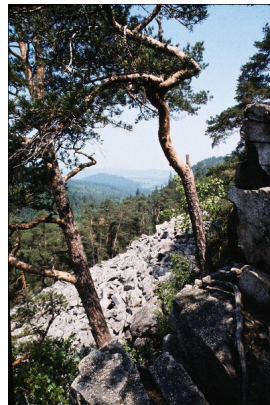




# CONFERENCE PROGRAMME

## International Conference on Groundwater in Fractured Rocks



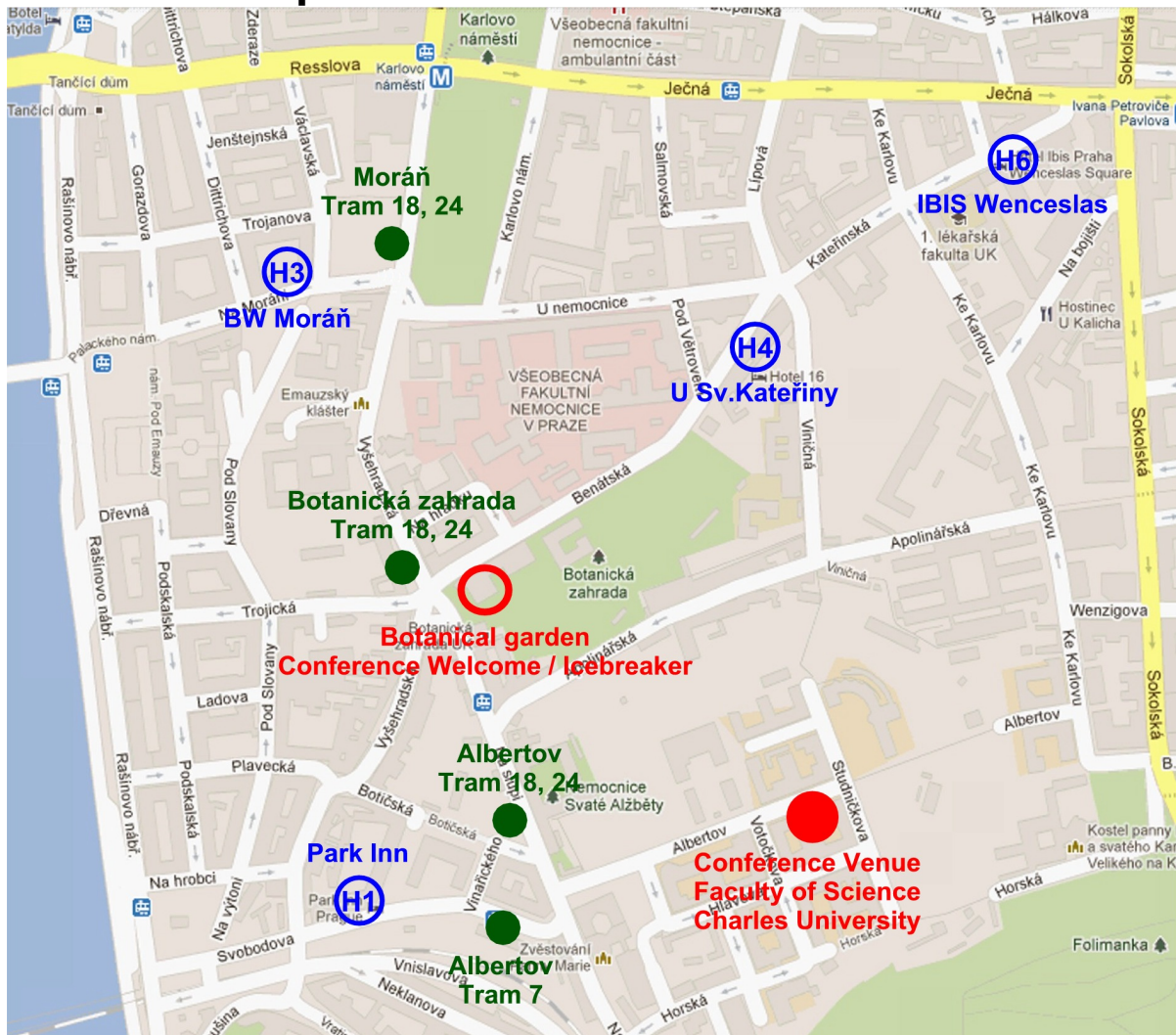
**21 – 24 May 2012**  
**Prague, Czech Republic**

The convening organizations are:

- International Association of Hydrogeologists (IAH), IAH Commission on Hydrogeology of Hard Rocks
- IAH National Chapter of Czech Republic
- International Association of Hydrological Sciences (IAHS)
- Faculty of Science, Charles University (Univerzita Karlova), Prague, Czech Republic
- T.G. Masaryk Water Research Institute (VÚV), Prague, Czech Republic.



