



中国科学院成都生物研究所
CHENGDU INSTITUTE OF BIOLOGY, CHINESE ACADEMY OF SCIENCES



University of Zagreb, Faculty of Science

**Environmental Conservation:
From Idea to Implementation -
Call to Collaboration**



Chengdu, April 26 - May 1, 2020

Environmental CIC Committees



People's Republic of China

Republic of Croatia

Local Organizing Committee

- | | |
|----|--------------------------------------------------------------------------------------------------------------|
| 1. | 1. Prof. <i>Anđelka Plenković-Moraj</i> , PhD
University of Zagreb, Faculty of Science |
| 2. | 2. Prof. <i>Bruno Želić</i> , PhD
University of Zagreb, Faculty of Chemical
Engineering and Technology |
| 3. | 3. Assoc. Prof. <i>Marija Gligora Udovič</i> , PhD
University of Zagreb, Faculty of Science |

Scientific Committee

- | | |
|----|---------------------------------------------------------------------------------------------------------------|
| 1. | 1. Prof. <i>Ivančica Ternjej</i> , PhD
University of Zagreb, Faculty of Science |
| 2. | 2. Prof. <i>Božena Mitić</i> , PhD
University of Zagreb, Faculty of Science |
| 3. | 3. Prof. <i>Ivica Kisić</i> , PhD
University of Zagreb, Faculty of Agriculture |
| 4. | 4. Prof. <i>Dražen Balen</i> , PhD
University of Zagreb, Faculty of Science |
| 5. | 5. Prof. <i>Zvezdana Bencetić Klaić</i> , PhD
University of Zagreb, Faculty of Science |
| 6. | 6. <i>Damir Kralj</i> , PhD, Senior scientist
Ruđer Bošković Institute |
| 7. | 7. Prof. <i>Nenad Jasprica</i> , PhD
University of Dubrovnik, Institute for Marine
and Coastal Research |
| 8. | 8. Prof. <i>Dario Baričević</i> , PhD
University of Zagreb, Faculty of Forestry |

logo design: Renata Horvat, University of Zagreb, Faculty of Science

CIP record

WELCOME NOTE

It is our great privilege in welcoming to you all the attendees of the Environmental CIC Workshop. Welcome to all those that are engaged in the knowledge and in the conservation of nature and biodiversity. In a very fast-changing world due to the severe human and climate alterations, it is necessary to join collaborative and strong efforts to mitigate environmental problems and to keep ecosystems at equilibrium. Biodiversity is a global platform for sharing world scientific experiences and discusses one of the main current challenges worldwide, which are, without doubt, Environmental conservation. The main aim of the workshop is to generate common investigations, research and innovation capacities, aiming at strengthening cooperation and collaboration between Chinese and Croatian scientists. At this workshop more than 40 experts from both countries will exchange their valuable experience and knowledge in the main trends of Biodiversity; Conservation; Endangered and Invasive Species; Climate Changes; Land and Freshwater Ecosystem; Sustainable Development.

We hope that this conferences with your participation, becomes a valuable experience in our scientific advancement and professional education. Personally, we hope that you have a very enjoyable and entertaining stay in Chengdu.

Under the auspices of
The Ministry of XXXXXXXX or?

Organized by
Chengdu Institute of Biology, Chinese Academy of Science
University of Zagreb, Faculty of Science

Supported by
Chinese MINISTRY of SICHUAN PROVINCE or CAS or ????? that provided generous financial support
through the XXX project

Venue

The opening ceremony, oral presentations, and all related workshop activities (for example registration desk which will be opened on April 27, from 7:30 to 8:30) will take place at the Chengdu Institute of Biology (ADD: No.9 Section 4, Renmin Nan Road, Chengdu, Sichuan at room XXX). The workshop badge is required for all sessions and activities.

Our volunteers will be available if you need more flexibility for your transfers or need some other help during your stay in Chengdu. We are very grateful to the local Chinese team of volunteers for their help and hospitality!

Up-to-date information will be posted regularly on the conference webpage (xxxxx)

Most importantly, we encourage you to feel free to apply to us with any questions you may have regarding the services and/or information contained. We look forward to your queries and application.

Oral Presentations

Speakers will have 20 minutes for their presentation. Please deliver all PPT presentations to the registration desk no later than the day before the lecture.

Social Events

Sunday, April 26, (depends on arrival of participants) - Leshan, Giant Buddha

Sunday, April 26, at 18:00 - Welcome Reception

Thursday, April 30, 9:00-11:30 - Chengdu Research Base of Giant Panda Breeding

Thursday, April 30, 15:30-16:30 - CIB museum and collection

Thursday, April 30, 18:00 - Farewell Dinner

PROGRAM AT A GLANCE

Sunday April 26	Monday April 27	Tuesday April 28	Wednesday April 29	Thursday April 30	Friday May 1
	7:30 - 8:30 registration				
	8:30-9:30 Opening and Welcome address	9:00 - 11:30 SECTION 3	9:00 - 11:30 SECTION 5	9:00 - 11:30 Social Events	departure of participants
	9:30 -11:30 SECTION 1				
arrival, accommodation and Social Events	12:00-14:00 Lunch break	12:00-14:00 Lunch break	12:00-14:00 Lunch break	12:00-14:00 Lunch break	
	14:30 -17:10 SECTION 2	14:30 -17:10 SECTION 4	14:30 -17:10 SECTION 6	14:30 -15:30 Conclusions and closed ceremony 15:30 Social Events	

Last but not least, we are likewise grateful to the administrative staff of our institutions for their valuable time and support in organizing this event.

On behalf of the organizing committee, we wish you an exciting workshop and a great time in China!

Key notes - participating institutions

From China



Key notes - participating institutions

From Croatia



University of Zagreb



Employees: ~ 7 500
Academic staff: ~ 5000



Students: ~ 77 000 students
• ~ 3 500 PhD students
• 800 international students yearly
• 50% of all students in Croatia

- established on September 23, 1669
- the oldest and biggest university in South-Eastern Europe
- consists of 33 faculties, three art academies and the Center for Croatian Studies
- strongly research-oriented institution (~ 51% of the total yearly research output in Croatia)



Other organizational units and institutions:

- Centre for Advanced Academic Studies (CAAS) Dubrovnik
- University Computing Centre (Srce)
- Student Centre
- National and University Library

It offers a wide range of academic degree courses leading to Bachelor's, Master's and Doctoral degrees in the fields like Arts, Biomedicine, Biotechnology, Engineering, Humanities, Natural and Social Sciences etc.



Study Programmes:

- 138 undergraduate programmes (BA/BSc)
- 143 graduate programmes (MA/MSc)
- 66 doctoral programmes (PhD)
- 161 postgraduate specialist programmes

Number of graduates per year:

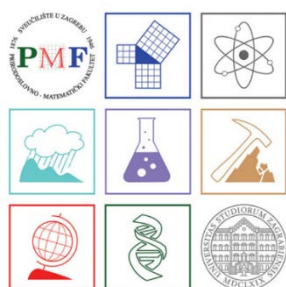
- ~ 5 500 BA/BSc degrees, ~ 2300 MA/MSc degrees, ~ 400 PhD degrees



University of Zagreb
Faculty of Science

On September 23rd, 1669 Leopold I certified at the Jesuit *Neoacademica Zagrebiensis*, a three-year higher education institution, which gradually developed the studies of Philosophy, Law and Theology. At the Jesuit School philosophy was taught even earlier, and part of its first year studies were Logic, "Physics", and Metaphysics. Neither Jesuit School (until 1773), nor royal Regia Scientiarum Academica (until 1850) represented a real university. Croatian Sabor (Parliament) and King Franjo Josip I, introduced the Law on founding the University of Zagreb. Soon after the establishing of the University of Zagreb, Faculties of Law, Theology and Philosophy started operating. The Chairs of the Faculty of Philosophy were appointed gradually. In the field of natural sciences the teaching started in 1876, with first lectures in mineralogy and geology, and then in botanic, physics, mathematics, chemistry and zoology and geography. A long endeavour of the Science Department of the Faculty of Philosophy to attain the status of Faculty finally materialized in 1946, when the Faculty of Science was established.

The Faculty includes seven departments, the Seismological Service, the Mareographic and Meteorological stations, and the Botanical garden. The Faculty has 288 full professors, associate and assistant professors, over 180 junior researchers and about 5000 students. The Faculty offers undergraduate, graduate, and postgraduate study programs, and pursues research in the fields of natural

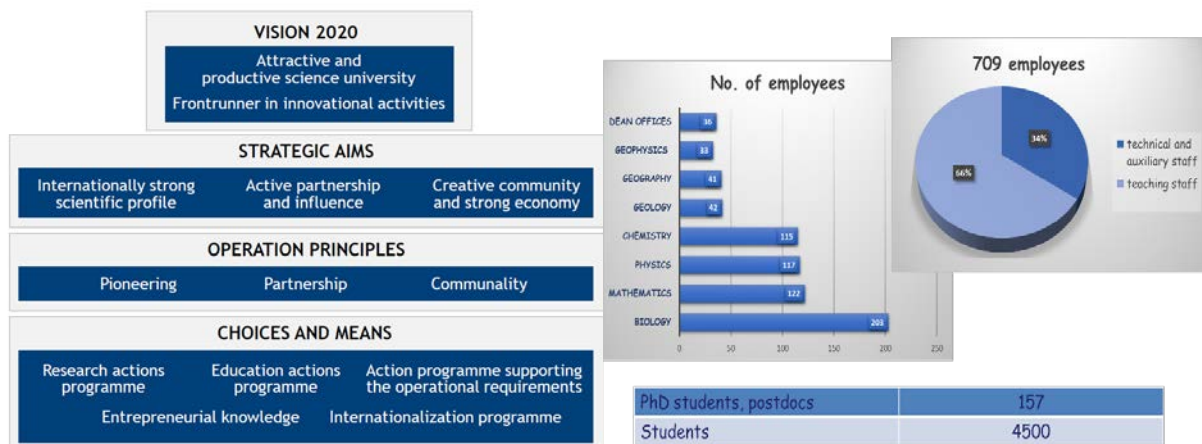


sciences and mathematics. The Faculty of Science is engaged in excellent cooperation with numerous universities and institutes abroad. Professors of the Faculty have been invited as visiting lecturers to European and American universities, and young staff members, as well as postgraduate students, are regularly sent to international universities and institutes for further research. The Faculty of Science has 8 undergraduate study programs (Bachelor degree) encompassing 3 years of studies (180 credits), 26 graduate study programs (Master degree) encompassing 2 years of studies (120 credits) or

5 years of studies (300 credits) and 7 postgraduate study programs (PhD degree) encompassing 3 years of studies (180 credits). Education is at all levels characterized by teaching and supervision at a high academic level by staff actively involved in research. Departments of the Faculty are placed on several locations in Zagreb. The departments of Physics, Mathematics, Geophysics, Chemistry, Geology, and the main administration of the Faculty are set at Horvatovac area where a "Campus of Science" is being built. Departments of Biology and Geography are also going to be set at the same location in the near future.

The education of students in science and mathematics is a part of a comprehensive science education that qualifies them to work in research institutes, different branches of industry and production, the civil service (environmental protection, regional planning), public institutions (national parks, nature parks, reserves) and elsewhere, or as teachers in primary, secondary, and vocational schools. All the academic staff is actively involved in research carried out at high international standards, and are supported by postgraduates and research personnel from seven departments. They work across the

whole spectrum of scientific activities ranging from basic to applied research and many have been recognized internationally for their contributions to research and development.



Research in service of sustainable development covers large number of projects related to environmental protection, green chemistry, biodiversity, nature conservation, and sustainable development with special emphasis given to landscapes and freshwater ecosystems in the karst areas; research of karst from geomorphological and paleoenvironmental perspectives - influence of the geological structure on the

PMF publishes 6 international research journals:

- *Acta Botanica Croatica*
- *Geofizika*
- *Hrvatski geografski glasnik*
- *Acta Geographica Croatica*
- *Croatica Chemica Acta*
- *Glasnik Matematički*



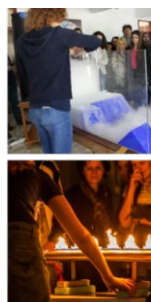
development of karstic relief forms analyses of glacial karst on the surface and within underground karstic caves; study of stress events in the geological past such as impact events, extinctions and glaciations; studies of seismicity of Croatia and the neighboring countries - earthquake risk assessments, research of seismotectonic relations and structure of the inside of the Earth in the area

of Adriatic, Dinarides and the Pannonian Basin; geochemical environmental research - differentiation of geogenic and anthropogenic factors in the environment for remediation and management of endangered and sensitive environments; research of atmospheric dynamics - for air quality, weather forecast, early announcement of dangerous weather phenomena, agriculture, energetics, tourism etc.; biodiversity and ecology of protists, plants and animals; monitoring of land, freshwater and marine ecosystems, environmental capacity and nature resources protection, and research of two-way interrelation of space and tourism - developing optimal concepts of tourism products in Croatia.

Faculty of Science - Popularization

Day and Night at PMF – the central popularization activity

- held in April each year
- lectures, workshops, presentations, exhibitions
- 1 000 students and academic staff involved in organization
- 15 000 visitors (children and adults) from Croatia and neighbouring countries



Educational activities on biodiversity, nature conservation and ecosystem services:

- workshops for general public
- rising awareness about necessity of natural resources and protection and sustainable development



University of Zagreb
**Faculty of Chemical Engineering and
Technology**



The Faculty of Chemical Engineering and Technology (FCET) was founded in 1919 with the aim of implementing scientific research and education of young scientists and engineers in the fields of chemistry and chemical engineering. The great tradition of excellence continued until today, placing Faculty of Chemical Engineering and Technology among the most research-oriented faculties at the University of Zagreb. Numerous papers in distinguished international journals and successful international and domestic scientific projects, as well as industry-related projects testify to that devotion to science. The Faculty of Chemical Engineering and Technology trains experts in the fields of chemical engineering, materials science and engineering, environmental engineering and applied chemistry. The Faculty provides university undergraduate, graduate and postgraduate study programmes, in which students acquire knowledge relevant to the development of sustainable chemical processes and their application in production, to the development of materials and processes for specific purposes and to the development of methods for quality control. It offers a variety of academic degree courses leading to Bachelor's, Master's and Doctoral degrees in the fields of technical and natural sciences. Since 1919 more than 5000 students have graduated at the Faculty of Chemical Engineering and Technology and about 600 candidates have been awarded their Doctoral degrees.

Today the Faculty is organized in 16 departments that perform teaching, scientific research, professional and consulting activities in chemical engineering, chemistry, and related fields. Teaching and education are based on modern, problem-oriented methods and provide students with analytical methodology in solving problems, but always keeping in mind the synthetic approach. Students of the Faculty obtain contemporary knowledge of research, development and design of new, sustainable chemical industrial processes as well as on the improvement of existing ones. This is done to ensure high quality, reliable and safe production that takes into account criteria of the economy, efficiency and environmental protection. In addition, students of the Faculty may specialize in drug design and the development of new polymeric and inorganic materials, development of novel synthesis routes as a basis for new processes, as well as in the quality management.

Regarding the number of papers published in distinguished international journals the Faculty of Chemical Engineering and Technology is among the most research-oriented faculties at the University

of Zagreb. The research at the Faculty of Chemical Engineering and Technology is focused on chemical and environmental engineering, applied chemistry and material science. Therefore, priority topics of research involve environmental protection and management, development of advanced materials and sustainable technologies, alternative and renewable energy sources, development of new pharmaceuticals, industrial biotransformations and other related subjects.

