

Advanced Methods of Biomedical Image Analysis (AMBIA)

2nd Edition of Summer School, Brno, 3 - 9. 9. 2017

Organized by:

Centre for Biomedical Image Analysis
Faculty of Informatics, Masaryk University, Brno, Czech Republic

<http://cbia.fi.muni.cz/>



CBIA CENTRE FOR BIOMEDICAL
IMAGE ANALYSIS

Welcome to Brno!



Welcome to Brno!

see www.brno.cz for more details about the city



Welcome to the Faculty of Informatics!

see www.fi.muni.cz for more details about the faculty



Welcome to Brno!

- **Brno**

- Second largest city in the Czech Republic: nearly 400,000 people
- Metropolis of Moravia since 9th century
- Historical city: cathedral, castle, churches, Mendel museum, etc.
- Exhibition city: the largest exhibition lands in the Czech Republic
- Sport: Grand prix – Brno Circuit
- Academic city: 69,000 students, 6 public universities and 8 private

- **Masaryk University**

- The largest university in Brno (2nd in Czech Rep.) with over 30,000 students
- Founded in 1919 by the first Czechoslovak president T.G.Masaryk

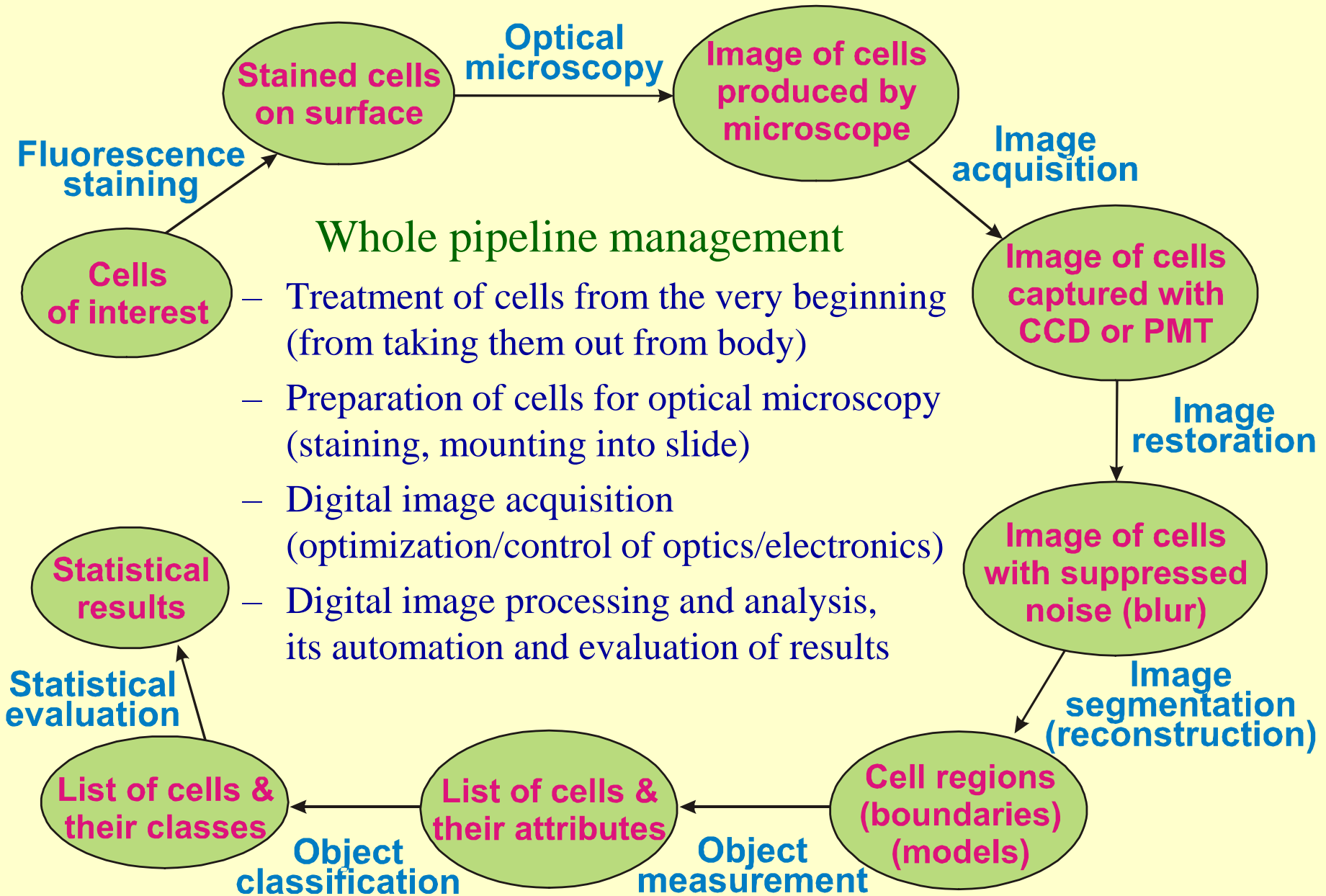
- **Faculty of Informatics**

- Founded in 1994 as the first Faculty of this type in the Czech Republic
- The number of students grew from 400 in 1994 to 2,000 nowadays
- Offers high-quality education in both theoretical and applied informatics

Centre for Biomedical Image Analysis (CBIA)

- Formed in 1998
 - by Michal Kozubek, Petr Matula and Pavel Matula
 - Formerly known as Laboratory of Optical Microscopy (now part of CBIA)
 - Interdisciplinary workplace (computer science, engineering, optics, biology)
- Scope
 - Primarily: Development and benchmarking of algorithms for the analysis and synthesis of cell microscopy image data
 - Secondly: Analysis of biomedical image data produced by other imaging instruments as well as employment of computers in the optimization and automation of image acquisition process
 - Main partial goals: Developing reliable and ideally automatic cell segmentation, quantification and tracking algorithms

