

**MUNI**  
**SCI**

# **Masaryk University, Department of Geological Sciences - Experience with projects and CRM**

Assoc. Prof. Jan Cempírek, Ph.D.

# Dept. Geological Sciences, Masaryk University

**Who we are:** Dept. Geological Sciences has ca. 30 full-time staff and ca. 30 researchers

**What we do:** full range of geological sciences (economic geology, petrology, mineralogy, palaeontology, sedimentology, hydrogeology, engineering geology, geochemistry, applied and environmental geology, ...)

## Whom we teach:

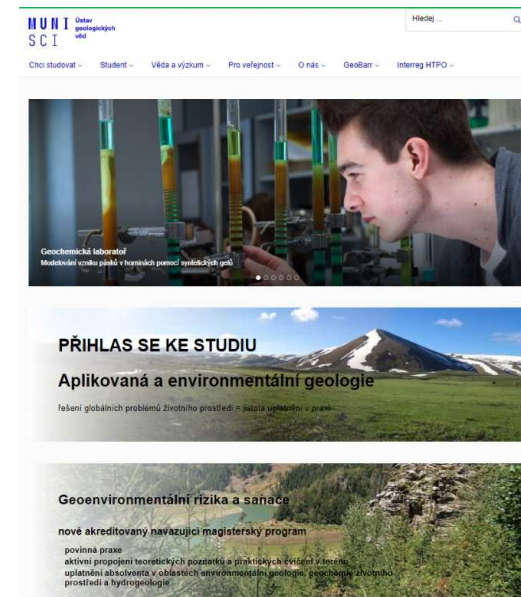
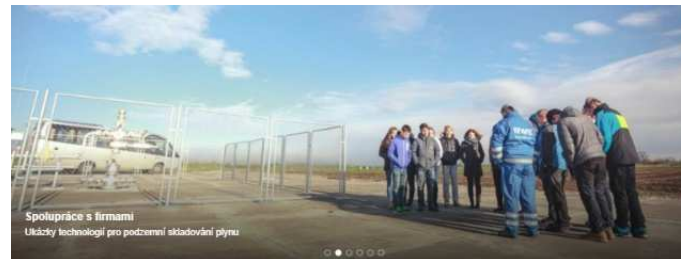
Bc. degree programs – cca. 120 students

Mgr. degree programs – cca. 60 students

Ph.D. degree programs – cca. 70 students

## How we teach:

emphasis on cooperation with industry  
and practical skills, GIS, modelling



MUNI  
SCI

# Projects we work on

- applied projects (typically with partners, EU-funded or TAČR)
- primary research (Grant Agency of the Czech Republic)
- contract research and services for industry

# Applied Projects

**Project Identification**  
CZ.02.1.01/0.0/0.0/16\_026/0008459

**Project Period**  
8/2018 - 12/2022

**Investor / Programme / Project type**  
[EU - Ministry of Education, Youth and Sports of the CR](#)

**Long-term research of geochemical barriers for nuclear waste disposal (GeoBarr)**

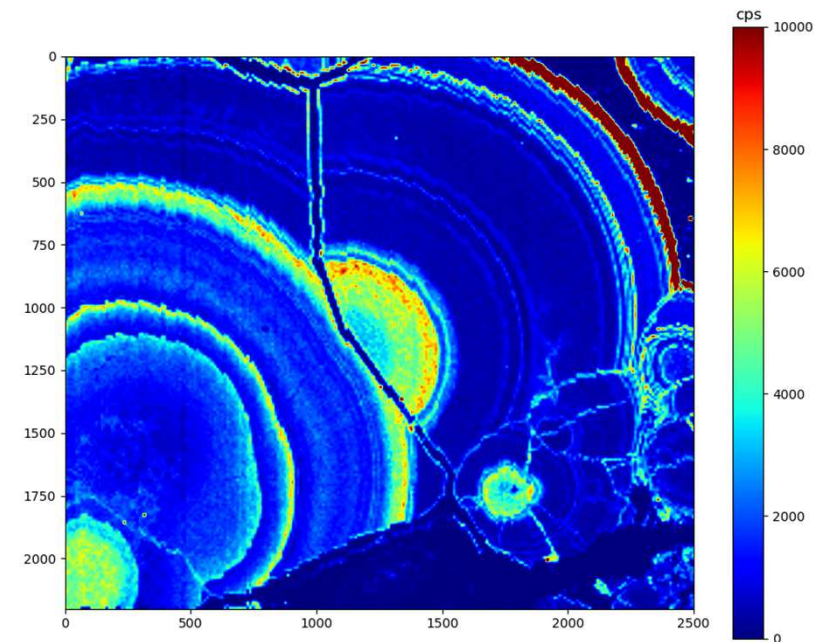
Lead Partner: MU

Government partner: Czech Radioactive Waste Repository Authority (SÚRAO)

Industry partner: DIAMO a.s.