The Faculty has developed valuable international cooperation with various scientific institutions in the world, either directly or through inter-university cooperation.



Study programmes are organized in three educational cycles: undergraduate study programmes (1st cycle), graduate study programmes (2nd cycle), and postgraduate study programmes (3rd cycle).

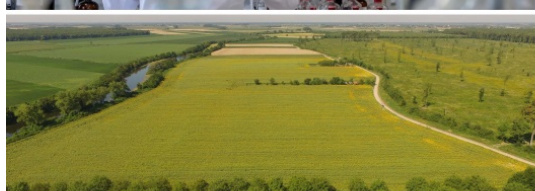
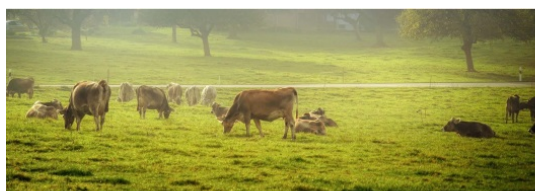
The first cycle normally takes three years in which students are required to earn 180 ECTS (European Credit Transfer System) credits while the second cycle takes two years in which students are required to earn

120 ECTS credits. University doctoral programmes that form the third cycle are regularly completed within three years with 180 ECTS credits earned.

The Faculty of Chemical Engineering and Technology offers four undergraduate and graduate study programmes, as well as one doctoral study programme. It is also involved in three postgraduate specialist programmes.



University of Zagreb
Faculty of Agriculture



UNIVERSITY OF ZAGREB
FACULTY OF AGRICULTURE





Study programme in environment, agriculture and resource management

INTER-EnAgro



UNIVERSITY OF ZAGREB FACULTY OF AGRICULTURE
Adress: Svetošimunska cesta 25, 10000 Zagreb, HR

tel: 01/239 3777 <http://www.agr.unizg.hr>  



Study programme - INTER-EnAgro

General information

The graduate study programme INTER-EnAgro offers theoretical and practical knowledge targeted at sustainable use and management of natural resources such as soil and water as well as positive and negative effects of human activities, primarily agriculture, on these resources. The programme is designed as a continuation of undergraduate studies and enables continuation of studies at the postgraduate level.

Based on contemporary teaching process and completely English taught study programme (with participation of national and international teachers), students will be able to acquire generic and field specific competencies that are needed to achieve sustainable development goals and to work in different fields of agriculture, environmental protection and sustainable use of natural resources. The objective is to educate experts who will have the knowledge, skills and competencies in the fundamental and applied scientific fields of agriculture, environmental protection and related natural, engineering and biotechnical sciences. Furthermore, the objective is to train students to participate in scientific research in the field of agriculture and environmental protection conducted in higher education institutions and scientific research institutes as well as for further education at the postgraduate study. Teaching in English enables participation in programmes at international level and also facilitates the exchange of information, upgrading and enhancement of study contents, cooperation with international partner and capacity building in teaching and research.

Program specificity

The graduate study programme enables students to develop and apply their knowledge, skills and competencies in the following areas: — Knowledge/understanding in fundamental scientific areas of: agriculture, environmental protection and related natural, engineering and biotechnical sciences; — Intellectual skills in fundamental and applied scientific areas - the functioning of natural and agro-ecosystems using the interdisciplinary, holistic approach; — Practical skills and competences in recognizing the current needs and trends in sustainable development of rural areas, notably the role of agriculture.

Employment opportunities

The study programme opens employment opportunities in areas such as developmental projects or institutions operating in the area of development, higher education, research, private entrepreneurship, counselling firms, institutions responsible for passing legal regulations and enacting them, governmental and non-governmental organizations, local, national and international institutions.

Scientific area of the study programme

Biotechnical sciences

Duration of the study programme

The study program lasts 2 years with a study load of at least 120 ECTS

Admission requirements

The graduate study programme is open to candidates who already have a bachelor's or equivalent degree in agriculture or forestry, ecology, biology, geology, geography or other related fields, with a minimum of 180 ECTS acquired.

Expression of interest (required documents)

- Filled and signed Application form
- Copy of bachelor degree (if obtained)
- Transcript of records
- CV
- English Language Proficiency

Language of instruction

All lectures, exercises and group work will be conducted in English. Students must have a good knowledge of English, which they have to prove by at least level B2 according to the European Reference Framework or by presenting their Cambridge Advanced Certificate in English.

Tuition fee

17.500,00 HRK (2.500,00 €) per academic year.

Students with Croatian citizenship and students from EU countries pay 50% of tuition.

Contact

Assoc. Prof. Gabrijel Ondrasek, PhD - study programme coordinator

Email: gondrasek@agr.hr

Phone: +385 1 239 3702

Ivona Filipović, MSc - IRO

Email: ifilipovic@agr.hr

Phone: +385 1 239 3611





University of Zagreb
Faculty of Forestry

The Faculty of Forestry, University of Zagreb is the only higher education institution in the Republic of Croatia related to the field of forestry and wood technology. It was founded back in 1898 as one of the



first constituents of the University of Zagreb. From the very beginnings of organized classes, in the academic year 1898/1899, at the then Academy of Forestry of the Faculty of Philosophy, University of Zagreb, and up to today, study programmes have always been up to date, thanks to the well-balanced combination of basic, general and professional knowledge that students acquire during their studies.

The current structure of undergraduate, graduate and postgraduate studies, as well as their curriculum content, makes study programmes of the Faculty of Forestry comparable to those of similar faculties in the European Higher Education Area, while ensuring that the Faculty of Forestry retains a leading position among forestry and wood technology scientific-teaching institutions in the regional environment.

Today, the Faculty of Forestry conducts modern study programmes pertaining to all study levels in the field of biotechnology, educating experts for the forestry and wood technology sector. There are four undergraduate studies at the Faculty (three undergraduate university and one undergraduate professional study programme), as well as four graduate studies (one of which has two majors), one postgraduate doctoral study programme and nine postgraduate specialist study programmes.

Upon completion of their studies, depending on the type and level of studies that the students complete, the fields of their professional and scientific work may be the following: forestry; urban forestry, nature and environment protection; wood technology processes and wood product design.

In addition to the theoretical knowledge conveyed to the students by experienced teachers from the six institutes of the Department of Forestry and five institutes of the Department of Wood Technology, special emphasis is placed on practical and field teaching taking place in 21 faculty laboratories, five educational and experimental forest facilities of the Faculty, as well as in wood production sites and forests in Croatia and abroad. Furthermore, through practical and field teaching, cooperation with the economy is achieved.

The Faculty of Forestry currently employs about 210 employees, of whom 128 are teachers, associates and expert associates. It also has more than 750 students studying at all study levels.



University of Dubrovnik
**Institute for Marine
and Coastal Research**



The University of Dubrovnik, was established in 2003, is making great efforts to continuously increase the quality of the teaching, scientific, research, and other activities. It pays attention to labour market and to local, regional and national community and hence launch studies that do not copy those already existing in Croatia. At the same time, the University cares about the past, present and future of the City and about the synergy of academia with our milieu, so we will keep on setting up the international and studies arising from the tradition and culture of Dubrovnik. It is after all written in its strategy and defined by the vision and mission of the University of Dubrovnik. The University has developed and profiled itself as internationally recognized university each year attracting a growing number of foreign teachers and students who wish to spend part of their studies in Dubrovnik. International cooperation, the excellence of studies and of scientific and research work are key determinants of the planned development. Therefore, the construction of the dormitory, whose completion was planned for February 2020, will give an impetus to the university. After the first phase of construction of the university campus, it will provide the necessary infrastructure in order to meet the set objectives. The University follows new technologies and consequently continues to equip the existing facilities with modern teaching aids, technical equipment and equipment needed for particular studies. For its students to be acquainted with the state of affairs and with the demand in the labour market the University we will enhance the good cooperation with entrepreneurs. Students will be given the opportunity to acquire new knowledge and skills by participating in various projects, contests, and programmes of professional practice. The University will help establish a centre for professional associations and thus will become a significant factor in writing feasibility studies, expert opinion, various professional studies in engineering, economy, etc. The University of Dubrovnik consists of the following seven departments: Department of economics and business economics, Maritime department, Electrical engineering and computing department, Department of aquaculture, Mass communication department, Art and restoration department and the studies outside the departments. They comprise fourteen three-year university undergraduate study programmes, three three-year professional undergraduate study programmes, twelve two-year university graduate study programmes, two two-year professional graduate study programmes, one postgraduate professional study programme and six inter- university postgraduate (doctoral) study programmes. The Institute for Marine and Coastal Research, was established by Croatian Academy of Sciences and Arts in 1949, is scientific unit of the University since 2006. Additionally, Institute for Mediterranean plant cultures is also part of the university, while the Student centre is linked to the University at the extra-institutional level.



University of Dubrovnik
Branitelja Dubrovnika 29
20000 Dubrovnik
Hrvatska
www.unidu.hr
e-mail: rektoratdu@unidu.hr



Rektorat
Rector's office
 Branitelja Dubrovnika 29
 20000 Dubrovnik
 tel. +385 20 445700

DEPARTMENTS	UNDERGRADUATE STUDIES	GRADUATE STUDIES
DEPARTMENT OF ECONOMICS AND BUSINESS ECONOMICS	ECONOMICS BUSINESS ECONOMICS (Tourism, Marketing, International Trade, IT management) FINANCIAL MANAGEMENT HOSPITALITY, RESTAURANT BUSINESS AND GASTRONOMY	ECONOMICS BUSINESS ECONOMICS (Tourism, Marketing, International Trade, IT management) FINANCIAL MANAGEMENT
MARITIME DEPARTMENT	NAUTICAL STUDIES MARINE ENGINEERING YACHT AND MARINA TECHNOLOGIES	MARITIME STUDIES
ELECTRICAL ENGINEERING AND COMPUTING DEPARTMENT	MARINE ELECTRICAL ENGINEERING AND COMMUNICATION TECHNOLOGIES APPLIED/BUSINESS COMPUTING	MARINE ELECTRICAL ENGINEERING AND COMMUNICATION TECHNOLOGIES BUSINESS COMPUTING
DEPARTMENT OF AQUACULTURE	AQUACULTURE	MARICULTURE
MASS COMMUNICATION DEPARTMENT	MEDIA AND SOCIAL CULTURE	MEDIA PUBLIC RELATIONS
ART AND RESTORATION DEPARTMENT	RESTORATION AND CONSERVATION (wood, paper, textile, metal and ceramics) HISTORY OF THE ADRIATIC AND THE MEDITERRANEAN	RESTORATION AND CONSERVATION (wood, paper, textile, metal and ceramics)
	NURSING	CLINICAL NURSING
	University Postgraduate Doctoral Study	HISTORY OF POPULATION

Projects WebPoSt (students making web pages for entrepreneurs) and PlanPoSt (students making business plans for entrepreneurs) came as a result of cooperation between the University of Dubrovnik and Croatian Chamber of Economy, County Chamber Dubrovnik. The goal of WebPoSt was to help small entrepreneurs present themselves on the Internet. lanPoSt aimed to make small entrepreneurs shape their ideas into a meaningful document. This was an opportunity for students to see the real market needs and achieve in practice what they have learned during their education. The students of Department of Economics and Business Economics participated at the Case Study Competition – the biggest student competition in the Republic of Croatia, which also has a regional character. Companies, which gave the students a chance to solve precisely their business case, show their competences and win rich prizes and possible internships at the most prestigious Croatian and foreign companies also participated in the competition.

International cooperation of the University of Dubrovnik has directed their activities toward development of international relations between their partner institutions in the world, encouraging mobility of young students, teachers, non-teaching staff and toward participation in international projects and programs in the field of high education.

Cooperation with foreign universities, scientific institutions, international agencies and associations for development of science is important for achieving fundamental goals of the development of the University. This creates conditions for participation in bilateral and multilateral research programmes, student/young scientist/teacher exchange programmes and for getting scholarships. The University tries to stimulate all existing forms of international cooperation and to create conditions for establishing new international co-operations, with emphasis on being a part of the EHEA (European Higher Education Area) and ERA



(European Research Area), which is of tremendous importance for the University. The ERASMUS Programme is directed toward academic mobility. This programme gives an individual the possibility to experience studying abroad, living and working in a different academic, cultural and social environment. As a result of that, individuals increase their chances of finding employment and their competitiveness in the labour market.

HALF A CENTURY OF SCIENTIFIC RESEARCH

The Ruder Bošković was founded in 1950 as a centre for advanced research, and named after the famous Croatian 18th century scientist Josip Ruder Bošković (1711 - 1787). The multidisciplinary character of the Institute is reflected through the different research fields in physics, chemistry, oceanography (including marine and environmental research and geosciences), biology, biomedicine, computer science and electronics/engineering.

Since its inception as the multidisciplinary non-profit governmental research institute, RBI has consistently endeavoured to provide high-quality support to industry and academia nationally.

Apart from fundamental research and education, the activities of the RBI also result in various forms of intellectual creations. One important mission of the RBI is the protection of intellectual property and its commercialization.

The **Mission** of the Institute is excellent scientific research in the natural, bio-medical and engineering sciences, with contributions to higher education and cooperation with the business sector based on outstanding scientific research.

The **Vision** of the Institute is to be a recognized top European center of scientific excellence.

Ruder Bošković Institute, Bijenička cesta 54, 10000 Zagreb
Tel: +385 (0)1 4561-111, Fax: +385 (0)1 4680-084
info@irb.hr, www.irb.hr



RUDER BOŠKOVIĆ INSTITUTE

Scientific Discoveries for Innovative Economy and Society



THE LARGEST CROATIAN MULTIDISCIPLINARY
RESEARCH INCUBATOR

> 5% OF
CROATIAN
RESEARCHERS

> 55% OF
ALL
HORIZON2020
PROJECTS IN
CROATIA

> 20% OF
CROATIAN
PUBLICATIONS

Croatia's leading scientific institute in the natural and biomedical sciences as well as marine and environmental research.

MULTIDISCIPLINARY SCIENCE INCUBATOR

The Ruđer Bošković Institute (RBI) is regarded as Croatia's leading scientific institute in the natural and biomedical sciences as well as marine and environmental research, owing to its size, scientific productivity, international reputation in research, quality of its scientific personnel and research facilities.

The RBI consists of eleven divisions, four centres, as well as administrative and technical services.

Today, the RBI gathers over 500 scientists and researchers in more than 80 laboratories pursuing research in theoretical and experimental physics, physics and materials chemistry, electronics, physical chemistry, organic chemistry and biochemistry, molecular biology and medicine, the sea and the environment, informational and computer sciences, laser and nuclear research and development. There are more than 440 PhDs working at the RBI, 58% of which are women. This places the RBI above the EU and world averages in the participation of women in science.

The RBI scientists actively participate in higher education in more than seventy undergraduate, more than two hundred graduate and doctoral studies, thus making the RBI an equal partner to universities in the Republic of Croatia and abroad.

The capital equipment of the RBI is worth more than 20 million euro and it comprises 50% of all scientific equipment in Croatia.