## Overview map of conference location



The address of the conference location is:  
Faculty of Science of the Charles University  
Albertov 6 (street)  
CZ-128 43 Prague 2  
Czech Republic

# Groundwater in Fractured Rocks

## Conference Programme

### Overview: Monday-Thursday, 21 – 24 May 2012

Sun 20 May	17.00-20.00 Registration
	18.00-20.00 Welcome / Icebreaker

Mon 21 May	8.30 -	9.00 -	10.00 -	10.30 -	12.30 -	14.00 -	15.30 -	16.00 -	16.45 -
	9.00	10.00	10.30	12.30	14.00	15.30	16.00	16.45	18.15
	Open ing	Session A	☉	Session A and B	☺	Session B	☉	Session B	Plenary visit to posters Coffee, snacks-beer- wine
Posters on display for poster sessions block 1:									

Tue 22 May	8.30-10.00	10.00 -	10.30 -	12.30 -	14.00 -	15.30 -	void	18.00 -
		10.30	12.30	14.00	15.30	16.00		22.30
	Session B	☉	Session B and C	☺	Session D	☉	void	Conference Dinner
Poster session block 1: continuation till the afternoon coffee break								

Wed 23 May	8.30-10.00	10.00 -	10.30 -	12.30 -	14.00 -	15.30 -	16.00 -	16.45 -
		10.30	12.30	14.00	15.30	16.00	16.45	18.15
	Session E	☉	Session E	☺	Session E and F	☉	Session F	Plenary visit to posters Coffee, snacks-beer- wine
				HYROC roundtable				
Posters on display for poster sessions block 2:								

Thu 24 May	8.30-10.00	10.00 -	10.30 -	12.30 -	14.00-15.15	15.15- 15.30
		10.30	12.30	14.00		
	Session F	☉	Session F and I	☺	Session I	Closure
Poster session block 2: continuation						

Regular oral presentations: 15 minutes (suggested 11 + 4 min discussion/questions)

Invited oral presentations: 30 minutes (suggested 25 + 5 min discussion/questions)

☉ is coffee break

☺ is lunch

**The following sessions are distinguished for ORAL presentation:**

**Session A:**

**Hydrogeological structure of fractured rocks**

**Session B:**

**Groundwater flow in fractured rocks**

**Session C:**

**Chemical, physical and isotope properties of groundwater in fractured rocks**

**Session D:**

**Groundwater prospecting, drilling and well construction in fractured rock environment**

**Session E:**

**Investigation and interpretation methods in fractured rock environment**

**Session F:**

**Modelling in fractured rock aquifers**

**Session I:**

**Groundwater protection in fractured rock environment (oral only, no posters)**

**The following sessions are distinguished for POSTER presentations:**

Posters will be grouped into two poster session blocks:

**Poster Session Block 1 (max. 31 posters)**

**Monday-Tuesday, 21-22 May, 16.45-18.15**

*Posters to be installed during the morning of Monday, May 21.*

**Session A: Hydrogeological structure of fractured rocks**

**Session B: Groundwater flow in fractured rocks**

**Session C: Chemical, physical and isotope properties of groundwater in fractured rocks**

**Poster Session Block 2 (max. 20 posters)**

**Wednesday-Thursday, 23-24 May, 16.45-18.15**

*Posters to be installed during the morning of Wednesday, May 23.*

**Session D: Groundwater prospecting, drilling and well construction in fractured rock environment**

**Session E: Investigation and interpretation methods in fractured rock environment**

**Session F: Modelling in fractured rock aquifers**

## **Conference Programme**

### **Sunday, May 20**

#### **Registration (17:00-20:00) and Welcome/Icebreaker (18:00-20:00).**

The **registration** and the **Welcome** of participants (**Icebreaker**) – with music, snacks and drinks – will take place in the greenhouse (glasshouse) of the Botanical Garden of Charles University. The Botanical Garden of Charles University is located close to Karlovo náměstí. The main entrance is

Na Slupi 16 (close to the corner with Benátská street)  
Prague 2 - Nove Mesto  
Czech Republic

**For the map of the location of Botanical Garden of Charles University please refer to page 2.**

**Welcome/Icebreaker, in the Registration area, 18.00-20.00 hours**

**Note that is required to register before Welcome/Icebreaker.**

The numbers at the oral and poster presentations in the programme (e.g. #163) refer to the identification numbers of abstracts, as they appear in the Volume of Abstracts.

### **Monday, May 21**

**Registration**, from 7.30 hours

Authors of the entire day are requested to hand in their USB memory stick or CD-ROM with oral presentation at the registration desk before 8.30 hours. Thank you!

**During the morning put posters on display for Poster session block 1**

#### **Only plenary presentations during the entire conference**

##### **Opening of the Conference**

8.30-9.00 hours

- Welcome on behalf of the Organizers and Czech Chapter of IAH (Zbynek Hrkal)
- Welcome on behalf of the Charles University, Professor Bohuslav Gaš, Dean of the Faculty of Science)
- Welcome by Jiri Krasny (Groundwater in Fractured Rocks 2003)
- Welcome on behalf of the Organizers (Karel Kovar)

## Session A

### Hydrogeological structure of fractured rocks

Chairpersons: Antonio Chambel (Portugal), Patrick Lachassagne (France), **chairs 1**

09.00-9.30 Lachassagne, P. (invited) (abstract #163)

The conceptual model of weathered hard rock aquifers. Its application to the survey, management, modelling and protection of groundwater

09.30-9.45 Vittecoq, B., Dewandel, B. (abstract #36)

Heterogeneity of hydraulic parameters and compartmenting of a volcanic aquifer revealed by long duration pumping tests: Example of the Lamentin aquifer – Martinique FWI

09.45-10.00 Mollema, P.N., Antonellini, M. (abstract #46)

Architecture and fluid flow properties of faults and associated structures in different rock types: Examples from outcrops

**10:00 – 10:30 Coffee break**

## Session A

### Hydrogeological structure of fractured rocks (continuation)

Chairpersons: Antonio Chambel (Portugal), Patrick Lachassagne (France), **chairs 1**

