

A faint, grayscale photograph of a classical building's facade, showing multiple windows and a decorative gable with a crest. This image serves as a background for the title text.

# ANNUAL REPORT OF THE UNIVERSITY OF NOVA GORICA 2020





Annual Report of the  
University of Nova Gorica  
2020





Fakulteta za znanosti o okolju  
v Novi Gorici

Ustanovljena: 24. 9. 1995

Ustanovitelja:

Mestna občina Nova Gorica

Zupan Črtomir Spacapan dipl. oec

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## Title

**Annual Report of the  
University of Nova Gorica 2020**

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## Published by

Univerza v Novi Gorici, Vipavska 13,  
Rožna Dolina, Nova Gorica

## Publication year

2021

The publication is free of charge.

The publications is funded from public resources.



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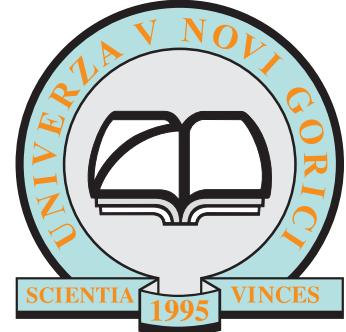
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# Introduction



In 2020, the University of Nova Gorica activity covered undergraduate and postgraduate education, and research, artistic, and developmental work. The educational activity was implemented within six schools, and an academy of arts. By the end of 2020, 245 doctors of science, 465 masters, and 945 graduates had completed their studies. The research activity took place in six centres and four laboratories. The year 2020 will be remembered by the COVID-19 epidemic. Many years of the systematic introduction of new teaching approaches has led to the exceptional readiness of the University of Nova Gorica to conduct remote studies, which we are dealing with today due to the limitations related to the COVID-19 pandemic. Thus, certain modes of study were conducted remotely even before the outbreak of the epidemic in order to facilitate the inclusion of students in need of adapted modes of study (employees, athlete students and students with special needs). We also record remote lectures, making them available to anyone unable to attend lectures due to various restrictions.

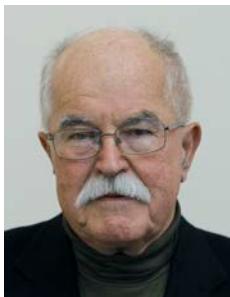
The University of Nova Gorica is becoming an increasingly internationally oriented university institution. In 2020, foreign students from 45 different countries, both from Europe and other continents, represented 55% of the student population. Moreover, the University is becoming an attractive environment for foreign scientists and professors, and consequently, the number of experts from other countries is continuously increasing – at the end of 2020, they represented 25% of all employees.

We would especially like to point out the employees who received awards in 2020. Prof. Dr. Andrej Filipčič, Prof. Dr. Samo Stanič and Prof. Dr. Marko Zavrtanik received the Zois Award for outstanding achievements in researching cosmic particles of extreme energies. The Blink Award for lifelong achievements in the field of physics was received by Prof. Dr. Danilo Zavrtanik, while Prof. Dr. Giovanni De Ninno received the Blink Award for one-time outstanding achievements in the field of physics. Prof. Dr. Iztok Arčon received the Pregl Award for outstanding scientific achievements, while Dr. Tina Škorjanc received the Pregl Award for outstanding doctoral work. The President of the Republic of Slovenia, Borut Pahor, presented the long-standing head of the University of Nova Gorica, academic professor dr. Boštjan Žekš, with the Golden Order of Merit.

In 2020, we acquired a new honorary doctor, a professor emeritus, an honorary member as well as a gold plaque recipient. Prof. Dr. Heino Falcke was named the honorary doctor of the University of Nova Gorica, being a world-renowned astrophysicist who, together with his colleagues, succeeded in capturing the first video of a black hole's immediate vicinity, achieving this title for outstanding scientific achievements in the field of astrophysics. For his important contribution to the international reputation and development of the University of Nova Gorica and the exemplary performance of pedagogical and mentoring work, the title of professor emeritus was awarded to distinguished Slovenian and internationally renowned expert in the field of hydrogeology,

Prof. Dr. Miran Veselič. Reputable expert in the field of strategic planning of European research policy, Dr. Salvatore La Rosa, was awarded the title of honorary member for his outstanding contribution to the development of scientific excellence of the University of Nova Gorica and for his achievements in international scientific administration. Ivo Boscarol, founder and director of the world-renowned aircraft manufacturer Pipistrel from Ajdovščina, was awarded a golden plate by the University of Nova Gorica for his fruitful cooperation in the field of research and promotion of infrastructure construction.

In 2020, the University of Nova Gorica celebrated its 25<sup>th</sup> anniversary. The development so far has shown that the University of Nova Gorica must remain as it is in the future. »Therefore, our strategic orientations envisage that the University will remain a small, yet different, research-orientated and internationally welcoming university, while offering top-quality education accessible to all. In particular, the latter will require new approaches in the organization of the university as well. In this way it will further ensure its existence in the international environment and continue to contribute to the diversity of higher education in Slovenia«, said the Rector of the University of Nova Gorica, Prof. Dr. Danilo Zavrtanik.



# On the occasion of the 25<sup>th</sup> anniversary of the University of Nova Gorica

Personal viewpoint of Akad. Prof. Dr. Boštjan Žekš

This year, the University of Nova Gorica (the UNG) celebrates its 25<sup>th</sup> anniversary. Given that I had participated in the founding of the University and in the initial period of its operation, I was kindly invited to write a few words. I was happy to accept the invitation because I firmly believe that the UNG establishment has significantly marked the development of our higher education and science - but not as significantly as it could have if we were all aware of it.

It all commenced at the Jožef Stefan Institute (IJS), where the idea of a new higher education and research institution, which we felt was necessary for two reasons, first occurred. The first reason was that many highly qualified IJS scientists did not have access to education work and therefore no opportunity to pass on their knowledge to the younger generations. The second reason was that we felt our higher education needed to be renewed and opened and to have its links with the world enhanced. We believed that a new university of the highest possible quality, open to the world, could make a major contribution to the development and renewal of our higher education.

However, we have failed to encounter general support. We might say that we have encountered general resistance and widespread misunderstanding. It soon became clear that there was no possibility for the creation of a new, different state university. Therefore, the beginning of the UNG, dating back to 1995, is marked with the es-

tablishment of the School of Environmental Sciences as a private institution, which later evolved into a university with new schools. The UNG is considered a private university with regard to its status; however, it does not involve true privacy, as the UNG does not have a private owner who would make profit and subordinate the quality of study and care for students in this respect; throughout the history, the UNG founders were important Slovenian public research institutes (Jožef Stefan Institute, Scientific Research Center of the Slovenian Academy of Sciences and Arts) and important local communities in northern Primorska (Municipality of Nova Gorica, Municipality of Ajdovščina).

In light of this relatively successful development, we might well ask ourselves whether the UNG has managed to achieve the objectives of its foundation. Are scientists from institutes, the IJS and others more involved in the education process at universities today? I don't think they are. Has the establishment of the UNG, a new school with a new, different functioning method, changed the already existing higher education institutions? Once again, I believe that the answer is no. Our higher education is still focused more on quantity than quality and thus still differs from that in the developed world. Although at the commencement, the tasks were not fully fulfilled, it is clear that with constant quality assurance and avoidance of massiveness, the UNG has become a small yet high-quality university, I could say »elite«, however I will avoid using this word

as »chez nous« it is considered to have a negative connotation. Furthermore, the assessment of Europe's university-based research, conducted and published by the EU, ranks the UNG at the top of European universities. It is remarkable that we have managed to create a university that is comparable to Oxford, Cambridge, Zurich and Lausanne in terms of quality, but of course not in size.

Nevertheless, this achievement has failed to arouse enthusiasm and interest in our environment. Students continue to enrol en masse at faculties at universities in cities with developed student life, and the state funding follows this trend. I guess the state will have to seriously consider the development of our higher education; moreover, the UNG will also have to seriously consider its future development under these circumstances and perhaps place greater emphasis on scientific and research work, as this is where its strength and advantage lie. This does not mean, however, that the UNG will have to focus even more on postgraduate, doctoral studies and quality research work.

In my opinion, the UNG is a story of success. In 25 years, a small, internationally renowned university has emerged out of nothing. Hard work and interconnectedness have enabled the University to break down the concrete wall built by our society and the state in order to defend them against innovations and progress.

# The University of Nova Gorica development path 1995–2020

The School of Environmental Sciences, the first international postgraduate school in Slovenia, was the predecessor of the University of Nova Gorica. The School was founded on 24 September 1995 with the consent of the Council for Higher Education of the Republic of Slovenia of 12 July 1995. It started operating in the 1995/96 academic year. The School was founded by the Municipality of Nova Gorica and the Jožef Stefan Institute in Ljubljana.

## ○ 1995

- On 24 September, the Agreement establishing **the School of Environmental Science** (the predecessor of Polytechnic and the University of Nova Gorica) was concluded at Kromberk Castle near Nova Gorica. The founders were represented by the Mayor of the Municipality of Nova Gorica, Črtomir Špacapan, and the Director of the Jožef Stefan Institute, Danilo Zavrtanik.
- The establishment of **the Laboratory for Environmental Research**.

## ○ 1996

- The establishment of **the Laboratory for Astroparticle Physics**.

## ○ 1998

- The School of Environmental Sciences is transformed into **the Nova Gorica Polytechnic**.
- The establishment of **the School of Environmental Sciences**.
- The establishment of **the School of Engineering and Management**.
- The establishment of **the Nova Gorica Polytechnic Library**.

## ○ 1999

- The promotion of **the first Doctor of Science** and award of **the first Master's degree** of Nova Gorica Polytechnic.
- Nova Gorica Polytechnic became a co-founder of **Primorska Technology Park**.
- The establishment of **the Laboratory of Organic Matter Physics**.
- The establishment of **the School of Applied Sciences**.