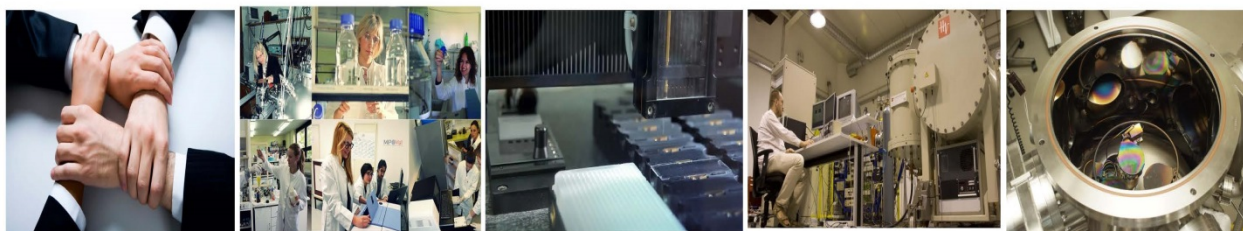
The RBI is the leading and internationally most competitive Croatian institute by virtue of its participation in international research projects, such as the IAEA and EC FP5-7 programs funded by the European Commission, NATO, NSF, UKF, SNSF, DAAD and other international scientific foundations.

Since the beginning of HORIZAON 2020 program implementation, the RBI scientists have participated in 22 projects valued at around €9,4 million. With the capacity of six percent of the total number of scientists in Croatia, RBI pulled more than 57 percent of the total funds raised by all scientific institutions in Croatia.

The RBI recognizes the importance of investing and further upgrading its infrastructure capabilities. In support of this momentum, the RBI has developed capital project 'Open scientific infrastructural platforms for innovative applications in the economy and society (o-ZIP)' valued at 72 million euro.

This EU Structural Funds project aims to create the basis for an innovation based economy in Croatia by focusing on RBI's most propulsive KET technologies, and likely Croatian Smart Specialization components.

Moreover, the RBI was granted two centres of excellence - Centre of Excellence for Advanced Materials and Sensors (CEMS) and Centre of Excellence for Marine Bioprospecting (BioProCro).



Due to knowledge, expertise and multidisciplinary approach to solving a variety of problems, project tasks and services available in the many RBI laboratories, the RBI provides great potential for cooperation with companies. Teaming with RBI could include these areas:
ADVANCED MATERIALS, NANOTECHNOLOGY & PRODUCTION TECHNOLOGIES, BIOMEDICINE, BIOTECHNOLOGY, ENVIRONMENT AND SEA, ICT.

PUT OUR KNOW-HOW AND PROJECTS TO THE TEST - CONTACT US FOR A CONSULTATION OR PARTNERSHIP TODAY!

Ruđer Bošković Institute
Bijenička cesta 54, 10000 Zagreb
Tel: +385 (0)1 4561-111,
Fax: +385 (0)1 4680-084
PR: +385 (0)1 4571-269
info@irb.hr | www.irb.hr

From Idea to Implementation

In accordance with the timetable

Monday, April 27

Opening address (8:30 -8:45)

Prof Wu Ning, Director General CIB CAS

Welcome address (8:45 – 9:00)

Somebody from Ministry or xxxxx, other important persons, I think our ambassador will like to come too

Introductory speeches (9:00 – 9:30)

1. Prof. Sun Geng, PhD - Chengdu institute of Biology Chinese Academy of Science
2. Prof. Anđelka Plenković-Moraj, PhD - University of Zagreb, Faculty of Science

Monday, April 27 2020, MORNING KEYNOTES (9:30 – 11:30)

Chairpersons: **XX & XX**

NAME, Institution 9:30 - 9:50

TITLE

Abstract

NAME, Institution 9:50 - 10:10

TITLE

Abstract

NAME, Institution 10:10 - 10:30

TITLE

Abstract

NAME, Institution 10:30 - 10:50

TITLE

Abstract

NAME, Institution 10:50 - 11:10

TITLE

Abstract

Discussion 11:10 - 11:30

AFTERNOON KEYNOTES (14:30 – 17:10)

Chairpersons: **XX & XX**

NAME, Institution 14:30 - 14:50

TITLE

Abstract

NAME, Institution 14:50 - 15:10

TITLE

Abstract

NAME, Institution 15:10 - 15:30

TITLE

Abstract

NAME, Institution 15:30 - 15:50

TITLE

Abstract

NAME, Institution 15:50 - 16:10

TITLE

Abstract

NAME 16:10 - 16:30

TITLE

Abstract

NAME 16:30 - 16:50

TITLE

Abstract

Discussion 16:50 - 17:10

Tuesday, April 28

MORNING KEYNOTES (9:00 - 11:30)

Chairpersons: **XX & XX**

NAME, Institution 9:00 - 9:20

TITLE

Abstract

NAME, Institution 9:20 - 9:40

TITLE

Abstract

NAME, Institution 9:40 - 10:00

TITLE

Abstract

NAME, Institution 10:00 - 10:20

TITLE

Abstract

NAME, Institution 10:20 - 10:40

TITLE

Abstract

NAME, Institution 10:40 - 11:00

TITLE

Abstract

Discussion 11:00 - 11:30

AFTERNOON KEYNOTES (14:30 – 17:10)

Chairpersons: **XX & XX**

NAME, Institution 14:30 - 14:50
 TITLE
 Abstract

NAME, Institution 14:50 - 15:10
 TITLE
 Abstract

NAME, Institution 15:10 - 15:30
 TITLE
 Abstract

NAME, Institution 15:30 - 15:50
 TITLE
 Abstract

NAME, Institution 15:50 - 16:10
 TITLE
 Abstract

NAME 16:10 - 16:30
 TITLE
 Abstract

NAME 16:30 - 16:50
 TITLE
 Abstract

Discussion 16:50 - 17:10

Wednesday, April 29

MORNING KEYNOTES (9:00 - 11:30)

Chairpersons: **XX & XX**

NAME, Institution 9:00 - 9:20
 TITLE
 Abstract

NAME, Institution 9:20 - 9:40

TITLE	
Abstract	
NAME, Institution	9:40 - 10:00
TITLE	
Abstract	
NAME, Institution	10:00 - 10:20
TITLE	
Abstract	
NAME, Institution	10:20 - 10:40
TITLE	
Abstract	
NAME, Institution	10:40 - 11:00
TITLE	
Abstract	
Discussion	11:00 - 11:30

AFTERNOON KEYNOTES (14:30 – 17:10)

Chairpersons: **XX & XX**

NAME, Institution	14:30 - 14:50
TITLE	
Abstract	
NAME, Institution	14:50 - 15:10
TITLE	
Abstract	
NAME, Institution	15:10 - 15:30
TITLE	
Abstract	
NAME, Institution	15:30 - 15:50
TITLE	
Abstract	
NAME, Institution	15:50 - 16:10
TITLE	
Abstract	
NAME	16:10 - 16:30
TITLE	
Abstract	
NAME	16:30 - 16:50
TITLE	

Abstract

Discussion

16:50 - 17:10

NOTE: Chairpersons are kindly asked to submit to any member of Organizing Committee a short written report (half a page) that summarizes the discussion and conclusions of each section at the end of the working day or at least the next morning.

Thursday, April 30

Conclusions and closed ceremony

14:30 - 15:30

NOTE - Text prepared by AUTHORS, who are fully responsible for the content of abstracts and its quality. Language corrections were not made.

Dražen BALEN,

University of Zagreb, Faculty of Science, Department of Geology, Croatia

time

Geology and wine: a case study of igneous and metamorphic rocks, soils and red wines of the Geopark Papuk (northern Croatia)

The Republic of Croatia is a country of a very complex and diverse geology marked with rocks that evolved from three dominant orogenic chains of southeastern Europe: Alps, Dinarides and Carpathians. Beside this orogenic movements and previous geologic history, dating back to Paleozoic era, the Cenozoic evolution of Pannonian Basin leaves final imprint on the landscape shaping. Such geological diversity, exposed in the area of Slavonia (Mt. Papuk) in northern Croatia, was the foundation for the natural heritage protection at the national level (Nature Park Papuk) as well as at the international level. The first Croatian geopark - Geopark Papuk - was founded under the protection of UNESCO. However, legislation oriented towards the environmental protection was not the obstacle but the base for a sustainable living of local population and various activities, among which the production of wine holds an important position. In spite of the fact that it is already on the high quality level, wine production in the area reflects constant effort of winemakers to improve the production, aiming mostly on the quality and not only the quantity of local wines. Within the Geopark Papuk, especially on the southern slopes of Mt. Papuk, numerous vineyards are positioned. They prograde up finding their place high on the mountain slopes, growing on the soil developed mainly on igneous and metamorphic basement rocks.

The scope of this case study contribution is to enable a better definition of the geological component of a *terroir* of red wine related to the specific microenvironment using classical approach and equipment for the mineralogical, petrological and geological studies for which Department of Geology at Faculty of Science is capable. With kind help provided by the Nature Park Papuk, Polytechnic in Požega and Vlado Krauthaker Winery, sampling of rock, soil, grape and wine of northernmost and highest vineyards at Mt. Papuk was performed. The vineyards with grapes that give red wines (Cabernet Sauvignon, Merlot and Shiraz/Syrah) are planted on a thin soil cover laying directly over the pre-Alpine crystalline basement of the Slavonian Mountains.

The crystalline rocks found as the debris in the vineyards are mostly orthogneiss and micaschist with subordinate amphibolite and metagabbro. Those rocks belong to the oldest dated rocks at Mt. Papuk (Cambrian – Ordovician) originating from calc-alkaline peraluminous crustal and mafic rocks as precursors, respectively. They are related to a former active continental marginal setting. The calculated peak P-T metamorphic conditions reach amphibolite facies conditions. The soil developed on the hill slopes was sampled at two horizons: at 30–35 cm and 60–65 cm depths. Upper level is characterized with brown colour where sand (and grus) predominates over the clay component. This level is rich in (altered) fragments of metamorphic rocks and quartz. At 60 cm depth, dark brown clay-rich soil comprises limonite substance, metamorphic rocks fragments and agglomerates of altered amphiboles. The minerals in the deeper horizon beside (altered) original rock-forming minerals (amphiboles and plagioclase) comprise greater quantities of various types of phyllosilicates (illite/muscovite, biotite, chlorite, talc, kaolinite and smectite). The deeper horizon is more acidic (pH=4.3–4.6 vs. 4.6–4.8; exchangeable acidity).

Standard minerals typical for the amphibolite facies conditions (garnet, amphibole, biotite and feldspar) are major hosts of elements important for the wine production. Such elements, liberated from the minerals through the alteration processes (i.e. production of the "clay minerals" and soil) and biochemical reactions enter the plant, grape and finally end up in the wine. All chemical elements measured here with ICP-MS are within Croatian legal normative. Combination and availability of Fe, Mg, Na, K and Ca together with other factors of wine production have created almost ideal combination for red wine production in this part of Nature Park/Geopark Papuk.

Potential further research on different aspects of *terroir* may be commenced through the European Geopark Network (Wine in Geoparks workgroup – Introducing geology from a bottle of wine) combining knowledge and equipment from various Departments at the Faculty of Science or any other frame and partners with interest for the joint work on this and similar environmental topics.

Ivica KISIĆ,*University of Zagreb, Faculty of Agriculture, Croatia*

time

Environmental aspects of open space fire

Over the past decade we are witnessing rapid climate change. The climate changes in the Mediterranean part of the Republic of Croatia (RH) were particularly manifested by the increasingly frequent occurrence of summer fires that had a certain negative impact on soil degradation, pollution of surface waters and changes in the landscape. The direct consequences of wildfire are changes in the physical, chemical and microbiological features of the soil. The indirect consequences are the distortion of the landscape, the phenomenon of wind and water erosion, as well as mudslides with all the consequences on the environment that these processes carry with them. In the Republic of Croatia, the greatest fire hazard is in the Mediterranean area with almost 100 000 fires in the period from 1998 to 2018. Deviations from the above number of fires in this area occurred in 2014 with 1,026 and the cataclysmic 2017 with an extreme appearance of 6,906 fires. This is in accordance with the weather conditions during those years. Due to the lack of freshwater sources, most of the coastal fires are extinguished with sea water, which directly affects the deterioration of the physical and chemical characteristics of the soil. Climatic conditions that are becoming ever more extreme and a drastic decline of rural population suggest that wildfires will become an increasing problem in the near future. The most efficient and effective method for the prevention of fire occurrence and, consequently, undesired changes in the environment is the preventive implementation of agrotechnical operations (agroforestry, water accumulation, management of plant residues in the forest area) in the autumn of the year when a fire occurred or in the early spring of the following year before the fire season. Unfortunately, the problem of fire is immediately forgotten at the end of the summer season and we remember them again with their appearance the next spring / summer. The problem is that the wildfire season is getting longer in the Republic of Croatia and fires occur at longitudes and latitudes where it was unthinkable 10 years

Damir KRALJ,*Ruder Bošković Institute, Croatia*

time

Investigation of kinetic and mechanisms of precipitation processes relevant for tufa formation

Precipitation is a physical-chemical process of formation of new phase in homogeneous system. Typically, precipitation is a formation of solid phase in liquid and it is recognized after the term "crystallization" as well. Actually, the precipitation is a common term for three basic processes: nucleation, crystal growth and aging. Relevant physical and chemical properties of precipitate (e.g., chemical and mineralogical composition, morphology, crystal size...) strongly depend on series of parameters, like initial concentration of reactants, temperature, pH, ionic strength, presence of impurities etc. The analysis of the precipitation kinetics of slightly soluble salts may give the information about controlling molecular mechanisms and, consequently, the properties of solid phase. Calcium carbonates are slightly soluble salts of carbonic acid and suitable models for studies of basic precipitation processes, because they appear in several different solid modifications: three hydrated forms (calcium carbonate monohydrate, calcium carbonate hexahydrate and amorphous calcium carbonate) and three anhydrous polymorphs (calcite, aragonite and vaterite), among which calcite is the only thermodynamically stable modification under standard conditions. Calcium carbonates are also of enormous importance in technology and particularly in natural environment, since their deposition is important sink for atmospheric CO₂ and mediator for observed intensive global warming and seawater acidification processes. On the other hand, particularly complex ecological systems of environmental CaCO₃ precipitation are tufa (travertine) and lacustrine sediment formation in the karstic regions. Their formation is a consequence of numerous processes and specific environmental settings (rainfall, soil penetration, acidification, chemical and mineralogical composition, vegetation cover, microbiological environment, aeration...). The mentioned processes may be responsible, either for dissolution of present sediments and physical-chemical or hydrological properties of the streams, but also for mechanisms and extent of redeposition on the suitable locations within the streams. Still, an extensive discussion can be found in literature about dominant

mechanisms governing the tufa deposition at specific locations. Thus, calcium carbonate may precipitate, either in the bulk of the water column or on the submerged macrophytes, organic and inorganic substrates, or precipitation may be initiated by active microbiological (cyanobacterial stromatolites) activity. Due to explicitly autotrophic nature of the majority of karstic streams, tufa deposition is particularly sensible on human impact. The aim of the proposed research is to analyze the kinetics and mechanism of calcium carbonate precipitation at controlled laboratory conditions, which are similar to the locations of intensive tufa formation. At that, the chemical composition of the macro components of the artificial karst water will be practically identical to the composition of the selected streams. A reasonable range of temperatures will be investigated, while particular attention will be paid to the specific role of Mg^{2+} on the processes of spontaneous and templated precipitation. In addition, the influence of the natural organic matter, as well as the phosphates and polyphosphates, used as the indicators of anthropogenic pollution of the streams which may deteriorate the tufa formation process, will be investigated. In parallel to the laboratory precipitation experiments, the appropriate field investigations of the calcium carbonate deposition rate will be conducted in the respective streams and by using previously prepared inorganic and modified substrates. The relevant chemical-physical parameters of the water streams will be continuously measured during the deposition period, while the samples of tufa will be chemically, morphologically and structurally characterized and compared with precipitate periodically obtained on substrates.

