



CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

Czech Optical Cluster: Introduction

Petr Prikryl – Czech optical cluster
Velke Pavlovice – 19.4.2023



CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

WHO WE ARE

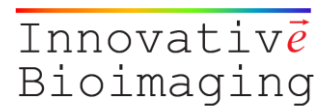
Czech Optical Cluster was created with the aim to improve the conditions for optical industry development in the Czech Republic through cooperation of companies, public sector and educational sector in the entire value chain in the field of optics, optomechatronics, photonics, optoelectronics and fine mechanics, including related production, technology and service development in supplier's and customer's domain.



CZECH
OPTICAL
CLUSTER

Let's Make Optics for the Future.
Together.

CLUSTER MEMBERS



Palacký University
Olomouc



University
of Defence



NenoVision



APPLIC



CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

CLUSTER MEMBERS

35 MEMBERS:

5 Large Enterprises: Hella Autotechnik Nova; Meopta – optika; Thermo Fisher Scientific Brno , TESCANA ORSAY HOLDING, a.s., Varroc Lighting Systems, s.r.o.,

20 Small and medium-sized enterprises (SME's): Pramacom-HT, spol. s r.o., ZEBR s. r. o., NETWORK GROUP, s.r.o., CRYTUR, spol. s.r.o., OPTICS TRADE, spol. s r.o., esc Aerospace s.r.o., asphericon s.r.o., TELIGHT Holding, s.r.o., Innovative Bioimaging, s.r.o., NenoVision s.r.o., FUJIFILM EUROPE GmbH, APPLIC s.r.o., Matex PM, s.r.o., LaserTherm spol. s r.o., Narran s.r.o., Lightigo s.r.o., Rigaku Innovatiove Solution Europe s.r.o., Carl Zeiss spol. s r.o., ZKW Automotive Engineering CZ s.r.o., ZAHORI TRADE s.r.o.

10 universities and research institutions: Brno University of Technology; Czech Technical University in Prague; Institute of Photonics and Electronics; Institute of Physics (HiLASE; ELI Beamlines); Institute of Plasma Physics (TOPTEC Centre); Institute of Scientific Instruments; Palacký University Olomouc; University of Defence; University of South Bohemia; VSB - Technical University of Ostrava



CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

BUILDING THE PLATFORM

The **main objective of the COC** is to build a platform for collaboration and knowledge sharing among actors of the science and industry in the field of Optics, to interconnect cluster members to strengthen their influence, innovations, and competitiveness, to promote the field of Optics and improve conditions for its development.

„Optical ecosystem“



CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

MAIN PILLARS

Czech Optical Cluster carries out its activities mainly in these pillars:

- 🎯 **Industrial and Consumer Optics**
- 🎯 **Military Optics**
- 🎯 **Lighting Technology**
- 🎯 **Laser Technology and Applications**
- 🎯 **Microscopy**
- 🎯 **Optical quantum technologies**



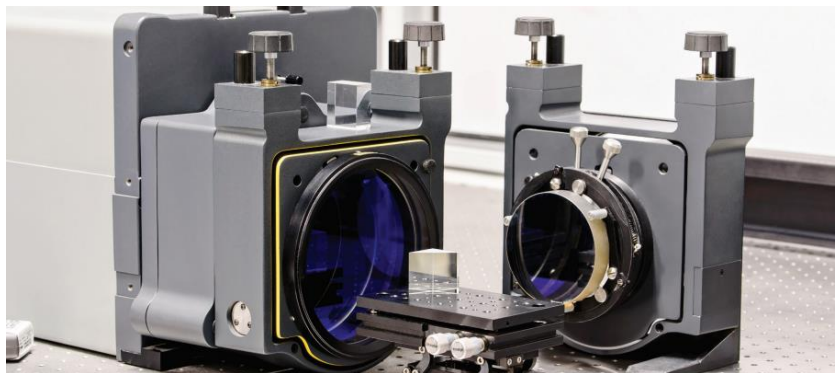


CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

INDUSTRIAL AND CONSUMER OPTICS

- **Development**, production of optical systems that are used in complex systems for checking semiconductor boards in the **Semiconductor Industry**
- **Medical technology** – optomechanical subsystems, which are used in dentistry, ophthalmology and dermatology
- **Spectroscopy** – clinical diagnosis of diseases, study of the structure of viruses
- **Aviation industry**– development and production of optical components
- **Space technology** – special optics with thin layers, subsystems, programming of satellite flight software, satellite communication ground stations etc.





CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

MILITARY OPTICS

- **Development**, integration, production and service activities in the fields of **optoelectronics**,
- **Soldier systems** – hand-held optical devices, SW and communication
- **Optical systems for armored vehicles and tanks** – observation devices of the driver, commander, etc., day/night vision, night vision devices
- **Optical systems for applications in the armed forces** – systems for training and simulation



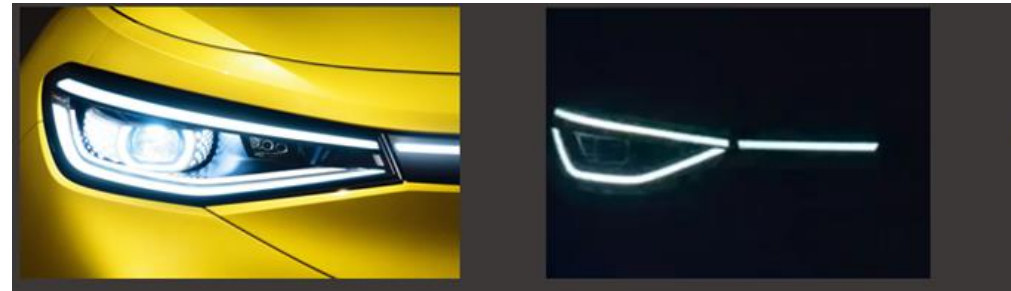


CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

LIGHTING TECHNOLOGY

- **Development** and production of innovative exterior lighting systems for the automotive industry - innovative series products, such as the first fully LED headlight, or the world's first xenon headlight with glare-free high beam.
- Development of electronic systems



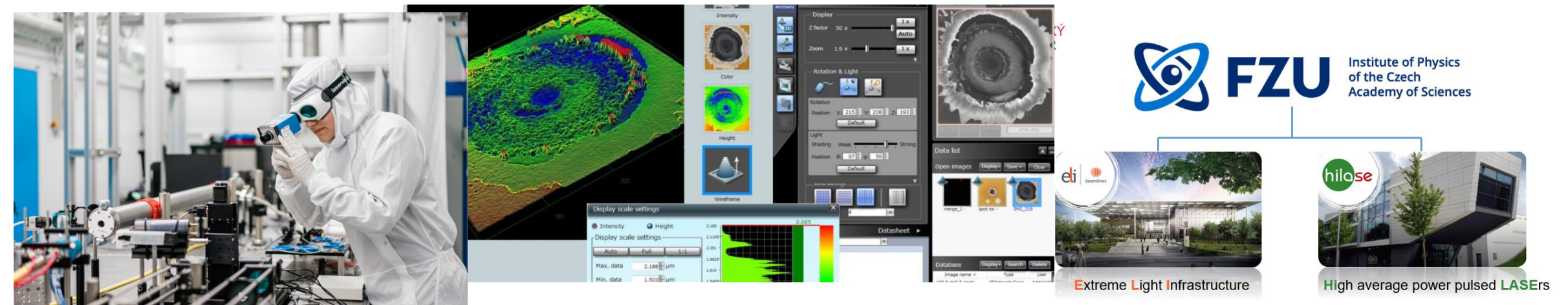


CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

LASER TECHNOLOGY AND APPLICATIONS

- Elementary particle physics, condensed systems and solids, optics and plasma physics
- **Development** of a new generation of diode-pumped with high average power and high repetition frequency
- Use of laser technology in industrial deployment - development of innovative processes in the field of effective **laser micromachining**
- determining the **optical threshold of laser damage (LIDT)**