## ○ 2000

- The award of the first title of **doctor honoris causa** to Nobel laureate **Prof. Dr. James W. Cronin**.

## ○ 2001

- The establishment of **the Edvard Rusjan Foundation**.
- The establishment of **the Laboratory for Multiphase Processes**.
- The establishment of **the Publishing House**.

## 2003

- The establishment of **the School of Humanities**.
- On 22 December, **the Scientific Research Center of the Slovenian Academy of Sciences and Arts (the SAZU)** and **the Municipality of Ajdovščina** join the founders, the Jožef Stefan Institute and the Municipality of Nova Gorica, with the conclusion of an agreement.

## 2004

- The establishment of **the Centre for Atmospheric Research**.

## 2005

- The Senate of the Nova Gorica Polytechnic adopts a Decision on **the transformation of the Nova Gorica Polytechnic into the University of Nova Gorica**.
- The inauguration of **the Otlica Observatory**.
- The establishment of **the Research Center for Humanities**.

## 2006

- On 17 March, the Council for Higher Education of the Republic of Slovenia confirmed the application of the Nova Gorica Polytechnic for the change of status into a university, thus enabling **the creation of the fourth Slovenian university - the University of Nova Gorica**.
- The establishment of **the School for Viticulture and Enology**.
- The establishment of **the Graduate School**.

## 2007

- The establishment of **the Centre for System and Information Technologies**.

## 2008

- The establishment of **the Wine Research Centre**.
- The Nova Gorica Polytechnic Library is transformed into **the University Library of the University of Nova Gorica**.

## 2009

- The establishment of **the School of Arts**.
- The establishment of **the Materials Research Laboratory**.

## 2012

- The establishment of **the Laboratory of Quantum Optics**.
- The establishment of **the Center for Biomedical Sciences and Engineering**.

## 2013

- Promotion of **the 100th Doctor of Science.**

## 2014

- The establishment of **the UNESCO headquarters called the Karsology Study Center.**
- The establishment of **the Centre for Cognitive Science of Language.**
- The award of **1000th diploma at the end of studies.**
- The Edward Rusjan Foundation is renamed as **the University of Nova Gorica Foundation.**

## 2017

- The Laboratory for Astroparticle Physics is renamed as **the Center for Astrophysics and Cosmology.**
- The Centre for System and Information Technologies is renamed as **the Centre for Information Technologies and Applied Mathematics.**
- The Laboratory for Environmental Research is renamed as **the Laboratory for Environmental and Life Sciences.**

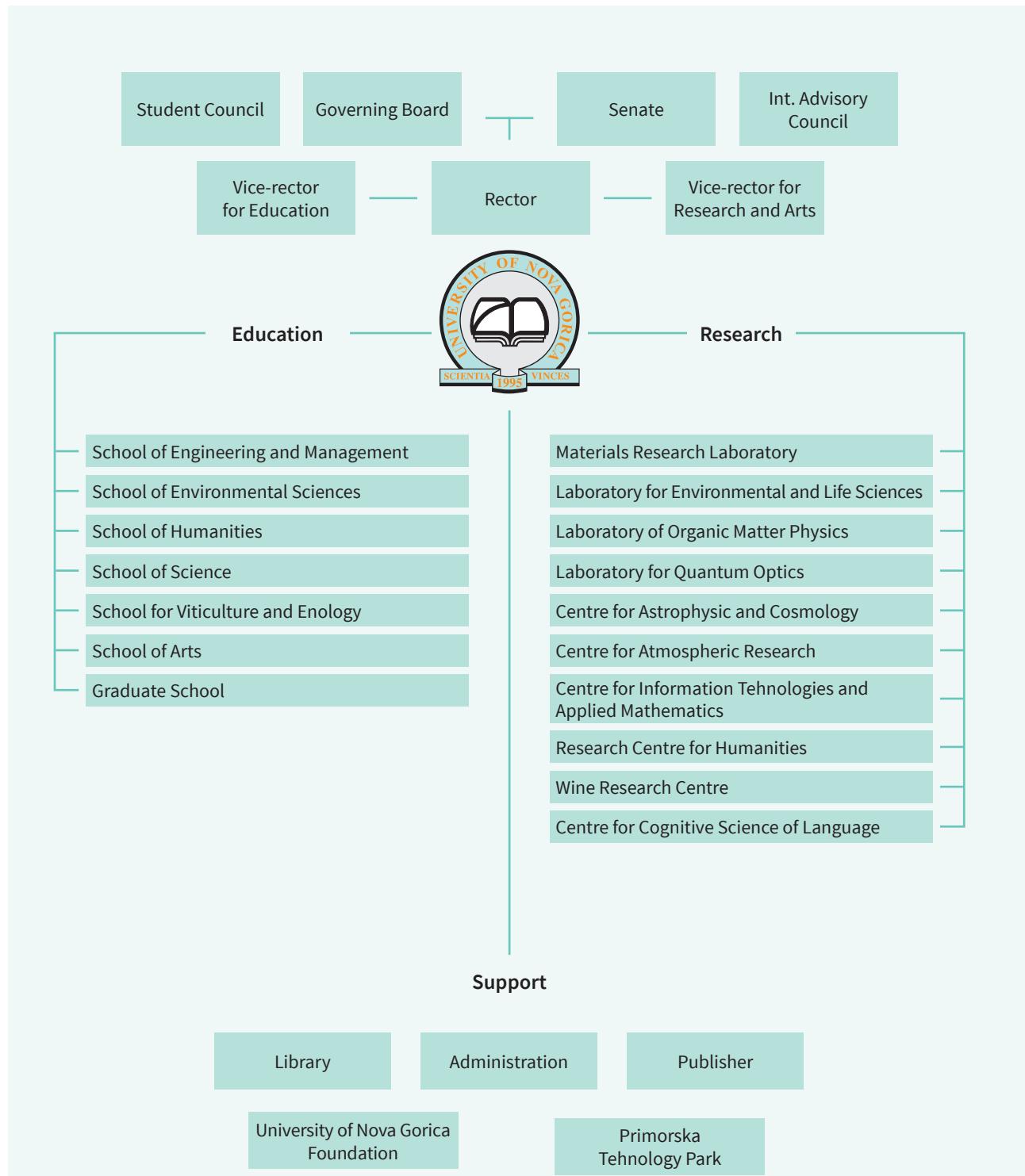
## 2015

- The University of Nova Gorica is awarded **the Order of Merit of the Republic of Slovenia.**
- The SAZU Scientific Research Center withdraws as a **co-founder of the University of Nova Gorica.**
- The School of Applied Sciences is renamed as **the School of Science.**

## 2019

- The **Municipality of Ajdovščina** withdraws as a **co-founder of the University of Nova Gorica.**
- The opening of **the University of Nova Gorica Gallery.**

# Organisational Structure



# Staff structure

As of December 2020, the University of Nova Gorica had a total of 158 regular staff members (of which 26 were shared employees with primary employment at another institution). This included 95 doctors of science, 14 research assistants, another 21 holders of bachelor's or master's degree, 22 administrative personnel, 3 librarians, 1 maintenance officer and 2 photocopy clerks; 36 staff members were foreign nationals.

	Regularly employed	Supplementary employed
2008	93	51
2009	113	57
2010	114	67
2011	124	49
2012	137	42
2013	130	42
2014	147	37
2015	121	33
2016	117	29
2017	115	31
2018	113	28
2019	118	29
2020	132	26

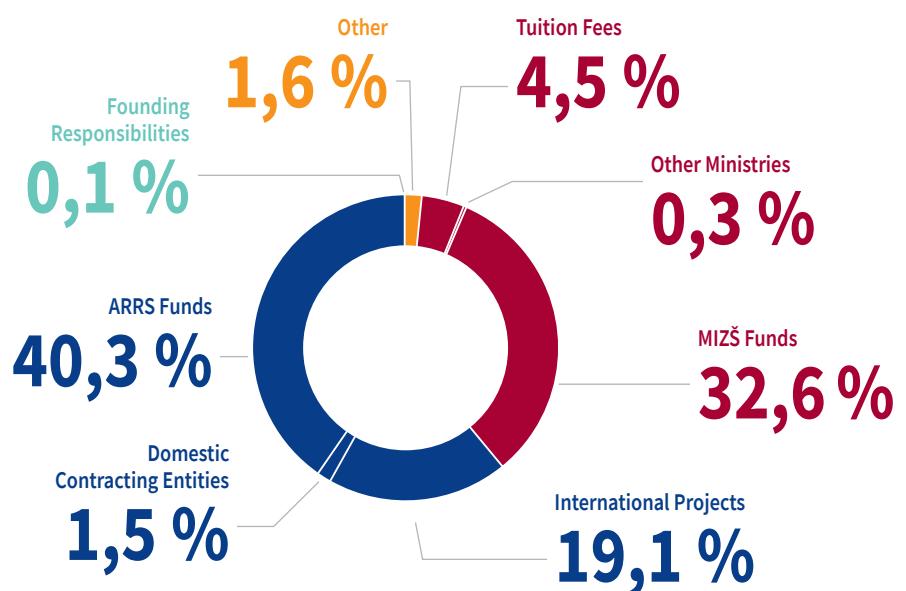
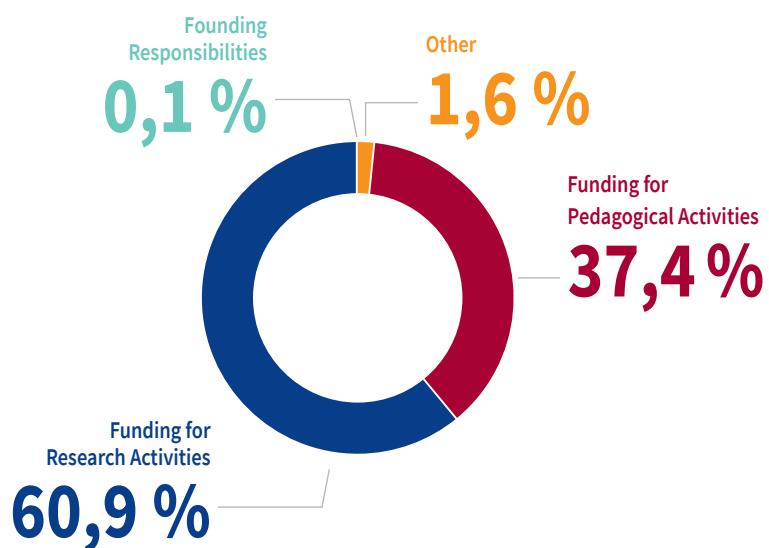
In addition, collaborating with the university were also over 200 adjunct faculty from other Slovenian universities and from universities outside of Slovenia.

