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SCI



HR EXCELLENCE IN RESEARCH

# Department of Geography, Faculty of Science MASARYK UNIVERSITY

**Petr Kubíček**

May 2024

**Interreg**



Spolufinancovaný  
Európskou úniou

Slovensko – Česko

FOND MALÝCH  
PROJEKTOV

**ER BBK**  
EUROREGIÓN BÍLÉ - BIELE KARPATY

# Basic facts and figures

Brno – Masaryk University

**B R N O**

**MASARYK UNIVERSITY**

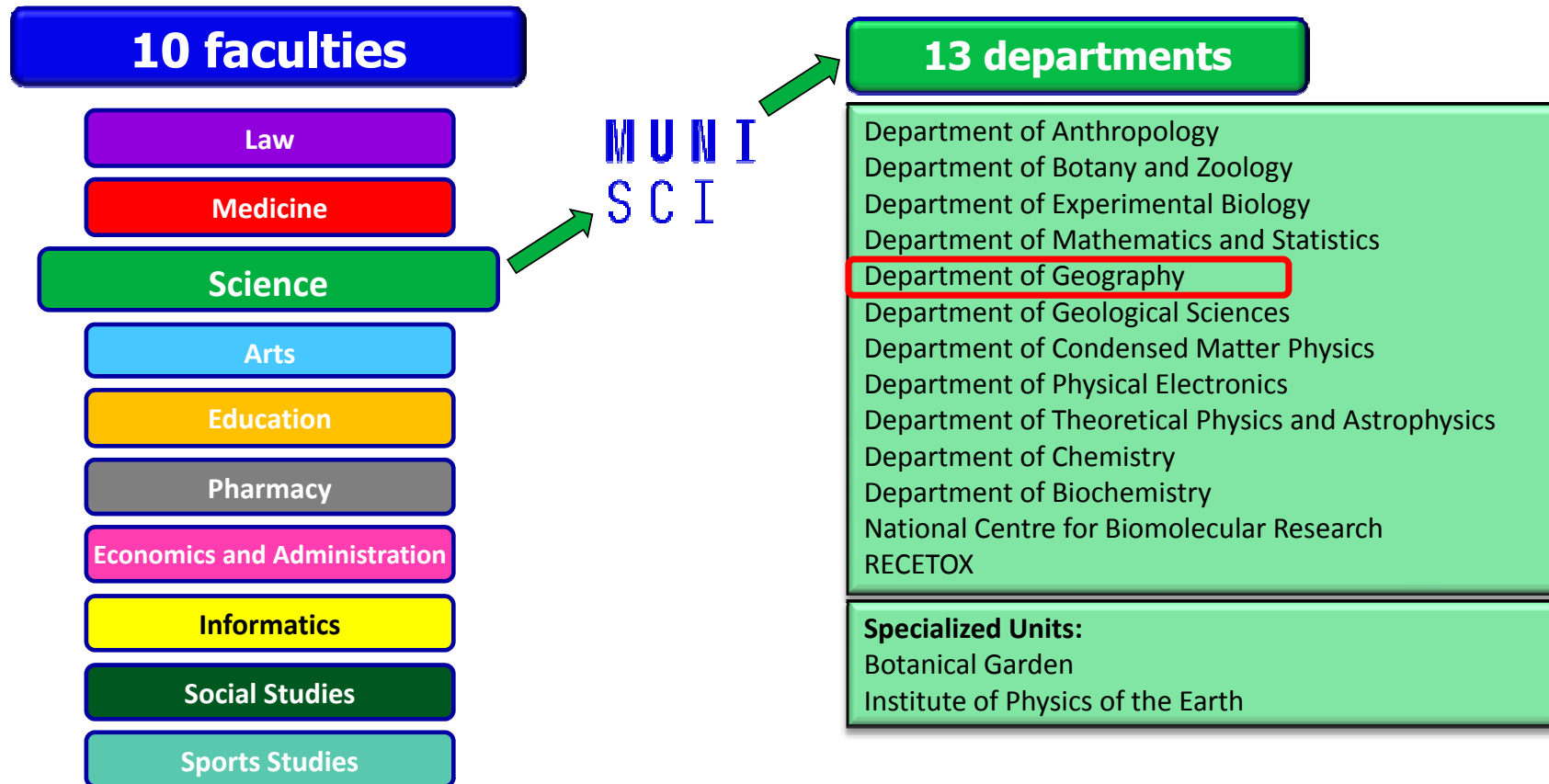
- 2<sup>nd</sup> largest city in CZ
- 380 000 citizens
- 6 public and 8 private universities
- More than 85 000 students
- Founded in 12<sup>th</sup> century

