

15th

# GARRM

RADON v.o.s. and Czech Geological Survey organize the

## **15<sup>th</sup> INTERNATIONAL WORKSHOP GARRM** (on the GEOLOGICAL ASPECTS OF RADON RISK MAPPING)

**September 21<sup>st</sup> – 23<sup>rd</sup>(24<sup>th</sup>), 2021**

**Prague, Czech Republic**

**and**

**RIM – Radon Intercomparison**

**Measurements at Radon Reference Sites**

**September 20<sup>th</sup>, 2021**

(it is certainly possible to participate both in the Workshop and in RIM, or only in the Workshop or only in the RIM)

**+ piece of news:**

**Possibility of calibration of radon in soil gas devices in Certified laboratory SUJCHBO, v.v.i. Kamenna**

**WEBPAGE: [www.radon.eu/workshop2021](http://www.radon.eu/workshop2021)**

### **IMPORTANT DATES AND DEADLINES**

Deadline for paper submission & for lower registration fee: July 26, 2021

### **PROGRAMME**

**September 20<sup>th</sup>** (Monday): Registration for RIM (in the field in the morning, will be arranged via e-mail with all participating groups) + Field measurements

Registration for Workshop (18,00-21,00) - venue

**September 21<sup>st</sup>** (Tuesday): Registration for Workshop (8,00-9,30), Sessions

**September 22<sup>nd</sup>** (Wednesday): Sessions, workshop dinner

**September 23<sup>rd</sup>** (Thursday): Sessions, Roundtable discussions, conclusions

**September 24<sup>th</sup>** (Friday): Field excursion, optional

**+ .. throughout:** Possibility of calibration of radon in soil gas devices

### **ORGANIZING COMMITTEE:**

**Workshop:** Matej NEZNAL (RADON), Ivan BARNET & Petra PACHEROVA (CGS)

**RIM:** Milan MATOLIN (Charles University in Prague), Matej NEZNAL (RADON)

**Calibration Kamenna:** Petr OTAHAL (SUJCHBO), Matej NEZNAL (RADON)

## WORKSHOP GARRM - GENERAL INFORMATION

### TOPICS

#### **RADON RISK MAPPING AND RADON ACTION PLANS**

- **NATIONAL STRATEGIES, RADON ACTION PLANS, APPROACHES TO RADON RISK; RADON RISK MAPPING ON VARIOUS SCALES INCLUDING GEOGENIC MAPPING & DETAILED MEASUREMENTS; DELINEATION OF RADON PRONE/PRIORITY AREAS; RESEARCH ACTIVITIES AND RESULTS**

#### **RADON IN GEOLOGICAL ENVIRONMENT**

- **METHODS OF MEASUREMENTS AND CLASSIFICATION OF RADON RISK; PASSIVE AND ACTIVE SOIL GAS SAMPLING; PERMEABILITY AS THE SECOND DECISIVE PARAMETER FOR RADON POTENTIAL ASSESSMENT; UNDERSTANDING RADON TRANSPORT MECHANISMS IN THE SOIL AND FROM THE SOIL INTO THE BUILDINGS; RESEARCH ACTIVITIES AND RESULTS, MULTIPARAMETRICAL MODELS; EARTHQUAKE PREDICTION; RADON AS A NATURAL TRACER; RADON IN KARST AREAS, RADON IN MINING AREAS**

Due to our common experiences from last workshops, we would like to ask you for oral presentations (15 min) or posters.

