3 – 6 June 2025

EMBL Advanced Training Centre and Imaging Centre

INDUSTRY AND COMMUNITY ROOM

ABSTRACTS

WORKSHOP 6

THURSDAY | 5 JUNE | 17:10 – 18:10

Abbelight

Multicolor TIRF Imaging with Abbelight's SAFe System

Presenter(s):

Yashar Rouzbahani - Abbelight, France

Dassine Zouaoui- Abbelight, France

Total Internal Reflection Fluorescence (TIRF) microscopy is a powerful tool for studying dynamic biological processes that occur at or near the plasma membrane. By selectively exciting fluorophores within a thin evanescent field, typically limited to 100–200 nm from the glass-sample interface. TIRF microscopy minimizes background fluorescence and delivers high contrast imaging of membrane associated structures and events.

In this workshop, we demonstrate Abbelight's 4-color TIRF imaging workflow, integrated into the SAFe platform, designed to combine versatility, automation, and precision. Our system enables both simultaneous and sequential 4-color acquisition, giving researchers the flexibility to study complex interactions involving multiple membrane bound proteins or structures within the same field of view.

One of the key advantages of Abbelight's SAFe system is its automated and user friendly TIRF configuration. Users can access a simplified interface with predefined settings, allowing rapid switching between imaging modes and color channels without the need for manual alignment. The system performs experimental calculation of illumination angles, and from these measurements, it can automatically estimate the penetration depth of the evanescent field. This gives users precise control over the excitation volume and ensures reproducible membrane level imaging across experiments. The SAFe system's multichannel capabilities allow for the use of four distinct fluorophores, either simultaneously or sequentially, depending on the experimental needs. This supports the investigation of protein colocalization, receptor clustering, membrane trafficking, and signal transduction, among other dynamic membrane processes.

We will cover:

• Simultaneous 4-color TIRF imaging workflows

• Automatic TIRF calibration, including predefined and automated angle settings

• Experimental estimation of penetration depth for different illumination angles

Schedule

10 min Introduction to TIRF imaging

10 min Introduction to Abbelight Safe MN 360

25 min Simultaneous 4-color TIRF imaging and automatic TIRF calibration

15 min Summary of the workshop & Questions

Abberior Instruments

Abberior STED-MINFLUX Workshop: Biological Imaging Across Scales

Presenter(s):

Bastian Klußmann-Fricke - Abberior Instruments GmbH, Göttingen

Clara-Marie Gürth - Abberior Instruments GmbH, Göttingen

Ulf Matti - Abberior Instruments GmbH, Göttingen

Biological samples span a vast range of sizes, from millimetre-scale organisms and tissues to nanometre-sized single molecules. Investigating these diverse samples necessitates a suite of optical microscopy functionalities. This includes large fields of view and high working distances for macroscopic specimens, optical compensation for thick tissues, and high resolution for subcellular and in vitro studies. Traditionally, these requirements demanded multiple specialized microscopes. The MIRAVA POLYSCOPE overcomes this limitation by integrating confocal, MATRIX, STED, and MINFLUX modalities into a single versatile platform.

Investigating the nuclear pore complex (NPC) at various levels of detail perfectly illustrates the need for a wide range of microscopy modalities. Confocal microscopy can reveal its cellular-level organization, while super-resolution techniques like STED and MINFLUX unveil its detailed macromolecular arrangement. To highlight the MIRAVA POLYSCOPE's comprehensive features, we will focus on the NPC as a prime example.

This workshop offers participants a unique opportunity to learn how to investigate a single biological structure across several orders of magnitude, spanning from diffraction-limited overviews to true molecular insights. Through hands-on demonstrations on the abberior MIRAVA POLYSCOPE, we will showcase how confocal, STED, and MINFLUX imaging can be strategically employed to answer different questions about the NPC at corresponding scales and resolutions.

