

# Curriculum Vitae

Stephan Preibisch, PhD

## Director

*Scientific Computing Software*

## Team Leader

*Computational Method Development Team*

## Team Leader

*Solutions Team*

*HHMI Janelia Research Campus  
19700 Helix Drive  
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20147 Ashburn, VA, USA*

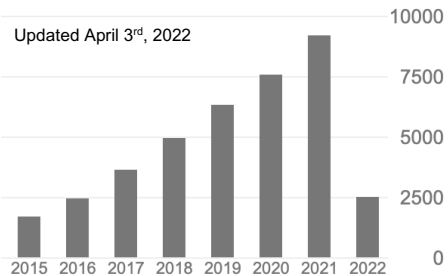
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## Personal

March 10<sup>th</sup> 1980      Born in Cottbus, Germany

## Education

2011      **Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG) / TU Dresden**

*Ph.D. in computer science with advisor Dr. Pavel Tomancak (summa cum laude)*

Title: "Reconstruction of Multi-Tile Microscopic Acquisitions"

2006      **Interdisciplinary Center for Bioinformatics Leipzig (IZBI) / TU Dresden**

*Diploma in computer science with advisor Dr. Hans Binder and co-advisor Prof. Dr. Michael Schroeder*

Title: "Sequence specific signal adjustment of Genechip expression data"

# Research/Work Experience

- 2019 – current      **Director Scientific Computing Software**  
Team Leader Computational Methods Development Team  
Team Leader Solutions Team  
*HHMI Janelia Research Campus (Ashburn, VA, USA)*
- 2019 – 2021      **Team Leader Computational Methods Development**  
*HHMI Janelia Research Campus (Ashburn, VA, USA)*
- 2015 – 2021      **Independent Research Group Leader**  
*Berlin Institute for Medical Systems Biology of the Max Delbrück Center for Molecular Medicine (Berlin, Germany)*  
Microscopy, Image Analysis & Modeling of Developing Organisms
- 2012 – 2015      **Human Frontier Science Program (HFSP) Fellow**  
*Albert Einstein College of Medicine (Robert Singer, New York, USA)*  
*MPI-CBG (Eugene Myers, Dresden, Germany)*  
In-toto analysis of the signaling network regulating the *C. elegans* dauer diapause
- Visiting scientist**  
*HHMI Janelia Research Campus (Ashburn, VA, USA)*
- 2011 – 2012      **Bioinformatics Specialist**  
*HHMI Janelia Research Campus (Eugene Myers, Ashburn, VA, USA)*  
In-toto analysis of the signaling network regulating the *C. elegans* dauer diapause
- 2011 – 2019      **Consultant**  
*Carl Zeiss, Andor, 3i and HHMI Janelia*
- 2010 – 2011      **Postdoc**  
*MPI-CBG (Pavel Tomancak, Dresden, Germany)*  
Segmentation of SPIM datasets of *Drosophila* embryogenesis & Fiji/ImgLib development
- 2008              **Visiting scientist**  
*Stanford Research Institute (Torsten Rohlfing, Menlo Park, CA, USA)*  
Image registration and image fusion strategies
- 2006 – 2010      **PhD student**  
*MPI-CBG (Pavel Tomancak, Dresden, Germany)*  
Reconstruction of Multi-Tile Microscopic Acquisitions & Fiji / ImgLib2 development
- 2002 – 2006      **Student assistant**  
*IZBI (Hans Binder, Leipzig, Germany)*  
Model-based Analysis of Gene Expression Microarray Data

## Grants, Honors & Awards

2019	<a href="#">Nature Methods Author File</a> , <i>Nature Methods</i> <b>16</b> , 793 (2019)
2019	Established the Helmholtz Imaging Platform, externally funded W3 (full) professorship for image data science
2019	Speaker at the Berlin Institute for Medical Systems Biology opening symposium with German Chancellor Angela Merkel
2019	Member of the EU-Flagship Proposal “LifeTime”
2018	Excellent to Exceptional (1.5) rating of research work as group leader at the MDC
2018	BMBF in-vitro Challenge
2018	Studienstiftung des Deutschen Volkes Award
2018 – 2021	HFSP Program Grant
2017 – 2020	H2020 Marie Curie: Innovative Training Networks
2017 – 2019	H2020 Marie Curie: Individual Fellowship
2012 – 2015	HFSP Long-Term Fellowship
2011	PhD thesis awarded with “highest honors”
2006 – 2010	Max Planck Society PhD Fellowship