Cell Imaging Pipeline



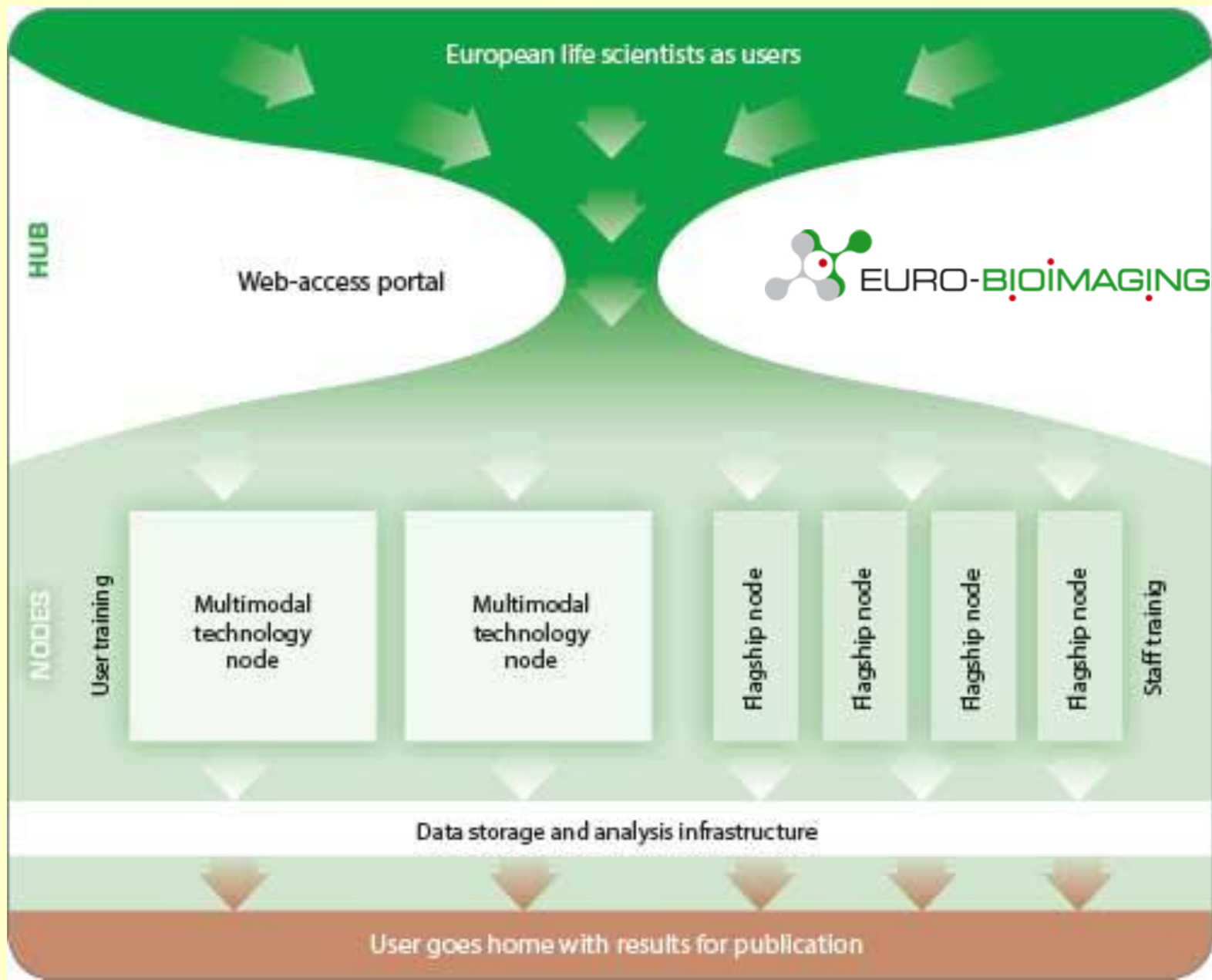
AMBIA Organizing Committee

- **Michal Kozubek**
 - Coordinator of the Summer School
 - Head of CBIA (since 1998)
 - Responsible for image analysis in Czech-Bioimaging (part of Euro-Bioimaging)
- **David Svoboda**
 - Web administrator
 - Arrangement of accommodation, meals, social program
 - Summer school secretary