Abberior Instruments

Abberior MINFLUX Workshop: 3D and 2 Colour MINFLUX Nanoscopy

Presenter(s):

Ulf Matti - Abberior Instruments GmbH, Göttingen

Clara-Marie Gürth - Abberior Instruments GmbH, Göttingen

Bastian Klußmann-Fricke - Abberior Instruments GmbH, Göttingen

Achieving molecular-scale imaging of protein complexes has long been a goal in the life sciences. MINFLUX nanoscopy addresses this challenge by precisely localizing single fluorophores through sequential fluorescence readout at defined positions surrounding the molecule. The use of a donut-shaped excitation beam enables localization with exceptional precision while minimizing photon requirements and thereby surpasses limits of other super-resolution techniques. Previously, such high-performance microscopy remained largely accessible only to specialized optics experts.

Here, we present the MINFLUX microscope built upon a conventional fluorescence microscope stand, providing this powerful technique for a broader range of users. This system seamlessly integrates ultra-high localization precision with standard experimental workflows, empowering non-experts to readily apply MINFLUX. We demonstrate its capabilities by visualizing intricate structures, such as the nuclear pore complex (NPC), at the nanoscale in three dimensions. Furthermore, through the labelling of different components within this complex, we achieve nanoscale resolution in two colours.

This workshop will provide participants with practical insights into the 3D analysis of biological structures using MINFLUX. We will showcase how two-colour MINFLUX experiments enable the detailed investigation of spatial relationships between different proteins at the nanoscopic level.

Bruker / Luxendo GmbH

Acquifer HIVE – Efficient image data workflows: Connecting acquisition with centralized storage and processing

Presenter(s):

Dr. Olaf Selchow, Microscopy & BioImaging Consulting, Germany

Dr. Balint Balazs, Bruker Fluorescence Microscopy, Germany

Modern microscopes generate vast amounts of digital image data, which are typically transferred via internal networks to centralized servers or decentralized workstations for analysis. However, the infrastructure and IT solutions required to manage, transfer, and analyze these large datasets are often complex and costly to maintain, requiring expert support.

To address these challenges, ACQUIFER has developed the HIVE data platform—an easy-to-use, all-in-one solution tailored to meet the IT and networking demands of modern microscopy. This workshop will demonstrate how HIVE streamlines image data workflows from acquisition to analysis.

The HIVE system enables fast, secure, and direct data transfer from multiple microscopes via the HIVE NET to a centralized storage unit (HIVE DATA). Once stored, the data can be accessed remotely by multiple users for analysis using the high-performance HIVE CORE processing unit. The CORE module combines powerful hardware with the familiar and user-friendly Windows server environment, supporting efficient image visualization and analysis.

We invite you to bring your own laptop and image data to the session. With preinstalled software from various vendors, you'll have the opportunity to experience server-based image analysis workflows firsthand.

Carl Zeiss Microscopy Deutschland GmbH

Unlocking the Future of Imaging with ZEISS Lattice SIM 3

Presenter(s):

Dr. Christine Strasser, Carl Zeiss AG, Switzerland

Cellular processes are complex yet delicate. Therefore, we require an imaging solution that is gentle but allows visualization of finer details. The ZEISS Lattice SIM 3 represents a significant advancement in imaging such multicellular samples, designed to address the evolving needs of researchers studying developing organisms, organoids, 3D cell cultures, and intricate tissue sections. This system is optimized for objectives ranging from 10× to 40×, ensuring the capture of finer details critical to biological research.

Key features include the integration of SIM Apotome technology, which facilitates rapid optical sectioning through Leap Mode, delivering high-quality images with a remarkable speed of 85 fr/s. The Lattice SIM 3 offers a large field of view while allowing access to smaller regions of interest, enabling near-isotropic resolution in large volumes and gentle super-resolution imaging.

Additionally, Burst Mode enhances time-lapse imaging, allowing researchers to monitor dynamic changes over time with clarity. The innovative Lattice SIM imaging and SIM² image reconstruction techniques enable resolution of structures down to an impressive 140 nm.

