

## VISIT OF HYDROGEOLOGISTS FROM INSTITUTE OF KARST GEOLOGY (CHINA) TO THE CENTRE FOR KARST HYDROGEOLOGY

Centre for Karst Hydrogeology (CKH) of the Faculty of Mining and Geology, University of Belgrade (FMG UB), had the privilege to organize a visit of six experts in the field of karst research from the Institute of Karst Geology (IKG), Chinese Academy of Geological Sciences (CAGS), Guilin, China. During the visit experts had opportunity to enjoy in the beautiful nature of karst areas of eastern Serbia as well as to visit premises of the CKH and FMG UB and to present some ideas on the future cooperation between two institutions.

Field trip was guided by **Associate Prof. Dr. Saša Milanović** and **Assistant Prof. Dr. Ljiljana Vasić**, with the support of **Dr. Branislav Petrović**, **Dr. Veljko Marinović** and **MSc. Petar Vojnović**, all members of CKH. Delegation from IKG CAGS consisted of: **Prof. Dr. Cheng ZHANG**, **Jinliang WANG**, **Ping'an SUN**, **Yongli GUO**, **Qiong XIAO** and **Ying MIAO** arrived in Belgrade Airport „Nikola Tesla” on 30.06.2023. After a group of scientists arrived and further travel arrangements were made, excursion toward the karst area started. On every point, hosts explained geology and hydrogeology of the site and provided other information about local phenomena or history as well.

The first stop was **Manasija Monastery** near Despotovac (140 km SE from Belgrade) where the group had an opportunity to refresh while enjoying the peacefulness and silence of the perfect harmony of temple from XV century and nature that surrounds it.



***Manasija Monastery***

On the second stop, the guests of CKH were also able to see strong gravitational karst spring – **Veliko Vrelo**. This spring discharges from wide spring zone which is vertically shifted. Water from this spring forms a beautiful waterfall called **Lisine (Veliki Buk)**. Scientist from China made some measurements of the water quality and took some samples for further analyses. After that the group had enough time to rest until a common dinner in the nice local restaurant inextricably intertwined with the cultural heritage of the area.



*In front of Veliko Vrelo spring (above left), Lisine (Veliki Buk) waterfall (above right) and discussion about (hydro)geological setting of the wider area before dinner (below)*

Second day of the excursion started with the visit to the one of the most beautiful springs in Serbia, **Krupaja Spring** (220 m a.s.l.), near Milanovac village at the foothill of Beljanica karst massif. **Krupaja Spring** is one of the deepest explored karst springs in Serbia. The guests also had a chance to see, at the small distance from **Krupaja Spring (cold)**, a **thermal spring** that has a temperature of 26°C. IKG experts made some measurements of the water quality and took some samples for further analyses.

The next stop was **Belosavac Spring**, one the most important springs of the area since it is captured for water supply of Žagubica city and few nearby villages. The hosts showed equipment that is installed there for monitoring of quantity of groundwater as well as for monitoring of meteorology parameters while visiting scientist again made some measurements and took samples.

The third stop was **Mlava Spring** located on the northern part of the Beljanica Massif at the 305 m a.s.l. and largest one in the area. This spring is one of the first springs hydrogeologically observed in Serbia and one with the longest data series on quantity. Short rest with refreshment and coffee was made.



*Krupaja Spring (left) and thermal Krupaja Spring (right)*



*Belosavac Spring*



*Mlava Spring*

Next stop was at **Brestovačka banja spa**, one of the very interesting places in this part of Serbia. One of the oldest spas in Serbia is located at an altitude of 385 m a.s.l., just 8 kilometers southwest of the Bor city. According to archaeological findings, the beneficial properties of groundwater were used by the

Romans. It experienced its full bloom during the era of duke of Serbia Miloš Obrenović (XIX century). There are several thermo-mineral springs with groundwater temperature of 32 to 40 °C. Lunch break has been made in **Brestovačka banja spa** after which trip has been continued toward Negotin city area. Not even the rain, in some moment's showers, didn't stop explorers from seeing the karst phenomena, the natural stone bridges over the **Vratna River (Vratna village)**.

In the evening, group made a walking tour through the Negotin city center and had a common diner in very nice restaurant with the cultural heritage of the area on the display.



*Brestovačka banja spa*



*The big natural stone bridge over the Vratna River*



*A common dinner in the Negotin city*

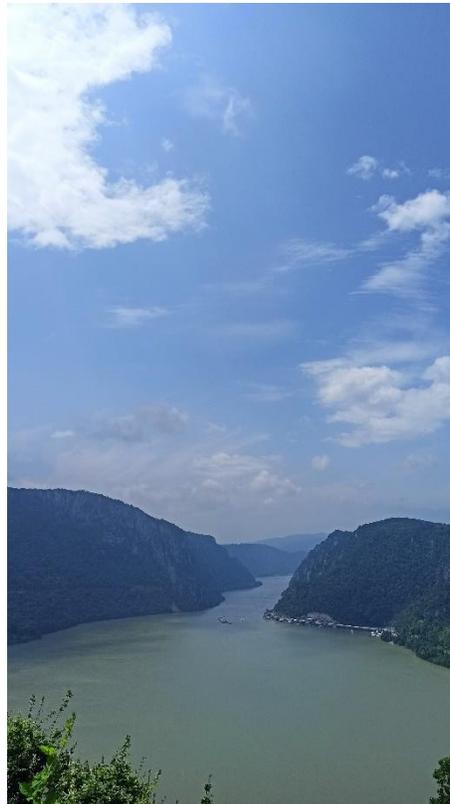
The last day of the excursion was dedicated to **Đerdap (Iron Gate) National park (UNESCO Global Geopark Network member since 2020)** and it started with the visit to **Blederija Waterfall** near Brza Palanka town. **Blederija Waterfall** is located near Reka village, some thirty kilometers southwest of Kladovo. It is approximately 7 m high and falls into a rimstone pool, forming a turquoise-green pond. A tufa barrier, over which the water flows in the form of a curtain, has an irregular horseshoe-like shape, with additional cascades flowing over it. IKG experts made some measurements of the water quality and took some samples for further analyses.

