Center of Excellence in Intelligent Engineering Systems

SEMINAR

Speaker: Prof. Dr. Dieter H. Bimberg

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Dieter Bimberg is the Executive Director of the Center of NanoPhotonics, TU Berlin and a HiCi Distinguished Adjunct Professor at King Abdulaziz University. He is a member of the IEEE Photonics Society fellow appointment and prize committees and an associate editor of IEEE Photonics Technology Letters. He is also a member of committees and co-chairman of more than 80 other international conferences. He is a scientific Reviewer for DFG, NSF, EU, Russian Academy of Sciences, Swedish Science Foundation, Carl-Zeiss-Foundation, and Volkswagen Foundation. He has more than 25 patents, 6 books and more than 1200 original publications in the fields of semiconductor physics, technology, optoelectronic and electronic devices and systems. He initiated/assisted in the creation of 6 start-up companies and has more than 45000 citations and an h-index of 93. He has given more than 300 invited and plenary talks at international conferences, institutes etc. and supervised more than 100 Ph.D. theses and more than 130 diploma/master/bachelor theses.

Date: **Monday, February 9, 2015**

Time: **1:00 PM**

Venue: **Engineering Building, Second floor, Room 24C28 (ECE Seminar Room)**

Title

High Brightness Pulse Generation from PBC Lasers

Abstract

High brightness picosecond sources in the 1064 nm range are currently attracting much attention for emerging applications within the fields of materials processing, advanced imaging techniques, medicine and metrology. These lasers provide precise targeting with minimum damage to the surrounding region while also reducing optics requirements due to their superior beam quality. Standard semiconductor laser sources already present a number of advantages compared to commercially available Ti:sapphire and fiber lasers owing to their higher efficiency, compactness, wavelength tunability, as well as the reduced complexity and footprint, but typically at the expense of reduced brightness.

Latest results on design and realization of high brightness laser diodes and how they pave the way to high brightness short optical pulse generation will be presented. The lasers are based on novel ultra-broad waveguides consisting of multiple vertically stacked layers allowing the expansion of the fundamental mode to obtain very low beam divergence together with an increased output power. Ridge waveguide lasers 9 µm wide have shown to exhibit record output powers of up to 2 W while still preserving a high beam quality with M^2 values of less than 2 in both the horizontal and vertical directions. Mode locking and gain switching of this type of lasers already generate record picosecond pulses with several Watts of peak power and divergence angles down to 10° in both directions. These results as well as alternative approaches for achieving even higher peak power and brightness pulses will be presented.

ALL ARE CORDIALLY INVITED