## Selected Publications & Reviews

\* - co-first author; # - (co-)corresponding author

Citations: <https://scholar.google.com/citations?user=P4RXq8QAAAAJ&hl=en>

[S. Preibisch](#)<sup>#</sup>, N. Karaiskos, N. Rajewsky<sup>#</sup>

**Image-based representation of massive spatial transcriptomics datasets**  
*bioRxiv* 2021.12.07.471629 (2021).

E. Bahry, L. Breimann, M. Zouinkhi, L. Epstein, K. Kolyvanov, X. Long, K. Harrington<sup>#</sup>, T. Lionnet<sup>#</sup>, [S. Preibisch](#)<sup>#</sup>

**RS-FISH: Precise, interactive, fast, and scalable FISH spot detection**  
*bioRxiv* 2021.03.09.434205 (2021).

F. Preusser, N. Santos, J. Contzen, H. Stachelscheid, E.T. Costa, P. Mergenthaler<sup>#</sup>, [S. Preibisch](#)<sup>#</sup>

**FRC-QE: A robust and comparable 3D microscopy image quality metric for cleared organoids**  
*Bioinformatics*, **37**(18), 3088-3090 (2021).

N. Vladimirov<sup>#</sup>, F. Preusser, J. Wisniewski, Z. Yaniv, R.A. Desai, A. Woehler, [S. Preibisch](#)<sup>#</sup>  
**Dual-view light-sheet imaging through tilted glass interface using a deformable mirror**  
*Biomedical Optics Express* **12**(4), 2186-2203 (2021).

D. Hörl, F. Rojas Rusak, F. Preusser, P. Tillberg, N. Randel, R. Chhetri, A. Cardona, P.J. Keller, H. Hartz, H. Leonhardt, M. Treier, [S. Preibisch](#)<sup>#</sup>

**BigStitcher: Reconstructing high-resolution image datasets of cleared and expanded samples**  
*Nature Methods* **16**(9), 870–874 (2019).

L. Breimann, F. Preusser, [S. Preibisch](#)<sup>#</sup>

**Light-microscopy methods in *C. elegans* research**

*Current Opinion in Systems Biology* **13**, 82–92 (2019).

V. Kapoor, W. G. Hirst, C. Hentschel, [S. Preibisch](#)<sup>#</sup>, S. Reber<sup>#</sup>

**MTrack: Automated Detection, Tracking & Analysis of Dynamic Microtubules**

*Scientific Reports* **9**(1), 3794 (2019).

C. Smith<sup>\*</sup>, [S. Preibisch](#)<sup>\*</sup>, A. Joseph, B. Rieger, S. Stallinga, E. Myers, R.H. Singer, D. Grunwald

**Nuclear accessibility of  $\beta$ -actin mRNA measured by 3D single-molecule real-time tracking**

*Journal of Cell Biology* **209**(4), 609-619 (2015).

[S. Preibisch](#)<sup>#</sup>, F. Amat, E. Stamataki, M. Sarov, R.H. Singer, E. Myers, P. Tomancak<sup>#</sup>

**Efficient Bayesian-based Multi-View Deconvolution**

*Nature Methods* **11**(6), 645-648 (2014).

T. Pietzsch<sup>\*</sup>, [S. Preibisch](#)<sup>\*</sup>, P. Tomancak, S. Saalfeld

**ImgLib2 – Generic image processing in Java**

*Bioinformatics* **28**(22), 3009-3011 (2012).

J. Schindelin, I.A. Carreras, E. Frise, V. Kaynig, M. Longair, [S. Preibisch](#), C. Rueden, S. Saalfeld, B. Schmid, J.Y. Tinevez, V. Hartenstein, K. Eliceiri, P. Tomancak, A. Cardona

**Fiji - an open source platform for biological image analysis**

*Nature Methods* **9**(7), 676-682 (2012).

[S. Preibisch](#)<sup>\*</sup>, S. Saalfeld<sup>\*</sup>, J. Schindelin, P. Tomancak

**Software for bead-based registration of selective plane illumination microscopy data**

*Nature Methods* **7**(6), 418-419 (2010).

