



CZECH — BIOIMAGING NEWSLETTER

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www.czech-bioimaging.cz

USER STORY

International Collaboration and Early Career Engagement at IPHYS Bioimaging Facility



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At the heart of the Czech-BioImaging infrastructure, the IPHYS Bioimaging Facility (BIF) stands as a vibrant hub of scientific collaboration and innovation, welcoming researchers from across the globe and at every stage of their scientific journey. A recent project exemplifies this spirit: a group of scientists led by **Dr. Nejc Umek from Institute of Anatomy, Faculty of Medicine, University of Ljubljana, Slovenia** joined forces with the IPHYS team to investigate morphological changes in fascia among diabetic patients. The project, ambitious in scope, is divided into multiple

morphological alterations in fascia tissue, providing unprecedented insights into **how diabetes affects connective tissue structure**. This work benefits from the facility's open access policy, which ensures that international users can tap into the expertise and resources of the Czech-BioImaging network, a principle that has enabled many researchers from countries such as Slovenia, Germany, Croatia, and the UK to advance their projects.

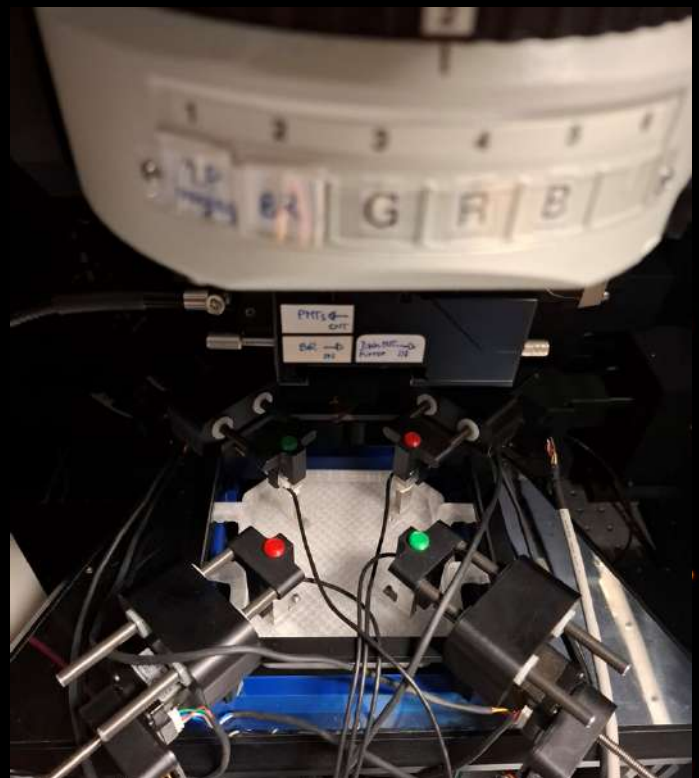
The second phase of the project focuses on biomechanical testing. Here, the IPHYS Bioimaging



High school student Iryna Honcharenko from Gymnázium Bohumila Hrabala preparing a sample.

synergistic parts such as sample preparation, imaging, and biomechanics or data analysis.

The imaging part leverages the advanced imaging technologies available at IPHYS BIF. Utilizing state-of-the-art microscopy, the Slovenian researchers are able to process the samples, visualize the samples and analyze subtle



Tensile device under the customized multiphoton Bruker Ultima microscope.

Facility's commitment to innovation comes to the fore: the team has developed **a custom bi axial tensile device compatible with most microscope stages**. This device allows researchers to perform **real-time mechanical testing of biological samples while imaging, bridging the gap between structural visualization and functional assessment**—a crucial step for understanding disease

mechanisms at the tissue level. Such technological advancements are supported by the facility's multidisciplinary team, which includes biologists, engineers, and mathematicians, all dedicated to supporting users from experiment design to data analysis.

Perhaps most inspiring is the facility's dedication to nurturing the next generation of scientists. For this project, **a high-school student Iryna Honcharenko from Gymnázium Bohumila Hrabala in Nymburk, Czech Republic** is conducting experiments as part of SPA (Students' Professional Activities - <https://www.soc.cz/english/>) program. Under expert mentorship of Dr. Barbora Radochová, Dr. David Vondrášek, and Jan Hadraba, this student is gaining **hands-on experience** with sample preparation and cutting-edge imaging such as,

SHG and biomechanical testing, and data analysis, contributing valuable data to a real-world research question. This approach reflects the broader ethos of Czech-Biolmaging: to connect and empower individuals at all career stages, from high-school students to principal investigators (PIs), fostering a diverse and inclusive scientific community.