Nenad JASPRICA,

University of Dubrovnik, Institute for Marine and Coastal Research, Croatia

time

The Mali Ston Bay – A Special Nature Reserve Under the Anthropogenic Influences

The Mali Ston Bay (4821 ha) is a bay in the south-eastern Adriatic, enclosed by the Pelješac Peninsula and the mainland in South Croatia. It expands to the northwest and connects with the Neretva River channel which is linked with the open sea. Due to its ecological and economic importance, this area, both marine and belonging terrestrial part, with a centuries-long mariculture tradition (European flat oyster farming) was proclaimed as Special Marine Reserve in 1983. In addition, the area is a part of NATURA 2000 ecological network in Croatia. The most important factors that affect the ecological conditions in the Mali Ston Bay, primarily salinity and nutrient enrichment, are the inflow of freshwater from the Neretva River and karstic underwater springs ("vruljas"). According to the nutrient concentrations and the phytoplankton abundances, the bay is characterized as a *moderately/naturally eutrophicated* ecosystem. The forested coastline does not allow for the sudden inputs of nutrients to the sea, therefore, intense phytoplankton blooms do not occur. The Mali Ston Bay is an extremely valuable natural heritage of the Republic of Croatia, a balanced ecological system with optimal conditions for the reproduction and production of bivalve molluscs with the highest standards of their health status. Planning the construction of tourist facilities in the area is of particular concern. There is predicting that a fourfold increase in the number of tourists will increase the yield of harmful substances into the sea; especially wastewater in the event of a failure of the sewer system, harmful bacteria and viruses, heavy metals from vessels and off-road access. Changes in soil structure caused by deforestation on the land alter hydrological and biogeochemical processes in soil and the sea as well. Maintaining an existing, equilibrium ecological status in the Mali Ston Bay can ensure the successful production of a European flat oyster that could bear the epitome of Croatian product for the 21st century.

Sandi ORLIĆ,

Ruđer Bošković Institute, Croatia

time

Novel approaches in the study of the Freshwater Microbial Community

Lakes represent the largest liquid Earth's freshwater ecosystems. They support enormous biodiversity and provide key ecosystem services to humans. Although, climate change and anthropogenic influence are among the greatest threats to lakes, still is missing an empirical knowledge of lake responses to this perturbances. Microorganisms have a major impact on climate changes and are influenced by human activity. They are an excellent biomonitoring tool that with the advent of molecular tools could have even a major impact. Karstic lakes are especially sensitive to climate changes and represent the majority of the water bodies in Croatia. The use of novel tools in microbial ecology (as next generation sequencing – NGS or Catalyzed Reporter Deposition Fluorescent in situ hybridization

- CARD FISH or metagenome analysis) have improved our knowledge of aquatic ecosystems in the last 10 years. In this presentation, we will give an overview of our results, possibilities and treats of the novel approaches

Zvezdana BENCETIĆ KLAIĆ,

University of Zagreb, Faculty of Science, Department of Geophysics, Croatia

time

Fine-scale responses of Kozjak Lake, Croatia to atmospheric forcings

We investigated the fine-scale thermal responses of an oligotrophic karstic lake (Kozjak, Plitvice Lakes, Croatia, maximum depth of 46 m) to atmospheric forcings. Lake temperatures (2-min means) were measured continuously at 15 depths from 0.2 to 43 m with waterproof temperature sensors (HOBO TidBit 400) during the 4-month period in which the lake was stratified. Meteorological data were observed at nearby meteorological site at hourly resolution. Results show thermocline deepening from 10 m at the beginning, to 16 m at the end of the observational period. This corresponds to the average deepening of 3–4 cm per day, while the maximum deepening (12.5 cm per day) coincided with the occurrence of internal standing waves (internal seiches). Further, results suggest three different types of forcings on the lake surface. Two of them are periodic with periods of 24 h, namely, 1) continuous heat fluxes and 2) noncontinuous but periodic stronger winds, while the third forcing corresponds to occasional along the basin-steady stronger winds. Continuous heat fluxes produced diurnal oscillations in the lake temperature within the first 5 meters of the lake throughout the entire observational period. Noncontinuous periodic stronger winds produced occasional diurnal oscillations in the lake temperatures at larger depths (from 7 to 20 m). Stronger along-the-basin winds produced two types of oscillations: internal seiches with a period of 8.0 h, and, surface seiches with a period of 9 min. Lake currents generated by the surface seiches due to sloped lake bottom generated high-frequency thermocline oscillations with periods of approximately 9 min.

Maria ŠPOLJAR

University of Zagreb, Faculty of Science, Department of Biology, Croatia

time

Shallow lakes functioning, restoration and preservation

Shallow water bodies, permanent or/and temporary, are in the frontline of those endangered ecosystems affected by anthropogenic environmental changes. Recent ecological studies suggest the importance of a ponds in the preservation of biodiversity, despite their small size, they contribute significantly to the regional diversity compared to other freshwater systems. Mediterranean temporary ponds are specific ecosystems, which include small, karst waterbodies with alternating hydroperiods, and due to the proximity of the sea are exposed to considerable fluctuations in salinity. In the presentation several aspects related to shallow lake functioning in different climates (temperate vs. Mediterranean) will be presented: (i) main drivers of zooplankton assemblage in shallow water bodies of different trophic state and macrophyte coverage; (ii) experimental possibilities of restoration and its application, and (iii) ecosystem modelling based on environmental and biocoenotic variables and suggest sustainable restoration based on nutrient reduction or macrophyte (re)establishment. Presented results contribute to the knowledge in ecosystem ecology, food webs interactions, fish aquaculture, taxonomy, biogeography, lake restoration and preservation. Environmental and biocenological features in karst ponds of eastern Adriatic coast and determine measures for their preservation and protection, focusing on the analysis of invertebrates in plankton and benthos, through the food webs and ecosystem functioning.

Domagoj ĐIKIĆ,

University of Zagreb, Faculty of Science, Department of Biology, Croatia

time

XXXXXX

Professor Domagoj Đikić will present the current studies and the research groups at the Division of Animal Physiology of the Biology Department of the Faculty of Science, University of Zagreb. The research topics can be divided in two parts. First is the application of natural molecules from plants, animals or environment applied in biomedical research and the second is comparative physiology of animals employed for studies and biomonitoring of changing natural environments and ecotoxicology.

The efficacy of the biologically active ingredients in such natural remedies are subject of research of the scientists at the Department of Animal Physiology of the Faculty of Science Zagreb. Even though medicines are often sought in the most distant parts of the world, some of them, like natural plant or animal molecules compounds, can be found on our doorsteps and used in the biomedicine or pharmacology of natural food supplements and nutraceuticals. We believe that the biodiversity richness in large natural areas of China and traditional Chinese remedies from natural origin offer great opportunity to jointly conduct research in teams with Croatian scientists to explore the natural compounds in Chinese species. How these products and their biologically active polyphenolic and flavonoid constituents affect the mechanism of tumor growth and metastasis, diabetes, neurodegenerative diseases, osteoporosis and autoimmune and inflammatory diseases and oxidative stress mediated pathology are some of the scientific questions that our experts are seeking to answer. We employ well established laboratory models on laboratory rodents that we keep in our animal facility. Our laboratories provide all sorts of physiological analysis regarding biotransformation enzymes hematology, immunology and general physiology measurements and analysis, including measurement on animal behavior. Also, there are numerous published papers covering the investigations of stress or foreign substances that enter the human body, cause damage to the DNA molecule and the emergence of cancerous diseases. We investigate numerous natural mechanisms of repair of DNA fractures, cancer prevention or tumor cell destruction, and how different natural compounds can protect from radiation and harmful chemical substances. Answers to these questions are gained by studying animal models but also in cell cultures facility.

At the Department of Animal Physiology we also conduct research related to other branches of physiology, for example comparative animal physiology on animals that are not laboratory models but from nature, especially in ecotoxicological and metabolic physiology, with an emphasis on physiological changes in metabolic effects of exposure of animals to toxic or changing environment (climate change). In the field of comparative physiology, papers on physiology of lower vertebrates stand out, for example oxidative stress measurements in euglena, insects ecotoxicology. In the field of metabolism physiology, especially in the area of interest, research is focused on the comparative thermal and lipid physiology and physiology of metabolism and biomass increment on several animal models for example physiology of omega fatty acids in fish. In next five years we are also planning to conduct a project on heat shock proteins and oxidative stress changes in various species of Cnidarians from Adriatic Sea and in laboratory set up models of anemones. Within toxicology research we have focused on investigating the exposure of pesticides to foods, especially triazines, imadazole, pyrethroids, carbamates and mixtures of pesticides present in the environment. In particular, it is a contribution to the study of the synergistic, antagonistic and potentiating effects of these xenobiotics on physiology and their effects on genome stability.

Mladen KUČINIĆ,

University of Zagreb, Faculty of Science, Department of Biology, Croatia

time

Faunal biodiversity and DNA barcoding in Croatia

DNA barcoding was proposed in 2003. By Paul Hebert as a universal system for assignment of specimens to a particular species but also as a tool for recognition of yet undescribed morphologically indistinguishable cryptic species. The method is based on the sequencing of standardized, ~650 bp long fragment of the mitochondrial cytochrome c oxidase subunit 1 gene (COI).

Geographically located in the Western Balkan and Mediterranean basin, Croatian territory has great habitat diversity and represents one of the European biodiversity hotspots. High biodiversity index is consequence of very diverse habitats, climatic and hydrological features as well as complex geological history of the region. The primary goal of the research project „DNA barcoding of biodiversity of Croatian fauna“ is to investigate the amount and geographic

distribution of the genetic biodiversity of selected groups of Croatian fauna (e.i. Pseudoscorpiones, Ephemeroptera, Plecoptera, Trichoptera, Butterflies, Mosquito, Amphibians, Reptiles, about 1200 species) by using DNA barcoding methodology, flagging species for further rigorous taxonomic, phylogenetic and phylogeographic studies. In the frame of the proposed project, the priority will be given to potentially taxonomically especially interesting groups and groups for which DNA barcoding is already in progress within other European barcode initiatives.

The project brings together great number of Croatian specialists from different institutions: taxonomic experts for each selected taxonomic group (trained taxonomists having primary scientific interest in taxonomy and ecology of proposed taxonomic groups, good oversight on the existing zoological collections and great experience in sampling and identification of specimens) as well as experts for molecular systematicists (having primary scientific interest in molecular systematics, phylogeny and phylogeography and great experience in laboratory techniques and bioinformatic analyses). They will use their professional skills, expertise, experience and knowledge to efficiently collect, conserve and precisely identify (if possible to species level) collected specimens (taxonomist); to carry on all necessary molecular-genetics and bioinformatic analyses (molecular systematicists), to enrich international databases with newly obtained DNA barcodes and to analyse and elaborate obtained results regarding biodiversity assessment in the frame of integrative taxonomic approach.

The material preserved in zoological collections will be used to the maximum extent possible (ethanol or cryopreserved tissues with vouchers as well as dry entomological specimens and ethanol preserved samples not older than 20 years). At least 50% of properly preserved specimens of selected animal groups are available and ready for analysis. The rest of material will be collected in the field with standard sampling techniques for each group (e.g. entomological nets, UV lamps, horsefly traps, surber net, with hand etc.). All prerequisite permissions will be acquired. The tissue sample of collected specimens will be immediately conserved in preservative such as 96% ethanol. All specimens will be identified by experienced taxonomists (experts for the group) up to the species level based on the morphological characters with exception of cryptic and very similar species. Vouchers of all analysed specimens as well as tissue samples accompanied by the essential identification elements (name of the species, date of collection, name of collector, geographic origin with latitude and longitude, name of identifier and photo documentation) will be properly conserved and deposited in the respective Natural History Collections (NHC) of the Croatian Natural History Museum (CNHM).

DNA barcodes obtained in this research will enable simple, fast and accurate identification for a great number of species, and flag certain groups for further investigation. They would most probably provide insights in some of still unrecognized or overlooked cryptic, probably endemic species in Croatia. The assessment will be of primary importance for the development of strategies and action plans for the conservation of biodiversity in Croatia. In addition, these results will also find application in biomonitoring as well as for epidemiological studies (identification and monitoring of disease vectors).

Marija GLIGORA UDOVIČ

University of Zagreb, Faculty of Science, Department of Biology, Croatia

time

Use freshwater algae in standards and thresholds for impact assessment

Although the water protection policy of the European Union (EU) dates back to 1970s, it was only during the 1990s that the European Commission (EC) recognized the need for an integrated approach to water management. The introduction of the Water Framework Directive (WFD) in the 2000 has established a policy framework that addresses all relevant aspects of maintaining and reaching a high quality of European freshwaters. It's main task is to provide quantitative and qualitative guidelines to environmental policy-making, particularly with regard to the ecological assessment of ecosystems and the approach to integrated river-basin management. EU Member States have been engaged in the development of new, or refinement and adaptation of existing, assessment methods for the eutrophication related biological quality elements (BQEs) required for the assessment of ecological status under the WFD. The principal eutrophication related BQEs for the ecological assessment of lakes and rivers are phytoplankton and phytoplankton. The first step in the development of assessment methods for these BQEs was to define type-specific reference conditions and class boundary criteria for the classification of ecological status. In step with the development and consequent intercalibration of these assessment methods, criteria for the eutrophication related supporting physico-chemical determinands, like nutrients and dissolved oxygen concentrations, were established. Although many indices describing the response of phytoplankton and

phytobenthos to eutrophication are used in the routine monitoring programmes in the EU countries, the current WFD-compliant phytoplankton and phytobenthos-based methods evolved through the adoption of WFD as a legislative for long-term integrated water management in the EU.

For biological monitoring and ecological assessment of waterbodies in Croatia, our laboratory uses standardized procedures of sampling, processing and identifying indicator species, followed by subsequent calculation of biotic metrics, which are then compared with metric values derived from reference conditions, in order to assign an ecological status. In our work we present approaches to establish a methodology to assess water quality in lakes, rivers and artificial waterbodies of Dinaric and Pannonian ecoregion of Croatia. The tools we use for bioassessment of aquatic ecosystems are based on traditional morpho-taxonomic approach, as well as on molecular approach. The combination of fundamental research and applied scientific studies has resulted in a unique collection of diatoms registered as a Croatian national diatom collection.

Martina JAKOVČIĆ OR Vedran PRELOGOVIĆ,

University of Zagreb, Faculty of Science, Department of Geography, Croatia

time

Human-Geographical research at the department of Geography in Zagreb

Human-geographical research-projects are mainly focused on research of rural areas, urbanization, population and tourism, while the human impact on the environment has been partially researched. In the last five years, several projects have been carried out addressing these issues.

The main objective of the CRORURIS (*Application of Scenario Methods in the Planning and Development of Rural Areas of Croatia*) interdisciplinary project was to formulate alternative scenarios for the development of rural areas of Croatia in 2030. The purpose of the project is to encourage consideration and public debate on the future of rural areas. Human activities in rural areas are changing the environment and causing changes to a whole range of ecosystems. Environmental change is one of the important aspects of possible scenarios for the development of rural areas in Croatia. Land cover changes form an integral part of this research. Therefore, the impact of demographic and socioeconomic transformations on land cover changes has been analyzed. Part of this research has focused on the incidence of fires in Dalmatia (southern region in Croatia) over the last 40 years. Weakening of economic activities and depopulation enabled the growth and development of combustible material in neglected agricultural areas, which affected the more frequent occurrence of fires. Furthermore, the project also addressed the methodological basis of scenario development. Three scenarios for the possible development of Dalmatia were thus created: Tourism Monoculture, Sustainable Tourism and Integral Development. According to demographic projections, most of the rural areas in Croatia will have depopulation characteristics in 2030.