For the closing day of the workshop, we would like to prepare meaningful roundtable discussions, where we would like to discuss following topics:

**MACHINE LEARNING/RADON MAPPING – possible predictors, assignment of geological data to a grid cell;**  
**RADON & ANTHROPOGENIC EFFECTS;**  
**LESSON LEARNED FROM THE EUROPEAN ATLAS OF NATURAL RADIATION PUBLICATION**

### VENUE

The conference will be held in the beautiful city of Prague, capital of the Czech Republic, at the conference hall of the Masarykova College, the Czech Technical University (the same as in 2006 and 2018). The Masarykova College is located in the western part of central Prague, near the Prague Castle, the dominant symbol of Prague, in the direction to the Ruzyně airport, close by to the Dejvicka underground station (line A). It is also well served by tram and buses. The best way to reach the venue from the airport is to use the bus No. 119 (it has a stop at terminal 1 and 2 as well), which goes from the airport to the Veleslavin underground station and then use the underground line A (two stations) to the mentioned Dejvicka underground station.



## Masarykova college

Thakurova street No.1, 160 41  
Prague 6



## ACCOMMODATION

On site accommodation (i.e. directly at the Masarykova College, medium/low price) is possible but limited in number.

You can try to book via e-mail: [mkrezervace@suз.cvut.cz](mailto:mkrezervace@suз.cvut.cz) or via booking.com

The direct neighbourhood has also a large number of excellent hotels, pensions, hostels, which you can find via internet (we recommend to concentrate on accommodation in the central parts of Prague – Prague 1 and/or Prague 6).

## RIM - GENERAL INFORMATION

**Compare your radon measurement with the international community in friendly field environment - comparison measurement of radon in soil gas at radon reference sites in the Czech Republic**

**Radon comparison measurement at reference sites** in the Czech Republic, RIM 2021, will be organized as an independent part of the International Workshop on the Geological Aspects of Radon Risk Mapping on September 20<sup>th</sup>, 2021. Comparison measurements at reference sites serve for verification of field radon measurements performed by single organizations.

**Radon intercomparison measurement will be organized at two reference sites** Cetyne and Buk established in 2000, located 60 km SW of Prague near the city Milín in the Czech Republic. Both reference sites are accessible for cars. Radon reference sites are situated on meadows, their soil cover enables soil gas sampling at the depth of 0.8 m, and their mutual total distance is 12 km. Each reference site implies 10 stabilized stations, which are marked by numbers. Single reference sites differ in radon activity concentration in soil gas, the radon distribution within the reference site is relatively homogeneous.

**Radon comparison measurements at reference sites** are organized for single participants or groups of participants. **Results of tests will be anonymous, each participant (group) will be denoted by a code.**

**Note:** the fee for the intercomparison measurement depends on the number of resultant sets of radon data from single equipment for testing and on the number of

participants in one measuring group (more detailed info in REGISTRATION FEE and INSTRUCTIONS for PAYMENT).

During this RIM we would like to focus not only on comparison of resulting soil-gas radon concentrations, but on the sampling methods themselves.

**Benefits** of participation in radon comparison measurement are:

- Radon comparison with international expert community.
- Radon comparison with radon site databases derived using measurements of 288 successful Czech organizations.
- The use of two well documented radon reference sites fulfilling geological requirements.
- Based on more than 25-year experience in periodical radon comparison measurement 1992-1999, and 2000-2020.
- Three tests by computer programme TestMOAR based on statistics, compiled by the Institute of Applied Mathematics and Computer Technique, Faculty of Science, Charles University in Prague.

**Working plan** for the comparison measurement: Instruction (via e-mail), transport from Prague (provided on request, we recommend to arrange the transport to the reference sites on an individual basis), meeting at the reference area, measurement of radon in soil gas, reporting of resultant data (kBq/m<sup>3</sup>) from measured stations and reporting results by 2 weeks after RIM measurement by e-mail. Data processing and evaluation by TestMOAR will follow after all participants provide the data. For those who will collect a lower number of measurements at reference sites, programme TestMOAR accepts their number of data.

There is no electrical power supply at radon reference sites, however a power supply generator can be provided on the request. We expect we will meet with all participants in the field in the morning, but transport from Prague can be provided as well.

**Accommodation:** Please, take into consideration, that this year "only" one-day intercomparison is hold. Suitable accommodation, just in the area of radon reference sites, is available in "Hotel u Milina" ([www.hotelumilina.cz](http://www.hotelumilina.cz)).