The seamless integration of arivis software further enhances the imaging system, providing advanced image analysis tools for sophisticated particle and cell tracking. This combination empowers researchers to transform their data into actionable insights, yielding faster and more accurate results while streamlining workflows. The ZEISS Lattice SIM 3 maintains compatibility with standard dyes and fluorescent proteins, offering flexibility for simultaneous two-colour imaging with clean channel separation.

In summary, the ZEISS Lattice SIM 3 not only elevates research capabilities but also unlocks new dimensions in imaging, paving the way for future discoveries in the field.

Chip NanoImaging

Ultra-Large-Field-of-View Imaging Using Innovative Photonic Chip Technology

Presenter(s):

Merete Storflor - Chip NanoImaging, Norway

Luis Villegas - Chip NanoImaging, Norway

Jon Kristian Hagene - Chip NanoImaging, Norway

Explore the full complexity of biological processes with the largest uniform field of view available. Chip NanoImaging offers multi-channel TIRF imaging at the millimeter scale, delivering exceptional signal-to-noise performance through high refractive index contrast. Our multimode waveguide technology is seamlessly integrated into the sample carrier, providing tight light confinement, high intensity, and a flat illumination profile - ideal for super-resolution imaging. Our bio-compatible carriers are well-suited for both live and fixed cell imaging as well as for use with tissue sections. Further, our landmarked carriers enable robust correlative microscopy workflows. The system also integrates EPI fluorescence with advanced post-processing tools for 2D/ 3D deconvolution, along with GPU-accelerated reconstruction software for single-molecule localization microscopy (SMLM) data. Its versatility makes it ideally suited for studying membrane dynamics and drug interactions with precision and ease.

Join our workshop and experience how advanced photonic chip-based TIRF increases the power of imaging techniques like SMLM - by allowing for super-resolution imaging across ultra-large fields of view. For those interested, we can also demonstrate on-chip histology. We will also showcase our user-friendly reconstruction software, designed to efficiently reconstruct large datasets, ensuring a seamless and high-performance imaging workflow.

Community room workshop

FAIR 101 - Navigating FAIR data from principles to practice

First author and presenter:

Isabel Kemmer - Euro-BioImaging ERIC - Germany

This workshop will introduce the FAIR principles in the context of bioimaging data. Designed for researchers working across scales and technologies of biological and biomedical imaging, the session will address the unique challenges posed by complex, multidimensional bioimaging datasets. With the aim of providing simple yet impactful steps for a smooth start to the FAIR journey we will explore the features and benefits of FAIR data through interactive exercises and discussions - from metadata annotation and data management planning to repository selection. By the end of the workshop, you will feel more confident in applying the FAIR concepts and be prepared to improve your imaging workflows to make your precious data even more valuable.

Community room workshop

Increase recognition for your methods and your Core Facility with protocols.io

Presenter(s):

Emma Ganley - protocols.io, Springer Nature - United Kingdom

Michele von Reibnitz - Springer Nature - Germany

Join this workshop for a hands-on demo of protocols.io - an online platform, repository, and tool for methods sharing and publishing.

After an introduction to protocols.io, we'll focus on the advantages of using the platform particularly for Core Facility researchers, including how it can contribute to increasing recognition for their scientific contribution. We will showcase microscopy protocols that are already publicly available on protocols.io (e.g. dx.doi.org/10.17504/protocols.io.14egn61pyl5d/v1, dx.doi.org/10.17504/protocols.io.3byl4bmdzvo5/v1, and dx.doi.org/10.17504/protocols.io.261genmkdg47/v1) and demonstrate how you can fork your own copies of those protocols, import, and/or create your own protocols directly. Sharing or publishing functionality will be covered ensuring you can get the most out of protocols.io.

The open access repository containing comprehensive step-by-step protocols, methods, and pipelines is a valuable tool for ensuring that wet-lab methods, device set-up and configuration, standard procedures, or computational pipelines are reproducible and easy to share. All published protocols are available under the CC-BY license and receive a DOI to include in any resulting research articles, ensuring citation of methods and credit for core facilities.