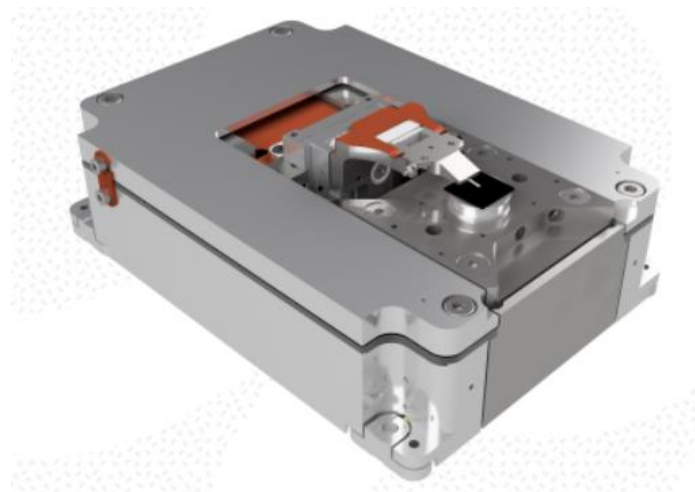
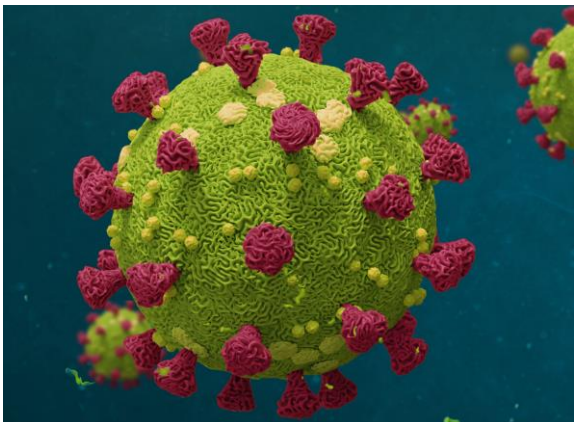


CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

MICROSCOPY

- **Electron, Correlative, Light, X-ray microscopy....**
- Q-Phase is a patented holographic microscope with high detection sensitivity (cancer research)
- Development and production of a revolutionary type of microscope for atomic forces (AFM), Litescope designed for quick and easy integration into scanning electron microscopes





CZECH
OPTICAL
CLUSTER

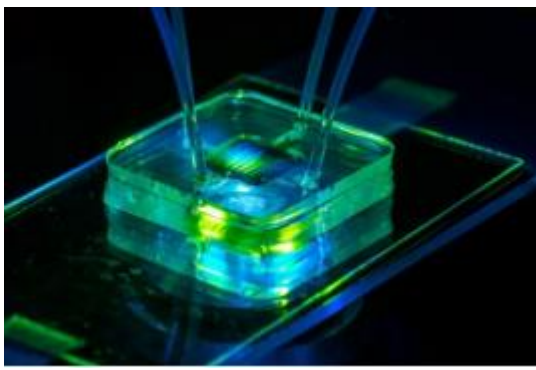
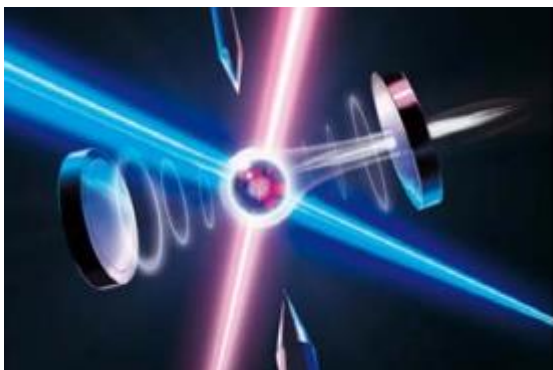
*Let's Make Optics for the Future.
Together.*

QUANTUM OPTICAL TECHNOLOGIES

FLAGSHIPS:

- Quantum metrology of time
- Quantum sensors
- Quantum communication
- Quantum simulators
- Quantum cryptography
- Quantum computers

FUTURE USE IN PRACTICE: Science, finance, security, defense, telecommunication, navigation, energy transfer