Budget: 1.78 mil. €

Research of geochemical barriers - geological environment and its geochemical properties that block migration of uranium from the repository site to the environment.



REE contents in uraninite mapped using LA-ICP-MS



EVROPSKÁ UNIE  
Evropské strukturální a investiční fondy  
Operační program Výzkum, vývoj a vzdělávání



MINISTERSTVO ŠKOLSTVÍ,  
MLÁDEŽE A TĚLOVÝCHOVY

# Applied Projects

**Project Identification**  
ATCZ167

**Project Period**  
9/2018 - 8/2021

**Investor / Programme / Project type**  
[Ministry for Regional Development of the CR](#)  
INTERREG V-A Austria-Czech Republic

## Hydrothermal potential of the area: Laa a.d.Thaya-Pasohlávky

Lead Partner: MU

Partner organizations:

Zentralanstalt für Meteorologie und Geodynamik (ZAMG)

Geologische Bundesanstalt (GBA)

Budget: 1.16 mil. €

Project aimed on origin, capacity and potential use of cross-border thermal water deposits in the region Laa – Pasohlávky, including possibilities of common management steps for their use.

The project evaluates distribution of the thermal waters in a complex geological model and assesses their use or eventual use conflicts.



# Applied Projects

**Project Identification**  
CZ.1.07/2.4.00/31.0019

**Project Period**  
2/2012 - 1/2014

**Investor / Programme / Project type**  
[EU - Ministry of Education, Youth and Sports of the CR](#)

## **Partner network for cooperation and applications in geoenvironmental and geotechnical fields (PasGeo)**

Lead Partner: MU

Partners: Těžební unie s.r.o.

Moravské zemské muzeum

Cooperation: Czech Geological Survey, DIAMO a.s.,  
RWE, MND, RWE, SÚRAO

Budget: 0.81 mil. €

Extension of cooperation in applied research and student exchange of the Masaryk University with its industry, non-profit and government partners.



EVROPSKÁ UNIE  
Evropské strukturální a investiční fondy  
Operační program Výzkum, vývoj a vzdělávání



MINISTERSTVO ŠKOLSTVÍ,  
MLÁDEŽE A TĚLOVÝCHOVY

**MUNI**  
**SCI**

# Other applied projects

MU role	Provider	Project title	MU budget
Lead Partner	Norwegian Funds and Ministry of the Environment of the Czech Republic	Carbon Capture & Storage – Sharing Knowledge and Experience.	292 500 €
Partner	Ministry of the Environment of the Czech Rep.	Preparation of a research pilot project of geological storage of CO <sub>2</sub> in the Czech Republic.	61 600 €
Partner	Technology Agency of the Czech Rep. (TAČR)	Production of mullite grit in shaft furnace.	32 000 €
Partner	Technology Agency of the Czech Rep. (TAČR)	Development of dinas with optimized properties with emphasis on corrosion resistance.	18 000 €

## Energy and Raw Material Security and Infrastructure (GAMU project)

- scientific and applied research in exploration and mining of energy raw materials (uranium, oil, gas) with **focus on social aspects (local acceptance and opposition)**

# Projects in CRM – primary research

Project	Years	Topic	CRMs	Budget
GA14-13347S	2014-2016	Light elements (Li, Be, B) variability in selected rock-forming and accessory minerals from felsic magmatic and metamorphic rocks	Li, Be, (Sn, Ta, Nb)	248 000 €
GA17-17276S	2017-2019	Tourmaline – indicator of geological processes	Li (Sn, Ta, Nb)	267 000 €
GA19-05198S	2019-2021	Greisenization and albitization - geological processes with potential to concentrate critical raw materials for modern technologies	<b>Li, Sn, W, Sc, Nb, Ta</b>	259 000 €