**B | R | N | O**

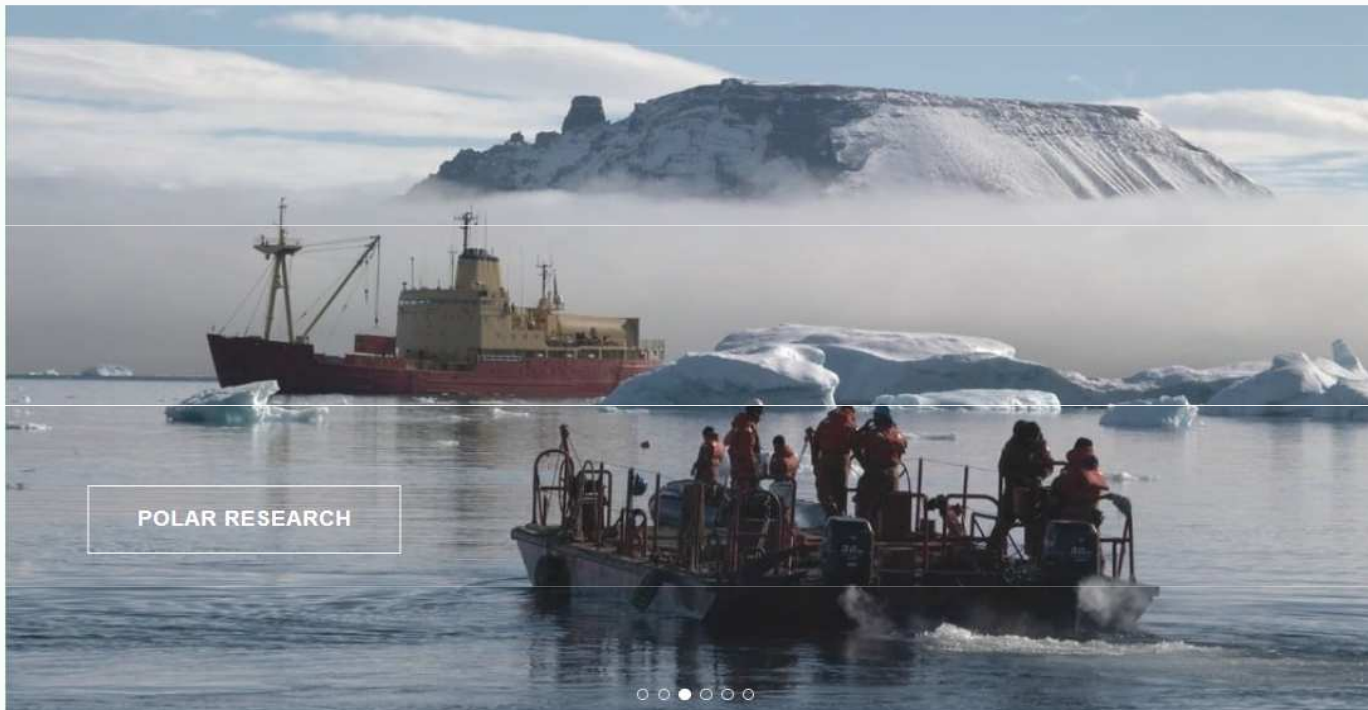
**M U N I**

- 2<sup>nd</sup> largest university in CZ
- 10 faculties
- Approx. 30 500 students
- 21 % international students
- Founded in 1919

# Masaryk University – Faculty of Science



# Department of Geography in a nutshell



# What can you study?

## – Bachelor programmes

- Geography and cartography (with specializations)
- *Geography and cartography (education)*

## – Master programmes

- Physical geography
- Social geography
- Cartography and geoinformatics

## – **Geography of global environmental change (EN)**

## – PhD programmes



# Research groups at the department

## – Physical geography

- Historical climatology
- River Landscape Research Group
- Polar research

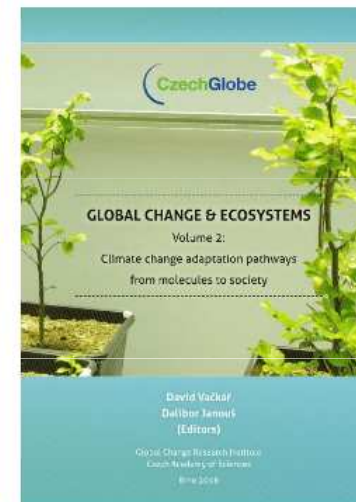
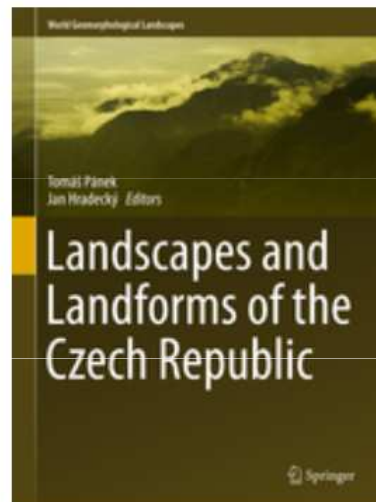
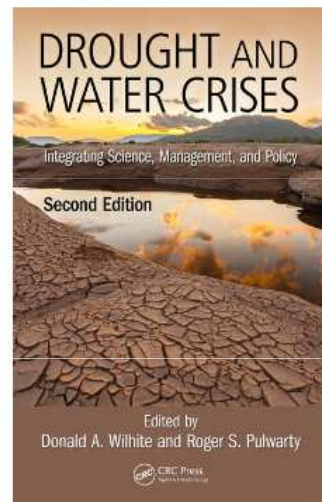
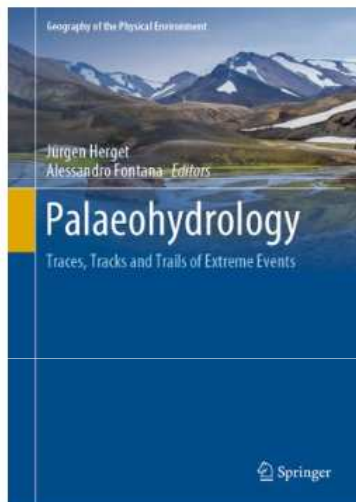
## – Social geography

- Time, Rhythms and Mobilities Research Group
- Border and cross-border cooperation research group

## – Cartography and geoinformatics

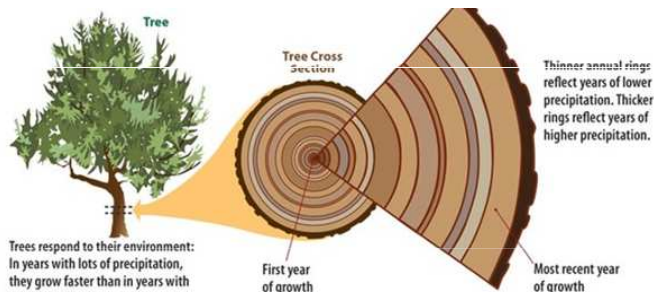
- Laboratory on Geoinformatics and Cartography
- Laboratory of Virtual Geographic Environments
- Precision agriculture and environmental informatics research group