The IPHYS Bioimaging Facility's story is one of international engagement, technological innovation, and educational outreach. By providing open access to advanced instruments and expertise, the facility not only accelerates scientific discovery but also builds bridges between countries and across generations, ensuring that the future of bioimaging is both collaborative and bright.



Iryna Honcharenko and facility expert Dr. David Vondrášek at the microscope side.



Sample preparation



How to get in touch?

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📷 [@iphys_bioimaging](https://www.instagram.com/iphys_bioimaging)

FOCUS ON TECHNOLOGIES

Multimodal and functional imaging laboratory (MAFIL), CEITEC, MUNI

MUNI

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In February of this year, one of the two original Siemens Magnetom Prisma MR scanners was upgraded to the latest research model of a **3T scanner called CIMA.X Fit**. The upgrade took place exactly after 10 years of operation and is a gift to celebrate the **ten-year anniversary of the operation of MR in the MAFIL laboratory at CEITEC MU and at the same time the 25th anniversary of functional brain mapping using MR in Brno**. Only the magnet itself remained from the original device (a cryogenic vessel with coils for creating a statistical magnetic field) and all electronics, gradient and radiofrequency coils and accessories were replaced.

It is still a 3T device. The Prisma model was a cutting-edge research device in its time, and although the upgrade to the CIMA.X Fit model brings a large number of changes and improvements at the HW and SW levels, overall it is more of an evolution. However, it allows us to continue to provide our users with top-notch services with regard to the latest trends in MR imaging.

The new MR scanner is particularly unique due to its **Gemini gradient system with 200 mT/m at 200 T/m/s**, offering unparalleled performance, especially in the field of diffusion MRI. Quality of images can be improved with the advanced reconstruction and denoising methods based on machine learning and deep learning techniques.

Biomatrix technology offers improved acquisition gated by physiological functions.

The scanner started with testing mode in March/April and since May is in full operation mode opened for user projects.



How to get in touch?

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UPCOMING OPEN CALL

User Project Support - Autumn 2025

Do you have an innovative research project in the field of biomedical imaging? Czech-Biolmaging offers funding opportunities to support the best research ideas, helping you take your project to the next level.

Through our funding scheme, we provide financial contributions, such as discounts on measurement costs or the acquisition of special materials needed for your experiments.

Each year, Czech-Biolmaging allocates approximately CZK 2.3 million for this scheme, divided into two calls. Many successful collaborations have led to impactful publications and joint grant applications that wouldn't have been possible without this initial support.

If you have a groundbreaking project in mind, apply now and be part of the next wave of innovation in biomedical imaging!

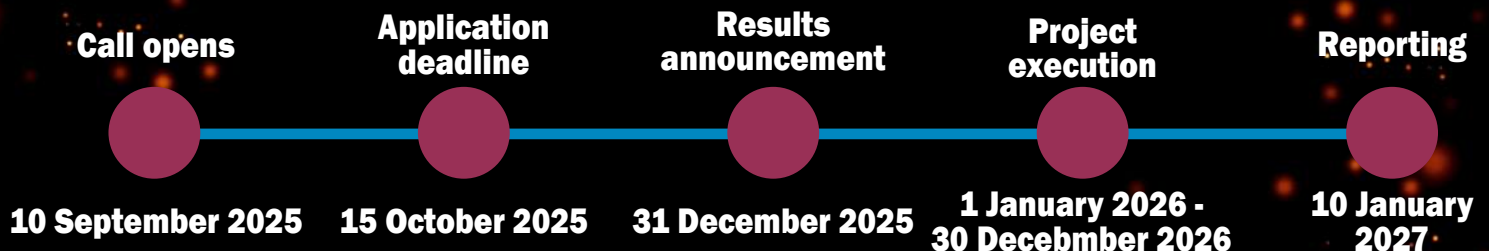
Eligibility

Academic users: Researchers working for academic institutions and conducting independent/basic research, e.g. universities and research institutes

Commercial users: only subjects conducting research included in the official List of Czech Scientific Institutions as published by the Ministry of Education, Youth and Sports of the Czech Republic (MEYS)

Inter/national users: Both Czech and international applicants are welcome (EU or non-EU)

Expected Timeline



Acknowledge us

Czech-Biolmaging research infrastructure is publicly funded, enabling us to offer advanced services and technologies. All work conducted through Czech-Biolmaging should be acknowledged in users' outputs (publications, presentations, etc.). This acknowledgment highlights the contribution of Czech-Biolmaging to research quality and supports our efforts to secure future funding.