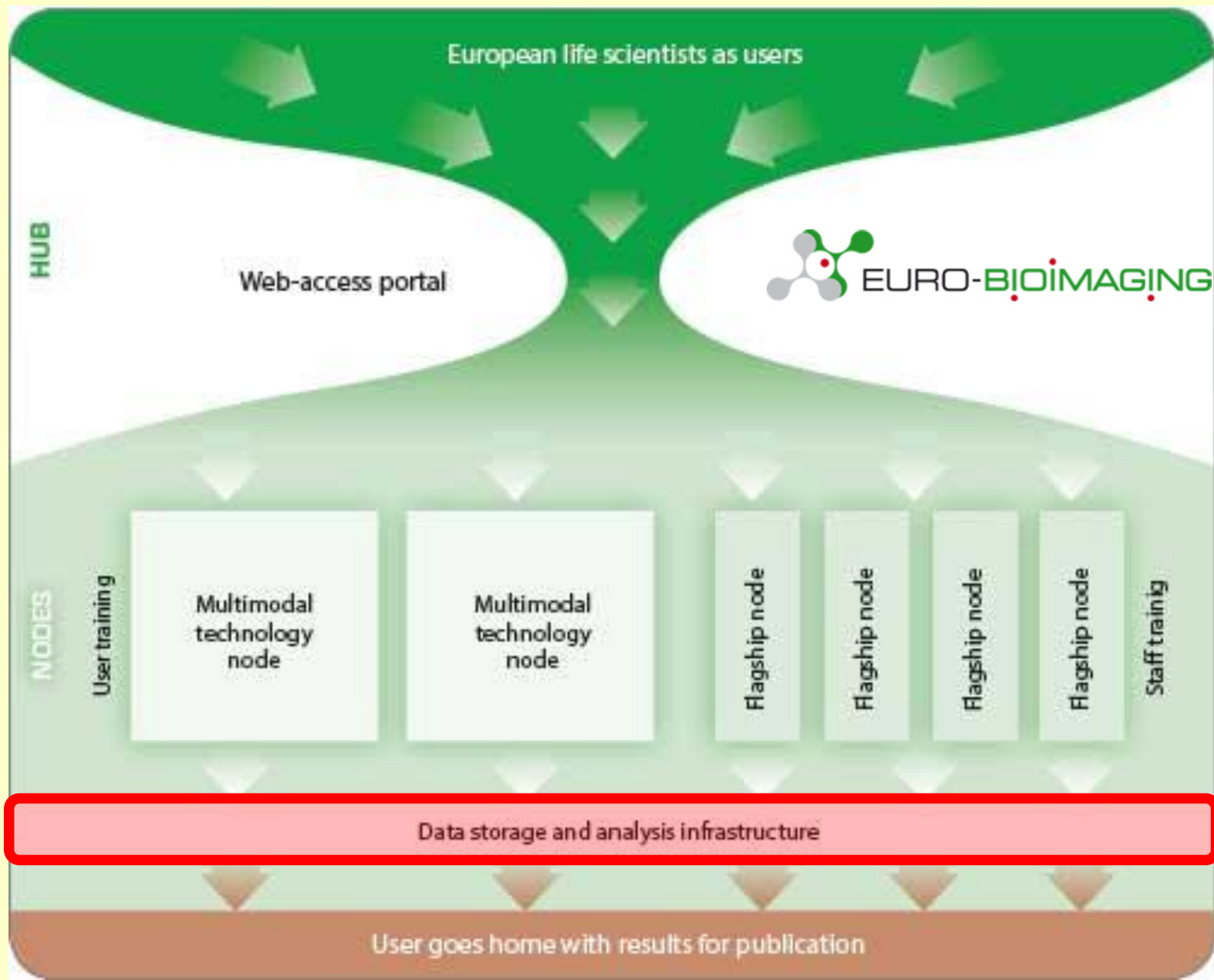
Sponsor



Euro-BioImaging Research Infrastructure