10.30-11.00 Barrocu, G. (invited) (abstract #170)

Groundwater role and integrated water resources management in hardrock areas

11.00-11.15 Compte, J.C., Cassidy, R., Pilatova, K., Nitsche, J., Offerdinger, U., Flynn, R. (abstract #83)

Conceptual modelling of Irish poorly productive hard rock aquifers using integrated hydrogeological approaches – Application to Precambrian metamorphic complexes in Northwest Mayo, Ireland

11.15-11.30 Pino, D.S., Rouleau, A., Roy, D.W., Daigneault, R., Fernades, A.J. (abstract #91)

Joint system and tectonic analysis of a crystalline bedrock aquifer: case study of the Kenogami uplands, Quebec, Canada

11.30-11.45 Roques, C., Aquilina L., Bour, O., Le Borgne, T., Longuevergne, L., Dauteuil, O., Vergnaud, V., Labasque, T., Lavenant, N., Hochreutener, R., Dewandel, B., Mougine, B., Schroetter, J.M., Palvadeau, E., Lucassou, F. (abstract #120)

Hydrogeological and geochemical characterization of a deep hard-rock aquifer (Saint-Brice, French Brittany)

11.45-12.00 Cucchi, F., Zini, L., Visintin, L., Grillo, B., Calligaris, Ch. (abstract #147)

Water flow in a diffuse underground karst context. The case of the Classical Karst (Italy-Slovenia)

## Session B

### Groundwater flow in fractured rocks

Chairpersons: Antonio Chambel (Portugal), Patrick Lachassagne (France), **chairs 1**

12.00-12.15 Mann, V., Novakowski, K. (abstract #6)

Comparison of hydraulic and mass balance apertures of bench-scale vertical fracture samples

12.15-12.30 Montenegro, H., Hekel, U. (abstract #14)

A withdrawal-injection-scheme at a large excavation site under uncertainty from karst-conduit dominated groundwater flow

**12.30-14.00 Lunch**

## Session B

### Groundwater flow in fractured rocks (continuation)

Chairpersons: Giovanni Barrocu (Italy), Philipp Blum (Germany), **chairs 2**

14.00-14.30 **Blum, P., Zeeb, C., Stark, L., Rausch, R., Bons, P. (invited) (abstract #127)**

Fracture flow simulations using satellite images

14.30-14.45 Hartley, L., Joyce, S., Roberts, D., Rhén, I., Selroos, J.-O. (abstract #55)

Hydrogeological discrete fracture network modelling to support site investigations for a final repository for spent nuclear fuel in Sweden

14.45-15.00 Krusic-Hrustanpasic, I., Cosme, F. (abstract #62)

Conceptual model of groundwater flow in a fractured basalt aquifer, south-east Australia

15.00-15.15 Chou, P.-Y., Lin, J.J., Hsu, S.M. (abstract #73)

Spatial distribution of fracture transmissivity of the hard rock aquifer in Central Taiwan: methods of interpretation and the results to date

15.15-15.30 Petitta, M., Tallini, M., Amoroso, A., Crescentini, L., Falcone, R.A., Falgiani, A., Manetta, M., Botta, V., Sbarbati, Ch. (abstract #80)

Groundwater recharge and fracture deformation in the carbonate Gran Sasso Aquifer (INFN underground laboratories, Central Italy)

### 15.30-16.00 Coffee break

## Session B

### Groundwater flow in fractured rocks (continuation)

Chairpersons: Giovanni Barrocu (Italy), Philipp Blum (Germany), **chairs 2**

16.00-16.15 Bauer, F., Alkhaled, A. (abstract #90)

An approach to define the relationship between waterflow direction and tectonics in the catchment of Barada Spring, Syria, using different geophysical and remote sensing methods

16.15-16.30 Rouleau, A., Saedi, A., Gagné, E.B. (abstract #96)

Hydrogeomechanical processes at underground mine sites: Research results and opportunities

16.30-16.45 Farkas, D., Vasvari, V. (abstract #103)

Hydrogeological investigations of the Buda Castle Hill

### **16.45-18.15 Poster Session Block 1, plenary visit to posters, Beer-wine-soft drinks-snacks**

*Posters to be installed during the morning of Monday, May 21.*

**Session A: Hydrogeological structure of fractured rocks**

**Session B: Groundwater flow in fractured rocks**

**Session C: Chemical, physical and isotope properties of groundwater in fractured rocks**

## Tuesday, May 22

### Registration Desk open from 8.00 hours

Authors of the entire day are requested to hand in their USB memory stick or CD-ROM with oral presentation at the registration desk during Monday. Thank you!