# Physical geography

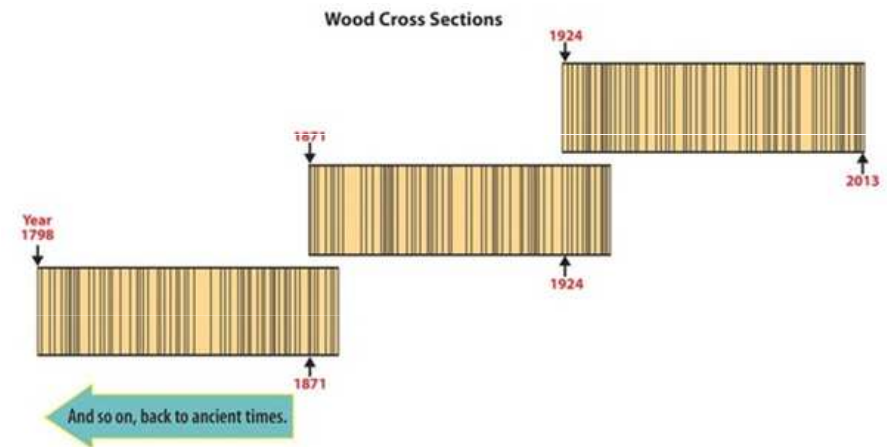


# Physical Geography: Historical climatology

- **HME - Droughts:** priority question in interdisciplinary drought research, drought based on documentary data.
- **HME – Windstorms:** windstorms and forest disturbances in CR (1801-2015),
- **Climate fluctuations and variability:** climate of early modern Europe in 1500-1800, climate reconstruction. Instrumental and proxy data combination.
- **Dendroclimatology:** reconstruction historical precipitation and drought. **Cooperation with Oxford University.**
- **Urban climatology:**, spatial and temporal distribution of urban heat island intensity, urban climate monitoring and urban climate modelling



Scientists build tree-ring chronologies by starting with living trees and then finding progressively older specimens—including archaeological wood—whose outer rings overlap with the inner rings of more-recent specimens.





# PG - River Landscape Research Group (RILAN)

## *Group members (academic staff)*

Zdeněk Máčka, Monika Šulc Michalková, Karel Brabec

## *PhD students*

Dominika Faturová, Simona Koreňová



Assessing water erosion on arable land as a part of sediment budget in small catchments



Mapping sediment sources and the tributary-trunk sedimentary links in the Dyje River fluvial system



# PG - Polar research

Johann Gregor Mendel Station  
James Ross Island  
eastern coast of Antarctic Peninsula



# Czech Antarctic Research Programme

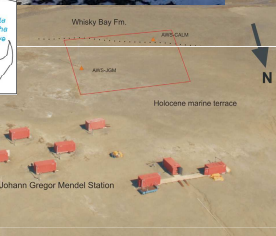
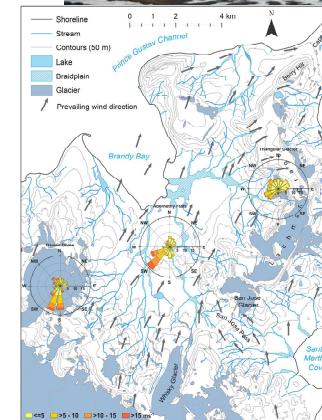
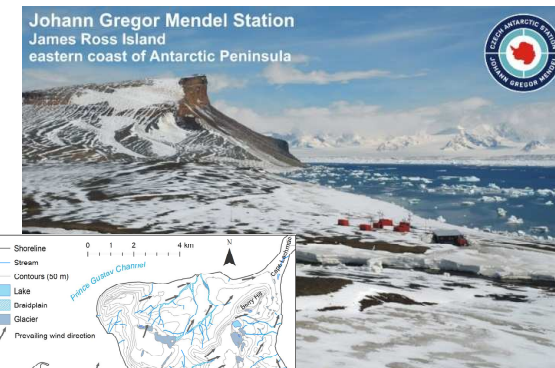
Daniel Nývlt, Head

- Response of Antarctic **geo- and ecosystems** and their components to past, present and future **environmental changes**
- **Mapping** the Antarctic **environment, from geology to wildlife**
- **New Antarctic species** – widening the general knowledge and applications
- **MUNI** with Department of Geography is **the only university in the world, which owns and manages Antarctic research station** – J. G. Mendel Czech Antarctic Research Station on the James Ross Island

**Excellent research covering the following disciplines:**

- geology, geomorphology, palaeontology, geochemistry, meteorology, (palaeo)climatology, permafrost science, pedology, hydrology, glaciology
- botany, ecology, microbiology, plant physiology, soil biology and other

**Wide range of Czech and international collaboration in open access mode**



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# Social geography

rytmy prostor  
každodennost časoprostor  
rutina  
chronotop  
rytmizátor  
mobilita čas  
dostupnost technologie  
chronopolis



## SG Border and cross-border cooperation research

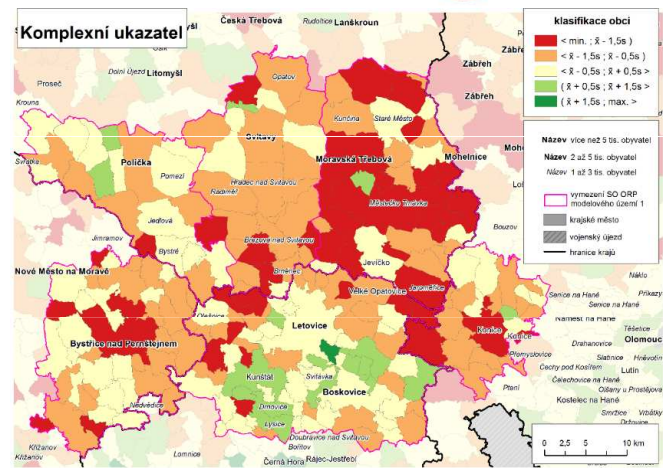
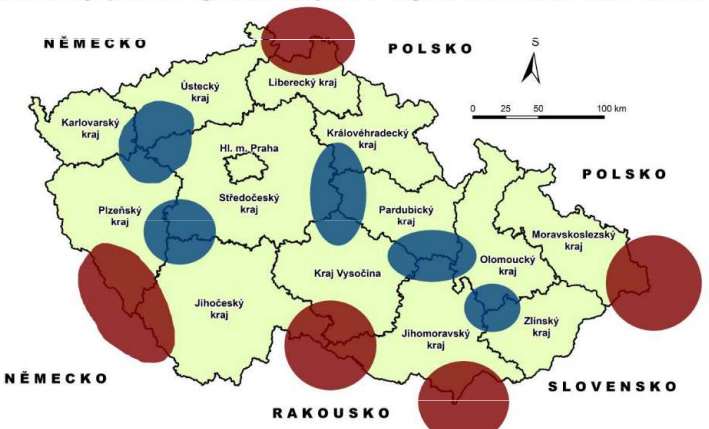
- Czech-Austrian border area/ EU FMP Interreg V-A and AKTION AT-CZ (MŠMT ČR) project.
- Transformation of borderlands on the example of the South Moravian-Lower Austrian region
- CZ-AT: borders - cooperation - partnership – transformation
- The potential of common cultural heritage for cross-border regional development
- Bilateral relations between the metropolises of Brno and Vienna