Urbanization in the Zagreb Urban Agglomeration (ZUA) has been researched within the framework of two projects: *Evaluation and Development Potential of Suburban and Rural Settlements of the City of Zagreb* and *Analysis and Evaluation of Development Potentials and Limitations of the Zagreb Urban Agglomeration*. Zagreb and its surroundings are the heartland of Croatia. It is a demographic core with a population of 1,100,000 (around 25% of the total population of Croatia). Strength and importance are also emphasized in the economic sphere - agglomeration has more than 1/3 of all jobs in the country. The expansion of the city into the surrounding area is accompanied by the construction of new residential areas, transport infrastructure, development of production and service activities, land conversion and habitat fragmentation. Detailed and multi-layered research has produced the regionalization of the ZUA. Its main purpose is to show the different human-geographical and physical-geographical features and developmental tendencies of the ZUA area. Development measures are proposed and selected that, according to the results of the analyzes, correspond to the identified pressures and development potentials. Regionalization of ZUA identified: three regression, one stagnation and four expansion zones. Each zone is explained by human-geographical (population dynamics, demographic and socio-economic structures, demographic projections and demographic resources, types of settlements, central functions, tourism and recreation) and physical-geographical features (geomorphological, hydrological, dominant landscape and habitat type, geo-ecological and ecosystem services), and development proposals.

Jasna LAJTNER

University of Zagreb, Faculty of Science, Department of Biology, Croatia

time

Invasive freshwater molluscs in Croatia: introduction pathways, current distribution, impacts and management methods

The increase in human activities and the recent climate change have made ecosystems progressively more disturbed and susceptible to biological invasions worldwide. Invasive mollusc species may have dramatic impacts on native biota and ecosystem functioning because they are direct competitors for food and space with the native species. Also, they caused significant and noticeable economic effects. In Croatia eight alien invasive mollusc species have been confirmed to the date and four of them have successfully established stable populations: mussels *Dreissena polymorpha*, *Sinanodonta woodiana* and *Corbicula fluminea* and snail *Potamopyrgus antipodarum*. *D. polymorpha* has become one of the most dominant species in many lakes and rivers of Europe and North America since it began spreading from the Caspian area in the early 19th century. Big invasive success of this species could be attributed to ability of adults to adhere to hard surfaces with their byssus, to development of free-swimming veliger larvae, and to its extraordinarily high fecundity. In Croatia *D. polymorpha* was recorded in rivers Danube, Drava, Sava, Kupa and Dobra. *S. woodiana* is native for the Eastern and South-Eastern Asia. The spread of this species in some areas of Europe, Central and North America is mainly due to the introduction of some Asian indigenous fish species acting as a host of mussel's parasitic larvae and therefore *S. woodiana* has become direct competitor for fish hosts with the native unionids. This species has the widest range of distribution in continental part of Croatia, including large rivers and their tributaries, as well as fish ponds and lakes. *C. fluminea* is native species in Eastern Asia. In Croatia *C. fluminea* was found in rivers Danube, Sava, Drava and Kupa. The main pathway for this species was construction of the connecting canals between Danube, Rhine and Main. Snail *P. antipodarum* is native to the freshwater streams and lakes of New Zealand. However, species has become invasive in Australia, Europe and North America. In Croatia this species has established stable populations in rivers Mirna and Drava. Finally, because negative impacts of some mollusc invasive species on native species were already recorded, and the process of their expansion in Croatia will continue, monitoring of these species is required in the future.

Bruno ZELIĆ,

University of Zagreb, Faculty of Chemical Engineering and Technology, Croatia

time

Micro-, Lab-, Pilot- and Industrial Scale Based Biocatalytic Processes

Nowadays as the availability and accessibility of fossil fuels is significantly declining, the need for the production of biofuels from various renewable sources is becoming increasingly interesting. Biodegradability, non-toxicity and low pollution emissions are merely some properties making biogas, biodiesel and bioethanol more environmentally friendly fuels. Apart from biofuels, second important technology based on biocatalytic process is waste-water treatment.

Solid-state fermentation could be a suitable technology for the production of value-added products by utilization of the renewable waste materials, which makes it also economically feasible. So far, this technology was used for production of enzymes, organic acids, mushrooms, flavor and aroma compounds, pigments, polysaccharides, hormones, human food and animal feed. Different type of bioreactors have been developed and successfully used for solid-state fermentation of broad range of substrates and in production of value-added products. Solid-state fermentation on lab-, pilot- and industrial-scale will be demonstrated as part of anaerobic degradation of several waste materials such as brewer's spent grain (mono-substrate) and whey and cow manure (co-digestion). The anaerobic process was divided into a reactor for the anaerobic digestion of solids (SS-AD - Solid State Anaerobic Digestion reactor), in which hydrolysis mainly took place and into a reactor with granular biomass (GBR Granular Biomass Reactor) in which most of the biogas production took place.

Microreactors are widely used in different fields of chemical and pharmaceutical industry, biotechnology and medicine. Previous studies of the application of microreactor technology in the production of biodiesel were limited

to the use of chemical catalysts. Mild reaction conditions, absence of unwanted by-products (soap), reusability, simple separation and purification of the resulting biodiesel as well as lower energy consumption are some of the many advantages that make the enzyme lipase – a biocatalyst – a better choice than traditional chemical catalysts in the process of biodiesel production. Different microreactor systems utilizing a commercially available lipase and a lipase produced by solid-state fermentation using the fungus *T. lanuginosus* were used for transesterification of fresh and waste cooking oil while biodiesel was separated using integrated microseparation unit.

The purification of sanitary-fecal municipal wastewater from hotels, camps, shopping malls and smaller settlements is today big challenge. The Biorotor is a modern, compact, portable and mobile device for the biological aerobic wastewater treatment for small number of person equivalents. Use of Biorotor will be clear example of pilot-scale biocatalytic process for waste-water treatment. Selected examples are demonstration of environmentally friendly and economic technologies used for efficient production of biofuels or waste-water treatment on micro-, lab-, pilot- and industrial scale.

Marko MILIŠA,

University of Zagreb, Faculty of Science, Department of Biology, Croatia

time

Ecosystem of tufa depositing Balkan karst

Water that surfaces in karst environments can be supersaturated with carbonates. Under certain circumstances calcium carbonate in the form of calcite is deposited on any immersed surfaces including organisms. Such deposits of calcite, developing under temperate conditions is called tufa. In Dinaric karst, due to rapid deposition, tufa forms very dynamic environments that exhibit exciting interplay of water flow, calcite, detritus and organisms. Since the deposition occurs very rapidly (more than 1 cm per year) the organisms that dwell here must be highly adapted for coping with the burial process. Some of these organisms play a crucial role in the process of tufa deposition. Detritus processing is also specific in these habitats. As in similar streams elsewhere the energetic basis for benthic assemblages is allochthonous detritus. While leaf litter decomposition can be hindered by encrustation, in Dinaric karst it seems that tufa deposition promotes the decomposition. The interaction between the microbial community and the porous character of this tufa allows microbial decomposition even under the tufa cover. Also, fast flowing water containing many calcite crystals and other particles is a potent abrasive that contributes to decomposition process. Macroinvertebrates, on the other hand, cannot influence the decomposition rates to any significant level. Moss plays a significant role in trapping the particles from seston especially in fast flow habitats. In addition to its surface role, moss is important as an energy source in the hyporheic zone, where moss tissue overgrown with tufa represents main source of particulate organic matter. This is especially important during summer when tufa deposition rates are highest. In this way tufa deposition ensures constant source of energy to the hyporheic zone.

Jasna HRENOVIĆ

University of Zagreb, Faculty of Science, Department of Biology, Croatia

time

Emerging hospital pathogens in environment

Due to the development of resistance to last-resort antibiotics, nowadays some bacterial species are a leading cause of serious hospital outbreaks worldwide. Carbapenem-resistant *Acinetobacter baumannii* is positioned at the first place of the WHO critical list of bacteria for which new antibiotics are urgently needed.

Clinically relevant *A. baumannii* were reported outside hospital settings, including natural waters and soils influenced by human waste. Viable *A. baumannii* in nature represent a public-health risk for the occurrence of community-acquired infections of humans and animals that are exposed to them in environment.

Carbapenem-resistant *A. baumannii* and other clinically relevant carbapenem-resistant bacteria could be easily selected from native bacteria present in the environmental samples when cultivated in the carbapenem-supplemented media at 42°C (CR42). The CR42 population is absent in environmental samples save of the influence of hospital wastewater or illegally disposed infective solid waste. Thus, the presence of CR42 in environmental samples could indicate the presence of emerging hospital pathogens and suggest the seriously anthropologically influenced environment.

The group of CR42 is valuable in monitoring and assessment of the anthropological influence on the pristine environment. When knowing the hydrogeological characteristic of the wider area, the source of CR42 could be

determined. The proper management of hospital wastewater and infective solid waste will mitigate the propagation of these emerging hospital pathogens in environment.

Dario BARIČEVIĆ

University of Zagreb, Faculty of Forestry, Croatia

time

The diversity of forest vegetation in the area of Plitvice Lakes National Park

Plitvice Lakes is the oldest National Park in Croatia, and in 1979 was listed on the UNESCO List of World Heritage. The basic phenomenon is the combination of waterfalls and 16 cascading lakes formed as a result of permanent biodynamic process of creation and growth of tufa. The lakes are surrounded by forest vegetation of a total area 25.000 ha under the Park's jurisdiction. Forests are very interesting and complex for phytocoenological research, primarily due to its preservation, geographical position which is characterized by intermediate forms of continental and Mediterranean, Alpine-Central European and Balkan-Illyrian vegetation, various environmental conditions and floristic composition, as well as numerous succession stages on deforested, mostly former agricultural land. The forest vegetation of the Plitvice Lakes National Park is characterized by several basic features: complex geological-lithological structure, intense anthropogenic influence in the distant past, the absence of management in the last sixty years, relief with relatively small elevation differences in which no typical vertical distribution is expressed.

Phytocenological research and presentation of forest communities were conducted according to the principles of the Zurich-Montpellier or standard Central European school (Braun-Blanquet 1964). Vegetation recordings were entered into the TURBOVEG database in analytical and synthetic form (Hennekens & Schaminée 2001). Cluster analysis, multivariate ordinal analysis, and the Simprof test were performed in PRIMER 6 (Clarke & Gorley 2001). The agglomerative hierarchical MDS (Non-metric Multi-Dimensional Scaling) and UPGMA (Unweighted Pair-Group Method Using Arithmetic Averages) methods were applied with the Bray-Curtis similarity index. Map of forest vegetation in scale 1:25.000 is made on basis of SPOT satellite images. Before field research unsupervised classification with a different number of clusters was conducted to determine spatial distribution of individual clusters (vegetation classes). Unsupervised classification results were used as a template for field research. The field research included 424 plots (176 relevés and 248 control points). Individual coordinates with 30 m radius for each forest community (habitat type) were set up as the learning field for supervised classification. For classifications "Maximum likelihood" method which is integrated within the program ArcMap 9.1. was used. The results of supervised classification in raster format are simplified by using the tools of generalisation and then transferred to the vector form (polygons). The final map is complemented by analysis of geomorphologic factors and the use of previous geological, soil, climate and other maps and research.

On the vegetation map 30 cartographic units and 3 cartographic characters are presented. They are defined according phytocenological principles taking into account the recent situation concerning the dominant species and the manner of their foundation or domination. They are divided into 4 different groups: natural forest communities, succession stages, forest plantations and secondary forest stands of anthropogenic origin and general group with the addition of cartographic signs of dominance or significant presence of certain tree species. Natural forest communities include 21 associations and subassociations. They are described in detail, their systematic affiliation, ecological conditions, localities of distribution in the Plitvice Lakes National Park and floral composition with emphasis on diagnostic species and other features. The forest vegetation of the Plitvice Lakes National Park is classified into 4 classes, 5 orders and 10 alliances, which indicates an extremely high diversity in a relatively small area.

Ivan ČANJEVAC,

University of Zagreb, Faculty of Science, Department of Geography, Croatia

time

Physical-geographical research at the Department of Geography, Faculty of Science

Physical-geographical research at the Department of Geography, Faculty of Science is mainly organized within the Division of Physical Geography which numbers ten research staff members including junior researchers. Research topics include: sea level change, influence of climate change on water resources and socio-geographical elements, speleology (microclimate, water, structural-geomorphologic research, protection), karst denudation (corrosion), karst hydrology, fluvial geomorphology (karst and non-karst), ecosystem services of city parks and protected areas, geodiversity and geoheritage mapping and evaluation, landscape delineation and typization etc.

Since 2017 our research team is involved in research and monitoring projects all-over Croatia dealing with the topic of hydromorphology, funded by the Croatian Waters (national water management authority). Hydromorphological assessment of water bodies is connected with the implementation of the EU Water Framework Directive (WFD). The aim of WFD is a good ecological status of water bodies through the assessment of biological (main), physico-chemical and hydromorphological (supporting) elements. The importance of hydromorphological status and assessment has been more and more recognized within EU, given that it is often a key element of healthy riverine environment. Hydromorphology in the sense of WFD is an interdisciplinary field which combines hydrological and fluvial geomorphological characteristics and processes in rivers with the aim of a good ecological status of rivers, quality water management and revitalization of rivers. It includes fieldwork and desktop assessment of hydrological regime; longitudinal connectivity; and morphology (incl. channel geometry, substrates, channel vegetation and organic debris, erosion/deposition character, bank structure and modifications, vegetation type/structure on banks and adjacent land, land-use and associated features and channel-floodplain interactions).

In addition, a project *Hydromorphological study of the Plitvica stream* is underway with the aim of improving information, knowledge and nature conservancy and management in the sensitive karst valley of the Plitvica stream in the Plitvice Lakes NP. Hydrological research within the Division of Physical Geography since 2012 are focused on the analyses of changes of discharge (flow) regimes of rivers and high flows (floods) resulted mainly from the changes of climate elements.

Božena MITIĆ

University of Zagreb, Faculty of Science, Department of Biology, Croatia

time

Possible Bilateral Collaborations

Research interests: plant taxonomy, systematics, nomenclature, terrestrial and freshwater flora, invasive alien plants and palynology.

