

**Dr. rer. nat. Alexander Jesacher, PhD**

Address: Georg-Bucher-Straße 2, 6094 Axams

Date of birth: 19.09.1978

Languages: German, English



**FIELDS OF SPECIALIZATION**

- Active & Adaptive optics in light microscopy
- Confocal microscopy
- Harmonic generation microscopy (SHG, THG)
- Coherent anti-Stokes Raman Scattering (CARS) microscopy
- Lensless imaging and digital holography
- PSF engineering (e.g. spiral phase contrast, double-helix phase engineering)
- Laser micro-fabrication (direct laser writing of waveguides, polymer- and photonic crystal structures)
- Optical Micromanipulation (holographic optical tweezers)

**PROFESSIONAL ACTIVITIES**

12.2014 – present

Associate Professor at the Division for Biomedical Physics, Innsbruck Medical University

06.2012 – 11.2014

Assistant Professor at the Division for Biomedical Physics, Innsbruck Medical University

01.2010 – 06.2012

Post-Doc at the Division for Biomedical Physics, Innsbruck Medical University, Innsbruck

07.2008 – 12.2009

Post-Doc at the Scanning optical Microscopy group, Dept. of Engineering Science, University of Oxford;

Research areas:

1) Development of adaptive optics methods in scanning optical microscopy (confocal and harmonic generation microscopy) to correct aberrations;

2) Development of methods using LC-SLMs for the direct laser writing of photonic structures;

The work was funded by an “Erwin-Schrödinger” fellowship of the Austrian Science Fund.

## **EDUCATION**

09.2004 – 06.2008 (PhD)

Doctoral Studies in “Image Guided Diagnosis and Therapy (IGDT)” at the Division for Biomedical Physics, Innsbruck Medical University, Innsbruck; graduation with distinction in May 2008

09.2004 – 08.2007 (Dr. rer. nat.)

Doctoral studies in Experimental Physics at the Leopold-Franzens University, Innsbruck; graduation with distinction in August 2007

10.1999 – 09.2004 (Mag. rer. nat)

Diploma studies in Physics at the Leopold-Franzens University, Innsbruck; graduation with distinction in September 2004

## **IMPORTANT ACADEMIC ACHIEVEMENTS / AWARDS (five most important)**

07. 2015      Young Researcher Award of the School in Advanced Optical Technologies (SAOT) at the Friedrich Alexander University Erlangen-Nürnberg, Germany.

09.2012      Physics award (Fritz-Kohlrausch prize) of the Austrian Physical Society (together with Dr. Daniel Kiener). The prize is the highest award for Experimental Physics of the Austrian Physical Society and biannually awarded to maximal two young researchers.

06.2008      Grant of an “Erwin Schrödinger” research fellowship of the Austrian Science Fund (FWF) for the duration of 18 months.

02.2007      Award of the Fürstentum Liechtenstein for scientific research at the Innsbruck universities. The prize is annually awarded to maximal three researchers in all fields of science.

04.2005      Grant of a DOC-scholarship of the Austrian Academy of Sciences.

## **PATENTS**

1. Pat. No. WO2006072581, “spiral phase contrast imaging in microscopy”, inventors: S. Bernet, M. Ritsch-Marte, A. Jesacher, S. Fürhapter
2. Pat. No. EP14180213.2, “generation of multi-color phase structures with a single spatial light modulator (SLM)”, inventors: S. Bernet, A. Jesacher, M. Ritsch-Marte

## **INVITED CONFERENCE TALKS (five most important)**

1. A. Jesacher, A. Thayil, K. Grieve, D. Débarre, T. Watanabe, T. Wilson, S. Srinivas, G. Marshall and M. J. Booth, *Aberration Correction in Harmonic Generation Microscopy*, SPIE Photonics West, San Francisco, USA, Jan. 2011
2. A. Jesacher, G. Thalhammer, S. Bernet, M. Ritsch-Marte, *LC-spatial light modulators as versatile diffractive optical elements for applications in the micro-regime*, Photon 12 conference, Durham, UK, Sept. 2012
3. A. Jesacher, R. Piestun, M. Ritsch-Marte, *3D information from 2D scans in a camera-based confocal microscope*, SPIE Photonics West, San Francisco, USA, Feb. 2015
4. A. Jesacher, M. Ritsch-Marte, R. Piestun, *Resolution enhancement in a double-helix phase engineered scanning microscope (RESCH microscope)*, SPIE Optics & Photonics, San Diego, USA, Aug. 2015.
5. A. Jesacher, W. Harm, C. Roider, S. Bernet, M. Ritsch-Marte, *A varifocal refractive/diffractive lens doublet for single-shot “Transport of Intensity” phase measurements*, Trends in Microscopy, Dresden, Germany, Feb. 2016.

## **INTERNATIONAL COLLABORATIONS (last five years)**

- Prof. Rafael Piestun, University of Colorado, Boulder, USA
- Prof. Martin Booth, Dept. of Engineering Science and Centre for Neural Circuits and Behaviour, University of Oxford, UK
- Prof. Miles Padgett, School of Physics and Astronomy, University of Glasgow, UK
- Prof. Min Gu, Centre for Micro-Photonics, Swinburne University of Technology, Melbourne, AUS
- Prof. Hervé Rigneault, Institute Fresnel, FR