

# Advances in Optics & Photonics Industrial Affiliates Symposium

## 12-13 March 2020

*CREOL 102 & 103*

Thursday, March 12

Short Courses 9:00AM–12:15PM

**9:00-10:30AM, CREOL Building, Room 102**

**Title: Coupled Diode Laser Arrays**

**Instructor: Yehuda Braiman**

Semiconductor diodes offer wide choice of advantages including wide-ranging availability wavelengths, small size, high electro-optical and wall-plug efficiency, and low cost. For many applications, however, single diodes do not emit enough power and this deficiency can be compensated by combining multiple diodes into arrays. In this short course we will be covering the basics of diode array design and structure, will overview variety of beam combining designs, will briefly talk about analytical modeling of semiconductor diode lasers and diode laser arrays, and will present experimental results showing spectral and coherent beam combining of semiconductor diode laser arrays. Finally, we will overview applications of diode laser arrays.

**10:45-12:15PM, CREOL Building, Room 103**

**Title: Practical Spectroscopy for Medicine, Industry and Defense**

**Instructor: Matthieu Baudelet**

This short course will introduce the participants to the different types of spectroscopies that are used for medical diagnostics, quality assurance as well as remote, stand-off and field sensing. We will discuss why and how to choose the appropriate techniques to obtain the best information adapted to the needs of the industry, analysts and field operators. An overview of the commercial availability of the technologies will also be presented to the participants.

**9:00-10:30AM, CREOL Building, Room 103**

**Title: Thin Film Characterization with Spectroscopic Ellipsometry**

**Instructor: James N. Hilfiker (J.A. Woollam Co.)**

Spectroscopic Ellipsometry is used to characterize the thickness and optical properties of thin films. It is perfect for films ranging in thickness from sub-nanometer to several microns. We will describe the technique and review measurements of dielectric, semiconductor, organic, and metal thin films. The applications of spectroscopic ellipsometry include optical coatings, flat panel displays, organic electronics, photovoltaics, microelectronics, data storage, biosensors, and much more.

**Career Fair 11:00AM-1:00PM (Engineer II Atrium)**

11:00 Professional Development Program  
Recruiting event in Engineer II Atrium

**Student Talks 1:30PM-2:30PM (CREOL 102/103)**

1:30	Optical thermodynamic theory of nonlinear highly multimoded systems	Student of the Year- Fan Wu
	Ytterbium doped multicore fiber saturable absorber for high energy fs fiber lasers	Stefan Gausmann
	Measurements of Transient Nonlinear Refraction of Air in the Mid-IR	Salimeh Tofighi
	Thin-film periodically poled lithium niobate devices and applications	Kamal Abdelsalam

**Poster Session, Reception & Lab Tours 2:30PM-4:30PM (CREOL Auditorium)**

2:30	Student Poster Session Lab Tours	CREOL Auditorium Tours start from CREOL Auditorium
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***Cape Florida Ballroom, UCF Student Union***  
**Friday, 13 March**

8:30 Continental Breakfast and Walk-in Registrations

9:00 Welcome and overview of CREOL David Hagan Interim Dean, CREOL, UCF

**Technical Symposium**

**Session I**

9:45 What Factors are Driving the Choice for Mixed Reality Optical Architectures Today? Bernard Kress Microsoft

10:15 Fluorescence Imaging with Tailored Light Kyu Young Han CREOL, UCF

10:35 BREAK & EXHIBITS

**Session II**

10:55 Air Force Science and Technology 2030 Strategy and Infrared Technology Research Michael Eismann AFRL

11:25 Few-Mode Photonic Systems Guifang Li CREOL, UCF

**Product Review**

11:45 L3Harris Nick Reigel

11:53 Ocean Insight Ty Olmstead

12:01 Elbit Systems of America Trisha Fish

12:10 LUNCH Served

1:10 SPIE Kent Rochford CEO

1:25 OSA Liz Rogan CEO

**Session III**

1:45 Using Light to Control Electrons that, in turn, Create New Light Sources Paul Corkum University of Ottawa

2:15 Novel High-Power Mid-infrared Lasers for Attosecond and Strong Field Science Zenghu Chang CREOL, UCF

2:35 BREAK & EXHIBITS

**Session IV**

2:55 Physics-AI Symbiosis: How to Utilize Physics to Accelerate Artificial Intelligence Bahram Jalali UCLA

3:25 Silicon Photonics beyond Silicon-on-Insulator Sasan Fathpour CREOL, UCF

**Award Presentations**

3:45 Distinguished Alumni Award Brian Lawrence Hill-Rom

4:00-5:00 Reception