3 – 6 June 2025

EMBL Advanced Training Centre and Imaging Centre

INDUSTRY AND COMMUNITY ROOM

ABSTRACTS

WORKSHOP 1

WEDNESDAY | 4 JUNE | 14:30 – 15:30

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.

Applied Scientific Instrumentation

Affodable Modular Microscopes From ASI

Presenter(s):

Stephen Saltekoff - Applied Scientific Instrumentation Eugene, Oregon, USA

Applied Scientific Instrumentation (ASI) Has been working with scientists all over the world for over 30 years. We started with a few motion control products and have since developed other great solutions for open microscopy. We believe researchers should be able to have control over their equipment, get exactly what they need and not overpay. A representative from ASI will present an outline of available solutions and take you through basic and complicated modular microscopes that ASI has made over the years.

Bruker / Luxendo GmbH

LCS SPIM – Light Sheet Microscopy for Large Cleared Samples in high resolution

Presenter(s):

Dr. Jürgen Mayer, Bruker Fluorescence Microscopy, Germany

The LCS SPIM is an inverted light sheet setup that was designed to image large, cleared samples in an easy way. The cuvette based sample mounting allows researchers to mount their samples under a fume hood in a safe way. The cuvettes can be sealed with a lid before installation on the microscope, such that there is no exposure to toxic fumes. The depth-dependent focussing assures best possible image quality throughout the entire depth of the sample.

Traditionally, the LCS is equipped with a 4x detection objective, emphasizing the acquisition of centimeter sized samples. Here, we present a new implementation that allows to image with higher magnification and higher resolution while keeping the easy and safe sample mounting of the inverted design of the LCS SPIM.

Carl Zeiss Microscopy Deutschland GmbH

Lightfield 4D - Keeping pace with the pulse of life

Presenter(s):

Dr. Sven Poppelreuther, Carl Zeiss Microscopy Deutschland GmbH, Germany

LSM 990 and 910 – One imaging platform. Endless possibilities

Life moves. Many neuronal and physiological processes occur at very high speeds, making it difficult to accurately capture their spatiotemporal dynamics. Although established technologies have become faster, the required acquisition time still increases with sample volume. So, fast processes like neuronal activity or heartbeats require a trade-off between volumetric information and image frame rate. With Lightfield 4D, you no longer must compromise, as you can capture up to 80 volumes per second without time delay in 3D. This makes it possible to follow neuronal activity in zebrafish brains, track tissue movement in developing Drosophila embryos and keep track of moving structures in crawling C. elegans larvae.

The unique one-snap-one-volume acquisition of Lightfield 4D minimizes light exposure and allows to efficiently acquire thousands of volumes over extended periods of time without harming your sample. Reach new heights of productivity with the ability to capture multi-color images at multiple positions within or between whole organisms, organoids or spheroids, in a single acquisition run.

As an integrated part of ZEISS LSM 990 or 910 systems, Lightfield 4D lets you effectively combine its fast volumetric imaging with any other LSM acquisition method: involving photomanipulation, super-resolution, spectral, and even molecular dynamic data can be added to each live imaging session.

In our workshop, we will give you the opportunity to experience to capture all 3D information with up to 80 volumes per second. We will show how you can draw scientific conclusions from this new unique volume data by utilizing the 3D algorithms of ZEISS arivis pro.

LSMs are one of the most complex high-end microscopy systems – providing a great variety of options. Microscopy Copilot, your personal AI assistant, helps you to interactively discover new possibilities for your imaging experiments, constantly evolve your research and exploit the potential of your specific LSM system configuration. We will show you this new path to immediate support by ZEISS in times of increasing numbers of microscopy technologies and reduced time to publication.

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

Estimation of the Photon Conversion Factor, Noise and Dynamic Range of Light Microscope Detection Systems (QUAREP-LiMi)

Presenter(s):

Valeria Berno - San Raffaele Hospital - Italy

Andre Zeug - Hannover Medical School - Germany

QUAREP-LiMi Working Group 2 (WG2) developed a set of protocols [1] which focuses on the characterization and monitoring of the performance of light microscope detection systems, which collects light from the sample at the microscope and helps to convert the “arbitrary digital units” (ADU) provided by the microscope into “number of photons”detected.