[S. Preibisch](#), S. Saalfeld, P. Tomancak

**Globally Optimal Stitching of Tiled 3D Microscopic Image Acquisitions**

*Bioinformatics* **25**(11), 1463-1465 (2009).

## Further Publications & Reviews

E.H.K. Stelzer, F. Strobl, B.J. Chang, F. Preusser, [S. Preibisch](#), K. McDole, R. Fiolka

**Lightsheet fluorescence microscopy**

*Nature Reviews Methods Primers* **1**(73), 1-25 (2021).

C. Malin-Mayor, P. Hirsch, L. Guignard, K. McDole, Y. Wan, W.C. Lemon, P.J. Keller, [S. Preibisch](#), J. Funke

**Automated Reconstruction of Whole-Embryo Cell Lineages by Learning from Sparse Annotations**

*bioRxiv* 2021.07.28.454016 (2021).

V. Gandin, B. English, M. Freeman, L.P.Leroux, [S. Preibisch](#), D. Walpita, M. Jaramillo, R.H. Singer

**Cap-dependent translation initiation monitored in living cells**

*bioRxiv* 2021.05.21.445166 (2021).

L. Breimann, A.K. Morao, J. Kim, D. Jimenez, N. Maryn, K. Bikkasani, M.J. Carrozza, S.E. Albritton, M. Kramer, L.A. Street, K. Cerimi, V.C. Schumann, E. Bahry, [S. Preibisch](#), A. Woehler, S. Ercan

**The histone H4 lysine 20 demethylase DPY-21 regulates the dynamics of condensin DC binding**

*Journal of Cell Science* **135**(2), jcs258818 (2021).

R. Chhetri, [S. Preibisch](#), N. Stuurman

**Software for Microscopy Workshop White Paper**

*arXiv* 2005.00082 (2020).

Y. Le Poul, Y. Xin, L. Ling, B. Mühlhling, R. Jaenichen, D. Hörl, D. Bunk, H. Harz, H. Leonhardt, Y. Wang, E. Osipova, M. Museridze, D. Dharmadhikari, E. Murphy, R. Rohs, [S. Preibisch](#), B. Prud'homme, N. Gompel

**Regulatory encoding of quantitative variation in spatial activity of a *Drosophila* enhancer**

*Scientific Advances* **6**(49), eabe2955 (2020).

F. Rudolph, J. Hüttemeister, K. da Silva Lopes, R. Jüttner, L. Yu, N. Bergmann, D. Friedrich, [S. Preibisch](#), E. Wagner, S.E. Lehnart, C.C. Gregorio, M. Gotthardt

**Resolving titin's lifecycle and the spatial organization of protein turnover in mouse cardiomyocytes**

*PNAS* **116**(50), 25126-25136 (2019).

D. Friedrich, L. Friedel, A. Finzel, A. Herrmann, [S. Preibisch](#), A. Loewer

**Stochastic transcription in the p53-mediated response to DNA damage is modulated by burst frequency**

*EMBO Molecular Systems Biology* **15**(12), e9068 (2019).

I. Lahmann, D. Bröhl, D. Bröhl, T. Zyrianova, A. Isomura, V. Kapoor, M. Czajkowski, J. Griger, P. Ruffault, D. Mademtzoglou, P.S. Zammit, T. Wunderlich, S. Spuler, R. Kühn, [S. Preibisch](#), J. Wolf, R. Kageyama, C. Birchmeier

**Oscillations of MyoD and Hes1 proteins regulate the maintenance of activated muscle stem cells**

*Genes & Development* **33**, 524-535 (2019).

N. Vladimirov, C. Wang, B. Höckendorf, A. Pujala, M. Tanimoto, Y. Mu, C.T. Yang, J. Wittenbach, J. Freeman, [S. Preibisch](#), M. Koyama, P.J. Keller, M. Ahrens

**Brain-wide circuit interrogation at the cellular level guided by online analysis of neuronal function**

*Nature Methods* **15**(12), 1117-1125 (2018).