State	Nr. collaborators
Austria	1
Bulgaria	2
France	1
Croatia	3
India	3
Iran	1
Italy	13
Kazakhstan	1
Hungary	1
Nigeria	1
Netherlands	1
Poland	1
Russian federation	1
Spain	1
Ukraine	3
Great Britain	1
United States of America	1
Total	36

# Financial Report

The University of Nova Gorica receives its funding from tuition fees, educational and research projects that are financed by the Slovene Ministry of Education, Science and Sport (MIZŠ) and the ARRS (Slovenian Research Agency), the income of the founders, international and industrial projects, as well as from various donations. In 2019, the University of Nova Gorica obtained about EUR 7,687 million of assets (cash flow) from the below listed sources:

<b>Founding Responsibilities 0,1 %</b>
<b>Funding for Research Activities 60,9 %</b>
ARRS Funds 40,3 %
Domestic Contracting Entities 1,5 %
International Projects 19,1 %
<b>Funding for Pedagogical Activities 37,4 %</b>
MIZŠ Funds 32,6%
Other Ministries 0,3 %
Tuition Fees 4,5 %
<b>Other 1,6 %</b>
<b>TOTAL 100,0 %</b>



# Prizes, Awards and Titles

## Employee awards in 2020

*The Golden Order of Merit*

**Akad. Prof. Dr. Boštjan Žekš**

*Pregl Award*

**Prof. Dr. Iztok Arčon**

*Blinc Award for extraordinary single achievement in the field of physics*

**Prof. Dr. Giovanni De Ninno**

*Blinc Lifetime Achievement Award in the field of physics*

**Prof. Dr. Danilo Zavrtanik**

*Open Collaboration Award for Excellence of the International Organisation Open Education Global*

**Prof. Dr. Tanja Urbančič**

*Lifetime Achievement Award of the Designers Society of Slovenia*

**Prof. Oskar Kogoj**

*Zois Award for exceptional achievements*

**Prof. Dr. Andrej Filipčič**

*Zois Award for exceptional achievements*

**Prof. Dr. Marko Zavrtanik**

*Zois Award for exceptional achievements*

**Prof. Dr. Samo Stanič**

*Pregl Award for exceptional academic achievements*

**Dr. Tina Škorjanc**

## Student awards in 2020

*Award for a student animation project in progress, Award of the Slovenian Animated Film Association*

**Amadeja Kribiš**

*Special mention for a completed student animation project, Award of the Slovenian Animated Film Association*

**Katarina Blažič**

*Special mention for a completed student animation project, Award of the Slovenian Animated Film Association*

**Larisa Nagode**

*Special mention for a completed student animation project, Award of the Slovenian Animated Film Association*

**Jošt Šeško**

*Award for a completed student animation project, Award of the Slovenian Animated Film Association*

**Miha Reja**

*Open Collaboration Award for Excellence, Award of the International Organisation Open Education Global*

**Anja Polajnar**

## Honorary Titles, Recognitions and Awards of the University of Nova Gorica in 2020

*Doctor Honoris Causa*

**Prof. dr. Heino Falcke**

*Honorary Member*

**Dr. Salvatore La Rosa**

*Professor Emeritus*

**Prof. dr. Miran Veselič**

*Golden plate*

**Ivo Boscarol**

*Alumnus Primus Student Award*

**Lucija Rutar**

**Peter Ferfoglia**

**Matej Stanič**

*Alumnus Optimus Student Award*

**Lucija Rutar**

**Jožef Petelinek**

**Matej Stanič**

**Matic Ferjančič**

**Anja Petra Bencek**

**Anika Velišček**

**Martin Batagelj**

**Anej Žagar**

# Important Events



## JANUARY

### We got a visit from the Minister of Agriculture, Forestry and Food, Dr. Aleksandra Pivec

On 22 January, Dr. Aleksandra Pivec, the Minister of Agriculture, Forestry and Food, and her colleagues visited the University of Nova Gorica. During the first part of the visit, we were at the Lanthieri Mansion in Vipava, where the University's management board presented the University's pedagogical and research work to the Minister.

The second part of the visit was centered around the field of viticulture and enology. Namely, since 2006, the University has offered the study of viticulture and enology at the School of Viticulture and Enology. The pedagogical work is tightly connected with the Wine Research Center, which incorporates applied and expert activities in the field viticulture and enology.

At the end of the visit, the Minister expressed her support for the university's pedagogical work, research, project work as well as its plans for the future.





## ● JANUARY

### **The French Ambassador Visited the University of Nova Gorica**

On 27 January, the French Ambassador to Slovenia, Her Excellency Florence Ferrari visited the University of Nova Gorica.

The Vice-Rector for Research and Arts, Prof. Dr. Gvido Bratina welcomed the Ambassador at the Lanthieri Mansion and introduced the work of the University to her. They talked about collaboration in the field of pedagogical work and research between our University and France, and moreover, about strengthening the ties in the areas of viticulture and winemaking.

At the end of the visit, the Ambassador visited the School for Viticulture and Enology and the Wine Research Center, where she was greeted by the Head of the Center, Doc. Dr. Melita Sternad Lemut and the Center associate, Doc. Dr. Guillaume Antalic.



## FABRUARY



### The University of Nova Gorica and the Slovenian National Building and Civil Engineering Institute signed a cooperation agreement

On 12 February the rector of the University of Nova Gorica, Prof. Dr. Danilo Zavrtanik and the director of the Slovenian National Building and Civil Engineering Institute, Dr. Aleš Žnidarič, signed an agreement on long-term cooperation. This agreement is a continuation of collaboration in the sphere of comprehensive handling of architectural heritage which was previously carried out as part of the agreement between the University of Nova Gorica, the Slovenian National Building and Civil Engineering Institute, and the Universita' Iuav di Venezia from Venice.

The collaboration will include the exchange of students, advisers and researchers within the EU programs, moreover, it will incorporate common research activities, educational programs, promotion of seminars, professional meetings, exhibitions, fairs and the like. Both institutions assume that the collaboration will continue to develop and it will strive to embrace other areas of work as well.

This long-term collaboration will help with the expansion and the strengthening of the scientific and research collaboration on the national and the international level, it will also contribute to the greater recognizability of both institutions, to the exchange of research and professional experiences and to joint efforts at organizing formal and informal educational meetings. Apart from the director of the Institute, Dr. Žnidarič, his assistant, Darko Korbar (MSc) was also present at the meeting. Together with the rector, Prof. Dr. Zavrtanik, they visited the laboratories at the university Center in Ajdovščina and the Wine Research Center in the Lanthieri Mansion in Vipava.



## MARCH

### **The University of Nova Gorica has joined the Green Light WorldFlight – GLWF (the Aviation for Science) Project**

On 2 March, the Rector of the University of Nova Gorica, Prof. Dr. Danilo Zavrtanik and a Slovene pilot and environmental researcher Matevž Lenarčič signed a collaboration agreement.

By signing this agreement, the University of Nova Gorica joined the Green Light WorldFlight – GLWF Project. The data collected during this year's environmental mission will form the foundation of the scientific research at the Center for Atmospheric Research at the University of Nova Gorica.

In April, Matevž Lenarčič is going on a mission to Indian, Bhutan, Nepal and the Himalayas. With the new, experimental plane Advantic WT10 Research, which has been made specifically for this type of research, he will measure the concentration of black carbon which affects the

environment in a negative way, as it warms up the atmosphere. The processing of data at the Center for Atmospheric Research of the University of Nova Gorica will offer a new insight into the current atmospheric state and the changes that we, humans, cause.

These are the words of the Rector of the University of Nova Gorica, Prof. Dr. Danilo Zavrtanik: »The Center for Atmospheric Research at the University of Nova Gorica has been operating for a while now and so far, it has mostly dealt with the measuring of the pollution levels at high levels of atmosphere and with a very specific study of the bora wind phenomenon. All those measuring devices were on Earth, at the observatory. Now, for the first time, we are starting to do measurement also at the mid-level of atmosphere and with devices that are installed on airplanes. That means that we measure the atmosphere directly from the atmosphere. This

way, our activities are expanding and our task in this project lies in the scientific work, specifically, in the interpretation and the processing of the data that the mission will collect.«

After signing the collaboration agreement, Matevž Lenarčič said that he was happy about this new partnership, the collaboration with people with whom he can share a way of thinking, his business philosophy and a responsible attitude towards the environment. »Field measurements are the basis of any serious research. The modelling of environmental processes without any measurements is unreliable. Also the sceptics who hinder such research can only be convinced with data.«

The Head of the Center for Atmospheric Research, Assistant Professor, Dr. Griša Močnik (who is also and the Head of the scientific mission) explained that the collected data would be key for the understanding of the affect of black carbon and other carbon aerosols (which absorb sunlight) on the warming up of the atmosphere. »Aerosolized black carbon is created with the burning of fuels and is the second most important factor of the warming of the atmosphere, right after CO<sub>2</sub>. The trip to the Himalayas, which is one of the most endangered territories, is important, as the melting of the glaciers (black carbon plays a major role here) threatens the supplies of drinking water for one third of the world's population. By doing the measurements and analysis of the air particles, we will be able to detect the transport of black carbon from its origin to the Himalayas.« »By all means this is a valuable contribution that will surely grow in its importance in the future and enable the growth of the Center for Atmospheric Research, as well as the broadening of the activities at the University of Nova Gorica,« stated Prof. Dr. Zavrtanik at the end.