# Vnitřní a vnější periferie v regionálním rozvoji Česka – od genetické determinace k územní kohezi (TAČR Éta /

## 2 Vnitřní a vnější periferie v regionálním rozvoji Česka - od genetické determinace k územní kohezi

Návrh modelových území pro projekt





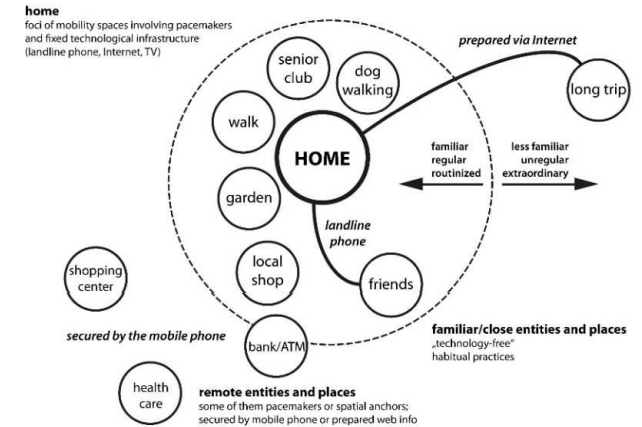
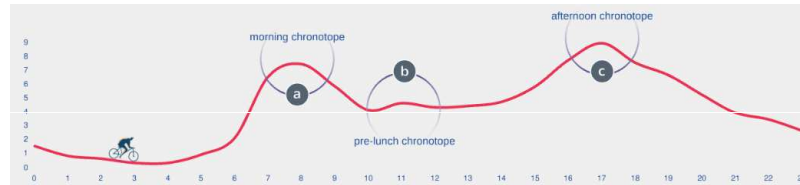
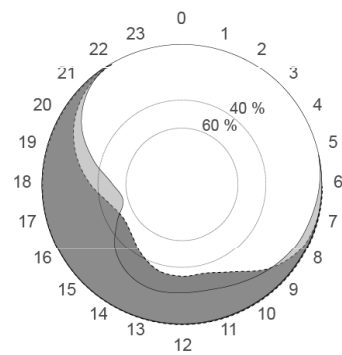
# Social Geography:

## Time, Rhythms and Mobilities Research Group



- focused on exploring **spatio-temporal routines** of everyday life, mainly in urban and metropolitan areas
- the issues of **time, city rhythms and mobilities** integrate disciplines of urban studies, transport geography, spatial planning, disability and technology studies into a comprehensive research framework
- innovative approaches to acquire, analyze and interpret various kinds of **spatio-temporal data** are being developed in order to describe fluid and **dynamic urban patterns**

b) Retail consumption





# Research projects | Publications

## MAPPING EVERYDAYNESS

Exploring the ways in which people conceptualize, organize, perceive, and represent the living space of daily routine activities.

[timespace.city](http://timespace.city)

## STRATEGIC URBANISM

Developing strategic planning tools to mitigate or remove the spatial barriers in public urban space.

[geografieznevyhodneni.cz](http://geografieznevyhodneni.cz)

## APPLIED RESEARCH

Implementing basic research results into the current practice of spatial planning and socio-spatial policy-making.

[brnourbangrid.cz](http://brnourbangrid.cz)

*Stress of Citizens and Entropy in Urban Setting (GAMU) | Modelling Daily Dynamics of Population Present in the Urban Space (TACR) | Compact and Polycentric Urban Forms: Conflicting Spatial Imaginations? (GACR) | Disability geography: visually impaired experience with urban space (GACR)*



GEOMATICA ANNALS: SERIES B, HUMAN GEOGRAPHY  
https://doi.org/10.1080/18618113.2018.1516270

**ORIGINAL ARTICLE**

**Technologies and the representations of activity spaces of older adults**

Ondřej Malíček and Zdeněk Stachová  
Department of Geography, Masarykova Univerzita, Brno, Czech Republic

**ABSTRACT**  
Technology in its various forms, mediates encounters between individuals and the lived time-space. Mobile phones, internet, navigation systems, and advanced transport technologies dramatically change the ways in which space and time are conceptualized, represented, and embedded into societal positions. This paper explores the routine spatiotemporal practices of older adults, who is outside mainstream technology use. Attention is paid to the role of digital technologies in negotiating and representing the everyday activity spaces. We attempt to capture the logic of everyday practices, which is based not only on rational accuracy and habitual spatial thinking but also on a more subtle mix of experiences, possibilities, and fears associated with the use of various technological devices and systems.

**ARTICLE HISTORY**  
Received 11 February 2018  
Revised 15 September 2018  
Accepted 10 September 2019

**KEYWORDS**  
Older adults; technology; activity space; representation; everyday

**Introduction**

There is steadily growing geographic interest in topics related to the spatialities and temporalities of ageing. As Harper and Laws (1993) and Andrews et al. (2009) have noted, there is a great diversity of research areas, scales, and conceptual approaches in this field of inquiry. More recently, Skinner, Clouston, and Andrews (2015) have confirmed that the 'geography of ageing' is prepared to absorb new theoretical developments within contemporary human geography. They have also uncovered 'the hidden geographies of ageing', that is, under-researched but prospective directions and themes, such as the biographies of older people or non-representational geographies of ageing. In this context, scholars also discuss relational approaches with an emphasis on spaces and places of older age as



**Brno Urban Grid**  
brnourbangrid.cz

**Obvykle bydlící obyvatelstvo**  
Vybraná oblast ke dni 26. 3. 2011

Data    Legenda

**3 601** OBYVATEL

**212**    **600**    **1 291**  
MINIMUM    PRŮMÉR    MAXIMUM

**6** BUNĚK V OBLASTI

Změnit datovou sadu

Stáhnout data

Received 2 March 2021 | Received in final form 10 September 2021 | Accepted 12 October 2021  
ISSN 1861-8113