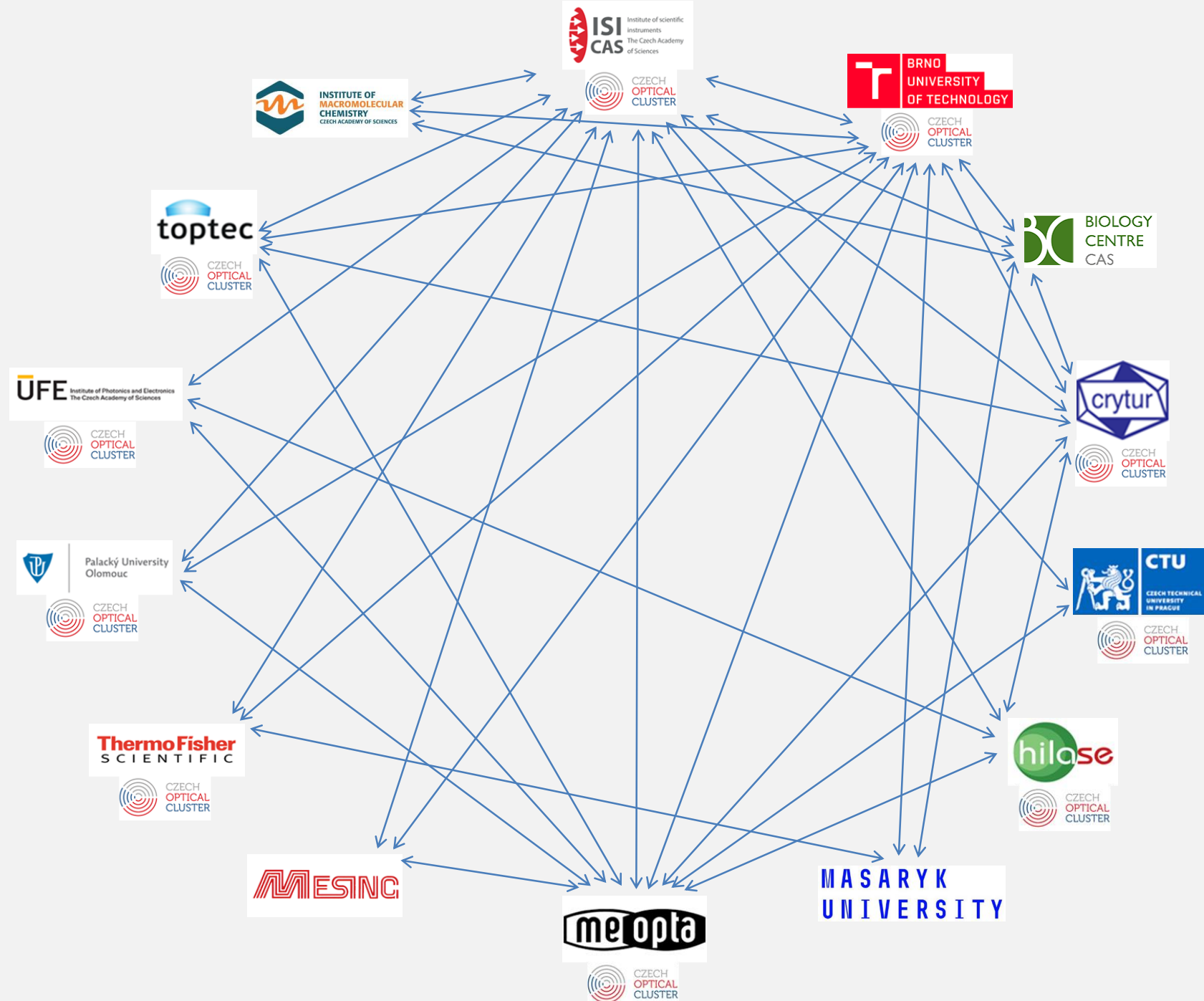
Development of the research collaborations in the field of Optics



Centre of Electron and Photonic Optics



Technology Agency of the Czech Republic



**Thank you for your
attention**



Mgr. Petr Přikryl
Executive manager
Vice-chairman of the Executive Board
mob.: +420 739 244 544
email: petr.prikryl@optickyklastr.cz

Czech optical cluster
Web: www.optickyklastr.cz