In continuation of trip, group had opportunity to see one of the largest dams and one of the largest hydro power plants in Europe, **The Iron Gate I Hydroelectric Power Station**. It was a joint venture between the governments of Romania and Yugoslavia (now operating by Serbia) for the construction of a major dam on the Danube River which would serve both countries. At the time of completion in 1972, it was the 10<sup>th</sup> largest hydroelectric power station in the world with twelve Kaplan turbines generating 2,052 MW, divided equally between the two countries at 1,026 MW each.

After lunch break, that was made in restaurant near **Donji Milanovac**, group continued trip along **Iron Gate gorge**, with few stops to enjoy scenic areas: **Iron Gate itself, Kazan area, Golubac medieval city**.



***Blederija Waterfall***



***Iron Gate***

The last two days of visit of experts from IKG have been dedicated to visit of FMG UB and CKH premises as well as some natural (karst) features and cultural sites in the Belgrade city area.

Welcome meeting is organized in Dean Office and led by **Vice Dean Prof. Dr. Aleksandar Cvjetić**, responsible for scientific research and marketing, **Associate Prof. Dr. Saša Milanović**, the Head of the Centre for Karst Hydrogeology, **Prof. Dr. Vesna Ristić Vakanjac** and **Assistant Prof. Dr. Ljiljana Vasić**. At the beginning of the meeting, **Prof. Cvjetić** introduced University of Belgrade, history of the Faculty of Mining and Geology, its organization and Departments' curriculums to guests from **IKG CAGS**.

After reception in the Dean Office, **Prof. Dr. Zoran Stevanović**, former Head of the CKH, joined the group and held two lectures about the CKH as well as about karst in this part of Europe. The meeting was continued at **Laboratory of the Centre for Karst Hydrogeology**, where **Assistant Prof. Dr. Ljiljana Vasić** and **Dr. Branislav Petrović** showed some of equipment that members of the CKH use in their field and laboratory research and facilities and classrooms of the Department of Hydrogeology, as well. Some gifts and memorabilia were exchanged between hosts and guests. Hosts then took guests to visit **Avala tower**, and after that **Hajdučka Česma spring** (karst spring in Košutnjak area).

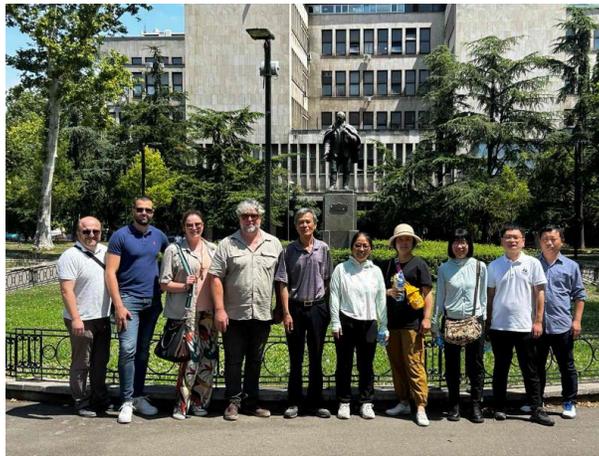


*Visit of IKG to FMG UB and CKH*



*Avala tower (left) and Hajdučka Česma spring (right)*

The last day of the visit was reserved for the museum of **Jovan Cvijić**, as well as the monument dedicated to this scientist, which is located in the very center of Belgrade. The visit to the museum included a one-hour tour, in which the curator of the museum explained all the interesting and historical facts from the life of our great scientist. Assistance during the tour of the museum was provided by **Dr. Branislav Petrović**, **Dr. Veljko Marinović** and **MSc. Petar Vojnović**.



***Members of CKH and IKG visiting the Jovan Cvijić museum (above) and in front of the Cvijić monument in the center of Belgrade (below)***

A visit to the **Serbian Academy of Sciences and Arts** and the **Kalemegdan Fortress** were next stops. The tour of Kalemegdan included a visit to the **Roman Well**, the "**Pobednik**" monument and the **outdoor exhibition of the Military Museum**.

The visit of the Chinese colleagues officially ended with a joint lunch in a restaurant in the center of Belgrade, where the hosts presented traditional gifts to their guests, while **Prof. Dr. Saša Milanović** was given a certificate of membership in the Academic Committee of the China-Slovenia Karst Geology Belt & Road Joint Lab for the term of 2023 to 2025.



***Visit to the Serbian Academy of Sciences and Arts (top left); visit to the Roman Well (top right); Visit to the "Pobednik" monument on Kalemegdan (bottom left); Members of CKH and IKG at the confluence of the Danube and Sava (bottom right)***



***Giving gifts to Chinese guests (left); Award of the certificate of Prof. Dr. Saša Milanović (right)***