**Organizers of the RIM 2021 offer the consultation** for your participation in radon comparison measurement through e-mail address [matolin@natur.cuni.cz](mailto:matolin@natur.cuni.cz) or [radon@comp.cz](mailto:radon@comp.cz)

More detailed information will be available at the workshop webpage, details will be discussed with all participants of RIM via e-mail.

## **CALIBRATION OF RADON IN SOIL GAS DEVICES**

***Possibility of calibration of radon in soil gas devices in Calibration laboratory  
SUJCHBO, v.v.i. – the accredited Calibration protocol***

**Calibration Laboratory SUJCHBO, v.v.i.:** National Institute for Nuclear, Chemical and Biological Protection (SUJCHBO, v.v.i.) is certificated by Lloyd's Register Quality Assurance according to standards ČSN EN ISO 9001 - quality management system, ČSN EN ISO 14001 - environmental management system, ČSN ISO 45001:2018 - safety management system.

The Authorized Metrological Centre (AMC) working under SUJCHBO v.v.i. ensures the metrological traceability for devices measuring the radon air concentration and the energy equivalent radon concentration connected with the radon decay products (RnDP). The AMS laboratory is authorized by the UNMZ (Czech office for standards, metrology and testing). Calibration Laboratory is accredited by the Czech Institute for Accreditation according to the standard ČSN EN/IEC 17025:2018 and certificated by Lloyd's. Following the metrological traceability, the AMC is on the same metrological level as BfS Berlin. These two institutions compare results periodically and cooperate in some international research projects.

**Working plan for calibration:** Expected time schedule differs for continual radon monitors and for grab sampling devices.

**In case of continual monitors,** a responsible person from SUJCHBO will pick up the participant's continual monitors at reference site Buk on Monday, September 20<sup>th</sup>, 2021, after the RIM intercomparison comparison measurement. It is necessary to prepare some similar operation manual and pack it for transport together with owner's contact data. Devices will be exposed in the Radon-aerosol chamber of SUJCHBO under two different levels of radon activity concentration. On Thursday, calibration of continual radon monitors will be completed and the responsible person from SUJCHBO will transport participant's devices back to Prague (GARRM venue). Participant will download data from the device and send results from two expositions no later than one month after the calibration. Time of each exposition will be sent to participants briefly after the calibration process. Based on the participant's results, SUJCHBO will send the accredited Calibration protocol to each participant forthwith.

**Grab sampling radon in soil gas devices** – on Friday, September, 24<sup>th</sup>, at about 8,00 in the morning; we will organize the transport of interested persons + equipment from Prague to the Calibration laboratory of SUJCHBO, Kamenna. Participants will take samples of the air from prepared sampling rubber tires with three different levels of radon activity concentration. Because of limited volume of air in the sampling rubber tires, participants can take at most four 150 ml samples (600 ml together) from each level of radon activity concentration. Expected time of arrival back to Prague: Friday, September 24<sup>th</sup> at about 14,00 – 15,00 in the afternoon. Participants will send the results of three levels of radon activity concentration no later than one month after the calibration. Based on the participant's results, SUJCHBO will send the accredited Calibration protocol to each participant forthwith.

**Note: Limits of participants/devices number** – due to the time schedule and due to the special price for calibration as well, there are limits of participants/devices for the calibration:

- continual monitors: 5 – 15 devices
- grab sampling devices: 5 – 15 devices

So, please take into account, that the number of participants is limited!

## **WORKSHOP FIELD EXCURSION**

**Workshop field excursion will be organized on Friday at the end of the workshop (an optional activity with a special fee).**

Expected time of departure – Friday, September, 24<sup>th</sup>, at about 8,30 in the morning; expected time of arrival to Prague - Friday, September 24<sup>th</sup> at about 17,00 – 18,00 in the evening.

More detailed information will be available at the workshop webpage.