2020



## JUNE

### Graduation Ceremony for Bachelor's, Master's, and Doctoral Students

On 23 June, the graduation ceremony for Bachelor's, Master's, and Doctoral students of the University of Nova Gorica was held at the Lanthieri Mansion in Vipava.

At the School of Engineering and Management six students received their bachelor degrees this year, three students graduated from the School of

Humanities and one student graduated from the School for Viticulture and Enology and the School of Arts. There were also eight master's students who finished their studies. Moreover, the Rector of the University of Nova Gorica, Prof. Dr. Danilo Zavrtanik, promoted three new doctors of science who graduated from the Graduate School at the following study programs: Molecular Genetics and Biotechnology, Physics and Environmental Sciences.

## SEPTEMBER

### 25<sup>th</sup> anniversary of the University of Nova Gorica

On 24 September 1995, the Contract establishing the School of Environmental Sciences – the first international postgraduate school in Slovenia established by the Municipality of Nova Gorica and the Jožef Stefan Institute in Ljubljana – was concluded at Kromberk Castle, Nova Gorica.

As Akad. Prof. Dr. Boštjan Žekš, the first principal of the School, said upon the jubilee, »It all commenced at the Jožef Stefan Institute (IJS), where the idea of a new higher education and research institution, which we felt was necessary for two reasons, first emerged. The first reason was that many highly qualified IJS scientists did not have access to education work and therefore no opportunity to pass on their knowledge to younger generations. The second reason was that we felt our higher education needed to be renewed and opened and to have its links with the world enhanced. We believed that a new university of the highest possible quality, open to the world, could make a major contribution to the development and renewal of our higher education.«

Within the three first years of operation, it was reorganised and renamed to the Nova Gorica Polytechnic due to the introduction of new study programmes and the expansion of scientific research. The key turning point came on 17 March 2006, when the Council for Higher Education of the Republic of Slovenia confirmed the establishment of the fourth Slovenian university – the University of Nova Gorica.

Today, pedagogical activity is carried out within seven schools. The research activities are carried out in six centres and four laboratories equipped with state-of-the-art research equipment. So far, 244 doctors of science, 433 masters and 925 graduates have completed their studies.



During the years of its operation, the University of Nova Gorica has developed into a first-class university institution, recognised worldwide primarily for its scientific excellence and international involvement. Our study programmes are increasingly attracting foreign students from all over the world. The number of foreign students increases from year to year; in this academic year, foreign students, from 48 countries in Europe and other continents, represent as much as 54% of the student population. The University is also an attractive environment for foreign scientists and professors – the number of experts from other countries comprises 25% of the total number of employees.

The University of Nova Gorica is unlike any other higher education institution in Slovenia and beyond. »One of the distinctions is certainly our status as a private or rather non-state university, which allows for greater flexibility and dynamism in carrying out our mission. The second is that we are not the result of a political project. The University of Nova Gorica was established, created and built by individuals, employees, external collaborators and students. Therefore, we all, including the students, nurture an extraordinary sense of belonging to it,« said the Rector of the University of Nova Gorica, Prof. Dr. Danilo Zavrtanik.

This year, the European Union once again recognised the excellence of the University of Nova Gorica, namely the results of the U-Multirank 2020 global international comparison of universities showed that the UNG is ranked among the world's elite universities in terms of quality. The University of Nova Gorica's excellence in research,

international orientation and regional involvement has been specifically recognised. Moreover, the UNG also shows good results in the field of learning and teaching. Already in 2015, upon the international evaluation by the EUA, a group of external experts considered our university to be »a young and dynamic university with happy and content students.«

The developments to date have shown that the University of Nova Gorica should remain as such in the future. »Therefore, in our strategic orientations, the University remains a small but distinct research and internationally open university that offers first-class education available to everyone. Particularly the latter will require new approaches in the organisation of the University and perhaps even in the ownership or establishment. This will ensure its existence in the international environment and that it continues to contribute to the diversity of higher education in Slovenia,« said Prof. Dr. Zavrtanik.

Upon this important anniversary of the University, Rector Prof. Dr. Zavrtanik congratulates all who have contributed to the successful development of the University, including employees, external collaborators and especially students, who have trusted us and spent good and difficult times with us. He wishes for his colleagues and students that their twenty-five-year-old dream of a university campus comes true as soon as possible, the dream of a university campus where all activities are concentrated, where scientific thought flourishes and where new knowledge will be passed on to younger generations.

# Organizing of Scientific Conferences

## Scientific Conference Open Education for a Better World Eduscope 2020

29 June – 2 July 2020

From 29 June to 2 July 2020, for the third time, this time in an online version, the Eduscope event took place. It was organized in the framework of the Open Education for a Better World (OE4BW) program by the University of Nova Gorica and the UNESCO Chair on Open Technologies for Open Educational Resources and Open Learning at the Jožef Stefan Institute. With the help of nine OE4BW thematic coordinators, Eduscope 2020 hosted 470 participants from 26 countries. Educational resources, innovative tools, technologies and good practices of open education were presented. The participants were also addressed by the Minister of Education, Science and Sport, prof. dr. Simona Kustec. She pointed out that the OE4BW program is an indicator of Slovenia's development towards inclusive, open and equitable education.



## Scientific Conference Linearising Constituents Across Domains

15 – 16 October 2020

Between October 15<sup>th</sup> and 16<sup>th</sup>, 2020, the University of Nova Gorica, the University College London and Bled Institute teamed up in the organization of the international linguistics conference Linearising Constituents Across Domains 2020. Due to the pandemic, the event was organized online. The conference was organized in the scope of the multipartner projects 'Coordinated Research in the Experimental Morphosyntax of South Slavic Languages' and 'Agreement Mismatches in Experimental Syntax: from Slavic to Bantu', which are coordinated at the University College London and within which we had already co-organized four thematic conferences between 2016 and 2019. The topic of this year's conference was commonalities and differences in linearization in various languages and in various language phenomena.

# Important Achievements

## ○ MAY

### **The University of Nova Gorica again ranked high (201st spot) on the international Round University Ranking (RUR)**

According to the results of the international Round University Ranking system, which evaluates and ranks the best universities in the world, the University of Nova Gorica once again got placed very high (it took the 201st spot) in 2020. It ranked high last year as well, when it was placed on the 140th spot. Also in previous years, the university was successful; in 2018, it got the 353rd spot, in 2017, it ranked really high too (186th), and in the year 2016, it was placed on 203rd spot. The first few places on this chart are normally taken by the best known American Universities (California Institute of Technology, Stanford, Harvard, ...) and English Universities (University of Oxford, University of Cambridge, ...).

The results of RUR show that in terms of all quality assurance indicators the University of Nova Gorica holds a remarkably strong lead over the rest of the universities in Slovenia. Up to date no other Slovenian university has been ranked so high on any of the internationally recognised world universities rankings. Moreover, it performed better than older and larger universities in Slovenia's cross-border area (See The world map of RUR Ranking)

RUR measures the performance of the leading world universities on an annual basis by universities' overall results achieved across four key missions: teaching, research, international diversity and financial sustainability.

Beside overall results RUR provides also subject rankings of the world universities. RUR subject rankings evaluate performance of 801+ world's leading higher education institutions by 6 broad subject areas: Humanities, Life Sciences, Medical Sciences, Natural Sciences, Technical Sciences, Social Sciences. All universities are assessed by the same 20 indicators and 4 key areas of university activities as in overall RUR World University Rankings.

RUR rankings are based on the data on world universities collected by Thomson Reuters, as part of the Global Institutional Profiles Project.

Thomson Reuters' assessment of universities is based on data obtained from three main sources: data on the institution's publications and citations from Thomson Reuters Web of Science®, the results of the annual Academic Reputation Survey and the data provided by the institution directly to Thomson Reuters. A database is thus formed on the institution's scientific and teaching performance, its sources of financing and the characteristics of its students and staff.

On the basis of the data obtained RUR's analysis is performed, considering 20 indicators of quality performance in the previously mentioned four key mission areas. The major part of the assessment is represented by the indicators in the area of research (40 %) and teaching (40 %). All indicators take into account the **size of the institution**. Consequently, small and large universities can equally be compared in terms of their performance.

Despite its short tradition and a relatively small size, the University of Nova Gorica excels on an international scale. Its excellence has also been recognised in the U-Multirank 2015, 2016, 2017, 2018 and 2019 comparative world university rankings and can by no means be considered as a coincidence but rather represents the results of hard work and the clearly defined mission of the development of the University of Nova Gorica. The University's scientific excellence was also identified and emphasized in the European Commission's report on the Scientific Output and Collaboration of European Universities in the period from 2007 to 2011, stating that according to the criteria of scientific excellence and the scientific impact of its publications, The University of Nova Gorica is ranked among five best universities in Europe, including the University of Oxford, the University of Cambridge, the École Polytechnique Fédérale de Lausanne (EPFL) and the ETH Zürich.

Such university rankings represent a valuable source of information for prospective students deciding at which university to study, since the quality of studies and study programmes ensuring high employment prospects are of key importance. The rankings can also serve to employers, providing them with the information which universities provide the most highly qualified young professionals.

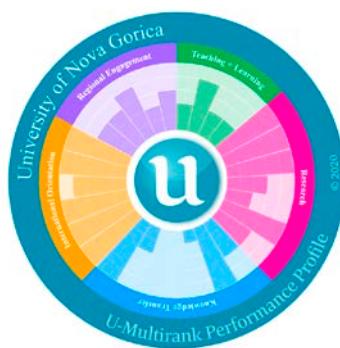


## JUNE

### U-Multirank, the global university ranking

The University of Nova Gorica (UNG) has been a part of the global university ranking program called »U-Multirank« since the very beginning of this European project.