The protocols collection is built around the photon transfer curve (PTC) method [2]. The goals of these protocols are to achieve 1) experiment quality control, 2) instrument quality control and 3) detection system characterization.The protocols include both point and area detectors, allowing researchers to select appropriate methods based on their specific detection systems.

During the workshop, we will demonstrate how to use the protocols to acquire images and upload them in the software [3] to characterize the photon conversation factor (PCF photons/ADU), readnoise, background and dynamic range of a light microscopy detection system. The set includes protocols on sample preparation, data acquisition, and analysis. Furthermore, we will demonstrate its integration in the QUAREP-LiMi Tool Kit [4].

[1]Characterization of the Photon Conversion Factor, Noise, and Dynamic Range of Light Microscope Detection Systems - https://dx.doi.org/10.17504/protocols.io.14egn61pyl5d/v1

[2] Janesick JR. 2007. Photon Transfer. SPIE. https://dx.doi.org/10.1117/3.725073

[3] McFadden D. 2022. GUI Calibration Tool. https://github.com/bionanoimaging/NanoImagingPack/releases

[4] QUAREP-LiMi Tool Kit, https://github.com/QUAREP-LiMi/QUAREP-LiMi-Tool-Kit

Community room workshop

Workshop: Imaging workflows in OMERO

Presenter(s):

Petr Walczysko - University of Dundee, OME Team - United Kingdom

The Open Microscopy Environment (OME) is an open-source software project that develops tools that enable access, analysis, visualization, sharing and publication of biological image data. OME supports more than 160 image data formats across many imaging modalities including fluorescence microscopy, high-content screening, whole-slide imaging and biomedical imaging.

OMERO, a software developed by OME, is an open source, enterprise software platform for image data management and analysis. OMERO is used in 1000s of institutions worldwide managing, sharing, analysing and publishing imaging datasets.

This workshop will cover all of the main functions of OMERO. We will explain the import to OMERO and then demonstrate organisation, viewing, searching, annotation and publishing of images using OMERO. After we cover the basics of OMERO, we will shortly explain the principles of how 3rd party image analysis packages work with OMERO. This will enable the participants to understand the manual data processing and automated processing workflows using a range of open source applications running alongside OMERO, such as ImageJ/Fiji or CellPose.

This workshop is designed for researchers at all levels who work with data from digital microscopes or other imaging systems. The workshop includes a presentation and hands-on session. Prior knowledge in microscopy, scripting and data analysis is not required.

Bringing your own laptop is strongly encouraged, but it is also possible to follow the workshop as a demonstration only.

Any student / researcher dealing with scientific images is more than welcome to join this workshop.

CrestOptics

Unlocking 3D Complexity: Integrated Confocal and Super-Resolution Microscopy for Organoid and Model Organism Analysis

Presenter(s):

Greg Perry - Business Development Manager EMEA, CrestOptics Spa

Francesco Bacchi - Business Development Manager EMEA, CrestOptics Spa

The study of complex biological systems, such as organoids and model organisms, demands imaging techniques that can capture both large-scale architecture and subcellular details in three dimensions. This workshop presents a powerful approach combining CrestOptics' X-Light V3 spinning disk confocal microscopy for rapid volumetric imaging with DeepSIM super-resolution microscopy for nanoscale resolution. The X-Light V3 enables efficient acquisition of large 3D datasets, while DeepSIM provides the necessary super-resolution to resolve intricate structures within these models. We will demonstrate the capabilities of this integrated workflow for high-content analysis of organoids and whole-organism imaging, highlighting its potential to accelerate discoveries in developmental biology, disease modeling, and drug discovery.

CSR Biotech

Unlock the Dynamics of Life: Experience High-Speed, Super-Resolution Live-Cell Imaging with the MI-SIM

Presenter(s):

Christiaan Stuut - CSR Biotech, Heidelberg, Germany

Jinqing Wang - CSR Biotech, Guangzhou, China

Shutang Zeng - CSR Biotech, Guangzhou, China

Ready to capture the dynamic processes of life at unprecedented speeds and resolution? The MI-SIM system is your gateway to dynamic live-cell microscopy, achieving imaging speeds of over 500 frames per second while resolving details down to 60 nm with Sparse deconvolution. Imagine visualizing the fastest cellular processes with stunning clarity and minimal artifacts. Whether you're exploring single-molecule dynamics at the cell surface using TIRF-SIM or delving deep into tissue samples with 3D-SIM, the MI-SIM provides the versatility and performance you need to push the boundaries of your research.