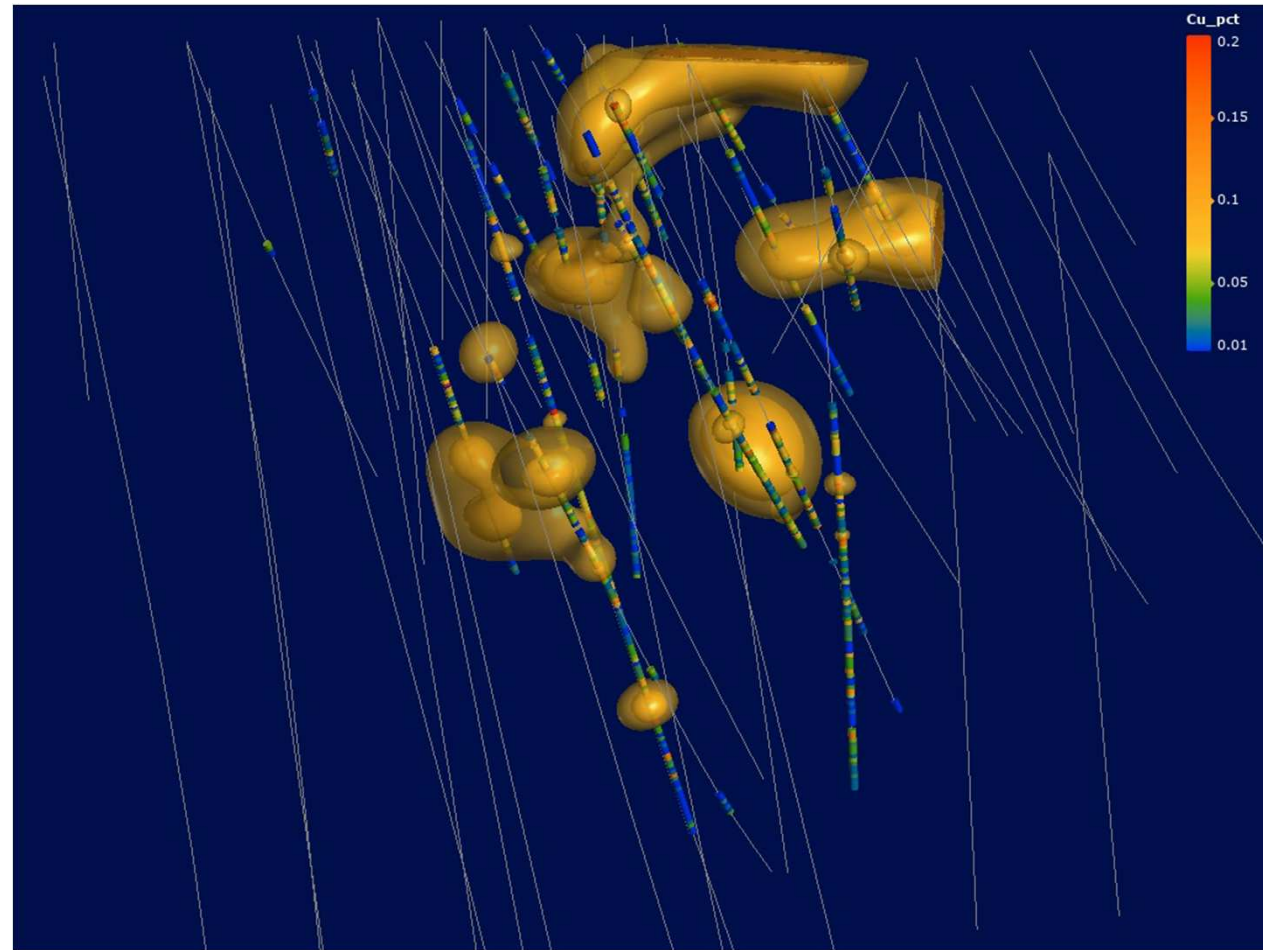
## Key to success:

- intensive international cooperation
- publications in excellent international peer-reviewed journals
- use of advanced analytical techniques



# Other activities in Raw Materials

Use of Leapfrog Geo and Leapfrog Edge professional mining software for 3D modelling of mineral deposits



# Other activities in Raw Materials

BSc., MSc. and Ph.D. theses on topics related to the CRMs

- tungsten mineralization in the Bohemian-Moravian Highlands,
- topics with cooperation with exploration company at the Cínovec Li-Sn-W-(Sc-Rb) greisen deposit
- 3D model of Křižanovice Cu-Zn-Pb-Ba
- research of source of In anomaly in the Havlíčkův Brod mining district
- metamorphosed Sn mineralization in Svatka Crystalline Unit
- lithium-bearing pegmatites, their origin and rare-element mineralization
- ...

# Other activities in RM

- Active SEG (Society of Economic Geologists) Student Chapter - education, field exploration workshops, excursions focused on mineral deposits.



*Joint excursion of Brno and Freiberg SEG student chapters, 2019*



*Brno SEG student chapter excursion to Poland, 2018*

# MU and projects - summary

- strong experience with **industry projects and international projects**
- long-term **research excellence** in selected CRMs
  
- our activities are well supported by advanced **analytical techniques** (at the Dept.Geol.Sci, other departments at MU, and CEITEC - Central-European Institute of Technology)
  
- **extensive international cooperation** for techniques we currently do not have (e.g. isotope geochemistry, specialized analytical and spectroscopic techniques)
  
- cooperation with **industry** (both education and projects)

**Thank you for your attention**