Euro-BioImaging Research Infrastructure



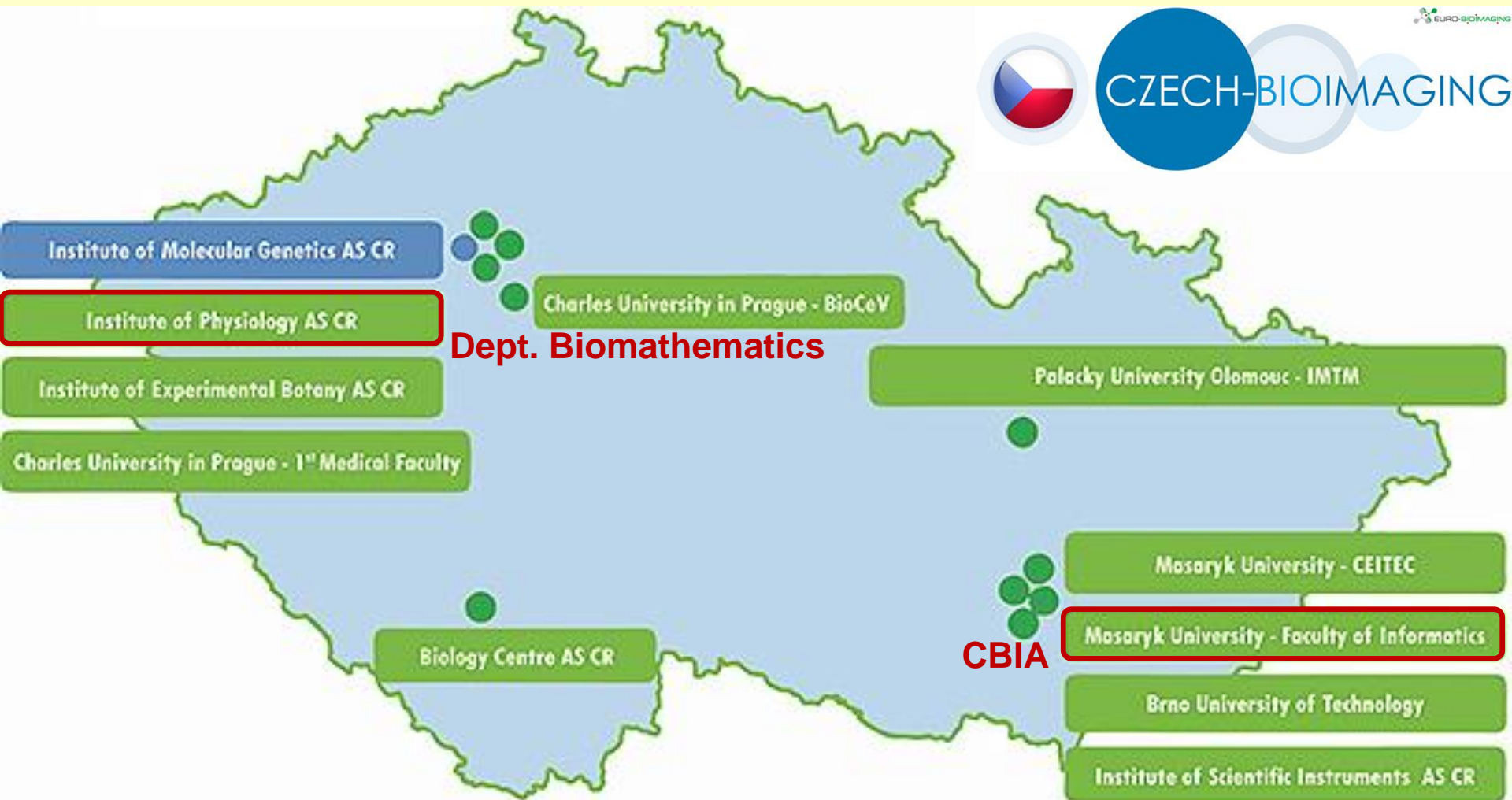
Czech-BioImaging Research Infrastructure

