

Andreas Knebl

Position: PhD Student
Project: B03
Address: IPHT Jena
Albert-Einstein-Str. 9
07745 Jena

E-Mail: andreas.knebl@leibniz-ipht.de
Tel: +49 (0) 3641206158



Research Interests

- Optical technology, especially fiber-enhanced Raman spectroscopy
- Monitoring of environmental gas exchange processes
- Gas sensing and Raman gas spectroscopy
- Nitrogen cycle, especially (biological) nitrogen fixation

Current Project

PhD thesis, working title: “Highly sensitive and spectrally resolved Raman gas sensing for online monitoring of biogenic gases”

Within this project, we seek to understand how subsurface gases reflect environmental conditions and functional biodiversity of the subsurface in the critical zone. New concepts for enhanced Raman gas spectroscopy will be developed as a tool for the simultaneous quantification of several gases, including isotopic tracer gases. Here, latest hollow core fiber technology will be studied regarding its potential for Raman signal enhancement. Besides, the miniaturization and automation of enhanced Raman gas spectroscopy instruments will be further advanced. One main aim is the development of fiber-enhanced Raman spectroscopy for tracing biogenic gases at low concentrations. Additionally, established techniques will be used to continue measurements of how gases and isotopes vary with time in the Hainich transect. Controlled laboratory experiments will support the research of microbial gas exchange processes.

Curriculum Vitae

Since 02/2019	PhD researcher at the Leibniz Institute of Photonic Technology IPHT Jena, Germany
02/2016 – 02/2019	PhD researcher at the Max Planck Institute for Biogeochemistry, Jena, Germany
10/2015 – 02/2016	Research assistant at the Leibniz Institute of Photonic Technology IPHT Jena, Germany
10/2014 – 03/2015	Research assistant at the German Center for Neurodegenerative Diseases DZNE, Munich, Germany

10/2013 – 09/2014	M. Sc. Photonics at the Friedrich Schiller University Jena, Jena, Germany
09/2012 – 09/2013	M. Sc. Optics at the College of Optics and Photonics CREOL, University of Central Florida, Orlando, Florida, United States
10/2009 – 09/2012	B. Sc. Physics at the Friedrich Schiller University Jena, Jena, Germany

Publications

- **Knebl A**, Domes R, Yan D, Popp J, Trumbore S, and Frosch T. (2019) Fiber Enhanced Raman Gas Spectroscopy for 18O-13C-labeling experiments. *Analytical Chemistry*, under review
- **Knebl A**, Yan D, Popp J, and Frosch T. (2018) Fiber enhanced Raman gas spectroscopy. *TrAC Trends in Analytical Chemistry*, Volume 103: 230-238, DOI: 10.1016/j.trac.2017.12.001
- **Knebl A**, Popp J, and Frosch T. (2017) Raman Gas Spectroscopy, in *Handbook of Optoelectronics: Applied Optical Electronics (Volume Three)*, D.J. P. and R.G. Brown, Editors, CRC Press
- Ehmke T, Nitzsche TH, **Knebl A**, and Heisterkamp A. (2014) Molecular orientation sensitive second harmonic microscopy by radially and azimuthally polarized light. *Biomedical Optics Express* 5 (7):2231-2246, DOI: 10.1364/BOE.5.002231
- Ehmke T, **Knebl A**, Reiss S, Fischinger IR, Seiler TG, Stachs O, and Heisterkamp A. (2015) Spectral behavior of second harmonic signals from organic and non-organic materials in multiphoton microscopy. *AIP Adv* 5 (8):084903, DOI: 10.1063/1.4915134
- Marinković P, Blumenstock S, Goltstein PM, Korzhova V, Peters F, **Knebl A**, and Herms J. (2019), In vivo imaging reveals reduced activity of neuronal circuits in a mouse tauopathy model. *Brain*, pii: awz035, DOI: 10.1093/brain/awz035

Conference contributions

- **Knebl A**, Jochum T, Trumbore S, and Frosch T. (2018) Raman Gas Spectroscopy - a Promising Tool to Study the Nitrogen Cycle. 23rd European Nitrogen Cycle Meeting; 19-21 September 2018 Alicante, Spain. (oral presentation)
- **Knebl A**, Drechsel L, Jochum T, Popp J, Trumbore S, and Frosch T. (2018) Measuring Biological Nitrogen Fixation With Raman Gas Spectroscopy. ICORS XXVI; 26-31 August 2018 ICC Jeju, Jeju, South Korea. (Poster)
- Ehmke T, **Knebl A**, and Heisterkamp A. (2015) Four-wave mixing microscopy: a high potential nonlinear imaging method. *Abstract Multiphoton Microscopy in the Biomedical Sciences XV SPIE BIOS*; 7-12 February 2015 San Francisco, California, United States, 932912, DOI: 10.1117/12.2076743