in the areas of optical MEMS, optical storage, physical optics and electromagnetic theory. He received a Ph.D. degree in Optics from the University of Rochester in 1995 and dual undergraduate degrees in Electrical Engineering and Physics from the University of Pennsylvania in 1989.