Partners of the consortium to be financed in 2016-2022



Czech-BioImaging Research Infrastructure

Partners of the consortium responsible for **data analysis**



AMBIA Summer School

- **AMBIA focus**
 - Advanced methods of biomedical image analysis: theory + labs
 - Students are supposed to know basics of signal and image processing
- **Main topics**
 - Introduction to Advanced Mathematical Morphology
 - Advanced Mathematical Morphology in Cell Image Analysis
 - Signal-Dependent Noise Models: Theory, Methods, and Practical Algorithms
 - Atlas-based segmentation in Biomedical Imaging
 - Image Analysis in Biomedical Screening Application
 - Machine Learning in Biomedical Image Analysis
 - Numerical Optimization
 - Energy Minimization Methods in Biomedical Image Analysis
 - Traction Force Microscopy in Cell Exploration
 - Benchmarking of Biomedical Image Analysis Algorithms

AMBIA Summer School

Teachers

- [Arrate Muñoz-Barrutia](#)
Bioengineering and Aerospace Engineering Department, Universidad Carlos III de Madrid, Madrid, Spain
- [Jussi Tohka](#)
A. I. Virtanen Institute for Molecular Sciences, University of Eastern Finland
- [Carlos Ortiz de Solórzano](#)
Centro de Investigación Médica Aplicada, Universidad de Navarra, Pamplona, Spain
- [Alessandro Foi](#)
Department of Signal Processing, Tampere University of Technology, Tampere, Finland
- [Maxime Bombrun](#)
Centrum för bildanalysis, Uppsala universitet, Uppsala, Sweden
- [Petr Dokládál](#)
Centre de Morphologie Mathématique, MINES ParisTech, Fontainebleau, France
- [Jan Kybic](#)
Department of Cybernetics, Center for Machine Perception, Czech Technical University in Prague, Czech republic
- [Michal Kozubek](#) , [Pavel Matula](#) , [Petr Matula](#)
Centre for Biomedical Image Analysis, Masaryk University, Brno, Czech Republic

