PHOTONICS SEMINAR

Dr. Marcos Dantus

Developing the Concept of Ultrashort Shaped Laser Pulses as Photonics Reagents and Probes

Faculty Host: Dr. Larry Ziegler

November 13, 2013

2:00-3:00 p.m.

Room 339

Photonics Center

8 Saint Mary's Street

Refreshments will be served!

Just like chemical reagents are used for testing, chemically transforming and sensing other compounds, photons can serve the same purpose. The key challenge, however, is determining how to create laser pulses that most efficiently achieve the desired goal and have no other effect on the target. Success in this endeavor can result in numerous significant applications, for example non-invasive cancer detection, advanced proteomic analysis capable of detecting weakly bound post-translational modification, and non-intrusive explosives trace detection. This presentation will discuss some of the principles of ultrafast pulse shaping, illustrate the most salient applications, and highlight technologies required to make this concept economically practical.

Professor Dantus has pioneered the use of spectrally and temporally shaped ultrafast pulses as photonic reagents to probe molecular properties, control chemical reactions and for practical applications such as biomedical imaging, proteomics and standoff detection of explosives. Dantus has over 180 publications, and was named Inventor of the Year by Michigan State University given his 43 invention disclosures and 17 issued patents. Dantus has founded two companies, KTM Industries, a company that manufactures biodegradable packing materials and Biophotonic Solutions, a company that is commercializing automated femtosecond pulse compression.

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