In this workshop, you'll discover the fundamental principles behind Structured Illumination Microscopy (SIM), the powerful super-resolution technique that empowers the MI-SIM. We'll explain how structured illumination patterns and advanced algorithms work together to overcome the diffraction limit of light, revealing cellular structures with remarkable detail in both 2D and 3D.

Gain hands-on insights into the MI-SIM experiment workflow. We'll guide you through efficient image acquisition, the crucial reconstruction process that generates super-resolution images, and the power of our advanced Sparse deconvolution algorithms to further enhance resolution and clarity.

Join us to experience the transformative capabilities of the MI-SIM for your live-cell imaging studies. From capturing rapid molecular interactions to resolving intricate organelle dynamics within complex tissues, see how the MI-SIM can revolutionize your understanding of cellular life.

Dotphoton

Raw image data: what it really is and how to handle it at scale

Presenter(s):

Dr Bruno Sanguinetti - Dotphoton, Switzerland

Andrea Ratzenberger - Dotphoton, Switzerland

Mark Lechler - Dotphoton, Switzerland

Retaining raw, high-quality microscopy data is critical for reproducible research, quantitative analysis, and AI-based workflows. But as imaging pipelines generate increasingly large, high-resolution, multidimensional datasets, research labs and facilities face growing challenges in transferring, processing, sharing, and storing raw data at scale. Is compression a solution?

This talk examines what raw image data really is - how it serves as a physical measurement and what's required to preserve its scientific value. We will explore the limitations of existing image quality metrics (e.g., PSNR) and why updated evaluation methods are needed to meet the demands of modern bioimage analysis.

In closing, we will present a data management approach featuring a new compression method that retains the full integrity of raw microscopy data while significantly reducing file size, making large-scale data easier and faster to work with.

EVIDENT Europe GmbH

Pushing the limit of spinning disk confocal with the IXplore IX85

Presenter(s):

Wojciech Brutkowski, Evident Europe

Advancements in spinning disk confocal microscopy are unlocking new frontiers in live cell imaging and high-speed volumetric acquisition. Explore at ELMI 2025, how IXplore™ IX85 with an industry-leading 26.5 FOV across two integrated imaging ports, redefines the potential of confocal research by integrating cutting-edge innovations designed to enhance usability, stability and resolution.

Experience seamless and efficient workflows supported by AI-based macro-to-micro imaging, auto-correction collar and intelligent shading correction. Learn, how our revolutionary LUPLAPO25XS silicone gel objective enhances organoid imaging and multi-well plate screening, providing deeper insights, more stable time-lapse imaging and precise data with ease.

Paired with spinning disk technology, the IXplore IX85 offers a powerful solution for advanced imaging. Researchers can now achieve higher resolution, improved signal-to-noise ratios, and enhanced reproducibility with minimal manual intervention. With a system built for adaptability and precision, the IX85 ensures that confocal imaging workflows are faster, more reliable, and capable of delivering unprecedented insights into complex biological systems.

Leica Microsystems

Advancing 3D Spatial Omics with High Multiplex Imaging

Presenter(s):

Luis Alvarez - Leica Microsystems, Germany

Irmtraud Steinmetz - Leica Microsystems, Germany

Julia Roberti - Leica Microsystems, Germany

The complexity of biological processes demands innovative methods for comprehensive study. Recent developments in fluorophore technology have enabled imaging techniques to detect an increasing number of signals within a single sample. This progress has paved the way for advanced multiplexing and imaging "omics" approaches, revealing crucial insights into tissue organization, cancer progression, tumor-immune interactions, therapy prognosis, and infectious diseases.

The STELLARIS confocal platform is ideally equipped for 3D high multiplexing applications, featuring a tunable white light laser excitation (WLL, range 440 nm - 790 nm) and up to five highly sensitive spectral Power HyD detectors, providing detection flexibility from 410 nm to the NIR range. This combination supports a wide array of fluorophores, optimizing various configurations.

In this workshop, we will explore the experimental design and considerations for conducting high multiplexing imaging experiments with 15+ fluorophores on a single sample, with the new functionality SpectraPlex for the STELLARIS platform. Topics will include selecting appropriate fluorophore panels, preparing samples, and addressing imaging challenges. We will also demonstrate how high multiplexing targets can be utilized for 3D omics together with image analysis to derive meaningful insights from complex spatial biology experiments.