This year's results of the comparative rankings of different universities from all over the world (»U-Multirank 2020«), published on the website [www.umultirank.org](http://www.umultirank.org), that UNG's results are high above average, within the global university chart. (Same exceptional results were obtained by UNG also in the



The graphic illustration of UNG's profile on the U-Multirank 2020 global ranking chart. The height of each column within a specific circular sector denotes a grade achieved for a specific criterion (the tallest column stands for 1 – exceptionally good, and the lowest column stands for 5 – weak).



Global Top 25 badge for International joint publications.

last years U-Multirank 2015, U-Multirank 2016, U-Multirank 2017, U-Multirank 2018 and U-Multirank 2019 comparisons of universities.)

In particular, the results show excellence of UNG performance in the field of research and international orientation. For U-Multirank's 2020 edition, UNG is among the Global Top 25 performers in the area of international joint publications, which reflects the degree to which a university's research is connected to international research networks.

Good results were also ascribed to UNG in the areas of teaching and learning, and regional engagement. If comparing U-Multirank results of UNG with the results of other universities in Slovenian and wider region outside Slovenian borders, it shows that the University of Nova Gorica is the best university according to a majority of ranking parameters. It not only ranks higher than other Slovenian universities, but also higher than bigger universities in our vicinity, such as the Graz University the University of Trieste, Padova University, and the University of Zagreb. According to these indicators UNG ranks among best European and world universities.

It is worth mentioning that scientific excellence of UNG was recognized and outlined also in the European Commission report on scientific performance of European universities »Scientific Output and Collaboration of European Universities«, in the period 2007 – 2011, which stated: »Four institutions stand out for their strong performances in terms of scientific impact, as they are always among the top five according to the three citation-based impact measures: the University of Nova Gorica, the University of Oxford, École polytechnique fédérale de Lausanne (EPFL) and ETH Zurich.«

*In 2020 UNG has been ranked amongst the top performing universities around the globe! For U-Multirank's 2020 edition, UNG is among the Global Top 25 performers in the area of international joint publications and was awarded a Global Top 25 badge for International joint publications. The percentage of international joint publications reflects the degree to which a university's research is connected to international research networks. The list of the 25 top performers for International joint publications is characterised by a diversity of countries; higher education institutions from 19 different countries are represented. The list includes some higher education institutions from small countries (e.g., Liechtenstein, Luxembourg, Slovenia and Iceland) which emphasize the importance of international research collaborations in order to achieve research excellence and international competitiveness.*

»U-Multirank« is a comparative university chart that was developed within the EU with the financial help that came from the European Commission. It is intended for comparative grading of universities from all over the world. This year 1,800 universities from 92 countries were included into the grading project.

U-Multirank is the first global chart that gives a multidimensional picture of the way universities operate, as it compares universities in five different areas: teaching and learning, research, international orientation, regional engagement and knowledge transfer. If compared to other ranking charts that are geared towards classifying universities in charts like »best 100 universities« (based on a communal grade that is composed of parameters with different levels of importance), U-Multirank gives a complete picture of each university's virtues and disadvantages.

U-Multirank allows users to compare universities based on what matters to them. It reveals different strong performers in areas as diverse as research, teaching and learning, knowledge transfer, internationalisation and regional engagement. This approach and method give students the right sort and amount of information so they can pick the university that is appropriate for them more easily. This gives students an ability to make informed choices of the best universities for their interest. Students are also able to identify universities that do well in terms of international linkages and student mobility.

European Commissioner for Education, Culture, Youth and Sport, Tibor Navracsics, said: »U-Multirank gives students, parents and other stakeholders a valuable insight into the higher education institutions of their choice, across a range of parameters. This is vital to help drive informed decisions.«

In order to create an efficient display that compares universities, the U-Multirank project offers to the students an online application that can be found on the following website <https://www.umultirank.org/>. By using this application, anyone can directly pick various universities in the select region or wider (on a global scale) and compare them in the areas of their interest.

U-Multirank uses 39 different indicators by means of which universities are graded and compared in various areas and activity fields. U-Multirank uses a five-degree chart: 1 – exceptionally good; 2 – good; 3 – average; 4 – below average; 5 – weak. Detailed results that pertain to UNG (based on individual indicators) can be found on U-Multirank's website: <https://www.umultirank.org/>.

Despite its youth and relative smallness, the University of Nova Gorica displays a visible degree of excellence on the global scale. The top results that it has achieved are not coincidental, but a result of hard work and a clear vision the university has set for itself and was approved by the University's Senate.

## ○ JUNE

### Hunting Dark Matter with Supernova Explosions

The nature of dark matter, the substance that accounts for more than 85% of all matter in the Universe, remains a mystery. Many theories predict that dark matter is made up from yet – undiscovered fundamental particles. A plethora of ground-based and space born experiments are looking for traces of these particles. A new study involving Tanja Petrushevska of the Center for Astrophysics and Cosmology at the University of Nova Gorica shows how researchers can use explosions of stars outside of our Milky Way to search for a particular class of dark matter particles.

One popular hypothesis is that dark matter consists at least partially of hypothetical particles called axions. These particles are potentially lighter than any other known fundamental particle (neutrinos might be an exception), and can »interchange personality« with photons in electromagnetic field. In other words, when flying through a magnetic field or close to charged particles, a beam of axions could actually transform into photons or vice versa.

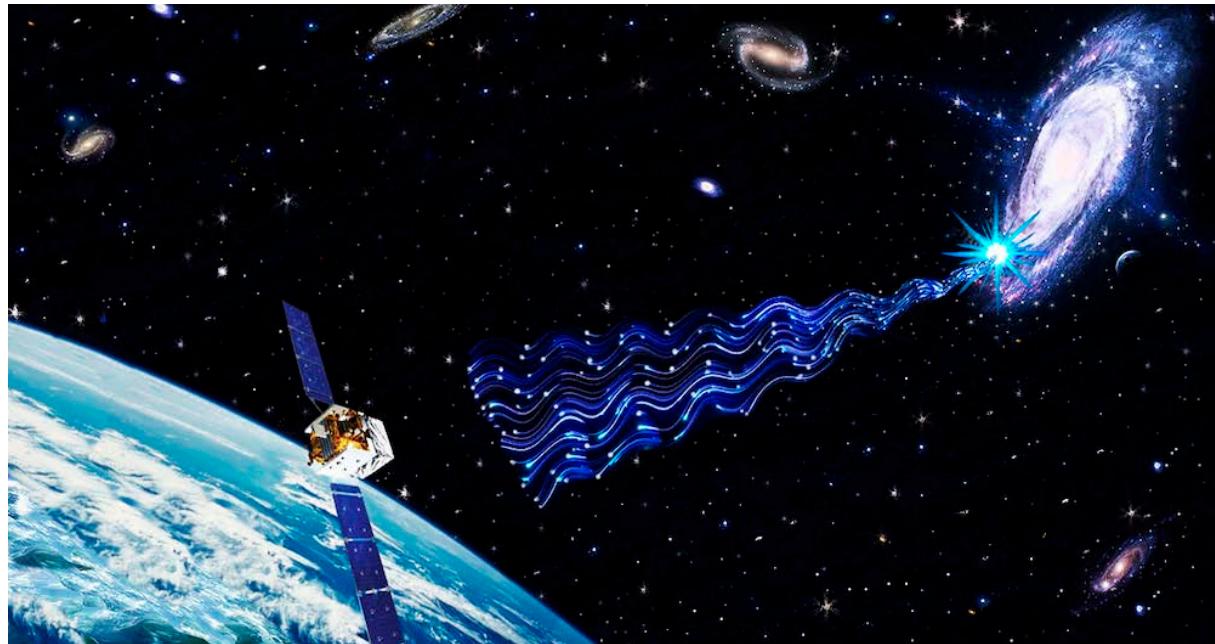
This special property leads to an intriguing possibility, where axions could be created during the explosion of a massive star at the end of its lifetime, an event commonly known as a supernova. In the core of the explosion, ions and protons are densely squeezed together, allowing energetic photons, called gamma rays, to transform into axions. In this ghostly axion form, they can quickly escape the dense core and slowly return to gamma-ray form on their long path through the magnetic fields in space.

Upon reaching Earth, the resulting short burst of gamma rays could be detected with the Large Area Telescope (LAT) on board the Fermi satellite, which constantly scans the entire sky for gamma rays and sees roughly 20% of the sky at any given moment. The challenge is to know when exactly to look for the burst, which, according to theory, is only tens of seconds long.

A new study uses the wealth of data collected with the Fermi LAT to search for the axion-induced bursts by correlating them, for the first time, with the results of dedicated supernova surveys which use traditional optical telescopes. These surveys detect hundreds of supernovae each year. By modeling the fading glow of the explosions, Manuel Meyer from the Erlangen Center of Astroparticle Physics and Tanja Petrushevska from the University Nova Gorica were able to make predictions for the time window of the explosion and search for the expected gamma-ray burst in the LAT data. Not finding any gamma-ray signal during the time windows in question, allowed them to constrain the interaction strength between axion particles and photons.