Please include the following acknowledgment in your outputs:

The authors used services of the Czech-Biolmaging research infrastructure, specifically [Name of the Core Facility], [Institution], supported by project LM2023050 funded by the Ministry of Education, Youth and Sports of the Czech Republic, with the instrumental equipment co-financed by the European Union.

Learn more:

www.czech-bioimaging.cz/open-calls

IMAGING PRINCIPLES OF LIFE 2025

Celebrating 10th Anniversary of Czech-Biolmaging with our users and staff



**17-19 SEPTEMBER
2025**



**HOTEL ATLANTIS,
ROZDROJOVICE-BRNO**



**31 JULY
2025**

Meet Our Invited Speakers

REGISTER



Dr. Hans-Ulrich Fried

Service Leader of the
Light Microscope
Facility, DZNE, Bonn,
Germany



Dr. Paula Sampaio

Advanced Light
Microscopy Platform
Head, i3S, University of
Porto, Portugal



Dr. Jiří Nováček

Head of the Cryo-electron
Microscopy and
Tomography Core Facility
at CEITEC Masaryk
University, Brno



Dr. Ota Samek

Head of the
Biophotonics and
Optofluidics group,
Institute of Scientific
Instruments, Brno,
Czech Republic



**Prof. Christian
Schöfer**

Center for Anatomy and
Cell Biology (Division of Cell
and Developmental
Biology), Medical University
of Vienna, Austria



Dr. Alena Salašová

Department of
Biomedicine, Aarhus
University, Denmark

UPCOMING COURSES

June - November 2025

BIOIMAGE ANALYSIS

June 30 - July 4, 2025 | Viničná Microscopy Core Facility, Charles University, Prague

ADVANCED COURSE ON PRE-CLINICAL IMAGING — JOINT COURSE

September 8-12 2025 | Institute of Experimental Medicine of the Czech Academy of Sciences, Prague, Institute of Physiology of the Czech Academy of Sciences, Prague, Institute of Scientific Instruments of the Czech Academy of Sciences, Brno

MICROSCOPY METHODS IN BIOMEDICINE

October 13-17, 2025 | Institute of Molecular Genetics of the Czech Academy of Sciences, Prague

ADVANCED MULTI-MODAL LIGHT MICROSCOPY IMAGING IN PLANT RESEARCH

October 14-15, 2025 | Institute of Experimental Botany of the Czech Academy of Sciences, Prague

PYTHON FOR ANALYSIS AND PROCESSING OF IMAGES

20 – 21 October + 27 – 28 October, 2025 | BIOCEV, CUNI, Vestec

LIVE CELL IMAGING

November 11-13, 2025 | Institute of Molecular Genetics of the Czech Academy of Sciences, Prague

INTRODUCTION TO PROGRAMMING FOR IMAGE PROCESSING

November 12-14, 2025 | Institute of Experimental Medicine of the Czech Academy of Sciences, Prague

3D-CLEM

November 18-21, 2025 | BIOCEV, CUNI, Vestec

MECHANICAL CHARACTERIZATION OF BIOLOGICAL SAMPLES USING CORRELATIVE METHODS

November 25-26, 2025 | Institute of Physiology of the Czech Academy of Sciences, České Budějovice

www.czech-bioimaging.cz/activities/courses

PAST ACTIVITIES

10th Anniversary Celebration of Czech-Biolmaging

This year, Czech-Biolmaging is celebrating its 10th Anniversary, marking a decade of providing open access to cutting-edge imaging technologies to enhance scientific research in the Czech Republic and internationally.

To mark this significant milestone, a special meeting took place on **March 18, 2025**, at the Institute of **Molecular Genetics of the Czech Academy of Sciences** in Prague. The workshop titled “**Long-term Sustainability of Research Infrastructures**”, brought together key representatives from Czech-Biolmaging,

Euro-Biolmaging, and the **Ministry of Education, Youth, and Sports of the Czech Republic**. The workshop focused on the long-term sustainability of large research infrastructures, ensuring that these resources continue to benefit future generations of researchers and advance scientific discovery. Following the workshop, an evening program was held at Jazz Dock in Prague, providing an opportunity for networking and informal discussions among experts and stakeholders in the bioimaging field.



