Department of Engineering Science

Announces 8th lecture of the
Engineering Science Lecture Series
Academic Year 2016-2017

This is a series designed to benefit the Sonoma State students and faculty in the School of Science and Technology, high tech and biotech industries and related businesses and community in the North Bay Region.

***

The Lecture Series covers a broad range of topics with focus on recent developments and trends and provides a platform for the exchange of ideas among the audience.

***

Attendance is open to the students, faculty and staff of SSU and other academic institutions, engineers and scientists from industries, members of the business community and members of the community, in general. A parking permit is required to park on campus, and is available for $5.00 at machines in the parking lots. Talks are otherwise free.

Days & Dates: 1st & 3rd Thursday of every month

Venue: Cerent Engineering Science Complex, Salazar Hall Room #2009A

Reception: 4:00 to 4:30 p.m.

Lecture: 4:30 to 5:15 p.m.

Q&A: 5:15 to 5:30 p.m.

Acknowledgement

The ES Lecture Series is supported by the local industry including Keysight Technologies.

"VCSEL-based Multimode Fiber Optics for Datacenters and Supercomputers"

by

Dr. Brendan Hamel Bissell,
Department of Engineering Science,
Sonoma State University

Thursday, February 16, 2017

Abstract – High Performance Computing and Data Centers are driving the demand for high bandwidth interconnects. According to Cisco, cloud data center traffic is projected to grow to 8.6 Zettabytes per year, with 73% of that traffic within the data center. Future exascale supercomputers capable of more than a quintillion operations per second will demand higher performance networks characterized by lower power consumption, lower cost, and higher bit rate. VCSEL-based multimode optical links are one key solution to enable this growth. In this talk, I will present three projects to address the demands of future optical links. In the first part, I will describe a 30Gb/s 90nm CMOS-driven multimode optical link that uses equalization to achieve higher data rates and lower power consumption. In the second part, I will describe a 4-channel wavelength division multiplexing solution for uncooled lasers using injection-molded optics to reduce system costs. In the third part, I will describe a system to characterize VCSELs using hyperspectral imaging, and I will show how this system can be used to improve multimode fiber bandwidth from 6.3GHz to 17.5GHz over 300m.

Dr. Brendan Hamel-Bissell is an Assistant Professor at the Department of Engineering, SSU. He grew up in Underhill, Vermont, where he spent most of his time in the mountains skiing, including 6 years on the US National Ski Patrol. He did his undergrad at McGill University in Montréal, Canada, and became interested in the applications of optics, especially optical communications. He completed his PhD in electrical engineering at Stanford University in 2016,

with a focus of optical communications in data centers. While at Stanford, he worked with industry researchers as a Senior Scientist at Finisar Corporation and taught electrical engineering at De Anza College. Brendan is passionate about supporting the LGBTQ community; he has served on the Board of Directors of Stanford Pride, Stanford's LGBT alumni association since 2012 and as the Director of Admissions for the Out for Undergrad Engineering Conference since 2014.

Upcoming Lectures

2017	Title of the Lecture	Guest Speaker
Mar 2	Communication & signal processing	Dr. Birsen Sirkeci-Mergen, EE Dept., San Jose State University
Mar 9	Starting a Successful Tech Company	Mr. Chris Stewart, President/COO & Co-Founder of Pocket Radar & Invention Planet
Apr 6	Why we invest in startups	Dr. Patrick Pfeffer, Sr. Director of Growth Strategy and Venture Investments, Juniper Networks
Apr 20	Power Electronics, Electric Motor Drives, MACAUTO	Dr. Yin Ye, EE Department, San Francisco State University