*»Even though our study does not rule out the possibility of axion particles making up all of the dark matter, we were able to test a so-far unexplored region of the axion-particle parameter space«, says Meyer, who was responsible for the gamma-ray analysis. »Our study improves by a factor of two previous limits from the non-observation of the gamma-ray burst from the supernova that occurred in 1987 in the Large Magellanic cloud.«*

There still remains a 10% chance that the LAT wasn't looking at the right spot in the sky when the explosions occurred. *»With on-going surveys such as the Zwicky Transient Facility and the up-coming Rubin Observatory, the chance that we observe at least one supernova explosion with Fermi should be almost 100%,« adds Petrushevska, who studies optical supernova observations. She continues, »this is one exciting part of the study: it opens up a new way to use supernova explosions in other galaxies to search for answers in fundamental physics.«*



## ○ DECEMBER

### Pregled desetih najodmevnjših člankov v letu 2020

Number	Journal	Authors, University of Nova Gorica members	The Impact Factor
1	Nature: the international weekly journal of science	Giovanni De Ninno	42.778
2	Nature nanotechnology	Ario De Marco	31.538
3	Nature photonics	Giovanni De Ninno, Barbara Ressel	31.241
4	Applied catalysis. B, Environmental	Nataša Zabukovec Logar, Nataša Novak Tušar	16.680
5	Physical review. X	Giovanni De Ninno	12.577
6	ACS catalysis	Andraž Mavrič, Mattia Fanetti, Matjaž Valant	12.350
7	Nature communications	Luigi Giacomazzi, Matjaž Valant	12.121
8	Journal of materials chemistry. A, Materials for energy and sustainability	Tina Škorjanc	11.301
9	Biosensors & bioelectronics	Ario De Marco	10.257
10	Chemistry of materials	Iztok Arčon	9.567



# Research Activity

In 2020, the research work at the University of Nova Gorica was organized at four research laboratories and six research centers: Laboratory for Environmental and Life Sciences, Laboratory of Organic Matter Physics, Materials Research Laboratory, Laboratory of Quantum Optics, Center for Astrophysics and Cosmology, Center for Atmospheric Research, Center for Information Technologies and Applied Mathematics, Research Centre for Humanities, Wine Research Centre, Centre for Cognitive Science of Language.



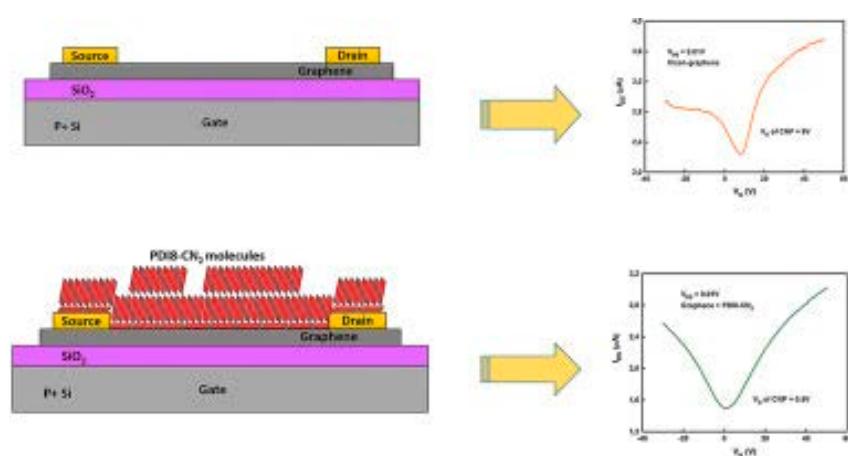
# Laboratory of Organic Matter Physics

Head: Prof. Dr. Gvido Bratina

In 2020, the activities in Laboratory of Organic Matter Physics were severely hampered by the COVID-19 virus pandemic, since almost 5 months the researchers were banned from the laboratories. Nevertheless some important experiments were performed and yielded promising preliminary results in the area of two-dimensional materials such as graphene and transition metal carbides (MXenes) and in the area of charge transport in modified graphene layers. In May we have also started a new FLAG-ERA project Prospect. This is a collective effort with University Mons, Belgium as a coordinator, University of Strasbourg, France and Chalmers University, Sweden and focuses on innovative multirange pressure sensors founded on layered polymers blended with graphene flakes. We have successfully concluded the activities within the projects NanoElMem (M-ERA.NET), RETINA (Interreg Slo-At), and continued to work on FLAG-ERA MX-OS-MOPED project, the ARRS program P1-005 Biophysics of polymers, membranes, gels, colloids and cells, and the NANO-REGION (Interreg Slo-Ita).

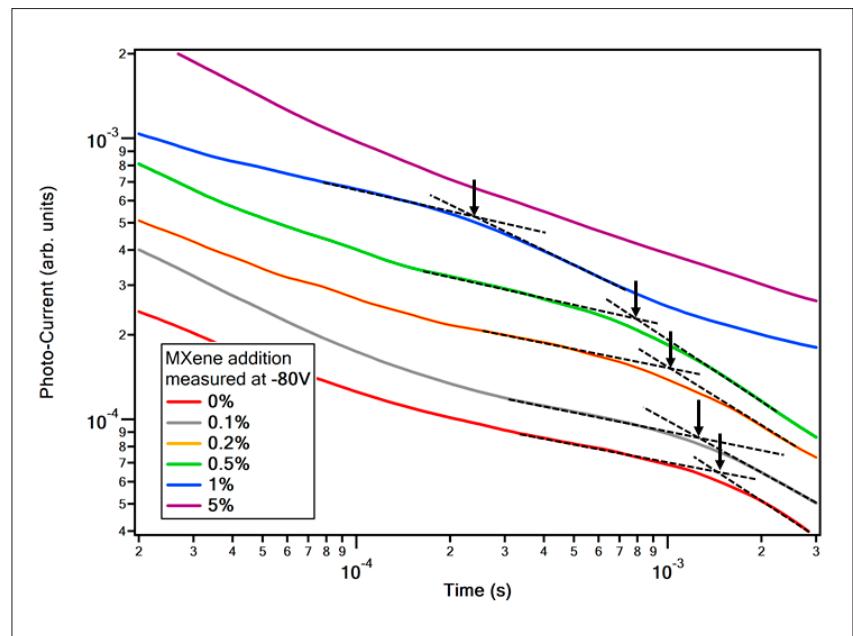
## Description:

Graphene field-effect transistor structures were used to investigate the role of molecular alignment on charge transport properties of heterostructures comprising a single-layer graphene and variable thickness of  $N,N'$ -bis(n-octyl)-(1,7&1,6)-dicyanoperylene-3,4:9,10-bisdicarboximide (PDI8-CN2) - an n-type organic semiconductor. Our atomic force microscopy data show that under selected growth conditions PDI8-CN2 grows in a layer-by-layer fashion up to a second monolayer. The first layer comprises flat-lying molecules, whereas the molecules in the second layer orient themselves in an upright orientation. Transconductance measurements show that the flat-lying molecules have little effect on the position of the Fermi level in graphene. Upright oriented molecules in the second layer instead, have a strong effect as to neutralize native p-type doping of graphene and cause a shift of charge-neutrality level towards the Dirac point. We interpret such behavior in terms of different orientation of the surface dipole on layers with different molecular orientations. At the same time the overall mobility of the charge carriers reaches values exceeding 3000 cm<sup>2</sup>/Vs. The work was published in the journal *Organic Electronics*.

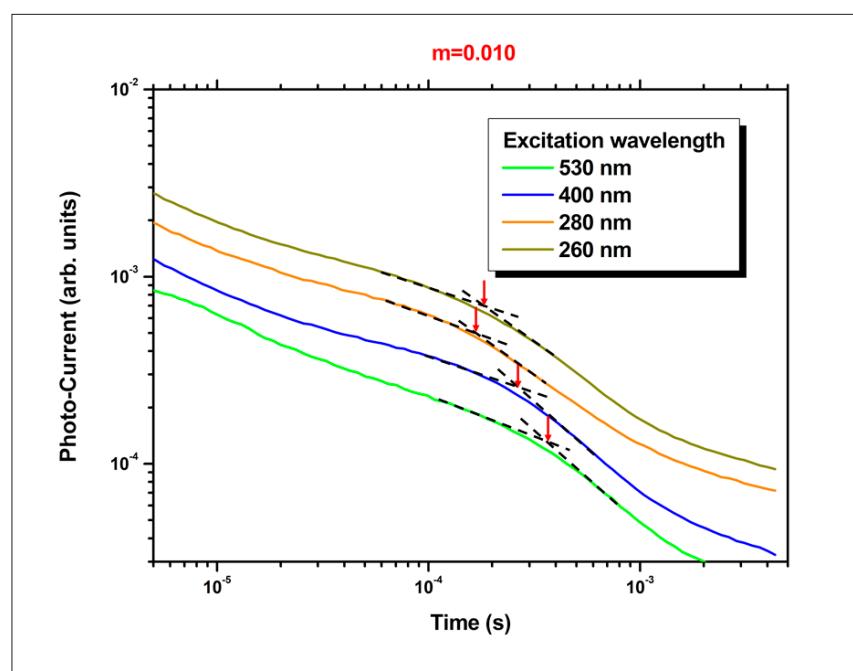


Schematics of the cross-sections of graphene transistor without (top left) and with organic layer deposited on top of graphene layer (bottom left). The corresponding transfer curves are shown on the rightmost side of the figure, and demonstrate a shift in Dirac point due to the p-type doping of graphene.

In the field of charge transport in MXenes we investigated the role of MXenes on charge transport in we fabricated structures with active layers comprising blends of Poly(3-hexylthiophene-2,5-diyl) (P3HT) with varying concentration of MXene. We have used time-of-flight photoconductivity (TOFP) to asses charge transport in structures comprising thin layers deposited on glass substrates and contacted with Al coplanar electrodes spaced for 90 nm. TOFP measurements were performed using our canonical setup. The samples were illuminated by focusing short (3ns) laser pulses near one of the electrodes. A variable bias was applied between the electrodes and the time-dependent current ( $I(t)$ ) of the drifting photoexcited charge carriers was measured as a voltage drop across the resistor connected to the opposite electrode. The interelectrode bias polarity was selected so that the resulting photocurrent is a result of drifting holes- a majority type of carriers in P3HT. We have used several different excitation wavelengths ranging from 530 nm corresponding to the maximum absorption in P3HT to the ultraviolet range, where the absorption in MXenes is substantially bigger than in P3HT. The  $I(t)$  lineshapes are characteristic for the charge transport frequently observed in layers comprising structural and energetic disorder, such as organic semiconductor layers. As the holes drift towards the opposite biased electrode the energetic and structural disorder causes a spatial and temporal distortion of the initial charge carrier distribution that is a reminiscence of the Gaussian light intensity distribution of the incoming light pulse. Due to the various combination of trapping/de-trapping processes a relatively monotonous decrease in current is observed in all  $I(t)$  curves. As the fastest charge carriers in the distribution reach the collecting electrode the photocurrent rapidly drops, which is characterized by a notable change in slope of  $I(t)$ . The location of the change in slope on a time scale is considered as a time of arrival of the holes across the interelectrode portion of the layer. From the wavelength dependent measurements we have obtained rather unexpected result: the mobility of the charge carriers obtained with high-energy photons was considerably bigger than the mobility of the charge carriers obtained by low-energy photons. We interpret this finding in terms of probing nearly-free electron states that may exist in MXenes.



