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SFB - Tomography Across the Scales

**3rd Internal Meeting**

December 1 - 5, 2019, Obergurgl, Austria

## Program

### Sunday, December 1, 2019

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| 17:30 – 18:30 | Opening Dinner   |
| 18:30 – 19:15 | <b>Image similarity measures and applications</b><br><i>Ming Jiang, Peking University, China</i> |
| 19:15 – 19:20 | <i>Discussion</i>  |

### Monday, December 2, 2019

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| 08:30 – 09:00 | <b>Imaging, simulation and reconstruction of oligomeric structures in cryo super resolution microscopy</b><br>Magdalena Schneider, Montse López (TU Vienna)   |
| 09:00 – 09:15 | <b>A localisation algorithm for cryo single molecule microscopy</b><br>Fabian Hinterer (RICAM Linz)   |
| 09:15 – 09:20 | <i>Discussion</i>   |
| 09:20 – 10:05 | <b>Direct measurement of optical torque</b><br>Franziska Strasser (MedUni Innsbruck)<br><b>SAFTL - Super critical Angle Fluorescence Total internal reflection Localization</b><br>Lisa Bodner (MedUni Innsbruck)<br><b>Light propagation methods for optical trapping and tracking</b><br>Simon Moser (MedUni Innsbruck) |
| 10:05 – 10:10 | <i>Discussion</i>   |
| 10:10 – 10:25 | <i>Coffee Break</i>   |

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| 10:25 – 10:50 | <b>Reconstruction of galaxies via tomography in coloured orbit space</b><br>Prashin Jethwa (Department of Astrophysics, University of Vienna)                             |
| 10:50 – 10:55 | <i>Discussion</i>   |
| 10:55 – 11:20 | <b>A Frame Decomposition of the Atmospheric Tomography Operator</b><br>Simon Hubmer (RICAM Linz)  |
| 11:20 – 11:25 | <i>Discussion</i>   |
| 11:25 – 11:45 | <b>Recent progress in quantitative OCT</b><br>Leopold Veselka (University of Vienna)  |
| 11:45 – 11:50 | <i>Discussion</i>   |
| 11:50 – 12:15 | <b>A Fourier approach to the inverse source problem in an absorbing and scattering medium with applications to optical molecular imaging</b><br>Kamran Sadiq (RICAM Linz) |
| 12:15 – 12:20 | <i>Discussion</i>   |
| 12:20 – 12:45 | <b>Data Driven regularization by projection</b><br>Andrea Aspri (RICAM Linz)  |
| 12:45 – 12:50 | <i>Discussion</i>   |
| 12:50 – 17:30 | ~ Lunch Break ~   |
| 17:30 – 18:30 | Dinner  |
| 18:30 – 19:15 | <b>Digital Enhancement of Resolution and Contrast in Optical Coherence Tomography</b><br>Rainer Leitgeb (MedUni Vienna)   |
| 19:15 – 19:20 | <i>Discussion</i>   |

## Tuesday, December 3, 2019

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| 08:30 – 09:15 | <b>Ultrasonic robotics - particles manipulation across the length scales</b><br>Bruce Drinkwater, Faculty of Engineering, University of Bristol, UK                                 |
| 09:15 – 09:20 | <i>Discussion</i>   |
| 09:20 – 09:50 | <b>Open discussion about collaborations &amp; synergies with project 'optical tomography of trapped particles'</b><br>Presented by Gregor Thalhammer (MedUni Innsbruck)             |
| 09:50 – 09:55 | <i>Discussion</i>   |
| 09:55 – 10:10 | <i>Coffee Break</i>   |
| 10:10 – 10:40 | <b>Recent progress in high resolution imaging of the retina with adaptive optics optical coherence tomography</b><br>Günther Auzinger (JKU Linz), Elisabeth Brunner (MedUni Vienna) |