Possible collaborative projects in the following scientific fields:

1. Palynology:
 - a) Aerobiology (pollen in the air / Allergology) – in collaboration with Croatian national Institutes of public health
 - b) Vegetation palynology (vegetation history and climate change) – in collaboration with the Croatian Geological Survey
 - c) Plant taxonomy and phylogeny
 - d) Forensic Palynology
2. Flora and Palynology: Alergophytes (plants with allergenic potential – mapping, pollen monitoring, creation of datasets of allergenic indices, modelling of distribution of allergenic plants etc) - in collaboration with Croatian National Institutes of public health (mainly Zagreb and Zadar)
3. Invasive alien plants:
 - a) Mapping, distribution and database(s) of invasive alien plants
 - b) Modelling of potential threats and spread of invasive alien plants
 - c) Phytochemistry of invasive alien plants
4. Ethnobotany

Ivančica TERNJEJ,
University of Zagreb, Faculty of Science, Department of Biology, Croatia

time

XXX

Under construction

Call to Collaboration

List of participants (in alphabetical order)

Participants from Republic of Croatia



Prof. **Dražen BALEN** PhD, Full professor tenure
University of Zagreb, Faculty of Science, Department of Geology
Horvatovac 102a, HR-10000 Zagreb, CROATIA
E-mail: drbalen@geol.pmf.hr
Phone: +385 (0)1 46 059 67; Fax: +385 (0)1 46 059 98
<http://www.pmf.unizg.hr/>

Prof. **Dražen BALEN** PhD was born in 1967 in Zagreb, Croatia. Graduate, master of science and Ph.D. diploma obtained in the field of geosciences at the University of Zagreb, Faculty of Science in 1991, 1994 and 1999, respectively. Since 1991, he works at the Faculty of Science as an assistant (1991-2001), as an assistant professor (2001-2006), as an associate professor (2006-2011), a full professor (2011-2016) and from 2016 full professor tenure. His main research is petrology and geochemistry of igneous and metamorphic rocks with emphasis on accessory minerals, geothermobarometry, and reconstruction of P-T-t paths. Recently he and his group study the influence of rocks and soil on the quality of the wine (terroir). He has wide experience as a principal researcher in the international collaborations with the scientific institutes and faculties from Europe, mostly through scientific, but also through science popularization projects. D. Balen published over 45 peer-reviewed scientific papers, several field-trip guidebooks, and manuals and had over 120 presentations at scientific conferences. He is a reviewer for the international scientific journals and international and domestic agencies. He was a member of Organization Committees of international meetings including the PANCARDI (2000), the Workshop on Alpine Geological Studies in Croatia (2005), and the Croatian Geological Congress in 2010, 2015 and 2019. He is a member of the Editorial Board of the scientific journals *Geologia Croatica* and Herald of the National Museum of Bosnia and Herzegovina. He was elected for the Head of the Department of Geology and Division of Mineralogy and Petrology (Faculty of Science, University of Zagreb) in several terms, member of the Croatian Geological Society (HGD), the American Geophysical Union, the European Geoscience Union (EGU), and the European Association of Geochemistry. In addition, he is a member of the University of Zagreb Council (Senat Sveučilišta) and National Committee for Geoparks. Under his supervision at all levels over 60 students finished theses including three Ph.D. He supervised three student kinds of research awarded with the Rector Award as well as research for the European Mineralogical Union and HGD awards for young researchers. During last years he held courses at the University of Zagreb but also at University of Bratislava with petrology, geochemistry and mineralogy subjects.



Prof. **Dario BARIČEVIĆ** PhD, Full professor tenure
 University of Zagreb, Faculty of Forestry
 Svetošimunska cesta 25, HR-10000 Zagreb, Croatia
 E-mail: dario.baricevic@zg.htnet.hr
 Phone: +385 (0)1 2352 563 Fax: +385 (0)1 2318 616
<https://www.sumfak.unizg.hr/>

Prof. **Dario BARIČEVIĆ** PhD was born on 27 January 1969 in Požega, Croatia, where he completed elementary and secondary school. He graduated in 1994 from the Forestry Department of the Faculty of Forestry in Zagreb, where he later received his Master's (1998) and Doctorate (2002) degrees. The topics of the master's and doctoral degrees were in the scientific field of biotechnical sciences, the scientific field of forestry, the scientific branch of ecology and silviculture. He has worked at the Faculty of Forestry, University of Zagreb, Department of Ecology and Silviculture since 1995, from 12 December 2017 such as an Full professor tenure. In the learning activities involved in lectures, exercises and fieldwork from several subjects (Forestry phytocenology, Forest vegetation, Synmorphology and mapping forest vegetation, Phytocenology, Knowledge of vegetation, etc.) at undergraduate, graduate and post-graduate studies at the Faculty of Forestry in Zagreb. It also teaches the course Applied Vegetation Ecology at the Graduate Study of the Faculty of Agriculture, University of Zagreb, Department of Landscape Architecture, where he performed fifteen years teaching at the course Phytocoenology. He also teaches at the university's interdisciplinary postgraduate specialist study program Ecoengineering the course Floral composition as an indicator of the state of the ecosystem, where he is also a member of the Expert Council. He is the head of the graduate study program Forestry, direction Silviculture and Forest Management with Wildlife Management at the Forestry Department of Faculty of Forestry, University of Zagreb. He has been a mentor in the production of more than 60 final and graduate papers, one final specialist thesis and two doctoral theses. In addition to his teaching responsibilities, so far as manager participated in five, and as a contributor to fourteen national research projects and one international. As co-author, he has participated in the drafting of several ecological studies and projects. He is a member of several national expert committees at the Ministry of Regional Development, Forestry and Water Management and the State Institute for Nature Conservation. He has actively participated in 16 international and 20 national scientific meetings. He has published more than 70 scientific and professional papers as author and co-author and is also co-author of a scientific book (manual) and co-author of six chapters in scientific books and monographs. He is a member of several national and international social and professional organizations such as the Academy of Forestry Sciences, Eastern Alpine and Dinaric Society for Vegetation Ecology and the International Association for Vegetation Science - Working Groups European Vegetation Survey. His main scientific fields are forestry phytocenology, especially sinecological-vegetational research of forest ecosystem and mapping them.



Prof. **Zvezdana BENCETIĆ KLAČIĆ** PhD, Full professor
 University of Zagreb, Faculty of Science, Department of Geophysics
 Andrija Mohorovičić Geophysical Institute
 Horvatovac 95, HR-10000 Zagreb, Croatia
 E-mail: zklaic@gfz.hr
 Phone: +385 (0)1 4605929; Fax: +385 (0)1 4680331
<http://www.pmf.unizg.hr/>

Prof. **Zvezdana BENCETIĆ KLAČIĆ** PhD was born in Zagreb, Croatia on 10th of September 1958. She graduated in Geophysics with meteorology at University of Zagreb, Faculty of Science in 1983. At the same university she obtained her master's degree in Natural Sciences – Physics - Physics of the Atmosphere (1989), and doctoral degree in Natural Sciences - Physics (1998). From 1983 to 1988 she worked at the Department of Geophysics, Faculty of Science, University of Zagreb, first as technician, and later as assistant. During 1988 - 1994 she was employed in the companies 'Hidroprojek' and '3Dnet' where she was engaged with hydrological and hydrotechnical modelling and database creation. As of 1994 till now, she has been working at Department of Geophysics, Faculty of Science, University of Zagreb as an assistant (1994 - 1998), senior assistant (1998 - 2002), assistant professor (2002 - 2006), associate professor (2006 - 2010) and full professor (from 2010 till now). From 2010 to 2014 she was a Head of Department of Geophysics, while from 2014 - 2018 she was Vice Head. Between 1987 and 2006 she spent in total 14 months at foreign institutions (Det norske meteorologiske institutt, Oslo, Norway; Meteo-France, Toulouse, France, Desert Research Institute, Reno, Nevada, USA; and Laboratory of Heat Transfer and Environmental Engineering, Aristotle University, Thessaloniki, Greece) at professional and scientific specialization. As of 2003, ZBK is an Editor-in-Chief of Geofizika journal (<http://geofizika-journal.gfz.hr/>). Fields of her scientific interests are air pollution, mesoscale meteorology and physical limnology. She was principal investigator of Croatian team for the one international project (European Coastal-shelf sea operational observing and forecasting system - ECOOP) and one domestic project (Air quality over the complex topography). Currently, she is principal investigator of the domestic project (Hydrodynamic modelling of the system of Plitvice Lakes). She published 45 papers in scientific journals and results of her work were presented in over 50 conference presentations.



Assis. Prof. **Ivan ČANJEVAC** PhD, Assistant Professor
 University of Zagreb, Faculty of Science, Department of Geography
 Marulićev trg 19/II, HR- 10 000 Zagreb, Croatia
 E-mail: canjevac@geog.pmf.hr
 Phone: +385 (0)1 4895 424; Fax: +385 (0)1 4895 440
<http://www.pmf.unizg.hr/>

Assis. Prof. **Ivan ČANJEVAC** PhD was born in Zagreb in 1980 where he finished primary and high school. From 2000 till 2005 he studied geography at the University of Zagreb, Faculty of Science. After finishing his masters with excellent grades, he started a PhD studies at the same Department and defended his PhD thesis *Typology and changes of discharge regimes of rivers in Croatia* in July 2012. During his PhD studies and as a postdoc he spent altogether 15 months at the University of Natural Resources and Life Sciences, Vienna, Austria. Since late 2006, he is employed at the University of Zagreb, Faculty of Science. He worked as a junior researcher in the period 2006-2016 on several research projects in the field of hydrology and geomorphology. Since 2017 he is continuously leading national projects on first fieldwork based hydromorphological monitoring of rivers and lakes, funded by the national water management authority *Croatian Waters*. In addition, now (2019-2020) he is leading a research project *Hydromorphological study of the Plitvica stream*, funded by the *NP Plitvice Lakes*. His scientific interest includes influence of climate change/oscillation on society and water resources; analyses of discharge regimes; hydromorphology; fluvial geomorphology; tourism and water supply; sustainable development in

hydrology. He published fifteen scientific papers including publications in *Nature* and *Science*. He participated with presentations on around twenty international and domestic conferences and workshops. He was one of the authors of publishing project *National encyclopaedia in 20 books* published by Pro Leksis and Večernji list. He is a secretary of *Geografski horizont*, a professional journal of the Croatian Geographic Society, and is a member of Croatian Geographic Society (vice-president in the 2014-2018 period), Croatian Hydrologic Society and Croatian Geomorphologic Society. In addition, he is a Steering Committee member of the Commission for Water Sustainability of the International Geographic Union (IGU-UGI).



Prof. **Domagoj ĐIKIĆ** PhD, Full professor
 University of Zagreb, Faculty of Science, Department of Biology
 Rooseveltov trg 6, HR-10000 Zagreb, CROATIA
 E-mail: domagoj.djickic@biol.pmf.hr
 Phone: +385 (0)1 4877 753; Fax: +385 (0)1 48 262 60
<http://www.pmf.unizg.hr/>

Prof. **Domagoj ĐIKIĆ** PhD was born on August 31, 1975 in Zagreb. He graduated Biology-Ecology at the Faculty of Science (PMF), University of Zagreb in 1999. Since 2000 he has been employed at the Department of Animal Physiology, Department of Biology, Faculty of Science, where in 2018 he was elected as the Full professor and scientific advisory. He is actively involved in research and teaching in the field of Animal Physiology, Ecotoxicology and Environmental toxicology, Neurophysiology and Metabolism and bioenergetics. He was also teaching at Faculty of Food Technology and Biotechnology, University of Zagreb, on courses regarding nutrition and natural food supplements from biological sources and his research laboratory is actively cooperating with the department for food biochemistry. During his career, he attended postdoctoral training at the University of Marburg at the Department of Animal Physiology and Metabolism. Within current research, in addition to model biomedical animals, he extended his interest in the study of physiology, toxicology and metabolism in a comparative approach to other invertebrates and vertebrates, especially aquatic organisms. He was the leading more than 35 master's theses, 5 doctoral theses. He was actively involved or leading the implementation of 13 scientific projects (national, European and international), he was the. So far, he has published 76 scientific papers, and was author or coauthor in 10 scientific or educational books or textbooks (list of publications at <https://bib.irb.hr/lista-radova?autor=236741>).



Assoc. Prof. **Marija GLIGORA UDOVIČ** PhD, Associate Professor
 University of Zagreb, Faculty of Science, Department of Biology
 Rooseveltov trg 6, HR-10000 Zagreb, CROATIA
 E-mail: marija.gligora.udovic@biol.pmf.hr
 Phone: +385 (0)1 61 897 06; Fax: +385 (0)1 48 262 60
<http://www.pmf.unizg.hr/>

Assoc. Prof. **Marija GLIGORA UDOVIČ** PhD was born in 1977 in Split, Croatia. Her graduate and Ph.D. diploma obtain in the field of biology at the University of Zagreb, Faculty of Science in 2001 and 2007. Since 2001, she works at the Faculty of Science as an assistant (2001-2009), as an Assistant Professor (2009-2018), and from 2018 as an Associate Professor. Her research interests have developed around aquatic ecology and algae, especially the diatoms. She published over 30 peer-reviewed scientific papers. The key research objects in her scientific publications are microalgae in fresh environments, with a special emphasis on oligotrophic karstic aquatic ecosystems and within the context of specific taxonomy and ecology. She has also applied phycologist

with wide-ranging interests in developing quality assessment methods and she participated in more than 40 projects closely related to developing and applying the methodology for estimation of ecological status based on phytoplankton and phytobenthos as biological elements, in Croatia. She participated in the undergraduate, graduate, and postgraduate teaching at the University of Zagreb (Faculty of Science, Faculty of Forestry, and Faculty of Agriculture). Under her supervision at all levels, 12 students finished theses including one Ph.D. At this moment, she is a mentor on three PhD thesis in progress. She has participated in the implementation of more than 20 scientific grants and has participated in more than 70 scientific conferences. Assoc. Prof. Gligora Udovič was a member of Organization Committees of international meetings including the [Symposium on Aquatic Microbial Ecology](#), Central European Diatom Meeting and European Phycological Conference. Recently, she initiated the opening of the Croatian national diatom collection.



Prof. **Jasna HRENOVIĆ** PhD, Full professor
 University of Zagreb, Faculty of Science, Department of Biology
 Rooseveltov trg 6, HR-10000 Zagreb, CROATIA
 E-mail: jasna.hrenovic@biol.pmf.hr
 Phone: +385 (0)1 6189 700; Fax: +385 (0)1 48 262 60
<http://www.pmf.unizg.hr/>

Prof. **Jasna HRENOVIĆ** PhD is employed at the University of Zagreb, Faculty of Science, Department of Biology, Division of Microbiology in Zagreb, Croatia. From 1997, her research interest is focused on the bacteriology, particularly on the detection and characterization of pathogenic bacteria in the environment. The main project that she leads now „Natural habitat of clinically important *Acinetobacter baumannii*” is granted by the Croatian Science Foundation. She has published 92 scientific papers, two university books, four book chapters, and co-authored 108 conference papers. Her scientific papers are cited in the base Web of Science for 888 times with H-index 17.



Assoc. Prof. **Martina JAKOVČIĆ** PhD, Associate Professor
 University of Zagreb, Faculty of Science, Department of Geography
 Marulićev trg 19/II, HR- 10 000 Zagreb, Croatia
 E-mail: mjakovci@geog.pmf.hr
 Phone: +385 (0)1 4895 424; Fax: +385 (0)1 4895 440
<http://www.pmf.unizg.hr/>

At this moment which of two candidates (prof. M. Jakovčić or prof V Prelogović) will attend the workshop

Assoc. Prof. **Martina JAKOVČIĆ** PhD was born on August 25th 1977 in Zagreb, Croatia. At this moment she is a Head of the Department of Geography, Faculty of Science, University of Zagreb. Holds MA in history and geography from Faculty of Arts and Humanities, an PhD in geography from Faculty of Science. Research interest encompass economic geography, transportation geography and spatial planning. Over the years, her scientific interest shifted from retail geography and retail planning toward urban planning with the special interest on strategic city projects and their impact on development of the city, redevelopment of brownfield sites and urban ecology with the special attention on social and cultural services of urban ecosystems.