Time-of-flight photoconductivity  $I(t)$  of P3HT film with added MXene amount of 0% to 5% at fixed  $V_b = -80V$  in double-logarithmic plot. Arrows represent the transit time  $t_{tr}$ , which corresponds to the intersection of dashed asymptotic lines.



Time-of-flight photoconductivity  $I(t)$  of P3HT film with added MXene amount of 1% at fixed  $V_b = -80V$  in double-logarithmic plot for different excitation wavelength. Arrows represent the transit time  $t_{tr}$ , which corresponds to the intersection of dashed asymptotic lines.

# Materials Research Laboratory

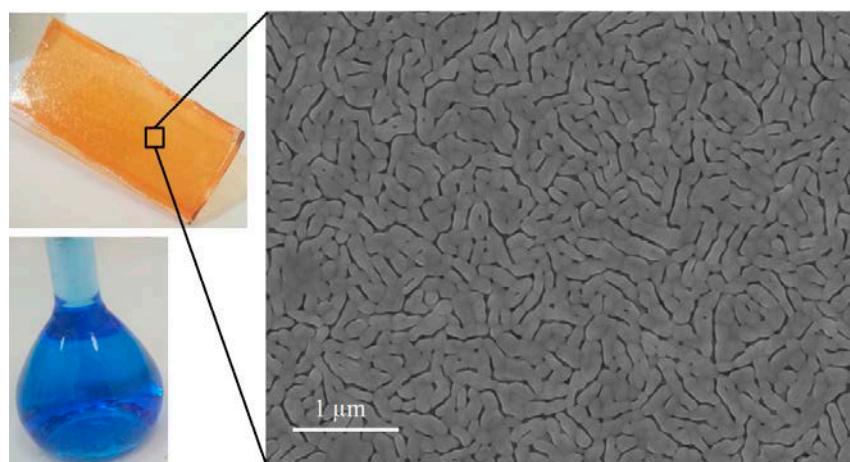
Head: Prof. Dr. Matjaž Valant

Material Research Laboratory was established in 2009 and has evolved in a sizeable research unit with state-of-the-art equipment and diverse expertise of the team members ranging from synthetic and crystal chemistry, functional materials, surface science, theoretical and computational chemistry etc. We have not only maintained the initial research focus on environmental and electronic materials but also developed it towards new exciting and advanced material systems and processes that include topological insulators, energy storage, nanostructured photo-catalysts and materials in extreme environments. The joint efforts of the team members again resulted in some exciting discoveries and developments.

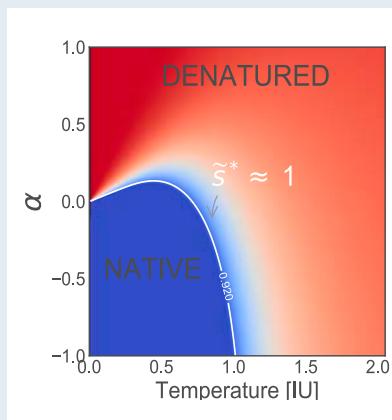
In collaboration with CEA (France) and CNR-IOM (Italy) we studied, by means of ab-initio calculations: i) the paramagnetic centers in alkali phosphate glasses. The study has unraveled the origin of the P3 centers and local environment effects. ii) the effect of electric fields in the context of ionic transport in solids. The research work shows that classical models to calculate the migration barrier may fail due to collective dipole effects. The results of this study were published in the journal Nature Communications.

We studied cathodoluminescence (CL) emission related to oxygen vacancies in  $\text{CeO}_2$ . A Gaussian deconvolution procedure allowed us to find out that for low oxygen pressure,  $\text{F}^0$  centers prevail over  $\text{F}^+$  centers in  $\text{CeO}_2$ , while for high oxygen pressure  $\text{F}^+$  centers are more dominant than  $\text{F}^0$  centers. The demonstrated ability of CL spectroscopy to distinguish between various charge states of oxygen vacancies is useful for defect engineered property enhancements of  $\text{CeO}_2$  related solid solutions.

We developed a novel method for preparing porous hematite ( $\alpha\text{-Fe}_2\text{O}_3$ ) thin films by using a combination of spin-coating and heat-treatment approaches. We used the obtained  $\alpha\text{-Fe}_2\text{O}_3$  material in photo-electrochemical (PEC) degradation of a textile dye bezacryl blue: Basic Blue 41 (B41). The PEC degradation of B41 using a  $\alpha\text{-Fe}_2\text{O}_3$  electrode was compared with electrochemical (EC) and photocatalytic (PC) ways. The degradation of B41 were remarkably faster under PEC conditions, whereas the activities of the PC and EC processes were negligible. The degradation of B41 was confirmed by HPLC studies.



SEM image of the  $\alpha\text{-Fe}_2\text{O}_3$  thin film, used for photo-electrochemical degradation of the textile dye bezacryl blue.



*Phase diagram of protein folding within Zimm-Bragg model. With added description of water, the developed approach is relevant for numerous applications in Bio-technologies and Pharmacy.*

We reported solvothermal synthesis of iron phosphide electrocatalysts using a low-cost phosphorus precursor. The annealing at 500°C under reductive atmosphere induced structural changes in the samples: (i) Fe<sub>2</sub>P provided a pure Fe<sub>3</sub>P phase and FeP transformed into a mixture of iron phosphide phases (Fe<sub>2</sub>P/FeP). The electrocatalytic activities of heat-treated were studied for hydrogen evolution reaction (HER) in 0.5 M H<sub>2</sub>SO<sub>4</sub>. The lowest electrode potential of 110 mV vs. a RHE at 10 mA cm<sup>-2</sup> was achieved with Fe<sub>2</sub>P/FeP catalyst. Also the chemical vapor deposition (CVD) approach to grow MoSe<sub>2</sub> thin films using colloidal molybdenum nanoparticles (Mo Nps) was reported by MRL. The synthesis of Mo NPs was achieved using a wet-chemical method. After spin-coating of Mo NPs onto graphite substrates, heat treatments in the presence of selenium vapors at several temperatures ( $\geq 750^{\circ}\text{C}$ ) were carried out. The best performing MoSe<sub>2</sub> film (800°C) showed an overpotential of 218 mV at 10 mA cm<sup>-2</sup> in 0.5 M H<sub>2</sub>SO<sub>4</sub>.

In the context of synthesis and characterization of new topological insulators (TIs), in collaboration with ISM-CNR and IOM-CNR (Trieste, Italy) we explored the properties of the quasi-binary Bi<sub>2</sub>Se<sub>3</sub>-Bi<sub>2</sub>S<sub>3</sub> system. Spin- and angle-resolved photoemission spectroscopy shows that topo-

logical surface states develop on the surfaces of the Bi<sub>2</sub>Se<sub>3-y</sub>S<sub>y</sub> ( $y \leq 0.66$ ) rhombohedral crystals, in close analogy with the prototypical case of Bi<sub>2</sub>Se<sub>3</sub>, while the orthorhombic crystals with higher S content turn out to be trivial semiconductors. The work is relevant in the context of synthesis and characterization of new TIs.

In 2020, we started a bilateral project in cooperation with the Vinča Institute from Belgrade with the aim of long-term cooperation for research and development of new catalytically active hybrid materials that will combine topological insulators and dihalides with transition elements. We performed Bi<sub>2</sub>Se<sub>3</sub> syntheses, did the SEM analysis and sent the products to the Institute in Belgrade. There will try to combine them with MoS<sub>2</sub> nanoparticles to obtain composite materials.

In the last years we conducted a deep investigation about the reactivity at the interface between various metals (Au, Ag and Ti) and Bi<sub>2</sub>Se<sub>3</sub>, the most studied topological insulator (TI). We concluded the research line of Platinum reactivity (a noble metal as Au and Ag), which is interfaced with TIs in several applications, from electronics to catalysis. We discovered that, despite Pt's noble metal character, a chemical interaction takes place, together with the formation of an interfacial ternary phase. These findings allowed us to find general criteria to predict which kind of chemical reaction to expect when a metal get interfaced with Bi<sub>2</sub>Se<sub>3</sub>.