C. Wolff, J.Y. Tinevez, T. Pietzsch, E. Stamatakis, B. Harich, [S. Preibisch](#), S. Shorte, P.J. Keller, P. Tomancak, A. Pavlopoulos

**Multi-view light-sheet imaging and tracking with the MaMuT software reveals the cell lineage of a direct developing arthropod limb**

*eLife* **7**, e34410 (2018).

J. Icha, C. Schmied, J. Sidhaye, P. Tomancak, [S. Preibisch](#), S. Norden

**Using Light Sheet Microscopy to Image Zebrafish Eye Development**

*Journal of Visualized Experiments (JoVE)* **110**, e53966 (2016).

- C. Schmied, P. Steinbach, T. Pietzsch, [S. Preibisch](#), P. Tomancak  
**An automated workflow for parallel processing of multiview SPIM recordings**  
*Bioinformatics* **32**(7), 1112-1114 (2015).
- T. Pietzsch, S. Saalfeld, [S. Preibisch](#), P. Tomancak  
**BigDataViewer: Interactive Visualization and Image Processing for Terabyte Data Sets**  
*Nature Methods* **12**(6), 481-483 (2015).
- F. Jug, T. Pietzsch, [S. Preibisch](#), P. Tomancak  
**Bioimage Informatics in the context of Drosophila research**  
*Methods* **68**(1), 60-73 (2014).
- P. Pitrone, J. Schindelin, L. Stuyvenberg, [S. Preibisch](#), M. Weber, K.W. Eliceiri, J. Huisken, P. Tomancak  
**OpenSPIM - an open access platform for light sheet microscopy**  
*Nature Methods*, **10**(7), 598-599 (2013).
- A. Cardona, S. Saalfeld, J. Schindelin, I. Arganda-Carreras, [S. Preibisch](#), M. Longair, P. Tomancak, V. Hartenstein, R. Douglas  
**TrakEM2 software for neural circuit reconstruction**  
*PLoS ONE* **7**(6), e38011 (2012).
- M.S. Uddin, H.K. Lee, [S. Preibisch](#), P. Tomancak  
**Restoration of Uneven Illumination in Light Sheet Microscopy Images**  
*Microscopy and Microanalysis* **17**(4), 607-613 (2011).
- A. Kalinka, K. Jastrzebowska, D. Gerrard, [S. Preibisch](#), J. Jarrels, D. Corcoran, U. Ohler, C. Bergman, P. Tomancak  
**Gene expression divergence recapitulates the developmental hourglass**  
*Nature* **468**(7325), 811-814 (2010).
- F. Carrillo Oesterreich, [S. Preibisch](#), K. Neugebauer  
**Global analysis of nascent RNA identifies splicing-specific transcriptional pausing**  
*Molecular Cell* **40**(4), 571-581 (2010).
- A. Cardona, S. Saalfeld, [S. Preibisch](#), B. Schmid, P. Tomancak, A. Cheng, J. Pulokas, V. Hartenstein  
**An integrated micro- and macroarchitectural analysis of the Drosophila brain by computer-assisted serial section electron microscopy**  
*PLoS Biology* **8**(10), e1000502 (2010).
- [S. Preibisch](#), P. Tomancak, S. Saalfeld  
**Into ImgLib – Generic Image Processing in Java**  
*in ImageJ User and Developer Conference 2010* (1), 72-76 (2010).
- P. Oteiza, M. Koeppen, M. Krieg, E. Pulgar, C. Farias, C. Melo, [S. Preibisch](#), D. Müller, M. Tada, S. Hartel, C.P. Heisenberg, M. Concha  
**Planar cell polarity signaling regulates cell adhesion properties in progenitors of the Zebrafish laterality organ**  
*Development* **137**(20), 3459-3468 (2010).

[S. Preibisch](#), S. Saalfeld, T. Rohlfing, P. Tomancak

**Bead-based mosaicing of single plane illumination microscopy images using geometric local descriptor matching**

*in SPIE Medical Imaging 2009: Image Processing 7259 (72592S)*, 1-10 (2009).

H. Binder, [S. Preibisch](#), H. Berger

**Calibration of microarray gene-expression data**

*in Methods in Molecular Medicine: Cancer gene profiling, Methods and Protocols*, ISBN:978-1-934115-76-3 (2009).

[S. Preibisch](#), R. Ejsmont, T. Rohlfing, P. Tomancak

**Towards Digital Representation of Drosophila Embryogenesis**

*in IEEE Biomedical Imaging: From Nano to Macro 5*, 324-327 (2008).