## **REGISTRATION FEE and INSTRUCTION for PAYMENT**

The registration fee for the workshop (**390 €** if paid after July 26, 2021, **350 €** if paid before) covers the workshop program, the book of abstracts, refreshments during the sessions and the workshop dinner. Accommodation is not included in the registration fee.

The fee for the field excursion – optional activity – (**90 €** if paid after July 26, 2021, **80 €** if paid before) covers the whole excursion.

The fee for RIM – (**370 €** if paid after July 26, 2021, **340 €** if paid before) means a fee for an independent participant or for two participants in one measuring group using one equipment/measurement and sampling technique. The fee for each another one (third, fourth ..., participant in the same measuring group) is **60 €**. The fee for each another measurement/equipment/sampling technique used by the same participant/group (involved in final testing) is **280 €**. Accommodation is not included in the registration fee.

The fee for Calibration – (**300 €** if paid after July 26, 2021, **270 €** if paid before) means a fee for calibration of one piece of equipment (continual radon monitor or grab sampling device).

VAT is 21% and is included in the fees. VAT number of the beneficiary is CZ00473316

In order to confirm your registration, a proof of payment (photocopy of bank transfer) should be sent to RADON v.o.s. (via e-mail: [radon@comp.cz](mailto:radon@comp.cz)), accepting the given conditions of payment and cancellations. Participants are kindly asked to indicate clearly the name of the person for whom the services are booked in the bank document sent. Payments can only be accepted in Euros.

Cancellation and requests for refunds should be made in writing and sent to RADON v.o.s.. Those made before 30 August 2021, will be refunded at 80 % of the original sum. After that date no refunds will be possible. All bank charges will be deducted from the refund. Refunds will be issued after the Workshop (15th October 2021).

**Payment - by bank transfer** (the payee name ... RADON v.o.s.)

**The bank name:** KOMERCNI BANKA

**The bank address:** POBOCKA PRAHA - PODVINNY MLYN, EXP. PALMOVKA  
ZENKLOVA 12/351  
180 00 PRAHA 8  
CZECH REPUBLIC

**Account number:** 35-6485850237/0100

**Swift (BIC):** KOMBCZPPXXX

**IBAN code:** CZ9501000000356485850237

Var.symbol/details of payment: 340121

There would be also a possibility to pay cash at the registration, but those participants should also send us the registration form in advance (the number of participants, especially in case of RIM, calibration and the field excursion, is limited!).

## **CALL FOR PAPERS AND INSTRUCTIONS FOR AUTHORS**

The language of the conference will be English.

Authors are kindly asked to send their contributions (extended abstracts) as camera ready file, e-mail attachment (best in Word 6. or higher, for high quality print, black+white, A4 format, 2.5 cm margins on all sides). Please do not number the

pages. The papers should not extend 7 pages including figures, tables and references.

Contributions (extended abstracts) should be submitted by the 26<sup>th</sup> of July, 2021. The volume of the extended abstracts will be made available (probably on CD and/or USB flash disk) during the workshop.

**For further contacts, please, send us the registration form (via e-mail, or – the easiest way - directly through the workshop webpage). Please fill in your e-mail with attention as it is the most effective way how to contact you.**

## REGISTRATION FORM

I shall take part in - the workshop ... - field excursion ... - RIM ... - Calibration ...

**Name** ..... Mr/Mrs

Full address .....

.....

Phone .....

e-mail .....

**Title of my contribution(s):**

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**Names of participants and number of instruments in one measuring group in case of RIM participation:**

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**Names of participants and specification of instruments (continual x grab sampling) in case of Calibration:**

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**Contact addresses of the organizing committee:**

Matej Neznal, RADON v.o.s. corp., 18000 Prague 8, Novakovyh 6, Czech Republic, phone +420 266314112, e-mail [radon@comp.cz](mailto:radon@comp.cz) or [matej@radon.eu](mailto:matej@radon.eu)