The protocols.io platform helps core facilities to communicate their standard approaches with precision, to educate researchers using shared equipment (ensuring best practices are adhered to), to refine custom protocols, and to ensure credit for the facility in the researchers' publications.

CrestOptics

Multiplexed Confocal Imaging: A High-Throughput Approach to Deciphering Spatial Omics

Presenter(s):

Francesco Bacchi - Business Development Manager EMEA, CrestOptics Spa

Greg Perry - Business Development Manager EMEA, CrestOptics Spa

Understanding the spatial relationships between various molecular markers in complex tissues, such as the whole brain, is fundamental to unraveling the principles of brain function and disease. This workshop will showcase a multiplexed imaging strategy employing CrestOptics' X-Light V3 and DeepSIM for high-content analysis of whole brain slices. X-Light V3 facilitates rapid acquisition of large volumetric datasets, enabling the simultaneous visualization of multiple markers across the entire tissue. DeepSIM is then used to resolve subcellular details within these multiplexed datasets, providing crucial information on protein localization and interactions. This workflow offers a powerful tool for spatial omics studies, linking molecular identity to cellular and tissue context.

CSR Biotech

MI-SIM Advanced: Mastering Intelligent Features for Super-Resolution Live-Cell Imaging

Presenter(s):

Christiaan Stuut - CSR Biotech, Heidelberg, Germany

Jinqing Wang - CSR Biotech, Guangzhou, China

Shutang Zeng - CSR Biotech, Guangzhou, China

Take your live-cell microscopy to the next level with an in-depth exploration of the MI-SIM system and its powerful IMAGER software. Building upon the fundamentals of super-resolution imaging, this workshop focuses on leveraging intelligent software features and smart hardware design to streamline complex experiments and maximize data acquisition efficiency.

The core of this advanced workshop lies in mastering the intelligent capabilities of the IMAGER software. Discover how to seamlessly stitch large fields of view captured with the MI-SIM, learn how to keep your sample in the center of your field of view using Tracker, and explore the event detection built into the IMAGER software. Furthermore, we will delve into the Acquisition Workflow module, showcasing how to design and execute sophisticated, multi-dimensional experiments with precise control over acquisition parameters, time-lapse settings, and triggering events. Learn how to automate complex imaging routines to enhance reproducibility and throughput.

This workshop is ideal for researchers already familiar with the basics of SIM microscopy who are looking to optimize their experimental design and analysis using the advanced features of the MI-SIM and IMAGER software. Get a sneak peek at the integrated potential of the IMAGER software for handling multiple imaging modalities, a key aspect of our next-generation SIM-Supreme system.

EVIDENT Europe GmbH

Best-in-class S/N ratio and acquisition speed for LSM – FV4000 with SilVIR™ Detectors

Presenter(s):

Björn Sieberer - Evident Europ GmbH

Join us at ELMI 2025 for an exclusive EVIDENT workshop showcasing the FLUOVIEW FV4000, our advanced laser scanning microscope solution, designed to meet the evolving needs of imaging core facilities. This session will provide a deep dive into the cutting-edge technologies that define the FV4000.

Experience firsthand the revolutionary SilVIR™ detectors, which set new benchmarks in sensitivity, dynamic range, and signal-to-noise performance, ensuring exceptional imaging quality even in the most challenging applications. Learn how the FV4000's high-speed scanning capabilities, adaptive AI-driven noise reduction, and seamless integration with advanced imaging modalities empower researchers to push the boundaries of confocal microscopy.

Whether you are looking to enhance your facility's imaging workflows or explore the latest developments in laser scanning microscopy, this workshop will provide valuable insights into how the FV4000 continues to redefine the standards of confocal imaging.

Leica Microsystems

Viventis Deep: Open top multi sample dual view light sheet microscope for live imaging of large multicellular systems

Presenter(s):

Andreas Fulterer - Leica Microsystems, Germany

Andrea Boni - Leica Microsystems, Germany

Visualizing the dynamics of individual cells to understand the underlying mechanisms shaping complex tissues is an overarching goal in cell and developmental biology.