AMBIA Summer School

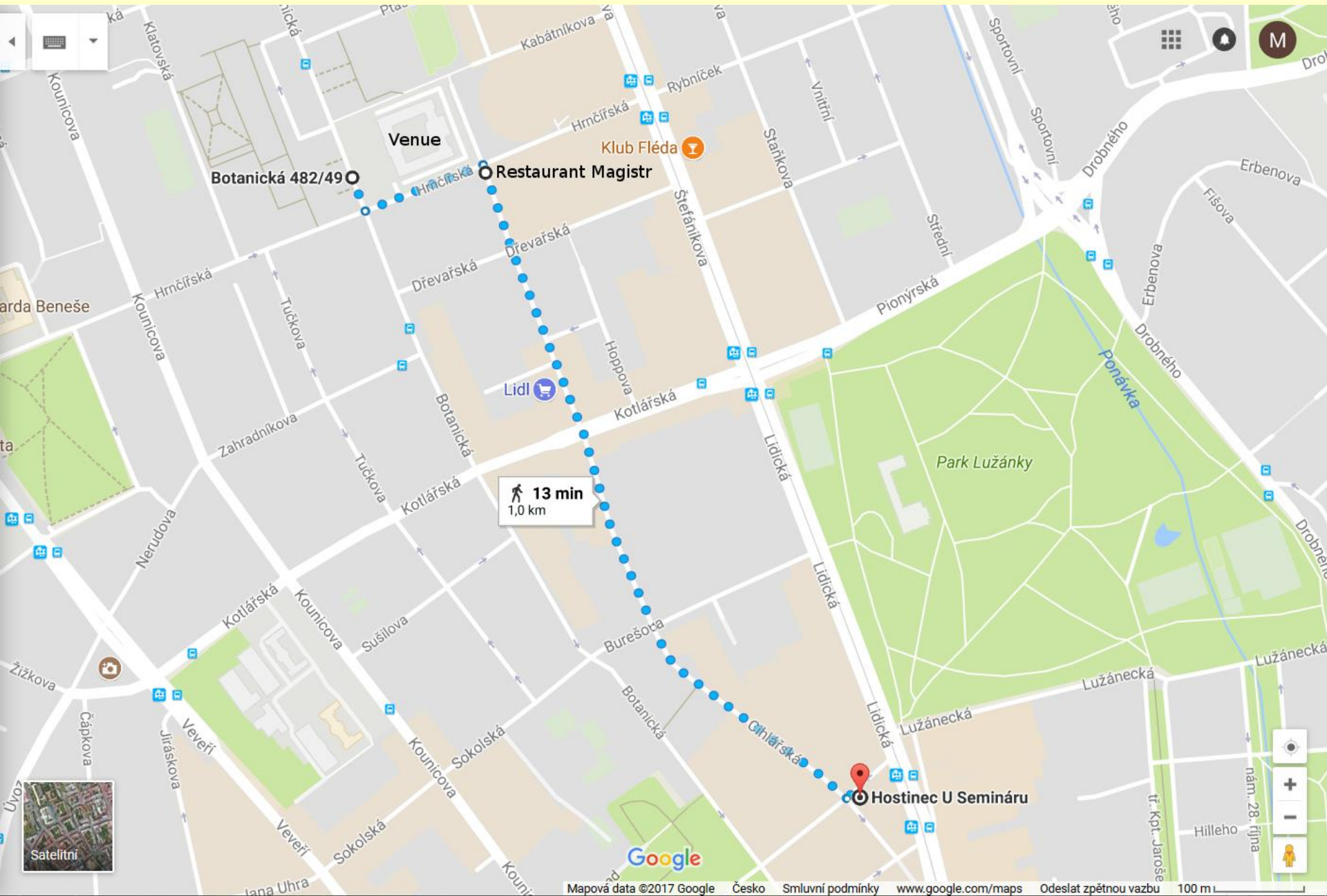
- **Organizational remarks**

- Venue: Faculty of Informatics, 3rd floor
 - A318: Lectures
 - A319: Coffee breaks + posters (can remain until Friday)
 - B311: PC labs (Windows 10 + MATLAB, etc.)
- Meals:
 - Breakfast: your hotel
 - Lunch: restaurant Magistr opposite the Hrnčířská street (includes 1 small soft/beer)
 - Dinner: on your own except for Wednesday gala dinner in restaurant U Seminaru
- Please wear your badge!
- Czech-Bioimaging request: We need your signature and feedback form!
- Strict restriction: no smoking in the building/yard/restaurant! Only outside!
- Toilets: behind the lifts next to the lecture room and opposite PC labs
- Saturday trip: Moravian Karst and Punkva Caves
- Poster competition results: Wednesday at the end of poster session (14-14:50)
- Certificate of attendance: Friday

WIFI: wlan_fi
Connect and go to:
<http://wifi.fi.muni.cz/>
* login: wifi06
* passwd: iteqemapop

www.useminaru.cz

Map of Venue and Restaurants



- Moravian Karst

- Caves (>1000)
- Abysses
- Gorges

Macocho abyss (138m deep)