**ARTICLE**

**Chronotopes of urban centralities: Looking for prominent urban times and places**

Radim Liskovec | Marek Lichner | Ondřej Malíček

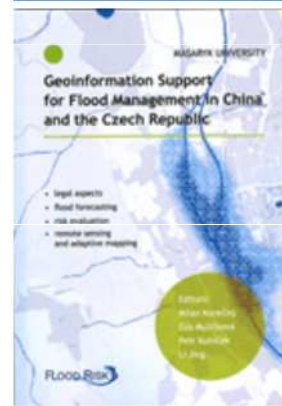
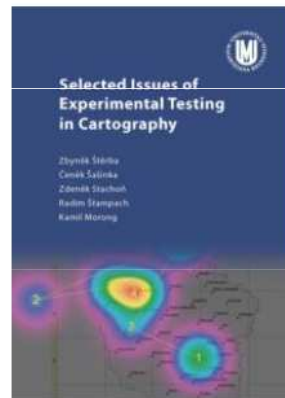
**ABSTRACT**  
The aim of the paper is to discuss an issue of urban centralities not only in spatial but also in temporal terms. We wish to examine the traditional view of urban centralities in multidimensional plans. We argue that prominence of place is closely tied to certain time regimes or rhythms and that some prominent times result from the qualified through certain urban places. We explore the hybrid spatiotemporal nature of urban centrality that emerges from the inseparable coupling of the spatial and temporal dimensions of urban centralities. The paper makes a systematic attempt to formalize and operationalize the concept of urban centralities. The methodology links together a hybrid spatiotemporal approach and the concept of chronotopes. A complex dataset that depicts the aggregated rhythms of people presence in selected locales is employed to demonstrate multiplicity of prominent times present in the contemporary city. The chronotopes are regarded as recurrent situations in which specific urban locales and specific times are intertwined and linked together through the presence of interacting individuals. The chronic spatiotemporal centrality is reflected in the story of the chronotope, describing its rhythm, scale, parameters, and axes.

**KEY WORDS**  
Urban centrality; chronotope; spatiotemporal urban rhythm; urban trajectory

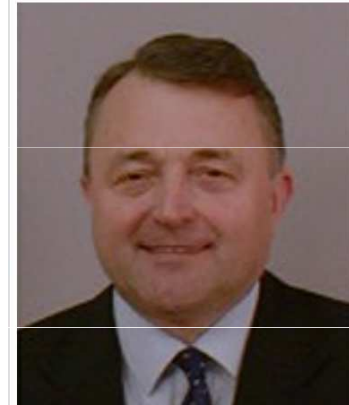
**1 | INTRODUCTION**

The heterogeneity of various urban structures, whether tangible or intangible, and the complexity of human practices give rise to multiple, more or less distinct representations of the city at various scales. When the situation of both local and regional urbanities in the narrow level of political and planning urban models, indicators and problems are represented by the backdrop of more or less representative but more fine-grained conceptual images of the city, transforming the city into an understandable, manageable and plausible system (Tringali & Wallace, 2005). Most abstract representations of cities in some way reflect certain and concrete urban entities and through a set of data, representational modes or high-density

# Cartography, geoinformatics

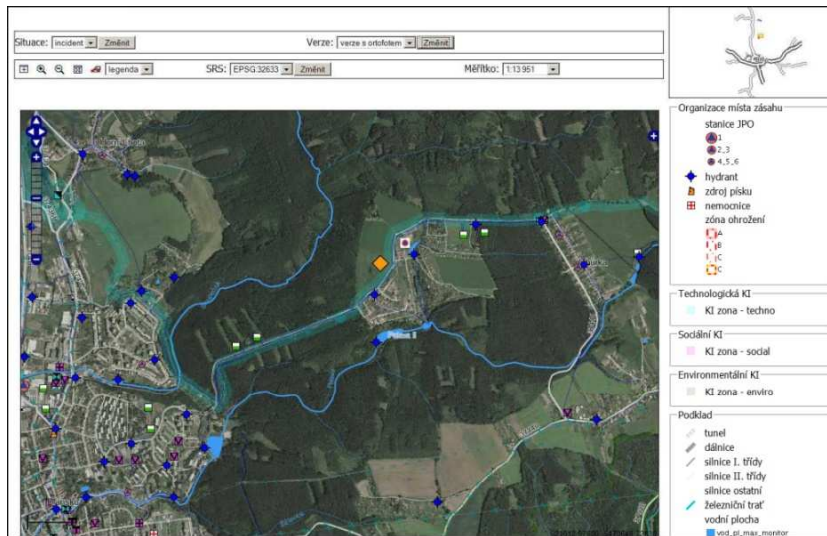


# Cartography, geoinformatics: Laboratory on Geoinformatics and Cartography



## Dynamic Geovisualization in Emergency Management

- ICA commission EWaCM
- Contextual cartography - CWMS
- Near real time support
- Combination of sensor data sources



## Adaptive (contextual) Approach to Web Cartographic Visualization

Map Client



CWMS Server



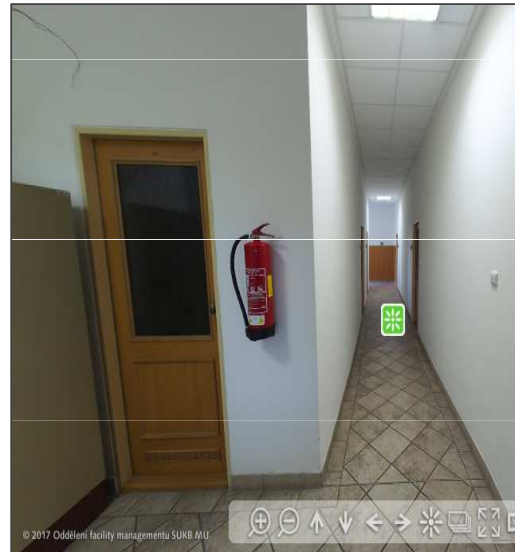
### Description of a context

**SITUATION** = Leak of flammable liquid  
**ROLE** = Firebrigade operator  
**DISPLAY DEVICE** = Color LCD 22"  
...



# CGI – Virtual Geographic Environments Lab

- Empirical studies – users and usability, UX
- Mixed research approach
- Crosscultural studies
- Indoor navigation and evacuation planning
- Virtual Immersive Environments