However, visualizing single cells in the innermost layers of large 3D multicellular systems like developing model organisms or 3D cell culture systems including spheroids or organoids is challenging, mainly due to light scattering causing poor penetration. In addition, understanding complex processes in these samples often requires crossing large spatiotemporal biological scales. Due to its high spatiotemporal resolution and low phototoxicity light sheet microscopy should be the method of choice for imaging of large living samples [1].

In this workshop we present Viventis Deep, an open-top dual-view and dual-illumination light-sheet microscope purposefully designed for live imaging of large specimens at single-cell resolution. The configuration of objectives together with a customizable multi-well mounting system combines for the first time dual view light sheet imaging with multi-position imaging.

We will show the easiness of Viventis Deep imaging workflow from system alignment, sample mounting, time-lapse acquisition and downstream visualization/analysis with AIVIA software.

References

[1] J. Huisken, J. Swoger, F. Del Bene, J. Wittbrodt, and E. H. K. Stelzer, “Optical Sectioning Deep Inside Live Embryos by Selective Plane Illumination Microscopy,” Science, vol. 305, no. 5686, Art. no. 5686, Aug. 2004, doi:10.1126/science.1100035.

[2] Moos, F., Suppinger, S., de Medeiros, G. et al. Open-top multisample dual-view light-sheet microscope for live imaging of large multicellular systems. Nat Methods 21, 798–803 (2024). https://doi.org/10.1038/s41592-024-02213-w

Lyncée Tec

Fast, Label-Free, Live-Cell Analysis with Digital Holographic Microscopy

Presenter(s):

Benjamin Rappaz

Head of Life Sciences

Lyncée Tec, Lausannne, Switzerland

Digital Holographic Microscopes (DHM®) by Lyncée Tec offers a fast, label-free, noninvasive imaging approach based on quantitative phase measurements. This technique enables real-time monitoring of living cells, providing metrics such as cell morphology, dry mass, and intracellular dynamics without the need for exogenous labels or dyes. Thus, allowing to quantify cell health status and ongoing bioprocesses without perturbing your cells.

In this workshop, we will present the principles and key applications of DHM® in life sciences:

Quantitative analysis of morphology, proliferation, and cytotoxic responses

Applications for high-content screening and long-term live-cell monitoring

4D tracking of live cells

The system offers multi-objective support (2.5x to 100x), a large field of view (up to 1.3 mm at 5x), and fast acquisition speeds (up to 194 fps), allowing robust and scalable live-cell imaging. DHM® can also be correlated with fluorescence for simultaneous recording and correlative studies.

Case studies and live demonstrations will illustrate how DHM® enables reproducible, high-throughput analysis of cellular processes, with minimal perturbation to the biological system. The session is intended for researchers seeking robust, quantitative, and label-free imaging methods for live-cell studies.

More info:

www.lynceetec.com

benjamin.rappaz@lynceetec.com

Miltenyi Biotec B.V. & Co. KG

Integrated 3D Imaging Workflows: From Sample Prep to Stunning Results with the UltraMicroscope Platform

Presenter(s):

Luigi Prisco, Miltenyi Biotec B.V. & Co. KG

Zahra Labbaf, Miltenyi Biotec B.V. & Co. KG

Rafael Kurtz, Miltenyi Biotec B.V. & Co. KG

L Prisco1, Z Labbaf1, R Kurtz1, C Ahlert1

1 Miltenyi Biotec B.V. & Co. KG.

Visualizing the three-dimensional architecture of complex and large biological specimens has traditionally been a time-intensive task, often taking hours to days. Miltenyi Biotec simplifies this process with a complete, end-to-end workflow encompassing sample preparation, imaging, and data processing – all centered around the UltraMicroscope Platform.