#### Session B

##### Groundwater flow in fractured rocks (continuation)

Chairpersons: Werner Balderer (Switzerland), Björn Frengstad (Norway), **chairs 3**

- 8.30-8.45 Bricker, S., Barron, M., Manamsa, K., James, K., Jackson, C., Hughes, A., Peach, D. (abstract #108)  
Geological framework for hydrogeological understanding – Modelling the Middle Jurassic limestone succession of the Cotswolds
- 8.45-9.00 Gargini, A., De Nardo, M.T., Piccinini, L., Segadelli, S., Vincenzi, V. (abstract #121)  
Monitoring and modelling groundwater flow systems in hard rock aquifers: Experiences from northern Apennines (Italy)
- 9.00-9.15 Rai, S.N., Thiagarajan, S., Kumar, D., Ratnakumari, Y., Bulliabai, M. (abstract #123)  
Exploring volcanic rocks for groundwater exploration
- 9.15-9.30 David, K. (abstract #129)  
Use of several different methods for characterising fractured rock aquifer: Case study Kempfield, NSW, Australia
- 9.30-9.45 Pontin, A., D'Alberto, L. (abstract #138)  
Interactions between (partly) karstified and fractured aquifers revealed by continuous monitoring at springs (southern Alps, Feltre, Italy)
- 9.45-10.00 Fendeková, M., Machlica, A., Horvát, O., Fendek, M., Stojková, M., Vrablíková, D., Porubská, D. (abstract #144)  
Estimation and evaluation of groundwater drought in fractured environment

### 10.00-10.30 Coffee break

#### Session B

##### Groundwater flow in fractured rocks (continuation)

Chairpersons: Werner Balderer (Switzerland), Björn Frengstad (Norway), **chairs 3**

- 10.30-10.45 Hokr, M., Balvín, A., Škarydová, I., Rálek, P. (abstract #155)  
Tunnel inflow - fitting the field observations with hybrid model of discrete fractures and continuum

#### Session C

##### Chemical, physical and isotope properties of groundwater in fractured rocks

Chairpersons: Werner Balderer (Switzerland), Björn Frengstad (Norway), **chairs 3**

- 10.45-11.15 Frengstad, B. (invited) (abstract #140)  
Uranium distribution in groundwater from fractured crystalline aquifers in Norway
- 11.15-11.45 Balderer, W., Leuenberger, F. (invited) (abstract #174)  
Short time behaviour of the thermal water of the Brigerbad Thermal Spring south-western Switzerland with respect to chemical and fluorescent properties of the outflowing water
- 11.45-12.00 Jaunat, J., Huneau, F., Dupuy, A., Franceschi, M., Le Coustumer, P., Celle-Jeanton, H. (abstract #86)  
Flow conditions, geochemistry and residence time of groundwater from a gneissic aquifer. Case



- study of the Ursuya Mount, Northern Basque Country (France)  
12.00-12.15 Henry, T. (abstract #106)  
The hydrogeology of the Tynagh Mine area, Galway, Ireland  
12.15-12.30 Strauhal, T., Zangerl, C., Prager, C., Spoetl, C., Brandner, R. (abstract #151)  
Hydrogeochemical characteristics of porous and fractured aquifers in metamorphic rocks  
(Tyrolean Alps, Austria)

### 12.30-14.00 Lunch

#### Session D

#### Groundwater prospecting, drilling and well construction in fractured rock environment

Chairpersons: John Sharp (USA), Shivandra Nath RAI (India), **chairs 4**

- 14.00-14.30 **Chambel, A. (invited)** (abstract #52)  
Groundwater prospecting, drilling and well construction in hard rocks in semi-arid regions: an overview  
14.30-14.45 Davies, J., Robins, N. (abstract #15)  
Groundwater occurrence in weathered and fractured Precambrian Crystalline Basement –  
Compare and contrast studies in Tanzania, Zimbabwe and the UK Channel Islands  
14.45-15.00 Lyle, S., Pedder, R. (abstract #75)  
Integrated geotechnical-hydrogeological field programmes in hard rock open-pit mining environments  
15.00-15.15 Tessema, A., Chirenje, E. (abstract #78)  
The relationship between lineaments and borehole yield around Mafikeng Town, Northwest Province, South Africa  
15.15-15.30 Ball, D.M. (abstract #150)  
Successful water supply borehole design, construction and supervision in fractured rocks

