

Invited Talk: Adventures in optical metrology



Date: 2 – 3 pm on April 21st (Friday), 2017

Location: Conference Room 821

Speaker: Peter de Groot

Executive Director of R&D

Zygo Corporation, Middlefield, CT

After 30 years in optical metrology, I have a few stories to tell! This presentation briefly reviews (1 or 2 slides for each example) selected metrology problems, projects, solutions and outcomes. On the menu:

- Holographic imaging of ultrasound in liquid helium
- Laser radar for aircraft manufacturing metrology
- 3D interference microscopy
- Automated flatness testing of rigid disks for data storage drives
- Dynamic flying height analysis of magnetic read-write heads
- Flatness, thickness and parallelism inspection of fuel injector parts
- Exposure tool for Telecom fiber Bragg gratings
- Measurement of transparent films for flat panel TV and computer screen production
- Interferometric scatterometry for semiconductor process control
- Vibration insensitive Fizeau interferometry
- Form and waviness measurement for large transparent flats
- A new class of interference objectives for wide field of view microscopy
- High-precision ($5\text{pm}/\sqrt{\text{Hz}}$) fiber-based position sensor
- Optical displacement metrology with air turbulence compensation
- Photolithography stage positioning using heterodyne encoders

This list catalogs some satisfying success stories; however, not all ideas were as successful as I would have liked. To keep it real, I have included a few projects for which the outcomes were best described as “lessons learned”.

Speaker biography

Peter is a Physics PhD working in precision optical measurements, and is currently the Executive Director of R&D at ZYGO and head of an R&D Team comprised of 7 PhD scientists. ZYGO R&D works on the invention, concept demonstration and development of new optical instruments. Peter is a fellow of the SPIE and of the OSA, has published 150 technical papers, tutorials and book chapters on a wide range of topics, and is an inventor for 132 issued US patents for optical instrumentation. As R&D Group Leader and a Principal Scientist, Peter has contributed to every ZYGO metrology product line since 1992.

If you have any questions regarding this talk, please, contact Dae Wook Kim at: dkim@optics.arizona.edu