Featuring both the UltraMicroscope Blaze™ and the UltraMicroscope Choros™, our platform delivers fast, high-resolution light sheet imaging for a wide range of sample sizes. In this workshop, we invite you to join us for a live demonstration that walks through the entire 3D imaging process, showcasing our latest innovations: LightSpeed Mode, which accelerates imaging performance; MACS UltraMounts, enabling high-throughput 3D imaging; and the MACS iQ View – 3D Large Volume software, which simplifies image processing.

Discover how our cutting-edge technology delivers scalable, efficient 3D imaging to accelerate your research.

A whole mouse brain cleared with the MACS Deep Clearing Kit and stained with antibodies for tyrosine hydroxylase (Vio G570, magenta), NeuN (Vio R667, purple), and neurofilament (Vio 780 Yellow) and imaged on the UltraMicroscope Blaze™ light sheet system.

Nikon Europe BV

From samples to easy results with Artifical Intelligence

Presenter(s):

Isabelle Delias - Nikon Europe BV

Pierre-Emmanuel Monet - Nikon Europe BV

Image analysis have been simplified in recent years by the development of Artificial Intelligence/Machine Learning/Deep Learning tools.

The complete workflow from the sample to results is now simplified but different precautions and understanding are necessary to get the best out of these innovative tools. During this workshop, we will discuss how to acquire all the necessary images to use those tools, how to create the ground truth used for training and how to ensure that the results are correct with different validation tools.

During the workshop you will have the opportunity to practice and be able to use some of the different AI tools integrated within Nikon NIS-Elements software and create your own deep learning network within a few minutes:

- Segment objects in fluorescence (Segment.ai) or use the brightfield images as label-free imaging for segmentation

- Pre-process the images in order to improve segmentation results (Clarify.ai, Denoise.ai, Enhance.ai, Convert.ai):

Cells: HeLa/Fucci(SA) RCB4917, RIKEN BioResource Research Center

The binary objects show cells in different stages of the cell cycle:

Yellow : G1-S phase

Red: G1 phase

Green: late S, G2 and M phase

NIS.ai webpage: https://www.microscope.healthcare.nikon.com/en_EU/products/software/nis-elements/nis-ai-1

Ji application notes using AI: https://www.microscope.healthcare.nikon.com/en_EU/products/digital-microscopes/eclipse-ji/application-notes

ONI

Lipid Nanoparticles! – Harness the power of ONI super-resolution expertise to characterise your LNP's with ease

Presenter(s):

Dr. rer. nat. Nensi Alivodej - Field Application Scientist, EU - nalivodej@oni.bio

Pip Timmins - Sales Executive - phillipa@oni.bio

Lipid Nanoparticles! – Harness the power of ONI super-resolution expertise to characterise your LNP's with ease

The Nanoimager is a compact and state-of-the-art microscope, offering quantitative analysis for localization-based imaging (dSTORM and PALM), single-particle tracking and single-molecule FRET.

The Nanoimager is designed to operate on a standard lab bench and has a footprint smaller than a piece of A4 paper, making it more accessible to researchers.

Lipid nanoparticles (LNPs) are advanced delivery systems formed from tiny, spherical lipid structures. They can encapsulate various therapeutic agents, including drugs and genetic materials like mRNA, protect them from degradation and facilitate their entry into target cells. By merging with cell membranes, these nanoparticles ensure effective delivery and release of their cargo, making them crucial for innovations in mRNA vaccines, gene therapies, and personalized medicine.

This workshop is intended for people working with lipid nanoparticles or with interest in related fields. During this work we will demonstrate that the ONI Nanoimager can acquire, image and analyse the complete work flow in a fully automated way!

Workshop attendees will receive a 10% discount voucher to be redeemed against the purchase of a LNP Kit.

Oxford Instruments

When Seeing Fails and Objective (Lens) Truths Prevail: Linking Microscope Quality Control Metrics to More Precise Biological Readouts

Presenter(s):

Geraint Wilde - Oxford Instruments

How much do optical component variations in the microscope affect common biological imaging assays? What are the impacts of these detectable variations on the repeatability and/or reproducibility of microscopy experimental results, and under what conditions do they really matter when observing a biological phenomenon?

