Personal Details

NAME: DR. Patrik Grychtol
Place of living: Boulder, Colorado 80302, USA
Nationality: German
Visa Status: J1 - 2 year rule does NOT apply

Physicist / Optical Engineer
Excellent analytical, technical and soft skills, working to strict deadlines within technically and culturally demanding environments. Major projects include the design and development of sources, optics and metrology in the visible and the extreme ultraviolet spectral range for investigations of material properties. Extensive knowledge in all aspects of electro-optical engineering from concept to implementation including project management. Published results from research in journals while also attending and presenting the research findings at physics and materials conferences internationally.

Education

2007 - 2011 **Ph.D in Physics**
Research Center Jülich (Peter-Grünberg Institut), Germany

RESEARCH THESIS: **Element-selective and time-resolved magnetic investigations in the extreme ultraviolet range**
Development of magneto-optical metrology for time-resolved and element-selective investigations of nano-structured magnetic materials employing ultrafast lasers, synchrotrons and tabletop extreme ultraviolet / soft x-ray sources.

1999 - 2006 **Diploma in Physics**
RWTH Aachen University (Institute of Semiconductor Electronics), Germany

RESEARCH THESIS:**Contrast enhancement in optical coherence tomography**
Construction and optimization of an interferometric, femtosecond laser-based biomedical imaging system: Optical Coherence Tomography (OCT).

2003 - 2004 **Graduate Diploma in Environmental Science**
University of Sydney (School of Geoscience), Australia

COURSE WORK: Postgraduate studies of sustainable development, resource management, remote sensing and alternative energy concepts.

Honors and Interests

2012 POSTDOCTORAL RESEARCH FELLOWSHIP GRANTED BY THE GERMAN SCIENCE FOUNDATION (DEUTSCHE FORSCHUNGSGEMEINSCHAFT).

2010 DOCTORAL RESEARCH FELLOWSHIP GRANTED BY THE GERMAN ACADEMIC EXCHANGE SERVICE (DEUTSCHER AKADEMISCHER AUSTAUSCHDIENST).

Hobbies Traveling, hiking, skiing, surfing, running, reading and family.

Working Experience and Skills

Since 2012 **Research Associate / Ph.D Advisor and Group Leader EUV Magneto-Optics**
University of Colorado at Boulder (JILA), Colorado, USA

Development of element-selective imaging techniques for magneto-optical investigations of cutting-edge data storage devices and waver/mask inspection on the nanometer and femtosecond scale by means of laser based extreme ultraviolet and soft x-ray radiation. Collaborations with Intel, Samsung, Western Digital and KMLabs Inc: Communicating technical requirements, developing and testing prototypes and commercialized ultrafast laser amplifiers and tabletop EUV/soft x-ray light sources. Coordinating research

efforts as well as publication/presentation activities with various groups, both locally and internationally. Training of graduate students in the optronic laboratory.

2007 - 2011 **Ph.D Research Student / Diploma Advisor**
Research Center Jülich (Peter Grünberg Institut), Germany

Built up a femtosecond pump-probe experiment for studies of ultrafast spin dynamics in ferromagnets interesting for next generation data storage applications. Acquired broad interdisciplinary experience in the design, realization, and performance of complex experiments. Prepared a wide variety of sample systems with molecular beam epitaxy and magnetron sputtering techniques. Applied optical and electron beam lithography techniques to create micro- and nanostructures in the clean room. Subsequent magneto-optical pump-probe experiments required frequent operation of pulsed Ti:Sapphire oscillators, regenerative and multipass optical amplifiers, and experience with optics in the visible and EUV regime. For the signal detection and processing, a broad range of approaches, for instance, lock-in methods, micro-channel plates or CCD arrays, were applied, which needed to be hard- and software controlled. Construction of very specialized mechanical, electronic, optical elements were performed independently as well as in collaboration with experienced technicians and engineers. The experiments were not only carried out in the optronic labs in Jülich, but required also a number of extended beam times at the synchrotron radiation source BESSY II in Berlin. These beam times required a lot of preparation and planning. In this way lot of experience was gained in managing projects and also taking the responsibility to coordinate a part of the experiments with collaboration partners of the group of Prof. Aeschlimann at TU Kaiserslautern. Established new scientific contacts, for example, with the groups of Profs. Murnane and Kapteyn at the University of Colorado and the group of Dr. Silva at NIST in Boulder. This initiative not only resulted in two research fellowships to work in Boulder, but also in a number of ground-breaking experiments which is confirmed by publications in high-ranking peer-reviewed journals and a broad international recognition.

2005 - 2006 **Diploma Research Student / Teaching Assistant**
RWTH Aachen University (Institute of Semiconductor Electronics), Germany

Worked in an optronic laboratory and significantly contributed to setting up an Optical Coherence Tomography (OCT) biomedical imaging system based on a Mach-Zehnder interferometer and a broadband Ti:sapphire femtosecond laser oscillator. Besides gathering experiences with all optical aspects of the OCT technique, the work focused on programming calibration and synchronization routines for the mechano-optical delay stages and on processing as well as analyzing the recorded data. Successful demonstration that a contrast enhancement in OCT can be obtained by introducing near infrared sensitive dyes in various biological samples in combination with a spectroscopic analysis of the recorded interference data. Communicated with a neighboring electrical engineering institute and the university hospital, thereby implementing the developed imaging and calibration algorithms on a FPGA in a collaborative effort. This allowed for real-time OCT measurements pursuing a clinical dermatological study. The work laid the foundation for a publication in a high ranking peer-reviewed journal as well as several conference contributions.

2002 **Research Student**
European Space Agency (ESA), Bordeaux, France

Participation in the 5th Student Parabolic Flight Campaign of the ESA and technical development of the flight experiment*: Formation of plasma crystals in zero gravity.* Gathered first experience in planning and developing a technologically challenging project that required meeting high safety standards, *i.e.* the engineered setup needed to be attached to an airplane (Airbus A-320).

Languages fluent in German & English with basic knowledge of French, Spanish and Polish.

IT Skills MatLab, Origin, LabView, RAYtracing, Autodesk Inventor, Microsoft Office.

Should you have any questions concerning my qualifications or person, please do not hesitate to contact me for a list of references. Furthermore, my full publication list can be freely accessed online at Google Scholar!

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