[S. Preibisch](#), T. Rohlfing, M. Hasak, P. Tomancak

**Mosaicing of Single Plane Illumination Microscopy Images Using Groupwise Registration and Fast Content-Based Image Fusion**

*in SPIE Medical Imaging 2008: Image Processing 6914 (69140E)*, 1-8 (2008).

H. Binder, [S. Preibisch](#)

**"Hook"-calibration of GeneChip-microarrays: Theory and algorithm**

*Algorithms for Molecular Biology*, 3:11 (2008).

H. Binder, K. Krohn, [S. Preibisch](#)

**"Hook"-calibration of GeneChip-microarrays: Chip characteristics and expression measures**

*Algorithms for Molecular Biology*, 3:12 (2008).

H. Binder, [S. Preibisch](#)

**GeneChip microarrays – signal intensities, RNA concentrations and probe sequences**

*Journal of Physics: Condensed Matter* 18(18), 537-566 (2006).

H. Binder, [S. Preibisch](#)

**Specific and non-specific hybridization of oligonucleotide probes on microarrays**

*Biophysical Journal* 89(1), 337-352 (2005).

H. Binder, [S. Preibisch](#), T. Kirsten

**Base pair interactions and hybridization isotherms of matched and mismatched oligonucleotide probes on microarrays**

*Langmuir* 21(20), 9287-9302 (2005).

## Conference Organization

Organizer of “**From Images to Knowledge with ImageJ & Friends**”

(30 November - 2 December 2020, HHMI Janelia, Ashburn, USA)

Organizer of the “**10<sup>th</sup> Lightsheet Fluorescence Microscopy Conference**”

(12-15 August 2018, MPI-CBG, Dresden, Germany)

Organizer of the “**10<sup>th</sup> Berlin Summer Meeting: Imaging Gene Regulation from DNA to RNA to Protein**”

(8-10 June 2017, MDC, Berlin, Germany)

Organizer of the EU-Life Course “**Biological Image Analysis and Reconstruction**”  
(14-18 November 2016, MDC, Berlin, Germany)

## Paper/Grant Review Activity

Grant reviews: **European Research Council (ERC), French Agence Nationale de la Recherche (ANR), British Wellcome Trust, Chan-Zuckerberg Initiative, Dutch Research Council** and others

Paper reviews: **Nature Methods, Nature Biotechnology, Bioinformatics, Nature Communications, Optics Express, NIPS, ICANN** and others

## Teaching

**From Images to Knowledge with ImageJ & Friends**  
(30 November - 2 December 2020, HHMI Janelia, Ashburn, USA)

**EMBO Practical Course** on Light Sheet Microscopy  
(17-19 August 2016, MPI-CBG, Dresden, Germany)

**EMBO Practical Course** on 3D Developmental Imaging  
(6-8 July 2016, Lisbon, Portugal)

**Molecular Biology of the Cell Course**  
(2-3 February 2016, Institute Pasteur, Paris, France)

**EMBL Master Course** on Bioimage Data Analysis  
(8-9 June 2015, EMBL, Heidelberg, Germany)

**EMBO Practical Course** on Light Sheet Microscopy  
(18-29 August 2014, MPI-CBG, Dresden, Germany)

**EMBO Practical Course** on 3D Developmental Imaging  
(4-12 July 2014, Lisbon, Portugal)

**FIJI Class** for the Master Course of Prof. Dr. Emmanuel Reynaud  
(19–21 February 2014, UCD Dublin, Ireland)

**FIJI Workshop**  
(17 September 2013, 4<sup>th</sup> SPIM Conference, Zeiss Headquarters, USA)

**ImgLib2 Workshop**  
(24 October 2012, ImageJ Conference, Luxembourg)

**FIJI Class** for the Master Course of Prof. Dr. Emmanuel Reynaud  
(22–24 February 2012, UCD Dublin, Ireland)

**FIJI Workshop**  
(12 October 2011, 3<sup>rd</sup> SPIM Conference, Toulouse, France)

**FIJI Workshop**  
(2–3 December 2010, HHMI Janelia Research Campus, Ashburn, USA)



### **ImgLib Workshop**

(28 October 2010, *ImageJ Conference*, Luxembourg)