The efforts of the QUAREP-LiMi consortium have established a rigorous and standardized approach to microscope quality control and have clearly highlighted large differences in optical performance between not only different types of microscopy technology, but also between identical microscope models using the same optics.

Building on this drive towards light microscopy standardization, we designed a set of experiments where different objective lenses are used to image the exact same field of view on the same microscope platform and thereby demonstrate the direct correlation between a measured quality control metric using a calibration sample and an image measurement on a real biological sample that depends on the metric's magnitude. We show how subtle yet quantifiable differences in a biological sample's sub-cellular component volumes, cross-channel colocalization, and cross-field of view intensities - which are difficult to ascertain by eye from the images - are directly relatable to measurable differences in point spread function (PSF), chromatic aberration, and field illumination uniformity obtained with each objective lens.

Our study illustrates how ascertaining a clear understanding of the microscope quality and performance metrics facilitates a better comparison and reproducibility of inter-microscope experiments with increased confidence. Seeing is not always believing.

PhaseView

Ultra-thin Light Sheet Microscopy Providing Multi-user Experience Combined with Automated Multi-scale Imaging Capabilities

Presenter(s):

Igor Lyuboshenko - PHASEVIEW

Alpha3 Facility Edition is an automated light sheet microscope designed for imaging facilities and research laboratories. It integrates key technologies to deliver ultra-thin light sheet thickness and a multi-user experience, from rapid sample screening to high-resolution image acquisition of fixed or live samples and whole cleared specimens. The system offers a seamless multi-scale imaging experience for diverse applications, enabling multiple users to observe the same sample at various scales without compromising imaging resolution.

As a fully automated system, the Alpha3 Facility Edition configures itself when changing magnification, allowing users to focus on capturing images. It recovers all settings and calibration parameters, providing a personalized multi-user and multi-application experience. Intelligent illuminators coupled to a wide-field detection microscope ensure maximum homogeneous light coverage for both small and large samples. Illumination from both sides simultaneously covers the maximum area of the sample. Observation is possible through oculars and with a camera.

The system features an extended working distance and objectives with high numerical aperture, providing a very thin optical section with optimized sharpness. It allows varying the orientation of the sample sectioning plane within the specimen, maintaining homogeneous image sharpness over the entire field of view. It automatically configures lenses for illumination and detection, optimizing image quality and ensuring excellent colocalization of images acquired with multi-wavelength light beams, thanks to the dynamic focusing module.Alpha3 Facility Edition offers advanced capabilities in light sheet microscopy, providing a versatile and automated solution for multi-user environments and diverse imaging applications. You are welcome to join us to explore these innovative features and discuss potential collaboration opportunities to further advance your research.

PicoQuant GmbH

Monitoring of dynamic processes: An easy and reliable way to perform single molecule FRET and FCS measurements

Presenter(s):

Isabel Gross - PicoQuant GmbH

Mathias Bayer - PicoQuant GmbH

Single molecule studies and – more specifically – single molecule FRET methodologies have become a standard tool for studying dynamic structural changes in proteins and nucleic acids. These types of measurements can reveal dynamic events on time scales covering several orders of magnitude from ~ns to several seconds. This allows studying e.g., chain dynamics, binding, folding, allosteric events, oligomerization, and aggregation. The power of these methodologies is highlighted by the study of Intrinsically Disordered Proteins (IDPs) whose biological relevance has been increasingly studied over the recent years.

In this workshop we will showcase how easy it is for new users to perform single molecule measurements on two model systems:

a) doubly labeled freely diffusing short oligonucleotides and

b) Cy5 molecules immobilized on the coverslip surface

Several online previews enable users to immediately judge sample and data quality. All correction parameters necessary to obtain FRET efficiency vs. stoichiometry histograms are automatically determined online, requiring no interaction from the user. The algorithm employs methodologies benchmarked by the scientific community.

Furthermore, we will show how the variable PSF feature can be used in smFRET and FCS measurements to fine-tune the observation window of freely diffusing biomolecules.