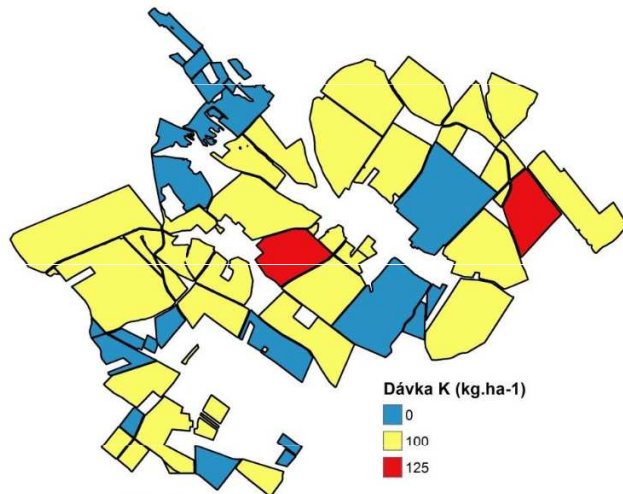


# CGI - Precision agriculture and environmental informatics

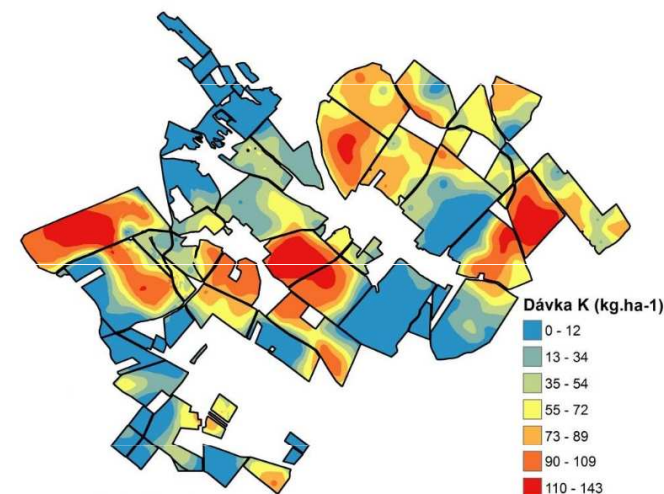
- A way of land cultivation that optimises inputs based on (geospatial) variabilities – better spatial distribution.
  - fertilizers, pesticides, seeds, fuel, ...



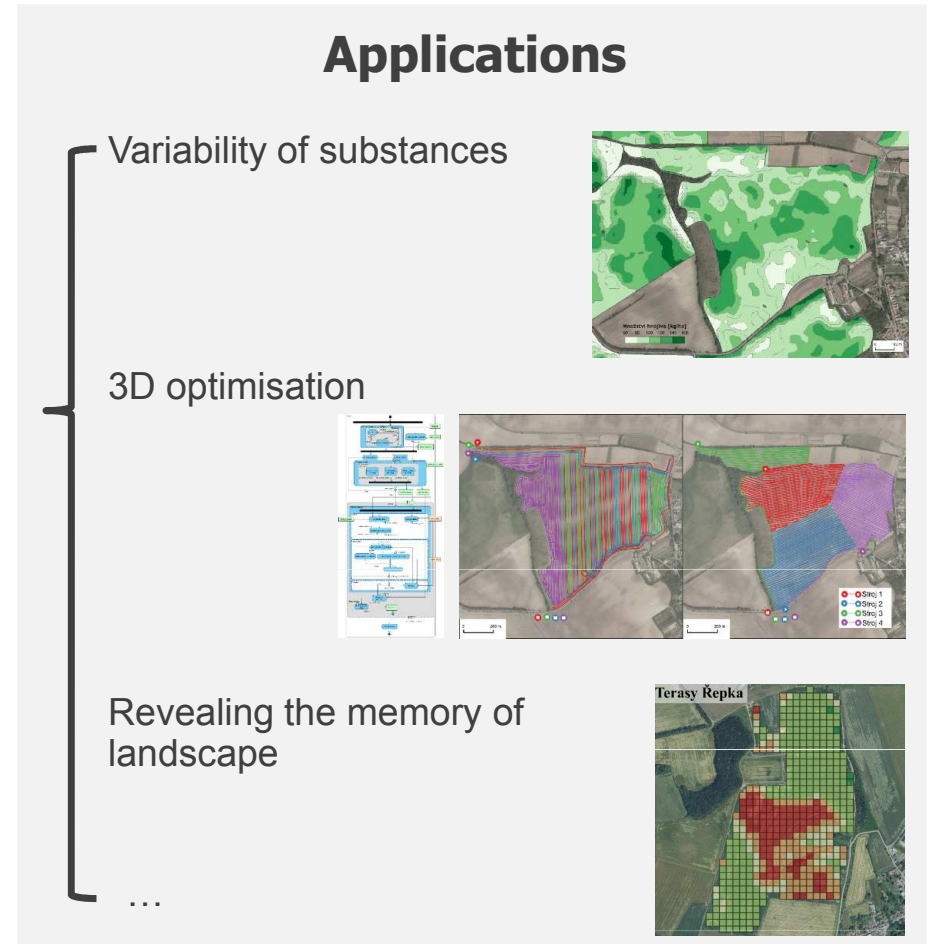
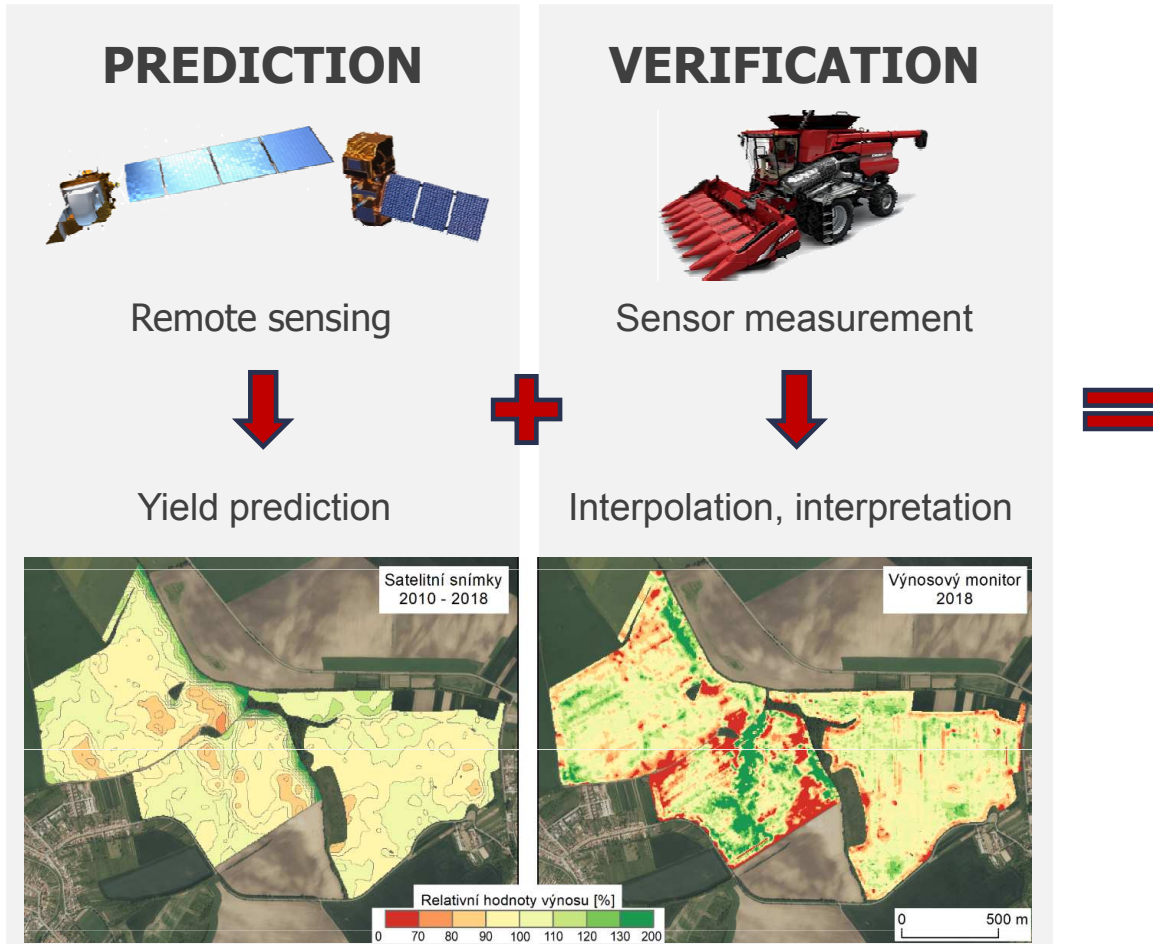
## CONVENTIONAL AGRICULTURE



