University of Basel

Department of Biomedical Engineering

Seminar Series FS 2020**: Robotics, Lasers and Beyond**

Lecture Room 14.03.002, Department Biomedical Engineering, Gewerbestrasse 14, Allschwil

Wednesday 29.4.2020, 11:00 – 12:30

Megawatts from micrometers: special optical fibers for novel applications

Prof. Dr. Valerio Romano

Bern University of Applied Sciences & Institute of Applied Physics, University of Bern

Abstract:

Optical fibers have dramatically increased the amount of information that can be delivered between places and people. The basis of this progress lies in the optical fiber and on the extreme purity that can be achieved when producing glass by the MCVD technique.

However the most phantastic advancement related to optical fibers occurred in the late 1980's, when scientists started to manipulate and structure these snippy hair-like glass fibers to control their light guiding properties. In an astonishingly short period of time a wealth of applications were developed such as multi-kilowatt laser systems with highest beam quality, sensing devices, hollow core fibers for the delivery of pico- and femtosecond pulses. These inventions were not only brilliant per se as research results; they were also trailblazers conducting photonics as a key enabling technology into the industrial environment by facilitating the use and integration of light and lasers in modern machines. The research work conducted in Bern and Burgdorf on these topics will be briefly presented.

Curriculum:

Valerio Romano is Professor for Photonics at the Bern Univeristy of Applied Sciences and heads the fiber drawing laboratory at the Institute of Applied Physics at the University of Bern. He is is co-director of the Institute for Applied Laser, Photonics and Surface Technologies ALPS at BUAS.

His present research interests are active and passive special optical fibers. In this field he pioneered a new production method based on sol-gel technology.

He obtained his PhD from the University of Bern for his studies in the field of IR-laser surgery with Erbium and Holmium mid IR lasers. Later he was head of the laser-matter interaction laboratory for 6 years before he received the leadership over the optical fiber lab and the annected fiber drawing tower. He is board member of the Swissphotonics NTN and coordinator of the Swiss National Fiber Lab SNFL.

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Department of
Biomedical Engineering

Self-optimizing fiber laser

Dr. Manuel Ryser

Institute of Applied Physics, University of Bern

Abstract:
An introduction to the technology of ultrafast fiber lasers is given. Subsequently, an overview of possible concepts for self-optimizing fiber lasers is presented. Experimental results of a self-optimizing fiber laser, which was built at the University of Bern, are shown and discussed.

Curriculum:
Manuel Ryser received his PhD in experimental physics at the University of Bern in 2009 in research and development of functional monitoring of biological tissues using microscopic and fiber optic sensing techniques. In the following years he was involved in numerous research projects for the development of novel fiber lasers. Currently, he is co-leader of the group Optical Fibers and Fiber Lasers and works in the areas of novel fiber optic light sources, fiber optic sensors and production and application of special optical fibers. Beside his engagement at the university Manuel Ryser is co-founder and managing partner at the University Bern Spin-Off company 8photonics (www.8photonics.com) and he is teaching physics and mathematics at a high school.