### 15.30-16.00 Coffee break

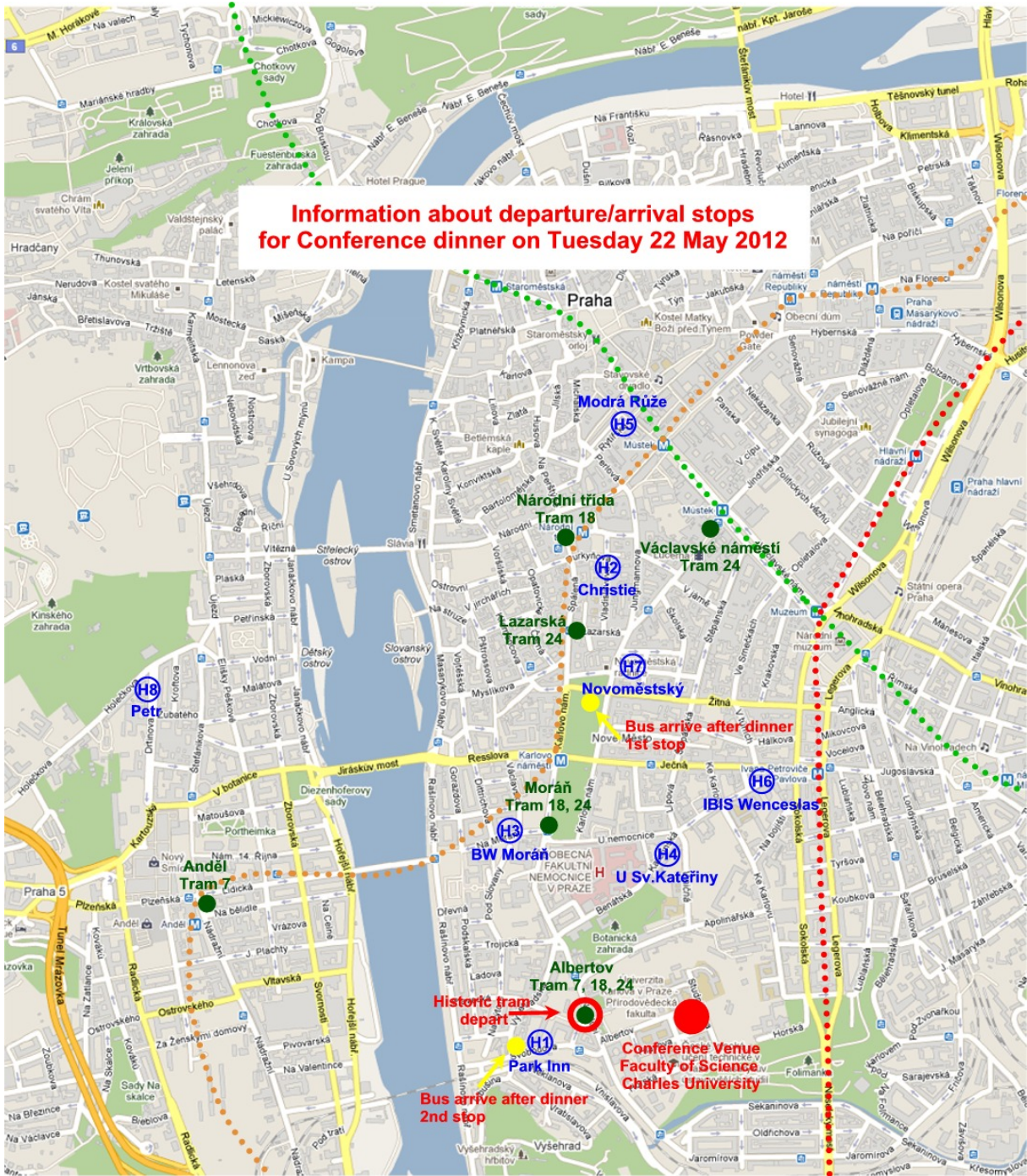
### 18.00-22.30 Conference Dinner

Refer to the map on the next page for relevant locations (**marked in red on the map**).

#### Times important for Conference Dinner:

- 18:00 Meet at the main entrance to **Conference venue**, Albertov 6, Prague 2  
18:10 Short walk from Conference Venue to the Albertov tram stop  
18:20 Trams leave from **Albertov tram stop (“historic tram depart”)**,  
across Prague to Strahov Monastery  
18:50 Arrive to tram stop Pohorelec, walk with English speaking guides to the Strahov Library  
19:00 Guided visit of the Strahov Historic Library & terrace with panoramic view of Prague  
19:30 Buffet dinner with live music  
22:00 Bus transfer from restaurant to the city centre:  
➤ / **1st bus stop** – at the Charles Square (Karlovo namesti) - for guests staying at Hotel Christie,  
Hotel U sv.Kateriny, Hotel Novomestsky, Hotel Modra ruze and Hotel IBIS Wenceslas;  
➤ / **2nd bus stop** – at Park Inn Hotel - for guests staying in Park Inn Hotel.

You will receive detailed instruction on the Conference Dinner when registering for the conference.



## Wednesday, May 23

### Registration Desk open from 8.00 hours

Authors of the entire day are requested to hand in their USB memory stick or CD-ROM with oral presentation at the registration desk during Tuesday. Thank you!

During the morning put posters on display for Poster session block 2

### Session E

#### Investigation and interpretation methods in fractured rock environment

Chairpersons: Gerfried Winkler (Austria), Stanisław Staško (Poland), **chairs 5**

08.30-09.00 Sharp, J.M., Ketcham, R.A. (**invited**) (abstract #171)

Prediction of fracture roughness aperture, and other hydraulic properties: Is upscaling of flow and transport possible?

09.00-09.30 Neuman, S.P. (**invited**) (abstract #50)

Lessons learned from analyses of pneumatic pressure experiments in unsaturated fractured tuffs near Superior, Arizona

09.30-09.45 Dragoni, W., Baiocchi, A., Lotti, F., Piscopo, V. (abstract #49)

Sustainable yield of fractured rock aquifers: the case of crystalline rocks of the Serre Massif (Calabria, southern Italy)

09.45-10.00 Mayo, A.L., Bruthans, J., Himes, S. (abstract #51)

Using heat flow and radiocarbon ages to calculate the recharge zone of thermal groundwater systems in granitoid rocks

### 10.00-10.30 Coffee break

### Session E

#### Investigation and interpretation methods in fractured rock environment (continuation)

Chairpersons: Gerfried Winkler (Austria), Stanisław Staško (Poland), **chairs 5**

10.30-11.00 Staško, S., Tarka, R., Buczynski, S. (**invited**) (abstract #166)

Hydrograph separation as a tool for hard rock hydraulic parameter estimation

11.00-11.15 Libby, J., Robbins, G. (abstract #60)

Characterization of water contributing fractures intersecting a well in crystalline bedrock through monitoring changes in a tracer profile during slug test recovery

11.15-11.30 Zhan, S.S., Song, Z.H., Wang, T.T., Chou, P.Y., Lin, J.J., Chen, P.J., Lo, H.Ch. (abstract #72)

Permeability of fracture planes and fractured rock mass determined from hydrogeological in-situ tests

11.30-11.45 Green, A.R., Langer, V. (abstract #79)

