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College of Optical Sciences
THE UNIVERSITY OF ARIZONA®

U of AZ College of Optical Sciences Computer Generated Holography (CGH) and Diffractive Optical Element (DOE) Workshop

Introduction

From the early work of Lohmann to present day, applications such as multi-spectral dispersers, chromatic compensators, aspheric testing, optical beam shaping and transformation, security marks, multiplexed optical detectors and laser pointers have used computer-generated holograms (CGHs) to perform otherwise difficult or impossible tasks. CGH design spans decades of applied and theoretical research. Diffractive Optical Elements (DOE) are CGHs used in optical systems. Fabrication of these devices has traditionally been time consuming, using binary photomasks and semiconductor foundry resources. The purpose of this workshop is to provide participants with a hands-on learning opportunity for design and fabrication of these devices using the Maskless Lithography Tool (MLT) at the College of Optical Sciences. Through a series of lectures, computer training and laboratory experiments, participants will be exposed to processes needed to design and build physical devices.

Learning objectives

Participants who successfully complete this three day course will be able to:

- Specify, analyze, design and test properties of Diffractive Optical Elements (DOEs)
- Specify, analyze, design and test properties of CGH display holograms.
- Design and use DOEs for optical testing applications.
- Describe basic fabrication procedures used in fabricating CGHs and DOEs with maskless grayscale lithography.
- Fabricate several types of CGHs and DOEs using the MLT

Intended audience:

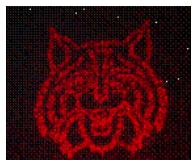
This course is geared towards scientists, engineers, managers and researchers interested in exploring fundamentals of Computer Generated Holography, Diffractive Optical Elements and Maskless Grayscale Lithography who want to gain hands-on, working knowledge in this field. A strong undergraduate-level mathematical background and a basic knowledge of optics are helpful.

Program Overview

Classes are divided into lecture and laboratory sessions each day. The laboratory involves hands-on training in fabrication and testing of CGHs. Custom software written in the Matlab® language is provided with an open-source license agreement as part of the course. Classes are held in the world famous College of Optical Sciences on the beautiful University of Arizona campus in Tucson, Arizona. See the accompanying sheet for detailed schedule and contact information. Class size is limited to provide a quality learning environment.

Instructors

- William J. Dallas, <http://www.radiology.arizona.edu/Dallas>
- Tom Milster, <http://www.optics.arizona.edu/milster>
- Burge, <http://www.optics.arizona.edu/faculty/Resumes/Burge.htm>



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MARCH 2010 CGH WORKSHOP

REGISTRATION INFORMATION

College of Optical Sciences

Meinel Building/Room 821 (West Wing)

Enrollment: Limited to 20 Participants
 Registration Begins: 11-30-09 until all openings are filled
 Includes: Lectures, Labs, Course Materials, Software,
 Coffee Breaks, and a Variety of lunches
 Individual Laptops will be provided.

PRIMARY	March 16-18 2010	CGH WORKSHOP A three-day course that includes classroom and laboratory instruction. Topics include training in design, fabrication and testing of diffractive optical elements (DOEs) and computer-generated holograms (CGHs) for applications in optical systems, display, and aspheric mirror testing.	Tuition: \$1500 SPIE Member: \$1350* * (10% Discount before 02-13-10) Payable to: University of Arizona College of Optical Sciences
ADDITIONAL	March 15 2010	Matlab, Optiscan & Zemax Basics This class is a computer-based introduction to Matlab [®] , OptiScan [®] , and Zemax [®] software that will prepare participants for more advanced topics presented in the workshop. Instructor: Tom D. Milster	Tuition: \$500 SPIE Member: \$450* * (10% Discount before 02-13-10) Payable to: University of Arizona College of Optical Sciences
ADDITIONAL	March 19 2010	Advanced DOE/CGH Design Using Optiscan This class is a continuation of the CGH Workshop that emphasizes practical design and fabrication issues of DOEs and CGHs. Advanced computer-based design using OptiScan [®] includes instruction for aberration compensators, harmonic DOEs, CGHs for testing, advanced CGHs, and other topics. Instructor: Tom D. Milster	Tuition: \$500 SPIE Member: \$450* * (10% Discount before 02-13-10) Payable to: University of Arizona College of Optical Sciences

Contact: Juliet Hughes at (520) 626-7080 or

juliet@optics.arizona.edu for further information

Information about the College of Optical Sciences: <http://www.optics.arizona.edu/>

Virtual tours of the University of Arizona Campus: <http://www.arizona.edu/tours/>

Maps and directions: <http://www.optics.arizona.edu/Maps/Default.htm>

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