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| 10:40 – 10:45 | <i>Discussion</i>  |
| 10:45 – 11:30 | <b>Recent advances in optical microscopy of trapped specimens: experimental setup and theoretical approaches</b><br>Mia Kvåle Løvmo, Benedikt Pressl (MedUni Innsbruck), Denise Schmutz (University of Vienna) |
| 11:30 – 11:35 | <i>Discussion</i>  |
| 11:35 – 12:05 | <b>Template driven image reconstruction with deformation regularization</b><br>Sebastian Neumayer, Department of Mathematics, Technical University Kaiserslautern, Germany                                     |
| 12:05 – 12:10 | <i>Discussion</i>  |
| 12:10 – 17:30 | ~ Lunch Break ~  |
| 17:30 – 18:30 | Dinner   |
| 18:30 – 19:15 | <b>Optical diffraction tomography (ODT) for label-free imaging of 3D tissues and organoids</b><br>Elizabeth Antoine, EPFL, Switzerland   |
| 19:15 – 19:20 | <i>Discussion</i>  |
| 19:20 – 20:00 | <b>Member Meeting</b>  |

## Wednesday, December 4, 2019

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| 08:30 – 09:00 | <b>Data driven regularization by projection and possible applications with the SFB</b><br>Otmar Scherzer (University of Vienna) |
| 09:00 – 09:05 | <i>Discussion</i>   |
| 09:05 – 09:35 | <b>Medical elastography - anything we can contribute?</b><br>Wolfgang Drexler (MedUni Vienna)                                   |
| 09:35 – 09:40 | <i>Discussion</i>   |
| 09:40 – 09:55 | <i>Coffee Break</i>   |
| 09:55 – 10:25 | <b>Attenuation in Photoacoustic Tomography</b><br>Peter Elbau (University of Vienna)  |
| 10:25 – 10:30 | <i>Discussion</i>   |
| 10:30 – 11:00 | <b>Tomography in Astronomical Applications: An (almost) Mid Term Update</b><br>Ronny Ramlau (JKU Linz and RICAM Linz)           |
| 11:00 – 11:05 | <i>Discussion</i>   |
| 11:05 – 11:35 | <b>Deep learning for tomographic reconstruction of optically and acoustically trapped pollen grains</b>                         |

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| 11:35 – 11:40 | Monika Ritsch-Marte (MedUni Innsbruck)<br><i>Discussion</i>   |
| 11:40 – 12:10 | <b>What we talk about when we talk about nanoclusters</b><br>Gerhard Schütz (TU Vienna)   |
| 12:10 – 12:15 | <i>Discussion</i>   |
| 12:15 – 17:30 | ~ Lunch Break ~   |
| 17:30 – 18:30 | Dinner  |
| 18:30 – 19:15 | <b>Enhancing phase sensitivity using wave-front shaping and cavity enhancement</b><br>Thomas Juffmann, Faculty of Physics, University of Vienna |
| 19:15 – 19:20 | <i>Discussion</i>   |
| 19:20 – 20:00 | <b>PIs Meeting</b>  |

## Thursday, December 5, 2019

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|---------------|---|
| 08:30 – 09:15 | <b>The hunt for intermediate-mass black holes in globular clusters</b><br>Glenn van de Ven, Department of Astrophysics, University of Vienna        |
| 09:15 – 09:20 | <i>Discussion</i>   |
| 09:20 – 10:05 | <b>Extracting novel information from biological specimens by super-resolution optical imaging</b><br>Johann Georg Danzl, IST Austria                |
| 10:05 – 10:10 | <i>Discussion</i>   |
| 10:10 – 10:25 | <i>Coffee Break</i>   |
| 10:25 – 10:50 | <b>Terahertz Tomography</b><br>Alexander Ploier (RICAM Linz)  |
| 10:50 – 10:55 | <i>Discussion</i>   |
| 10:55 – 11:40 | <b>Recent advances and challenges in Quantitative OCT-PAT Elastography</b><br>Ekaterina Sherina (University of Vienna), Lisa Krainz (MedUni Vienna) |
| 11:40 – 11:45 | <i>Discussion</i>   |
| 11:45 – 12:00 | <i>Closing Session</i>  |