## PRECISION AGRICULTURE



# Main research directions



# Projects at the department

- basic x applied research
- MUNI – national – international
- Interdisciplinary – FoA, FoI, PdF, ESF.
- Academy of Science – CzechGlobe, Geonika, Institute of Psychology.



Zaměstnanci O pracov  
ce

Rok

2022

Celkový počet projektů: 19

Český antarktický výzkumný program 2022 (VAN 2022)

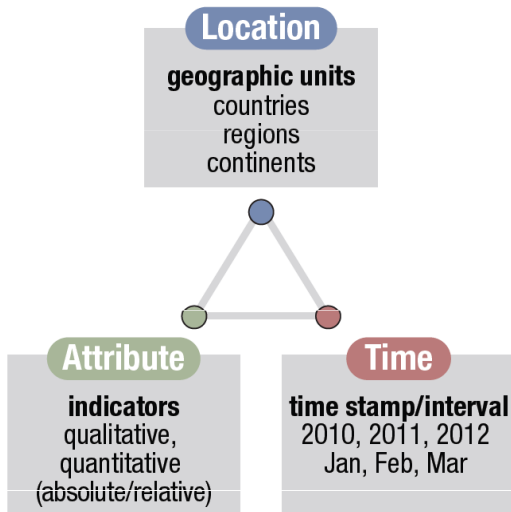
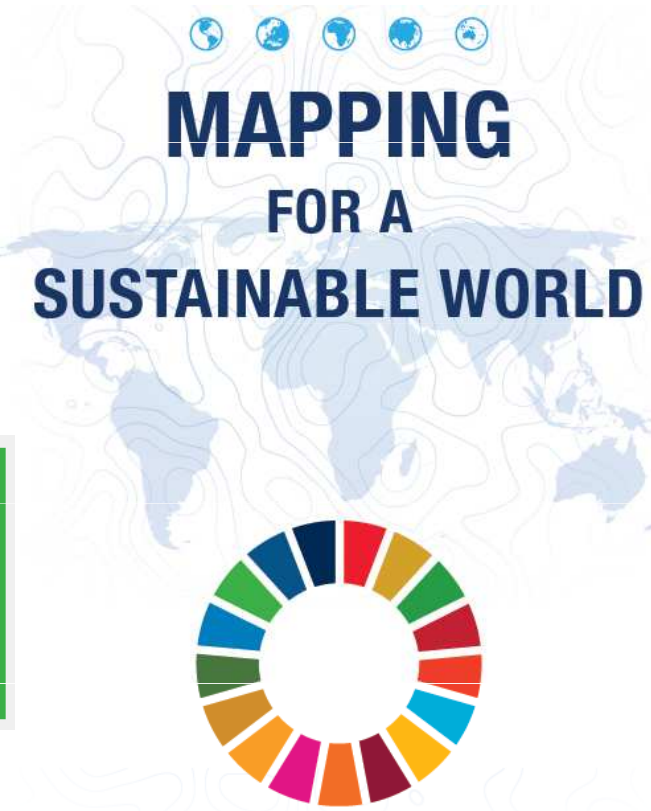