References

3D multiplexing imaging in cancer immunology. Leo Kunz, Dario Speziale, M. Julia Roberti, Susanne Holzmeister, Frank Hecht, Luis A. J. Alvarez, Irmtraud Steinmetz. Nat. Methods (2024). https://www.nature.com/articles/d42473-024-00260-7

SpectraPlex: A powerful toolbox for advanced 3D high-multiplex imaging. Roberti, M. J., Hecht F., Gai E., Straka T., Holzmeister S., Steinmetz I., Wong H., Alvarez L. Nat. Methods (2024). https://www.nature.com/articles/d42473-024-00262-5

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

Nikon Europe BV

Introducing the New Scanning Solution from Nikon – Slide Scanning Made Easy Without Compromising on Image Quality

Presenter(s):

Orsolya Szilagyi

Philipp Strunz

The NIS-Elements Slide Scanning Module is a powerful software tool that was developed specifically for our reliable Ni-E upright microscope. This state-of-the-art system features:

Scanning of up to 8 slides at a time

Full automation with premium-grade optics

High resolution, fast imaging capabilities

Intuitive, user-friendly interface

You don’t need to spend hours getting familiar with a complicated system to start using our scanning solution. Whether you're a seasoned microscopist or new to the field, our step-by-step workflow and pre-optimized settings ensure a seamless operation, making this an ideal tool for any imaging facility. Blurry images can be a thing of the past thanks to our high-quality optics. Furthermore, our AI-powered tools ensure that your samples are always perfectly in focus and all regions of interest are automatically detected. No need to spend countless hours in front of a scanner as our high-speed stage and precise tiling technology enable whole tissue section scanning in under a minute. You can easily navigate and visualize your high-quality scans in the convenient gallery view and use them for further analysis within NIS-Elements if required.

Experience the future of slide scanning firsthand by registering for our upcoming workshop. Discover how this innovative solution can transform your research capabilities and enhance your laboratory efficiency.

Reserve your spot today and take the first step toward elevating your microscopy experience with Nikon.

NIS-Elements Slide Scanning Module webpage:
https://www.microscope.healthcare.nikon.com/en_EU/products/slide-scanning/nis-elements-slide-scanning-module

ONI

Are you ready to begin your dSTORM journey? An introduction to the Nanoimager and the ONI Training Kit: dSTORM

Presenter(s):

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

Pip Timmins - Sales Executive - phillipa@oni.bio

Are you ready to begin your dSTORM journey? An introduction to the Nanoimager and the ONI Training Kit: dSTORM

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.

The ONI Training Kit™ for dSTORM is designed to provide a simple workflow for new and existing users to learn the fundamentals of single-molecule localization microscopy. Purchase of the training kit gives a free pass to one of our certified 'Live from the Lab' On-line training courses.

This workshop is intended for people who are new to dSTORM imaging or who want to brush up on their knowledge.

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

Oxford Instruments

Unlock the Potential of Microscopy Images with AI-Enhanced Analysis in Imaris 10.2

Presenter(s):

Julia Schweizer - Oxford Instruments

In this presentation, we will explore how the AI segmentation and classification tools in Imaris 10.2 can revolutionize your microscopy image analysis. This version features a Trainable Pixel Classifier, integral to its robust big-data segmentation model, capable of efficiently handling large datasets (hundreds of GBs) and enabling training on thick slices to visualize complex biological structures.

Imaris 10.2 facilitates advanced 3D visualization and analysis of various cell types, including neurons microglia, as well as subcellular components like the cytoskeleton, nuclei, and Golgi apparatus, along with organoids and blood vessels. The software automatically generates morphology measurements to enable comparisons across experimental conditions, investigates interactions between cells and organelles, and calculates distances and colocalization metrics.

For live-cell and time-lapse imaging, Imaris 10.2 excels in tracking dynamic objects, including dividing cells, allowing for comprehensive studies of morphological changes and interactions over time. Furthermore, with enhanced visualization speeds—twice as fast as previous versions—Imaris 10.2 significantly improves user interactivity. This version is available natively for both PC and Apple M platforms, making it a versatile tool for researchers.