Hydrogeological characterisation of a coastal fractured aquifer by the analysis of tidally induced groundwater fluctuations

11.45-12.00 Richard, S., Chesnaux, R., Rouleau, A. (abstract #87)

Estimating and analysing the transmissivity of fractured rock aquifers in the Saguenay-Lac-Saint-Jean region, Quebec, Canada

12.00-12.15 Parker, B.L., Cherry, J.A., Meyer, J., Quinn, P., Chapman, S.W., Pehme, P. (abstract #99)

Steps in the evolution of the discrete fracture network approach for investigating contaminated sites on fractured sedimentary rock

12.15-12.30 Blandford, T.N., Umstot, T., Marley, R., Wolf, Ch., Bushner, G.L. (abstract #102)

A case study of exploration and characterization of deep fractured rock aquifers for new groundwater development, New Mexico, USA

## 12.30-14.00 Lunch

**14.00 -15.30 Roundtable of IAH Hardrock Commission (“future of Hardrock Commission”, for interested IAH members)**

### Session E

#### **Investigation and interpretation methods in fractured rock environment (continuation)**

Chairpersons: Shlomo Neuman (USA), Alain Dassargues (Belgium), **chairs 6**

14.00-14.30 Winkler, G., Reichl, P. (**invited**) (abstract #146)

Scale dependent hydraulic investigations of heterogeneous complex rock masses (Semmering area, Austria, Eastern Alps)

14.30-15.00 Goderniaux, P., Daoudi, M., Orban, P., Dassargues, A. (**invited**) (abstract #23)

How tracer tests simulations strongly constrain flow and solute transport models in fractured chalk aquifers

15.00-15.15 Zeeb, C., Bons, P.D., Gomez-Rivaz, E., Blum, P. (abstract #134)

Critical review of different sampling methods for discrete fracture networks

### Session F

#### **Modelling in fractured rock aquifers**

Chairpersons: Shlomo Neuman (USA), Alain Dassargues (Belgium), **chairs 6**

15.15-15.30 Herrmann, F., Kunkel, R., Wendland, F., Berthold, G., Fritsche, J.G., Jenn, F., Voigt, H.J. (abstract #56)

Conceptual modelling of groundwater piezometric surfaces in fractured rock formations of Central Europe

## 15.30-16.00 Coffee break

### Session F

#### **Modelling in fractured rock aquifers (continuation)**

Chairpersons: Shlomo Neuman (USA), Alain Dassargues (Belgium), **chairs 6**

16.00-16.15 Rouquet, S., Lachassagne, P., Ledoux, E. (abstract #53)

Development and application of a surface water and groundwater modelling tool of a complex recent volcanic hydrosystem (Volvic, France)

16.15-16.30 Lang, U., Ufrecht, W., Schäfer, W. (abstract #88)

Modelling flow and transport processes in fractured and karstified aquifer system of Stuttgart – Isotopic study and development of reactive transport model for chlorinated hydrocarbon contamination

16.30-16.45 Frampton, A., Cvetkovic, V. (abstract #94)

Modelling sparsely fractured rock using flow log data

## **16.45-18.15 Poster Session Block 2, plenary visit to posters, Beer-wine-soft drinks-snacks**

*Posters to be installed during the morning of Wednesday, May 23.*

**Session D: Groundwater prospecting, drilling and well construction in fractured rock environment**

**Session E: Investigation and interpretation methods in fractured rock environment**

**Session F: Modelling in fractured rock aquifers**

## Thursday, May 24

### Registration Desk open from 8.00 hours

Authors of the entire day are requested to hand in their USB memory stick or CD-ROM with oral presentation at the registration desk during Wednesday. Thank you!

### Session F

#### Modelling in fractured rock aquifers (continuation)

Chairpersons: Jean-Christophe Marechal (France), Auli Niemi (Sweden), **chairs 7**

08.30-09.00 Maréchal, J.Ch., Aunay, B., Ladouche, B., Lanini, S., Perrochet, P. (invited) (abstract #34)

Water inflows into a deep tunnel through the Reunion volcano: Observation and modelling

09.00-09.15 Schoepfer, Ch., Schaul, T. (abstract #112) [*to be presented by A. Bender*]

Groundwater management plan for the Luxembourg Sandstone

09.15-09.30 Misstear, B., O'Brien, R., Deakin, J., Gill, L., Flynn, R. (abstract #132)

Analysis of flow pathways in fractured bedrock using a lumped modelling approach

09.30-09.45 Larsson, M., Niemi, A., Tsang, Ch.F. (abstract #145)

An empirical relationship between single-fracture heterogeneities & transport parameters and its application to solute migration in fractured networks

09.45-10.00 Dewandel, B., Maréchal, J.C., Bour, O., Ladouche, B., Ahmed, S., Chandra, S., Pauwels, H., Perrin, J., Aulong, S. (abstract #58)

Upscaling and regionalizing hydraulic conductivity and efficient porosity at watershed scale in crystalline aquifers

### 10.00-10.30 Coffee break

### Session F

#### Modelling in fractured rock aquifers (continuation)

Chairpersons: Jean-Christophe Marechal (France), Auli Niemi (Sweden), **chairs 7**

10.30-11.00 Therrien, R. (invited) (abstract #172)

Recent developments in modelling coupled fluid flow and transport processes in fractured porous media

11.00-11.30 Niemi, A. (invited) (abstract #168)

Multi-scale flow and transport in fractured rocks: Channeling persistence, flow compartmentalization, and effective flow-wetted surfaces