# MUNI strategic plan vision - SDGs



**SUSTAINABLE DEVELOPMENT**

**GOALS**





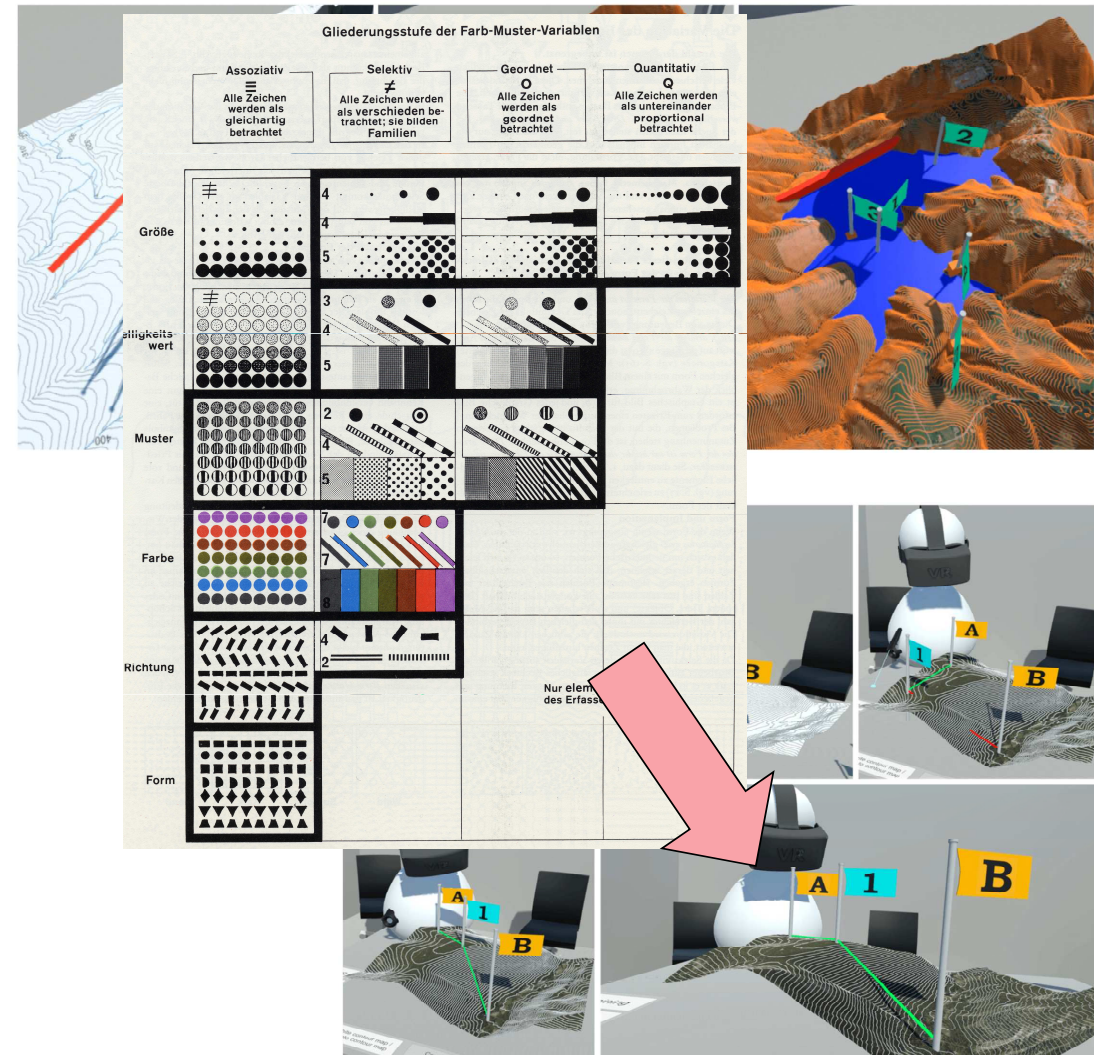
# Future directions

## What?

- PG - climate modeling, urban climate analysis focusing on the spatial adaptation and mitigation measures related to the recent climate change.
- SG – increase the application potential.
- CGI - Cartography and VGEs.

## How?

- **Projects** – concentrate on EXPRO (CZ), HEU, and ERC Advanced Grant.
- **Cooperation** with **urban/metropolitan institutions** (Office of City Strategy, Smart City, Brno City Chief Architect's Office)
- **International** students - MSc. programme in English (**Geography of Global Environmental Change programme**). EDUC.




# Geography department - the World context

## Academic Ranking of World Universities

SHANGHAI RANKING 上海交通大学

Home Rankings **Universities** News Activities 中文版

Universities > Masaryk University



Masaryk University

Region: Eastern Europe  
Country/Region: Czech Republic  
Found Year: 1919  
Address: Zerotinovo nam. 9  
Website: <http://www.muni.cz>

Introduction  
Masaryk University established in 1919 and located

### Academic Ranking of World Universities

401-500 Academic Ranking of World Universities

601-700 2021 401-500 2022 401-500 2023

### Global Ranking of Academic Subjects

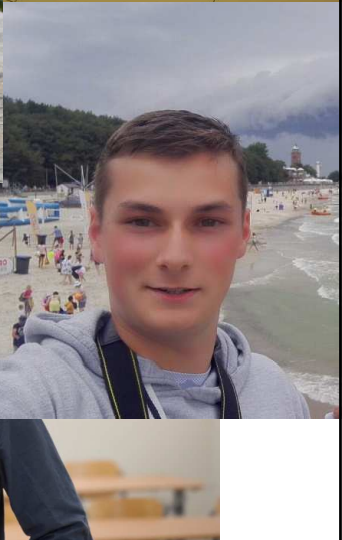
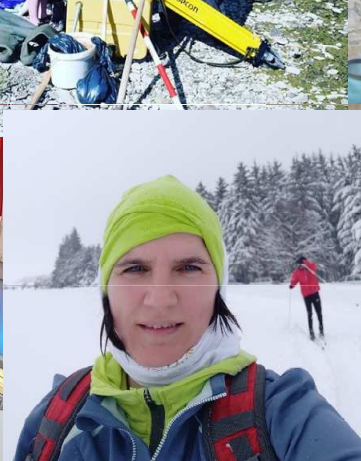
All Subjects All subjects

Subject	Rank
Earth Sciences	301-400
Geography	151-200
Ecology	201-300
Environmental Science & Engineering	151-200
Biotechnology	401-500
Biological Sciences	401-500

### Best Ranked Subjects

Subject	Rank
Geography	151-200
Environmental Science & Engineering	151-200
Ecology	201-300
Law	201-300
Earth Sciences	301-400
Agricultural Sciences	301-400
Medical Technology	301-400
Political Sciences	301-400

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