Thorlabs

Alignment-Free Two-Photon Microscopy with the Prelude® System

Presenter(s):

Anja Huss - Thorlabs GmbH

Sergey Matveev - Thorlabs GmbH

Alexander Jelzow - TOPTICA Photonics AG

Multiphoton microscopy is a powerful method for probing neuronal activity and other complex biological events, yet it has long depended on intricate, specialist instruments that hinder accessibility. This workshop presents an alignment-free system that streamlines multiphoton imaging, expanding its reach to a wider community.

The Prelude® Functional Imaging Microscope by Thorlabs is a compact, fully integrated two-photon system designed to meet the demands of modern neuroscience and functional imaging. Developed in collaboration with researchers from Baylor College of Medicine and Columbia University, the Prelude addresses real-world experimental challenges by offering a maneuverable platform optimized for in vivo imaging of green fluorescent protein (GFP) and GCaMP6-labeled samples.

At its core, the Prelude features a 920 nm femtosecond pulsed laser coupled via fiber optics, eliminating complex alignment procedures and enhancing portability. Here, we use TOPTICA FemtoFiber Ultra 920 FD laser with high-power fiber delivery of femtosecond pulses. The system incorporates a silicon photomultiplier (SiPM) detector with greater than 38% photon detection efficiency at 500 nm, ensuring high-quality signal acquisition even in challenging specimens. Low profile and flexible XYZ translation and manual ±90° rotation provide versatile sample access, accommodating various experimental setups.

For fine Z-focus control, users can choose between a vibrationless liquid crystal remote focus system and a high-speed piezo objective scanner, facilitating rapid volumetric imaging without disturbing live specimens. The Prelude supports a range of long working distance objectives, including the TL10X-2P and TL15X-2P dry objectives, as well as the N16XLWD-PF water-dipping objective, catering to diverse imaging requirements.

This innovative microscope exemplifies Thorlabs' commitment to customer-inspired design, offering a flexible and user-friendly solution for advanced functional imaging applications.

Tomocube Inc.

Holotomography : the next imaging breakthrough is unlabeled

Presenter(s):

Bruno Combettes - Tomocube Europe, Germany

Daniel Ghete - Tomocube Europe, Germany

"No stains. No labels. Just truth. See what you've been missing."

Label-free holotomography is redefining the way we explore live cells in 3D. By harnessing refractive index as intrinsic contrast, this cutting-edge technique enables high-resolution, quantitative imaging without the need for fluorescent dyes or stains. This workshop will introduce the fundamentals of holotomography, showcase applications in live-cell and tumoroid imaging, and provide insights into how it can complement your existing microscopy toolbox.

Whether you're managing an imaging facility or looking for new approaches in your research, this is your chance to discover the full potential of label-free imaging.

The showcased setup integrates holotomography with the CrestOptics spinning disk confocal module, giving you the best of both worlds — intrinsic contrast and molecular specificity, all in real time. Holotomography reveals structure and dynamics without labels. Spinning disk confocal adds molecular context with high-speed fluorescence imaging. Together, they offer a unique correlative approach — where cellular truth meets targeted insight.

그들은 함께 Cellular Truth가 목표 통찰력을 충족시키는 독특한 상관 접근법을 제공합니다.

Visitron Systems GmbH

Smart Imaging – Feedback Microscopy with VisiView Software

Presenter(s):

Dr. Marcel Dunkel - Sales and Application Support - Visitron Systems GmbH Puchheim

Dr. Andreas Babaryka - Sales and Application Support - Visitron Systems GmbH Puchheim

Since the early days of fluorescence imaging, many microscopists have spent much of their time looking through eyepieces, searching for and observing cells. Over the last few decades, microscopes have become digital and observation routines have become automated. However, this automated imaging has been far from flexible or adaptive. In this workshop, we will show how VisiView uses AI analysis and feedback to make imaging truly intelligent, reducing the time spent using the microscope, the workload of the researcher and minimising the amount of data that needs to be stored.