Participation at the All Hands Nodes Meeting in Heidelberg

Euro-Biolmaging All Hands Nodes Meeting 2025 brought together imaging nodes from across Europe to discuss innovations, collaborations, and the future of imaging technologies. The **Prague Node** and **CAPi Node** were actively involved throughout the program.

Dominik Pinkas (IMG CAS, Prague Node) presented on multimodal targeting of FIB lamella milling for Cryo-TEM, introducing methods that advance cryo-electron microscopy. **Aleš Benda** (IMCF BIOCEV, Prague Node) highlighted new services

and methodologies now available at the Prague Node. **Pavla Francova** (CAPi Node) contributed to an interactive session focused on user access experiences, sharing best practices for improving service delivery across nodes.

Vlada Filimonenko (Prague Node) took part in a session on the Job Shadowing Program, emphasizing its benefits for staff development and operational exchange. **Pavel Hozak** led a breakout session on evaluating core facility performance, discussing strategies for optimization.



Job Shadowing at the Electron Microscopy Core Facility IMG

As part of the **EVOLVE Job Shadowing Program**, Katlijn Vints from the VIB Biomedicine Core Leuven spent a week at the IMG Electron Microscopy Core Facility in Prague from October 14–18, 2024. Under the mentorship of Vlada Filimonenko and Dominik Pinkas, she received hands-on training on the **Jeol F200 200kV electron microscope, focusing on cryo-imaging, tomography, and STEM techniques**. Her visit was a deep dive into advanced microscopy, including **plunge-freezing, cryo-tomography, and 3D imaging using IMOD software**. She returned to Leuven with plans to apply her new expertise to image *Drosophila* brain synapses, train her colleagues, and contribute to the broader microscopy community through shared training resources. The experience highlighted the impact of knowledge exchange across imaging facilities and the lasting value of the EVOLVE program.

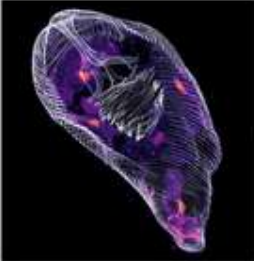

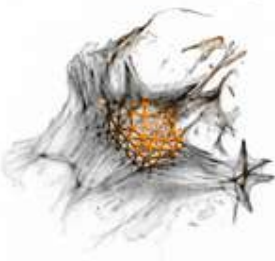







PHOTONS, ELECTRONS & SAUSAGES 2025 User meeting and BBQ organized by the Prague Node of Euro-Biolmaging

The annual Photons, Electrons & Sausages User Meeting and BBQ took place this June, gathering our vibrant imaging community for an afternoon full of good food, fun microscopic games, and networking. We had over **130 registered participants**. The great weather, BBQ, and informal discussions created an ideal setting for community building and sharing ideas. A highlight of the meeting was the announcement

of the Picture of the Year (POTY) competition results, which can be seen in the picture below. A special recognition went to **Tomáš Figura**, who received the most votes across his five submitted images, making him the overall winner of the 2024/2025 POTY competition.

Congratulations to all awardees and thank you to everyone who contributed to making this event such a success!

1 st place	2 nd place	3 rd place	Special award
Anežka Konupková <i>Microtubular Chaos</i>	Lenka Gmitterková <i>Cochlea</i>	Srikant Ojha <i>A Microscopic Cage</i>	Tomáš Figura
			
			

Czech-Biolmaging at the Core Technologies for Life Sciences (CTLS) Congress, Brno



Czech-Biolmaging participated at CTLS 2025, held 10-12 June 2025 in Brno, underscoring its role as an international contributor and its strength as an infrastructure—comprising 16 core facilities dedicated to biological and medical imaging across the Czech Republic. Czech-Biolmaging highlighted both its achievements and its forward-looking vision during the congress.

The infrastructure's decade of open-access service was commemorated in a poster presented by Director Pavel Hozák, titled **“Czech-Biolmaging: Infrastructure Dedicated to Users for 10 Years”**. The poster reflected on the growth of a research infrastructure that today supports over 1,300 users annually through cutting-edge facilities, expert

leader of IPHYS BIF. The session explored effective frameworks for training facility users and staff, with Hadraba emphasizing scalable and inclusive approaches built on real-world infrastructure experience.