Prof. **Nenad JASPRICA** PhD, Full professor
 University of Dubrovnik, Institute for Marine and Coastal Research
 Kneza Damjana Jude 12, pp 83, HR-20000 Dubrovnik, CROATIA
 E-mail: nenad.jasprica@unidu.hr
 Phone: +385 (0)20 32 34 84; Fax: +385 (0)20 32 38 72
<https://www.imp-du.com>

Prof. **Nenad JASPRICA** PhD was born in 1960. In 1983, he completed the study of *Biology, Experimental Biology*, Faculty of Science in Sarajevo (Bosnia and Herzegovina). Since 1984 has been working at the Biological Institute in Dubrovnik, which became a scientific unit of the University of Dubrovnik in 2006 as the Institute for Marine and Coastal Research. He received his MSc and PhD degrees in 1987 and 1994, respectively (Natural Sciences, Biology, Botany) on the Faculty of Science in Zagreb (Croatia). His entire working life has been at his home institution (Institute) where he has been a Senior Research Scientist (Natural Sciences, Biology) since 2013. In addition, since 2017, as the collaborator, he has been a full professor at the Department of Geology, Faculty of Science (Zagreb). His fields of expertise are Ecology of the Mediterranean Ecosystems, Phytoplankton Taxonomy and Ecology, Diatoms, Conservation Biology, Vegetation Ecology (Phytosociology). He taught botany at some universities, and has published more than 200 scientific, professional and popular science papers. The most important scientific contributions (authored and co-authored) were a description of algal taxon new to science; ii) several phytoplankton and vascular plant species were recorded in Croatia (or the Balkans) for the *first time*; iii) more than 60 vegetation types were revised and *newly* described. He served as the Director of the Institute for Marine and Coastal Research of the University of Dubrovnik (2006-2012; 2016-2018). At the same time, he is a member of several NGOs and international professional associations (e.g., International Society for Diatom Research, International Association for Vegetation Science, etc.). At this moment, he is the president of the Croatian Botanical Society since 2018, and Editor-in-Chief of the scientific journal *Acta Botanica Croatica* since 2019. He was the supervisor of one MSc, and four PhD theses. Participation in youth education and education of the general public for nature and environment protection is considered an important part of his scientific and professional activities.



Prof. **Ivica KISIĆ** PhD, Full professor tenure
 University of Zagreb, Faculty of Agriculture
 Svetošimunska cesta 25, HR-10000 Zagreb, CROATIA
 E-mail: ikisic@agr.hr
 Phone: +385 (0)1 23 939 59; Fax: +385 (0)1 23 153 00
<http://www.agr.unizg.hr/hr>

Prof. **Ivica KISIĆ** PhD, has published cited scientific papers with 226 scientists from Austria, Bosnia and Herzegovina, Brazil, Montenegro, Czech, Finland, Great Britain, Hungary, Japan, China, Macedonia, Germany, Serbia, Slovakia, Slovenia, Serbia, Spain, USA and United Kingdom. So far, as the author or co-author, he has published eight books, and is also the author or co-author of 19 chapters in scientific and professional books. He has participated in 218 scientific papers, as well as 303 technical papers, studies and expertise relating to issues of soil management and protection. A complete list of works can be seen in the Croatian scientific bibliographic database web site (<http://bib.irb.hr/lista-radova?autor=174323>). He participated in drafting Croatian Acts and Regulations governing organic

farming, as well as the Agricultural Land Act and Regulations regarding soil contamination. He is a member of the National Council for Organic Agriculture and the National Council for Combating Desertification. Main activities and responsibilities are: Management and conservation of soil; Mitigation of climate changes with tillage treatments, Organic agriculture. He was a coordinator for the University of Zagreb, Rijeka University and the University of Split, in a bilateral project: Project on Risk identification and land-use planning for disaster mitigation of floods and Landslides in Croatia, organized by the Japan International Cooperation Agency, Japan Science and Technology Agency and Croatian Ministry of Science and Education. The project is implemented in the period of 2009-2014. From 2004-2007 he participated in the EU FP6 project: Reintegration of Coal Ash Disposal Sites and Mitigation of Pollution in the West Balkan Area. Also, from 2005-2008 he was head of the LIFE project: Development of the Croatian Soil Monitoring Programme with a Pilot project, where he was the principal investigator on the development of monitoring soil contaminated with hydrocarbons. So far in his academic career, he participated in 9 different multi-annual research projects that were conducted at the Croatian Ministry of Science. Momentary, he is a project manager and coordinator of all investigation in the scientific project: Influence of Summer Fire on Soil and Water Quality (duration: December 1, 2019 - November 30, 2022). He received the annual Croatian Waters award for the best dissertation in 1998, as well as the annual Croatian Waters award for the best scientific paper published in 2006. He received the Honorary Advisor award granted by the Faculty of Agricultural and Environmental Sciences, Gödöllő, Hungary. He received - awards (Eco Oscar) on the occasion of World Environment Day, awarded by the Ministry of Environment and Nature for achievements in environmental protection in the 2012th year. Also, he got the annual award for science given by the Ministry of Science, Education and Sports of the 2012th year.



Dr Damir KRALJ PhD, senior scientist, permanent position

Ruder Bošković Institute

Bijenička c. 54, HR-10000 Zagreb, CROATIA

E-mail: kralj@irb.hr

Phone: +385 (0)1 4680207; Fax: +385 (0)1 01 4680 098

<https://www.irb.hr/eng/About-RBI/People/Damir-Kralj>

EDUCATION 1983 B.Sc. in Chemical Technology (Engineering), from Faculty of Chemical Engineering and Technology (FKIT) and University of Zagreb (UniZg); 1986 M.Sc. in Physical and Analytical Chemistry, from UniZg; 1990 Ph. D. in Chemistry from Ruder Bošković Institute (RBI) and UniZg. **FELLOWSHIPS** 1989 Panum Institute, University of Copenhagen, Denmark; 1991-1992 Laboratory for Process Equipment, Delft University of Technology, Delft, The Netherlands; 1995 Ecole Europeenne des Hautes Etudes des Industries Chimiques de Strasbourg, Strasbourg, France (sabbatical). **EMPLOYMENT AND DUTIES** 2005-2020 Head of Laboratory for precipitation processes; 2012-2020 Head of Division of Materials Chemistry. **TEACHING** 2014-2019 Doctoral Course at UniZg, Faculty of Science (Equilibrium and kinetics of heterogeneous processes). 2008-2013 Doctoral Course at the UniZg, FKIT (Precipitation processes in aqueous solutions) 2015-2019 Doctoral Course at the UniZg FKIT (Crystallization). 2009-2013 Undergraduate course at University of Rijeka, (Precipitation and Crystallization). Supervised 6 PhD and 2 BSc. **SELECTED PROJECTS (PI)** 2014-2018 Croatian Science Foundation, Bioinspired Materials - Formation Mechanisms and Interactions. 2010-2014 FP7 IDEAS – ERC Advanced Grant, Task 5.4, Corals and global warming: The Mediterranean versus the Red Sea (CoralWarm); Subcontract. 2002-2007 Technological project: Development of an Adaptable Procedure for the Preparation of Precipitated Calcium Carbonate (PCC). 2009-2010 Hrvatske vode d.d., Physical-chemical and geological characterization of River Neretva sediment. 2015-2019 City of Pag: Chemical and geological characterization of peloids from selected positions at City of Pag. 2019-2022 National Park Plitvička Jezera: Characterization of

biological and chemical processes relevant for tufa formation in National park Plitvička jezera. **AWARDS** 1994 The Award of the Croatian Chemical Society for the colloid and interface chemistry; 2005 Golden ARCA at The 3rd International Exhibition of Innovations, New Ideas, Product and Technologies (ARCA), Zagreb; 2005; 2005 Genius Cup - Award From the Association of Hungarian Inventors at 3rd ARCA; 2009 Silver ARCA at 7rd ARCA **MAIN RESEARCH TOPICS** Mechanisms of precipitation of slightly soluble ionic salts (metastable and precursor phases); Interfacial interactions: mineral surfaces/dissolved species (ions, molecules, macromolecules); Biomineralization, industrial crystallization and geochemistry (calcium carbonates); Environmental protection, pathological mineralization (calcium carbonates, magnesium ammonium phosphates, calcium oxalates); Author of more than 79 reviewed scientific and professional publications, more than 1400 citations, Average Citations per item: 25, h-index: 21. **COLLABORATIONS** Prof. Giuseppe Falini (biomineralization), Università di Bologna, Dipartimento di Chimica G. Ciamician, Bologna, Italy; Profs. D. Romić and M. Romić, (geochemistry) Faculty of Agriculture, Department of Soil Amelioration, UniZg; Dr. M. Mlakar (geochemistry) RBI, Division for marine and environmental research; Dr. I. Jerić (organic-inorganic hybrid materials, drug delivery) RBI, Division of Organic Chemistry and Biochemistry; Dr. D. M. Smith, dr. M. Dotour-Sikić (precipitation and modelling) RBI, Division for Physical chemistry.



Prof. **Mladen KUĆINIĆ** PhD, Full professor
University of Zagreb, Faculty of Science, Department of Biology
Rooseveltova trg 6, HR-10000 Zagreb, CROATIA
E-mail: kucinic@biol.pmf.hr
Phone: +385 (0)1 48 777 10; Fax: +385 (0)1 48 262 60
<http://www.pmf.unizg.hr/>

Professor **Mladen KUĆINIĆ** PhD was born in Zagreb, Croatia. He studied Experimental Biology at the Faculty of Science, University of Zagreb and finished it 1984. He obtained his PhD diploma from the field of biology (zoology) at the University of Zagreb, Faculty of Science in 2002. Since 1985 he worked at the Croatian Natural History Museum in Zagreb as curator (1985-1997) and High curator (1997-1998). From 1998 he worked at the Faculty of Science, University of Zagreb as an assistant (1998-2004), an Assistant Professor (2004-2009), an Associate Professor (2009-2016) and from 2016 as a Full Professor. His research interests are zoology, especially entomology. During the time spend in the Natural History Museum he worked with collections of Lepidoptera (butterflies and moths). At the Faculty of Science he started his research of caddisflies (Trichoptera), order of aquatic insects. He collected material (Lepidoptera and Trichoptera) in different parts of south-east Europe (for example: Croatia, Bosnia and Herzegovina, North Macedonia, Albania) and Asia (for example: Kazakhstan, Nepal, Laos). His research interests in Entomology are biodiversity, taxonomy, ecology, phylogeny, DNA barcoding and conservation biology of Lepidoptera (butterflies and moths) and Trichoptera (caddisflies). He participated in 20 scientific projects. At the moment he is a leader of scientific project: „DNA barcoding of faunal biodiversity in Croatia“. He published 128 scientific papers in different scientific journals (for example: *Natura Croatica*, *Zootaxa*, *ZooKeys*, *Molecular Ecology*, *Molecular Phylogeny and Evolution*, *BMC Evolutionary Biology*, *Limnology*, *Hydrology*, *Zoosymposia*, etc). He participated in the undergraduate and graduate teaching at the University of Zagreb (Faculty of Science, Faculty of Mechanical Engineering and Naval Architecture), University of Juraj Dobrića in Pula (Croatia), University of Primorska in Kopar (Slovenia) and University in Pavlodar (Kazakhstan). Under his supervision at all levels, 49 students have finished their theses, from which twelve are PhD. Also, he is a mentor on four PhD thesis in progress. He participated in 34 scientific conferences and symposiums. Professor Mladen Kućinić was a member of Organization Committees of several conferences of Croatian Biological Society. Now he is president of Croatian Biological Society. He is also a member of the Editorial Boards of two scientific journals: *Acta Entomologica Slovenica* publishing by Natural History Museum in Ljubljana (Slovenia), and *Natura Croatica* publishing by Natural History Museum in Zagreb (Croatia).



Assoc. Prof. **Jasna LAJTNER** PhD, Associate Professor
 University of Zagreb, Faculty of Science, Department of Biology
 Rooseveltov trg 6, HR-10000 Zagreb, CROATIA
 E-mail: jasna.lajtner@biol.pmf.hr
 Phone: +385 (0)1 4877 750; Fax: +385 (0)1 48 262 60
<http://www.pmf.unizg.hr/>

Assoc. Prof. **Jasna LAJTNER** PhD was born in **Zagreb, Croatia**. She is a lecturer for students at the undergraduate, graduate and PhD level and teach a few different courses, among them Malacology, General Zoology and Invasive Species. More than 50 graduate theses were done under her mentorship, as well as one master thesis and one doctoral thesis. At the beginning of her research career Jasna has accomplished Master degree in Ecotoxicology (acute and sub-chronic toxicity tests with freshwater molluscs, histopathological changes as a result of toxicity). For the past 15 years her main research interest was ecology, distribution, taxonomy and phylogeny of freshwater snails and bivalves. One of the current focuses of her research is distribution and impacts of invasive mollusc species in Croatia. Regarding the problem of invasive species she often collaborates with colleagues in the national institutions responsible for nature protection and legislation on invasive alien species, and also with colleagues from USA, Portugal, Italy, France, Poland and Czech Republic. Jasna has published over 40 papers in peer-review journals. She was a leader of Croatian-Slovenian bilateral project: "Biocontamination assessment of the Sava River - a step towards common strategy for invasive species management in transboundary waterbodies of Croatia and Slovenia", and leader of another 10 projects. Also, she was a collaborator on 45 projects (6 of them are still in progress). Nowadays, she is Management Committee member of the COST Action CA18239 (Conservation of freshwater mussels: a pan-European approach).



Assoc. Prof. **Marko MILIŠA** PhD, Associate Professor
 University of Zagreb, Faculty of Science, Department of Biology
 Rooseveltov trg 6, HR-10000 Zagreb, CROATIA
 E-mail: marko.milisa@biol.pmf.hr
 Phone: +385 (0)1 4877 715; Fax: +385 (0)1 48 262 60
<http://www.pmf.unizg.hr/>

Assoc. Prof. **Marko MILIŠA** PhD was born on June 6, 1978 in Zagreb, where he finished elementary and high school. He graduated from the Department of Biology, Faculty of Science, University of Zagreb, June 2001. Since, he has been employed at the Zoological Institute of the Biology Department of the Faculty of Science. He received his PhD in 2007, and in 2012, he was elected Assistant Professor, and in 2017 Associate Professor. He did several trainings abroad: the Erken Laboratory at the University of Uppsala (Sweden), Hashemite University and the American University in Madaba (Jordan), Jagiellonian University in Krakow (Poland), University of Belgrade, and University of Niš (Serbia). He is a lecturer for the courses Ecosystem Energetics, Principles of Scientific Work Invertebrates, Teaching Methods in Biology, Field courses (including a field course for the Queen Mary University of London).

His field of interest is freshwater ecology, in particular: 1) the flow of matter and energy through aquatic ecosystems, 2) structuring of the macrozoobenthos community and the reactions of macrozoobenthos to environmental disturbances, 3) bioassessment. He has published 35 papers, 31 cited in Scopus and 2 university textbooks. His h-index is 11 and he is currently involved in several international and national projects. COST: Science and Management of Intermittent Rivers and Ephemeral Streams (SMIRES) Croatian science agency: Accumulation, Subcellular Mapping and Effects of Trace Metals in Aquatic Organisms International non-institutional: The 1000 intermittent rivers experiment; CELLulose Decomposition EXperiment in streams and riparian zones across the Earth's major biomes National and EU: Intercalibration process in bioassessment (Dinaric region)

He is the co-founder and president of the Croatian Association of Freshwater Ecologists. Member of organization and/or scientific committees: 7. Croatian conference on waters, 8th International Symposium of Ecologists – ISEM8, 12th and 13th Croatian biological congress, 10th European Symposium for Freshwater Sciences, 1st and 2nd Symposium of Freshwater Biology, 2nd conference on protection of waters in KarstProject evaluator: European Cooperation in Science and Technology (COST), European federation for freshwater sciences – 2nd young projectsChair: 11th European Symposium for Freshwater Sciences (SEFS11)President of the Croatian association of freshwater ecologists (2014.-2017.); member of the board (2014.–present).



