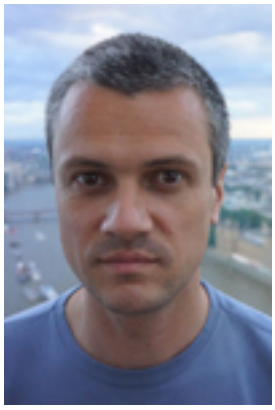
Abbe School of Photonics | JENA
Friedrich-Schiller-Universität

Visiting Professor

Pavel Polynkin



Pavel Polynkin is an Associate Research Professor of Optical Sciences at the University of Arizona in Tucson. He received his PhD degree in Electrical Engineering from Texas A&M University in 2000. and spent two years in a high-tech firm in Silicon Valley. In 2002, he joined the College of Optical Sciences at the University of Arizona. Dr.Polynkin's research interests include studies of nonlinear optic conversion processes at extreme laser intensities, laser filamentation, atmospheric optics, remote sensing, and ultrafast laser-matter interactions. Dr. Polynkin has co-authored 50 publications in refereed journals and 9 US patents. He is a member of the Optical Society of America and the Directed Energy Professional Society (DEPS)..

Self-focusing of ultra-intense shaped laser beams in transparent media

I will discuss recent experimental results on the applications of intense shaped beams for the generation of extended plasma channels and channel arrays in gases and liquids. Beam shapes investigated so far include diffraction-resistant Bessel beams, self-bending Airy beams and optical vortices. I will further discuss experiments and computer simulations on efficient Raman conversion inside intense femtosecond Bessel beams in air and on the extension of femtosecond plasma filaments through the application of auxiliary "dress" beams.

05 November 2013, 12:30, Conference room, Max-Wien-Platz 1

Laser plasmas for atmospheric applications

Ultra-intense femtosecond laser pulses are capable of creating extended plasma channels in ambient air through the process of laser filamentation. Natural filament plasmas, however, are very dilute and short-lived which limits their practical utility. I will discuss the "Igniter-heater" excitation approach that allows for boosting plasma density in femtosecond laser filaments and for extending the lifetime of filament plasmas. The approach relies on the application of an additional multi-Joule laser pulse with the duration in the picosecond to nanosecond range. Dense and long-lived plasma channels that are produced in air through the applications of the igniter-heater approach can be potentially used as remote atmospheric sources of impulsive laser-like radiation and as extended guides of various forms of electricity such as microwaves and lightning strikes.

07 November 2013, 14:00, Conference room, Max-Wien-Platz 1.