11.30-11.45 Normani, S.D., Sykes, J.F. (abstract #152)

Methodology to generate orthogonal fractures from a discrete, complex and irregular fracture zone network

11.45-12.00 Therrien, R., Blessent, D. (abstract #169)

Multi-scale hydrogeological modelling in crystalline bedrock - Application to Olkiluoto Island, Finland

12.00-12.15 Gvoždík, L., Polák, M., Milický, M. (abstract #187)

Numerical simulation of flow and diffusion in granitic rock matrix

### Session I

#### Groundwater protection in fractured rock environment

Chairpersons: René Therrien (Canada), Uwe Tröger (Germany), **chairs 8**

12.15-12.30 Neilson-Welsch, L., Allen, D.M. (abstract #20)

Modelling groundwater capture zones for mountain headwater streams in fractured rock

## 12.30-14.00 Lunch

### Session I

#### Groundwater protection in fractured rock environment (continuation)

Chairpersons: René Therrien (Canada), Uwe Tröger (Germany), **chairs 8**

14.00-14.30 Tröger, U., Schulze, F., Pitschka, B. (**invited**) (abstract #143)

Bad Brückenau – a case study of a fractured sandstone (Middle and Lower Bunter)

14.30-14.45 Brancelj, A. (abstract #105)

Epikarst – unknown and fragile environment rich in aquatic organisms

14.45-15.00 Molson, J., Parker, B., Frind, E. (abstract #131)

Capture probability and groundwater age simulations for a water supply well in fractured dolomite using a 3D discrete fracture network model

15.00-15.15 Gaut, S., Storro, G. (abstract #148)

Groundwater vulnerability related to technical quality of Norwegian groundwater wells in crystalline bedrock

## 15.15-15.30 Closure of the Conference

## **Poster sessions**

### **Session A: Hydrogeological structure of fractured rocks**

- #2 Zviadadze, U., Mardashova, M., Kitiashvili, N.: About the question of hydrogen sulfide origin in groundwaters
- #45 Antonellini, M., Mollema, P.N.: Theoretical constraints on fracture aperture based on linear elastic fracture mechanics: The importance of stress concentration and lithology
- #48 Diaz General, E.N., Mollema, P.N., Antonellini, M.: Fault development in Monte Conero (Italy) as a process of creating fracture porosity and permeability in carbonate rock
- #82 Guihéneuf, N., Perrin, J., Viossanges, M., Dausse, A., Maréchal, J.C., Dewandel, B., Bour, O., Boisson, A., Ahmed, S.: Compartmentalization of weathered-fractured crystalline aquifer in semi-arid region: an hydrodynamic approach
- #93 Flynn, R., Cassidy, R., Ryan, B.: Characterising the contribution of groundwater to stream flow in a granitic catchment, Oughterard, Co. Galway, Ireland
- #115 Celligoi, A., Duarte, U.: Hydrogeologic connotation of E-W structural lineaments in the northern Paraná State, Brazil

### **Session B: Groundwater flow in fractured rocks**

- #5 Ben, A.: Influence verticality of the well on the hardness of the rocks
- #17 Müller, E.: Results of simultaneous fluid logging measurements in the area of Wildbad Einoed (Styria, Austria)
- #27 Allen, D.M., Neilson Welch, L.A., Voeckler, H.: Defining groundwater catchment boundaries in mountain regions
- #44 Metcalf, M.J., Robbins, G.: Deciphering groundwater trends in the fractured bedrock using GIS for resource management and planning
- #74 Agarwal, P.M.: Flow of water in fractured rocks
- #136 Oz, B., Mori, N., Brancelj, A.: The influence of hydrogeology on selected Alpine springs in Slovenia
- #139 Liebel, H.T., Huber, K., Frengstad, B.S., Ramstad, R.K., Brattli, B.: Thermal response testing in fractured aquifers with groundwater flow
- #156 Grehs, S.A., Bulhões Mendes, C.A.: Hydrogeological features influencing Pantanal Wetland, Brazil-Bolivia-Paraguay
- #175 Jelmert, T.A.: Production capacity of wells in reservoirs with fractional (non-integer) spatial dimensions

### **Session C: Chemical, physical and isotope properties of groundwater in fractured rocks**

- #18 Djebebe Njiguim, C.L., Huneau, F., Denis, A., Jaunat, J., Le Coustumer, P., Celle Jeanton, H., Foto, E., Moloto a Kenguemba, G., Mabingui, J.: Definition of a target resource for the drinking water supply of an African capital - Hydrogeochemical characterization of the carbonate aquifers of the Bangui urban area (Central African Republic)
- #26 Marques, J.M., Matos, C., Carreira, P.M., Espinha Marques, J., Chaminé, H.I.: Geochemical and environmental isotope tracers to assess anthropogenic impact in an area of thermal springs
- #33 Carreira, P.M., Nunes, D., Marques, J.M., Carvalho, M.R., Antunes da Silva, M.: New insights on Melgaço - Messegães CO<sub>2</sub>-rich cold mineral waters (NW Portugal) ascribed to isotopes and geochemical composition
- #37 Vittecoq, B., Negrel, P.: Comparing hydrogeological properties of volcanic aquifer by combining piezometric and hydrochemical data: The Martinique Island example