Learn how ease of use can be combined with complex image analysis and sophisticated multi-step image analysis workflows. Imaris will become a game changer in your lab or imaging facility, providing all the image analysis tools needed from the moment of data acquisition to publishing a paper, including deconvolution, visualization, object detection, analysis and plotting - for data exploration and group comparisons.

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

Pushing Boundaries in FLIM to Enhance Efficiency, Quality and Reproducibility

Presenter(s):

Isabel Gross - Picoquant GmbH, Germany

Matthias Patting - Picoquant GmbH, Germany

Quantitative time-resolved fluorescence techniques like Fluorescence Lifetime Imaging (FLIM) have become more attractive recently to study mechanisms driven by phase separation or to sense the cellular environment, for example.

PicoQuant`s innovative confocal microscope Luminosa combines state-of-the-art hardware with cutting edge software to deliver high quality data while simplifying daily operation. The software includes several features which improve the ease of use and reproducibility of experiments, including context-based workflows, sample-free auto-alignment and excitation laser power calibration. Still, if required for new method development every optomechanical component can be fully accessible.

We will show how FLIM is streamlined with Luminosa.. In combination with GPU-accelerated algorithms, this enables high-speed automated analysis of FLIM images. The InstaFLIM analysis workflow suggests the best fitting model based on statistical arguments, requiring minimal user interaction. The additional NovaFLIM software package enables more extensive and advanced image analysis.

Many recent initiatives have focused their efforts on improving the aspects of Quality Assessment (QA), Quality Control (QC), and reproducibility in time-resolved fluorescence microscopy. In another push, an increasing number of funding and research institutions commit to FAIR principles as well as promoting open-science initiatives.

The design of Luminosa`s software makes all data easily accessible. It works with the open, well documented PTU data format, enabling custom analysis. Moreover, it includes various data export options.

Thermo Fisher Scientific

Leveraging Amira Software's AI capabilities for advanced image analysis and optical image segmentation

Presenter(s):

Sarawuth Wantha - Amira Software - Thermo Fisher Scientific

It is crucial for scientists and imaging experts to comprehend complex biological structures through image visualization and analysis. Imaging data serves as a valuable tool for understanding cellular architecture and processes. However, analyzing data from multiple imaging systems and modalities can be a challenging endeavor. Each experimental setup presents unique challenges, and multi-scale dynamic processes necessitate the detection of objects of various sizes, ranging from diffraction-limited particles to entire cells. Identifying and quantifying sub-cellular structures within datasets, which may contain anywhere from a few dozen to tens of thousands of objects, can be overwhelming.

Given the growing need for advanced analytical tools, researchers require image processing software that enables fast, high-quality visualization, effective processing, and accurate data analysis to expedite their workflows.

Thermo Scientific Amira Software is a powerful, comprehensive, and versatile solution designed for visualizing, segmenting, and understanding life science and biomedical images. It allows researchers to explore complex biological data in 3D, which would be impossible to fully comprehend with 2D images alone.

Amira Software empowers researchers to gain a deeper understanding of their image data. With its user-friendly interface and comprehensive tools, users can streamline their workflows and dedicate more time to advancing the field of optical imaging. The intuitive, flexible, and customizable "visual programming" workflow ensures accurate and reliable results.

Enhancing its segmentation capabilities, Amira Software now incorporates artificial intelligence for imaging and analysis applications. AI methods, such as deep learning, have proven to be powerful tools for improving resolution, reducing noise, and automating segmentation. The integration of AI-based deep learning represents a significant advancement for Amira Software solutions. This approach ensures that your analysis is repeatable across specimens, making future image segmentation independent of manual processing or user-based variability often encountered in manual annotation tasks.

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

VisiScope Confocal based on Yokogawa CSU-W1 with Lumencor ZIVA 7 turn-key Multimode Laser illumination

Presenter(s):

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

Dr.Bernd Zobiak - Sales and Application Support - Visitron Systems GmbH Puchheim Germany

Typically spinning disk confocal are available for 3-dimensional imaging of live cells, tissues and microorganisms. However, the range of fluorescence excitation wavelengths provided by light sources installed on CSU systems is commonly covered by four or six lasers. Further, the cost of these single mode laser light sources often exceeds that of the CSU scanner itself. Lumencor's ZIVA Light Engine for Yokogawa increases the number of lasers from four to seven at a price significantly lower than that of 4 to 6 single mode lasers especially if NIR is required with the 748nm laser line.