## **Selected Invited Talks**

### **USC Computational Biology Symposium**

(19-21 May 2022, **USC**, Los Angeles, USA)

### **Berlin Institute for Medical Systems Biology (BIMSB) Guest Speaker**

(13 Jan 2022, **BIMSB/MDC**, Berlin, Germany)

### **Lightsheet Conference & Workshop**

(10 May 2021, **Marine Biological Laboratory**, Woods Hole, USA)

### **“Shaping Life 2” International Conference**

Organized by: **Developmental Biology Institute of Marseille (IBDM)** and the **French Society for Developmental Biology (SFBD)**

(12-15 May 2020, now 4-9 Apr 2021, Cassis, France)

### **NIH Departmental Seminar**

(5 Dec 2019, **National Institute of Health (NIH)**, Washington D.C., USA)

### **Crick EM Symposium**

(15-16 July 2019, **Crick Institute**, London, UK)

### **Frontiers in Imaging Science II Symposium**

(1-4 May 2019, **HHMI Janelia**, Ashburn, VA, USA)

### **Swiss Lightsheet Workshop**

(24-25 Apr 2019, **University of Zurich**, Zurich, Switzerland)

### **From Images to Knowledge with ImageJ & Friends**

(6-8 Dec 2018, **EMBL**, Heidelberg, Germany)

### **EMBO Workshop “Imaging Mouse Development”**

(24-27 Jul 2018, **EMBL**, Heidelberg, Germany)

### **EMBO Workshop “*In situ* Methods in Cell Bio. & Cellular Biophys.”**

(26-28 Jul 2018, **FMP**, Berlin, Germany)

### **International Conference on Computer Vision**

(23 Oct 2017, Venice, Italy)

### **Keynote Lecture, 5<sup>th</sup> Lightsheet Fluorescence Microscopy Meeting**

(16 Jun 2017, **NUS**, Singapore)

### **Network of European Bioimage Analysts Conference**

(23 Oct 2017, Lisbon, Portugal)

### **9<sup>th</sup> Developmental Genetics Symposium**

(2 Dec 2016, **NYU**, New York, USA)

**Imaging Mouse Development Symposium**  
(28 Jun 2016, **HHMI Janelia**, Ashburn, VA, USA)

**Bioimaging Symposium**  
(8 Apr 2016, **LMU**, Munich, Germany)

**Internal Seminar**  
(15 May 2014, **GE Global Research**, Niskayuna, NY, USA)

**Focus on Microscopy Conference**  
(13 April 2014, Sydney, Australia)

**EMBL Group Leader Symposium**  
(11 Dec 2013, **EMBL**, Heidelberg, Germany)

**Transcription Imaging Consortium Meeting**  
(5 Sep 2012, **HHM Janelia**, Ashburn, VA, USA)

**Transcription Imaging Consortium Meeting**  
(5 Feb 2010, **HHMI Janelia**, Ashburn, VA, USA)

## Organizational Memberships

### Open Source Work

(Co-)founder of the **ImgLib2** and **BigStitcher** projects and developer of the **Fiji** & **BigDataViewer** projects.

### Helmholtz Incubator

Helmholtz Association, which is the largest scientific organization in Germany with an annual budget of 4,56 billion EUR in 2017. The goal of the incubator process is to re-define computer science and information-based research within the Helmholtz Association. This work led to the establishment of the **Helmholtz Imaging Platform (HIP)** concept and an externally funded W3 professorship for image analysis at the Max Delbrück Centrum Berlin.

### Network of European Bioimage Analysts (NEUBIAS)

The network organizes courses, conferences and allows scientists to visit the respective member laboratories by funding short-term scientific missions (STSM).

### Genshagener Kreis

Berlin-based non-scientific think-tank, which invites young leaders from economy, culture, science and arts to discuss ideas and develop concepts for a healthy civil society.

## Conference Session Chair

28 June 2016, **HHMI Janelia** Mouse Development Workshop, Ashburn, VA, USA

14 April 2014, **Focus on Microscopy Conference**, Sydney, Australia

2009, 2010, 2011, 2013 & 2016: 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> & 5<sup>th</sup> Light Sheet based Fluorescence  
Microscopy Workshops