- #47 Jiang, Y., Schirmer, M.: Hydrochemistry and  $\delta^{13}\text{C}_{\text{DIC}}$  as tracers of natural and anthropogenic influences on karst groundwater geochemistry in Nandong, southwest China
- #63 Uppin, M., Karro, E. Carbonate rocks as the natural sources of boron and fluoride-rich groundwater in western Estonia
- #76 Liu, A.W., Brancelj, A.: The hydrochemical profile of subsurface flows reflected by drip water in the Velika Pasica Cave (Slovenia)
- #95 Alfonso, M.J., Chaminé, H.I., Freitas, L., Pereira, A.J.S.C., Neves, L.J.P.F., Marques, J.M.: Groundwater in urban areas (NW Portugal): Hydrogeological GIS mapping and radon susceptibility
- #122 Cosme, F., Krusic Hrustanpasic, I.: Modification of standard Piper diagram approach to assess flowpaths in a fractured basalt aquifer system
- #133 Djokic, I., Cekic, M., Letic, G., Canic, V., Nuhovic, S., Nikolic, B.: The fissured aquifer in ultramafic complex of Maljen and Suvobor (western Serbia) - Aquifer of hyperalkaline groundwater
- #142 Fendekova, M., Horvátová, Z., Michalko, J., Ženišová, Z., Fľaková, R.: Chemical and isotopic parameters of groundwater in neovolcanic rocks of Slovakia
- #160 Deneva, B., Cristea, G., Puskas, R.: Use of stable isotopes to improve the conceptual model of Dolna Banya thermal water basin, Bulgaria
- #180 Murad, A., Werner, P., Hussein, S.: Groundwater quality assessment of fractured carbonate aquifer of the northern part of the United Arab Emirates (UAE)
- #181 Murad, A., Aldahan, A., Hou, L.X., Hussein, S., Possnert, G.: Groundwater quality and source in fractured carbonates from the United Arab Emirates
- #185 Esam, I., Abdalla, F., Niesner, E.: Evaluation of groundwater quality for drinking and irrigation purposes in West Tahta area, Sohag Governorate, Egypt
- #190 Takahashi, H.A., Tsukamoto, H., Kazahaya, K., Takahashi, M., Morikawa, N., Yasuhara: Chemical and isotopic compositions of groundwater in the fractures of Abukuma granitic province: ascending deep-seated carbon around geological tectonic line

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- #21 Ariyo, S.O., Adeyemi, G.O.: Significant of geology and geophysical investigations in groundwater prospecting - a case study from hard rock terrain of southwestern Nigeria
- #97 Bushner, G.L., Blandford, T.N.: An overview and comparison of deep groundwater exploration in fractured rock aquifers in two semi-arid states, USA
- #98 Gopinath, G.: Investigation on potential of a fractured aquifer for water demands of perennial crops - A Central Kerala River Basin Quintessence
- #110 Chirenje, E., Nyabeze, P., van Wyk, Y.: The integrated use of magnetics and ERT in borehole siting at Lesedi School, Pretoria, South Africa
- #119 Nuhovic, S., Canic, V., Djokic, I., Letic, G., Cekic, M., Nikolic, B.: Fissured-karstic aquifer in early Triassic limestone of Zlatibor Mountain (western Serbia) - substantial capacity and top quality groundwater aquifer

#### **Session E: Investigation and interpretation methods in fractured rock environment**

- #8 Zenner, M.A.: Various displacement well response testing: A well performance testing methodology to identify nonlinear formation-controlled flow
- #30 Yoxas, G.: Use of geological parameters analysis to evaluate groundwater vulnerability assessment in fractured rocks; a case study of Mantoudi - Central Euboea Island (Hellas)
- #38 Johnston, C.D.: Confounding effects on the characterisation of multi-phase liquid transmissivity for LNAPL remediation in fractured basalt
- #66 Nasrollah, K., Behzad, H.M.: Physico-chemical characteristics as a tool to determine feeding areas of the Bibitalkhon spring in the southwest of Iran



- #85 Comte, J.C., Cassidy, R., Offerdinger, U.: A combined dipole-dipole/multi-gradient ERT array optimized for hydrogeological modelling of hard rock aquifers
- #100 Lin, J.J., Chen, P.J., Lo, H.C., Chou, P.Y.: Lithological and hydrogeological characteristics of the regolith-fractured bedrock system in Taiwan: a local scale interpretation with a case study
- #137 Koch, M., Winkler, G.: Hydraulic studies on drill core samples of faulted hard rocks with triaxial permeability cell tests
- #182 Baker, H.: Identification fracture zones by magnetic and resistivity methods - A case study
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## Session F: Modelling in fractured rock aquifers

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- #61 Chlebica, D.W., Robbins, G.A., Spera, H., Bagtzoglou, A.C.: Resolving fractured bedrock aquifer flow and sustainability issues using an equivalent porous media model
- #111 Nick, H.M., Thullner, M., Regnier, P.: Modelling reactive solute transport in fractured media, seawater intrusion
- #126 Yang, Z., Niemi, A., Fagerlund, F.: Simulating immiscible fluid invasion in rough-walled fractures: Invasion-percolation and continuum models
- #153 Vincenzi, V., Piccinini, L., Pontin, A., Gaspare, A., D'Agostini, S.: Groundwater flow numerical modelling to forecast tunnel inflows: The case of a road tunnel inside a fractured rock mass aquifer (Southern Alps, Italy)
- #189 Holeček, J., Gvoždík, L., Rukavičková, L., Polák, M.: Study of rock matrix properties in Melechov granite massif using in-situ dye experiment and mathematical modelling