The infrastructure's international perspective was further amplified by **Julia Fernandez-Rodriguez, Vice-Chair of the Czech-Biolmaging International Advisory Board**, who delivered a lecture and co-chaired a scientific session **“Industry Engagement - Technological Showcases”** during the congress. Her leadership contributed to strategic discussions on how infrastructures can adapt to evolving research needs and promote user-driven innovation across borders.



guidance, and integrated access across disciplines and institutions.

Czech-Biolmaging team members shaped the scientific discourse at CTLS 2025 through active leadership in several sessions. **Aleš Benda**, a leader of the **CUNI IMCF BIOCEV facility**, co-chaired Session 5: **“Making Cross-Facility Workflows Work”**. This session focused on strategies for harmonizing operations across core facilities—highlighting interoperability, shared expertise, and the challenges of developing user-oriented workflows in complex, technology-driven environments.

Training, a strategic priority for Czech-Biolmaging, featured prominently in Session 7: **“How to Develop a Successful Training Program”**, co-chaired by **Daniel Hadraba**, the core facility

Lastly, **Marek Cebecauer**, a member of the **International Advisory Board**, contributed as a speaker in the session **“Core Facilities and Open Science”**. His talk addressed the responsibilities and opportunities core facilities hold in supporting open science principles—from data transparency and FAIR workflows to reproducibility and equitable access. Cebecauer emphasized how infrastructures like Czech-Biolmaging are uniquely positioned to drive this cultural and technical shift.

The congress served not only as a celebration of past achievements but as a launchpad for continued collaboration, innovation, and shared excellence across the European research infrastructure landscape.

CZECH-BIOIMAGING OPPORTUNITIES

Prague Node: Participate in the Picture of the Month/Year competition

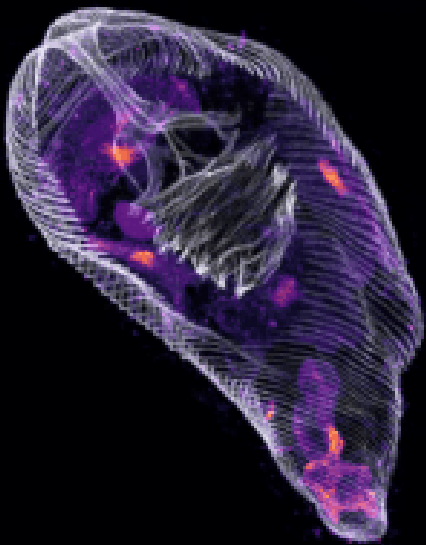
Do not miss out, the main prize for the Picture of the Year is 10 000 CZK, kindly sponsored by microscopy companies and announced at the annual barbecue Photons, Electrons and Sausages. Successful contributions will be featured in Czech-BioImaging promotional materials, giving you visibility and recognition in the scientific community.

For more information visit:

www.imcf.natur.cuni.cz/IMCF/picture-of-the-month

Year 2024/2025 Winner:

***Microtubular chaos by Anežka Konupková,
Charles University, Prague***

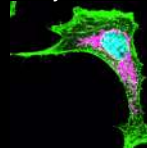


Monthly winners

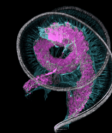
June 2024



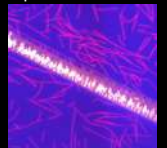
July 2024



August 2024



September 2024



October 2024



November 2024



December 2024



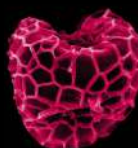
January 2025



February 2025



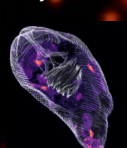
March 2025



April 2025



May 2025

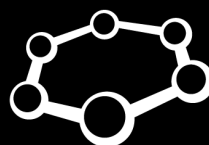


Brno: CELLIM Best Microscopy Picture Contest

Each year, the CELLIM Core Facility at CEITEC MU hosts a Microscopy Picture Contest to highlight stunning images captured by its users. Announced at the beginning of the year, the contest showcases images acquired on CELLIM microscopes during the previous year and offers exciting prizes, including a grand prize sponsored by Carl Zeiss spol. s r.o.

For more information visit:

www.cellim.ceitec.cz/contest



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Do you have any questions?



Visit our website or contact us at

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www.czech-bioimaging.cz



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