Prof. **Božena MITIĆ** PhD, Full professor tenure
 University of Zagreb, Faculty of Science, Department of Biology
 Marulićev trg 9a, HR-10000 Zagreb, CROATIA
 E-mail: bozena.mitic@biol.pmf.hr
 Phone: +385 (0)1 48 980 86; Fax: +385 (0)1 48 262 60
<http://www.pmf.unizg.hr/>

Prof. **Božena MITIĆ** PhD was born in 1961 in Zagreb, Croatia. She is a botanist, graduated in 1986 and defended her Ph.D. Thesis in 1998 at the University of Zagreb, Faculty of Science. Since 1987 she has been working at the same Faculty (Department of Biology, Division of Botany), and since 2013 as a full professor. From 2008 to 2010 she was vice head of the Department of Biology, and from 2010 to 2014 head of the Division of Botany. She has refined her skills, in total duration of one year, in several renowned European research institutions, mainly at the University of Vienna (Institute of Botany). Her research interests are focused on plant taxonomy and systematics, nomenclature, terrestrial and freshwater flora, invasive alien plants and palynology. She is strongly involved in aerobiological researches in Croatia, especially those related to the monitoring of invasive ragweed pollen in the air. Together with colleagues from her group, she launched and developed national standards and the preliminary list of invasive alien plants for Croatia. As a collaborator of the database Flora Croatica Database, she permanently works on the mapping and distribution of invasive alien plants in Croatia. Božena has so far published over 100 scientific papers and books, and participated in over 60 international and national scientific conferences with 124 contributions. She has been the leader of tithe, and a collaborator in a number of national and international research projects. She has reviewed numerous national and international scientific projects, several university books and international dissertations, and over 50 scientific papers in prominent international journals. Božena is a member of editorial boards of three international journals, an IUCN member of the Expert Group for Aquatic Plants and a regional expert of the invasive plants group. At the Department of Biology, Faculty of Science, University of Zagreb, she is the course leader and lecturer for students at the undergraduate, graduate and PhD level for different botanical courses (Plant Morphology, Palynology, Invasive Plants, etc.). Under her mentorship more than 70 graduate theses, master's theses and dissertations were defended.



Dr. **Sandi ORLIĆ** PhD, Senior research associate

Ruđer Bošković Institute

Bijenička c. 54, HR-10000 Zagreb, CROATIA

E-mail: sandi.orlic@irb.hr

Phone: +385 98 778806 Fax: +385 (0)1 4680084

<https://www.irb.hr/eng/About-RBI/People/Sandi-Orlic>

Dr. **Sandi ORLIĆ** PhD, Senior scientific associate at the Ruđer Bošković Institute, Zagreb. 1999 BSc; 2001 MSc; 2005, PhD: Postdocs in KU Leuven Belgium and Institute from evolutionary biology and ecology Cavanilles Valencia Spain. Other specialization at the Max Planck Institute for marine microbiology, Bremen, Germany. For the 2015 Associate member of the PhD school on Marine Microbiology at the Max Planck Institute. Research interests: microbial ecology, microbial biotechnology, novel tools application and development in molecular ecology. He was involved in different national and international projects and currently is leading a project of the Croatian Science Foundation - A multiphasic approach for deciphering the microbial ecology and biotechnological potential of hot springs in Croatia. He has published 35 CC papers; citation - more than 1000; h index 18. He was a president of the 15th Organizing Committee of 15th Symposium on Aquatic Microbial Ecology (SAME); member of the 16th Scientific Committee Potsdam; ISME (International Society for Microbial Ecology) Ambassador for Croatia; representative of Republic of Croatia in the JPI «Healthy and Productive Seas and Oceans» Management Board; In the editorial board of Annals of Microbiology - Springer; member of the sub-group 'Healthy oceans, Seas, Coastal and inland Waters' of the 'shadow' Strategic Configuration of the Horizon Europe Programme Committee.



Prof. **ANĐELKA PLENKOVIĆ-MORAJ** PhD, Full professor tenure

University of Zagreb, Faculty of Science, Department of Biology

Rooseveltova trg 6, HR-10000 Zagreb, CROATIA

E-mail: andjelka.plenkovic-moraj@biol.pmf.hr

Phone: +385 (0)1 48 777 07; Fax: +385 (0)1 48 262 60

<http://www.pmf.unizg.hr/>

Prof. **ANĐELKA PLENKOVIĆ-MORAJ** PhD was born on August 12, 1956 in Zagreb. Her scientific and research activities include biocenological-ecological research, trophic relationships and saprobic features of freshwater algae in the phytoplankton and periphyton communities of lotic and lenitic biotopes with special reference to: a) the role of algae in the process of tufa formations/calcite incrustations, and b) assessment of the ecological status of the inland water bodies according to EU WFD. With many professional activities up today as an author or a co-author published: 75 scientific articles, chapters in 11 professional books, 10 expert papers and 138 scientific and professional contributions in environmental studies and expertise. Delivered 52 invited talks and lectures (35 were international) and with 95 scientific communications, she participated in international and national conferences. Up today she leads 31 projects (among which 22 are international) and actively participated in 70 as a researcher. Her teaching and expert activities include 35 years of work with students in numerous university courses and extracurricular activities and training in the ecology of freshwater algae, with students at undergraduate, graduate postgraduate study level. She was the mentor of 22 Diploma thesis, 4 Master thesis and 11 Dissertations at the University of Zagreb and the University of Osijek. For a long time, she is a member of numerous European scientific and professional societies in which usually performing one of the closest offices in the Steering Committee. She also actively participated in numbers administrative organizational activities at the level of: (i) Department of Biology, (Head, and Deputy Head, (ii) Faculty of Science (Vice Dean for Investment and Development, and (iii) University of Zagreb (a member of Commission for Physical and Investment Planning, Council of Natural Sciences, Working Group for the Establishment of the Northern Campus). Her active participation in the popularization of science is

manifested through a series of activities (secretary of the State Commission on Biology "Science for Youth", president of Croatian Commission of Biology Competition, vice-president of the National Committee of the Croatian Commission for the UNESCO MAB Program, Senior Researcher of Croatian Youth Researchers at European Competitions YEER and at International Association for Danube Research, etc.). For achievements in the popularization of science, among others honors, she was awarded the golden plaque on the 35th anniversary of the Croatian Ecological Society in 2004. In 2019 won the Tianfu Friendship Reward, the highest reward for foreigners from Chinese Sichuan Province



Ass. Prof. **Vedran PRELOGOVIĆ** PhD, Assistant Professor
University of Zagreb, Faculty of Science, Department of Geography
Marulićev trg 19/II, HR- 10 000 Zagreb, Croatia

E-mail: vprelogo@geog.pmf.hr
Phone: +385 (0)1 4895 424; Fax: +385 (0)1 4895 440
<http://www.pmf.unizg.hr/>

At this moment which of two candidates (prof. M. Jakovčić or Ass. prof V Prelogović) will attend the workshop

Ass. Prof. **Vedran PRELOGOVIĆ** PhD graduated geography at the Department of Geography, Faculty of Science, University of Zagreb (2000). In 2008 he received PhD at the same University. During this period, he participated in the work of several research projects: *Urbanization of Croatia*, *Urban System in the Spatial Organization of Croatia*, *Space as a Resource for Tourism Development in Croatia*, and *Demographic Atlas of Croatia* (in collaboration with the Institute of Geography, University of Potsdam). Since the academic year 2013/2014. he is the head of the research grant: *Changes in the spatial structure of the post-socialist city*. His research work focuses on urbanization, namely: urban-spatial structure, suburbanization and development of urban agglomerations, sustainable urban transport. At the Department of Geography, he teaches following subjects: *Urban Geography*, *Geography of Europe*, *Geography of Less Developed Countries*, *Urban-Social Geography* and *Urban Regions*. He has mentored more than 70 graduate and bachelor's theses and is also mentoring two doctoral theses. In the academic year 2011/2012 (April-May) he was a visiting professor at the Institute of Geography and Spatial Planning of Jagiellonian University in Kraków.



Prof. **Maria ŠPOLJAR** PhD, Full professor
University of Zagreb, Faculty of Science, Department of Biology

Rooseveltova trg 6, HR-10000 Zagreb, CROATIA
E-mail: maria.spoljar@biol.pmf.hr
Phone: +385 (0)1 61 897 54; Fax: +385 (0)1 48 262 60
<http://www.pmf.unizg.hr/>

Prof. **Maria ŠPOLJAR** PhD was born on September 6th 1967 in Zagreb, Croatia. She received a Ph.D. in biology from the University of Zagreb, Croatia in 2003. At this moment she is a full professor at the Department of Biology, Faculty of Science, University of Zagreb where she teaches courses related to limnology, invertebrate biology, ecosystem ecology and nature protection in the frame of Baccalaureus, Master and Doctoral studies. She is a mentor of 2 Ph.D. and 35 diploma theses. On Department and Faculty level she was a member of many types of the council. Her field of scientific activity refers to the functioning of freshwater ecosystems (i.e. karst and shallow lakes), zooplankton ecology, with particular assessment of Rotifera in biotic interactions and trophic networks, as well as the impact of macrophytes in the lake sustainability and restoration with the application of ecological

modelling (<https://bib.irb.hr/lista-radova?autor=212992&lang=EN>). She was a German Academic Exchange Service (DAAD) scholar for half of the year at the -Institut of Freshwater Ecology and Inland Fisheries (Berlin, Germany). She participated in 16 projects, in five as a leader, and is a member of several international (International Association for Danube Research IAD, Freshwater Biological Association FBA, European Pond Conservation Network EPCN) and national (Croatian Association of Freshwater Biologist HUSEK, Croatian Biological Association HBD, Croatian Ecological Association HED) science organizations and bodies (DAAD Alumni at University of Zagreb). Professor Špoljar has published over 50 scientific and expert papers, co-author is in 2 books and has 60, mainly international conference presentations. Besides English, she actively uses German. *Scientific publications, citations, editorial board of scientific journals, reviewer of scientific journals:*

Papers indexed in the base Web of Science - 30, Papers indexed in the base Scopus - 34, Other papers in journals with international review - 6, Papers in Conference Proceedings - 10, Member of Editorial Board of International Conference Proceedings - 2, Presentations at international meetings - 44, Presentations at national meetings - 16, Number of citation according to the base Web of Knowledge = 241, Scopus = 279, Google Scholar = 470, H index according to the base Web of Knowledge = 9, Scopus = 10, Google Scholar = 13. She is a member of the editorial board of the Journal of Aquaculture and Fisheries, The Holistic Approach to Environment and Croatian Journal of Fisheries (Associate Editor), and she is reviewer of more of 50 scientific papers (Science of Total Environment, PlosONE, Ecological Indicators, Ecological Engineering, Hyrobiologia, Knowledge and Management of Aquatic Ecosystems).



Prof. **Ivančica TERNJEJ** PhD, Full professor
University of Zagreb, Faculty of Science, Department of Biology
Rooseveltov trg 6, HR-10000 Zagreb, CROATIA
E-mail: ivančica.ternjej@biol.pmf.hr
Phone: +385 (0)1 48 777 21; Fax: +385 (0)1 48 262 60
<http://www.pmf.unizg.hr/>

Prof. **Ivančica TERNJEJ** PhD was born on May 12, 1967 in Zagreb, where she finished elementary and high school. She graduated in 1992 at the Faculty of Science, University of Zagreb, and in 1998 defend dissertation titled "The Trophic Structure of Macrozooplankton of the Lakes Visovac and Vrana (Cres)" also at the Faculty of Science, University of Zagreb. Since 1992, she has been employ as a scientific assistant at Faculty of Sciences, Department of Biology. Senate of University of Zagreb elect her on the position of Full Professor in 2016. The focus of her scientific work is ecology of freshwater microcrustaceans of group (Copepoda) and Cladocera in Croatia. Over recent years, scientific interest has expanded in the area of ecotoxicology. The focus is on the impact of water toxicity on organizational units in nature in situ: from cell to community and ecosystem. She is an author or co-author of 49 scientific papers. The published papers contributed to the development of ecology of freshwater and toxicity of aquatic environment pollution and enabled a better understanding of the biology, and distribution of microcrustacean groups in Croatia. She is also a co-author of two university textbook. Prof. Ternjej has repeatedly refined in foreign research laboratories (Poland, Sweden, Czech Republic, Thailand) for a total duration of 4 months. She has participated in the implementation of seven scientific grants, and has participated in 23 scientific conferences, with 28 contributions. She is also member of the editorial board of the Croatian Journal of Fisheries since 2013 and was a member of the editorial board of the scientific and popular journal "Priroda" of the Croatian Natural History Society from 2009 to 2014. Prof. Ternjej participated in the undergraduate and graduate teaching at the Faculty of Science since the beginning of her employment since 1992 in courses: General Ecology, Animal Ecology and Zoogeography, Biology of Groundwater, Biology of Polluted Waters and Zoogeography. She has introduced or innovated the contents of four courses. She was a mentor of 44 graduate, and was supervisor of two doctoral theses. She was a Head of the Division Zoology, and presently is the Head of the Department of Biology,

Faculty of Science, University of Zagreb. She was also a member of the Expert Committee for the preparation of the new study program at the Department of Biology, Head of the Graduate Study Program of Ecology. Prof. Ternjej is a member of numerous scientific and professional associations in Croatia. She participated in the development of about 30 professional projects (studies) and published 16 popular articles.



Prof. **Bruno ZELIĆ** PhD, Full professor tenure
University of Zagreb, Faculty of Chemical Engineering and Technology
Savska cesta 16, HR-10000 Zagreb, CROATIA
E-mail: bzelic@fkit.hr
Phone: +385 (0)1 45 971 04; Fax: +385 (0)1 45 971 34
<https://www.fkit.unizg.hr/>

Prof. **Bruno ZELIĆ** PhD was born 1973 in Osijek, Croatia. He is a full professor at Faculty of Chemical Engineering and Technology, University of Zagreb. From 2000-2002 he worked as young researcher at Forschungszentrum Jülich, Institute für Biotechnologie, Germany. In 2003 he received his PhD in chemical engineering at the University of Zagreb. From 2009 to 2013 he was a vice dean and from 2013 to 2017 he was a dean of Faculty of Chemical Engineering and Technology, University of Zagreb. His research interests are in the fields of application of microreactors in biotechnology and development of processes for biofuels production (biogas and biodiesel). More than 80 scientific and professional publications (52 in journals cited in Web of Science), 4 book chapters, 2 patent applications, and more than 10 plenary and invited presentations on the international conferences present his scientific work. He was a co-founder of the first spin-off company at University of Zagreb and initiator of the start-up based on the results of PhD thesis that he mentored. From 2018 he is Editor-in-Chief of "Chemical and Biochemical Engineering Quarterly" journal. He is a member of Croatian Society of Chemical Engineers and Technologists, European Federation of Chemical Engineering, EFCE (from 2016 to 2017 he was member of EFCE Executive Board) and Croatian Academy of Engineering.

Participants from the People's Republic of China