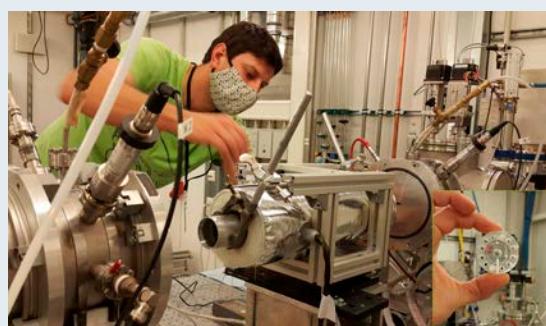
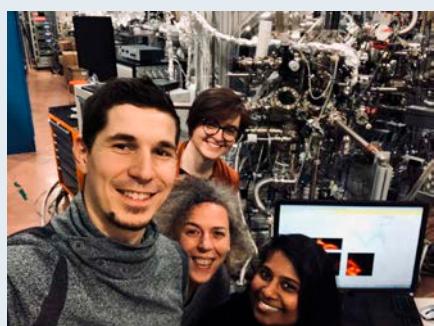
We continued with development of the method for detecting and confirming the presence of topological states on nanoparticles of TIs. It is based on measuring the optical properties in aqueous suspension by UV-vis spectroscopy. Due to topological states on the surface of a TI, such nanoparticles exhibit plasmon resonance. The latter is the direct evidence of the topological state. UV-vis measurement of Bi<sub>1.9</sub>In<sub>0.1</sub>Se<sub>3</sub> nanoparticles from our optimized syntheses, we compared with undoped Bi<sub>2</sub>Se<sub>3</sub> nanoparticles. Preliminary results show that topological states are present, despite doping the material with 2 at.% Indium.

Using our expertise in modeling bio-polymer conformations, we have constructed a model to analyze phase diagram of protein folding in water. The approach resulted in a new method to process Circular Dichroism data of classical folding experiments. Application of the method provides the information on hydrogen bond strength, inaccessible with other approaches.

The lab expanded its area of research in the last quarter of 2020 by starting to work on covalent organic polymeric materials. The aim of this research is to develop covalent organic frameworks for applications in fluorescence sensing of organic biological agents. As the first step in this new research direction, we compiled a literature review on fluorescent covalent organic polymers and frameworks for sensing of a range of analytes, including metal ions, explosives, pH, iodine, amines, enantiomers, solvents, anions etc.

Applied research and development of technologies for energy storage in solid matter we deepened further. We successfully integrated individual components of the laboratory system. The latter simultaneously serves as demonstrator and to study the operation of the technology. We achieved >90% energy efficiency of electrolysis of FeCl<sub>2</sub> (aq) into elemental Fe. We obtained a project for an XAS study of the properties of FeCl<sub>2</sub> (aq) electrolytes at various concentrations and temperatures, we fabricated dedicated liquid absorption cell including a heating system and successfully performed in-situ synchrotron measurements on the P65 beamline at Petra III (DESY) in Hamburg.

In the industrial field, we have developed an acrylic polymerization catalyst formulation for the company CES Institute d.o.o.. With ECUBES company, we have started a project to develop the concept of producing hydrogen, by using excess industrial heat. We also continue our cooperation with company Seven refractories d.o.o. from Divača, for which we perform input quality control of their bitumen.



*Despite the pandemic in 2020, we managed to realize synchrotron measurements in Italy (Left: during the experiment at APE beamline, Elettra Synchrotrone, Trieste) and Germany (Right: setting up the experiment at P65 beamline, Petra III, DESY, Hamburg).*

# Laboratory for Environmental and Life Sciences

Head: Prof. Dr. Mladen Franko

The Laboratory for Environmental and Life Sciences (LELS) provides the grounds for intensive research collaboration among analytical chemists, environmental chemists and technologists, biochemists, molecular biologists, toxicologists and material scientists. LELS focuses on development of novel and unique ultrasensitive laser-based analytical techniques, study of the fate, transport and transformations of pollutants in atmosphere, terrestrial and aquatic environments, food quality and safety, characterization of novel materials, biomedical diagnostic tools, as well as identification of recombinant antibodies specific for tumor biomarkers. The laboratory has extensive collaboration with research groups from all over the world.

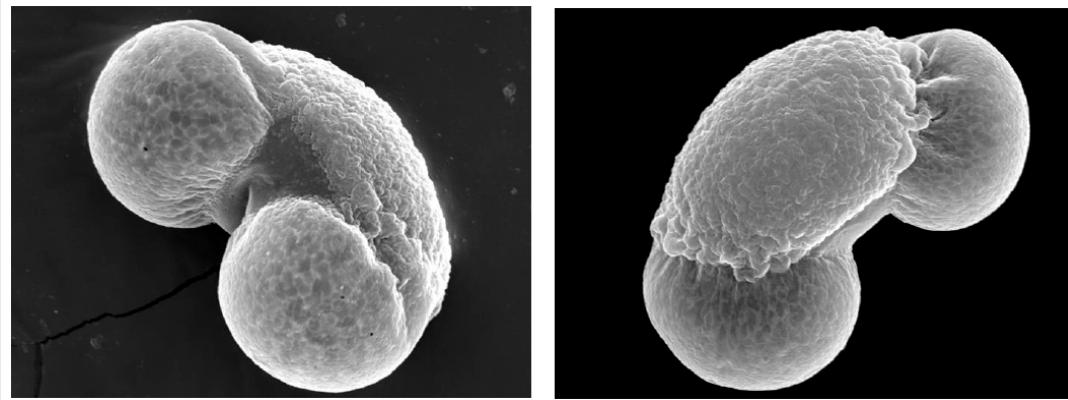
## Research activity

In the field of atmospheric pollution, techniques for the chemical characterisation of airborne particulate matter are under development that will enable the source apportionment of pollution. This is complemented by techniques for detection of volatile organic compounds which can be applied to measure biomarkers exhaled in human breath and determine the air quality impact on health. Related to impacts of environmental pollution, we study the interaction between plants and microplastics. By using acute toxicity tests, we studied the synergistic effects of microplastics and acid rain. Interesting preliminary results call for further investigations to understand the observed physiological response of plants.

In the field of ultrasensitive laser-based analytical techniques, we developed a novel theoretical model and built an experimental setup for photothermal beam deflection spectrometry (BDS). This method enables non destructive and non contact determination of open and total porosities of anticorrosion coatings and biocomposite materials containing pollen as carrier of antibiotics. The porosities were too low to be determined by other existing techniques such as electrochemical techniques or SEM. The BDS method was also applied for characterization of Cu and/or Zr modified  $TiO_2$  materials, which showed possible application for degradation of various pollutants in water. It was found that the presence of Cu and Zr particles improves the photocatalytic properties of the examined materials.



Young researcher working on a photothermal spectrometer constructed in the Laboratory for environmental and life sciences.



SEM images of a Loblolly pine (*Pinus taeda*) pollen grain after the cleaning procedure.

Our experimental results and theoretical analysis of measurements on  $\alpha\text{-Fe}_2\text{O}_3$  and  $\epsilon\text{-Fe}_2\text{O}_3$  thin-film hematite polymorphs and  $\text{Fe}_2\text{O}_3$  thin films coated with a  $\text{TiO}_2$  nanolayer demonstrated the suitability of an open photoacoustic cell technique to determine thermal parameters of thin two-layer photocatalytic materials. This method detects minute differences in the structure of the materials originating either from their native structure or from the deposition of ultra-thin coatings.

As part of the applied research, we study the properties of sporopollenin microcapsules as biocompatible carriers for biologically active compounds. Sporopollenin microcapsules are very promising vessels for bacterial colonisation and for maintaining the viability of probiotics under model intestinal conditions.

Regarding nanobody studies, we completed the characterization of tags suitable for nanobody expression. We determined the interaction surfaces between the nanobody A10 and its antigen HER2 and we progressed in the identification of *in silico* models suitable to improve nanobody stability and affinity. Additionally, we evaluated alternative diagnostic approaches for the detection and quantification of cyanobacteria, and the characterization of a new set of binders against the infection biomarker CRP. On the other hand, we designed, prepared and performed the preliminary validation of a new library of adhirons. It can be highlighted that we contributed with our expertise to a work recently accepted in *Nature Nanotechnology*. Furthermore, in response to the current social needs derived from the health crisis, we collaborated to research dealing with SARS-CoV-2.



Protein purification by fast protein liquid chromatography (FPLC).

In the field of virology, we began research on the role of APOBEC proteins in the oncogenesis of HPV viruses. We started with the analysis of genetic and epigenetic changes induced by APOBEC3 expression in cervical cancer samples and HPV model systems. Next, we will investigate the critical timing and mechanisms of APOBEC3-driven cell transformation in HPV-infected host cells.

Finally, we successfully completed the international research project *EcoLamb* (EU program ERANET SuSan). Based on the project results, the partner consortium prepared a list of indicators that will help both breeders and decision makers to define the conditions to produce healthy and high-quality lamb meat with a low environmental footprint. An important advantage of this breeding model is animal welfare, which at the same time improves the quality and safety of the meat and contributes to a greater acceptance and competitiveness of sheep farming among consumers.

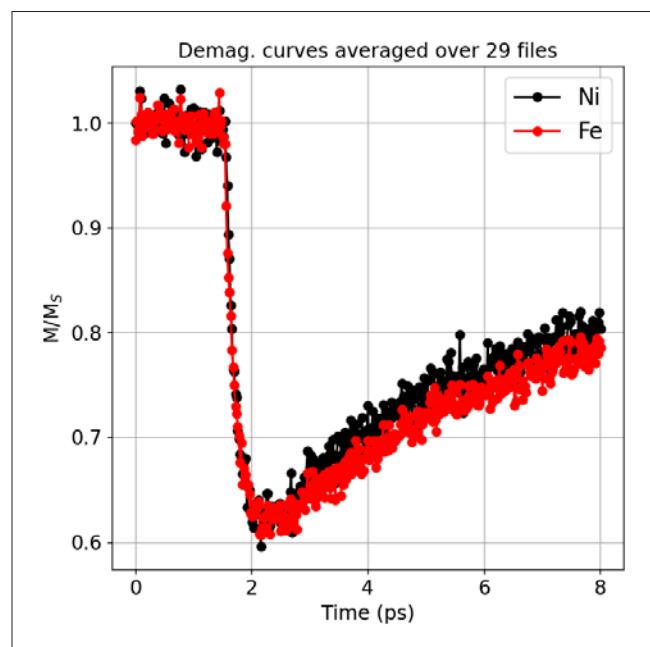
# Laboratory of Quantum Optics

Head: Prof. Dr. Giovanni De Ninno

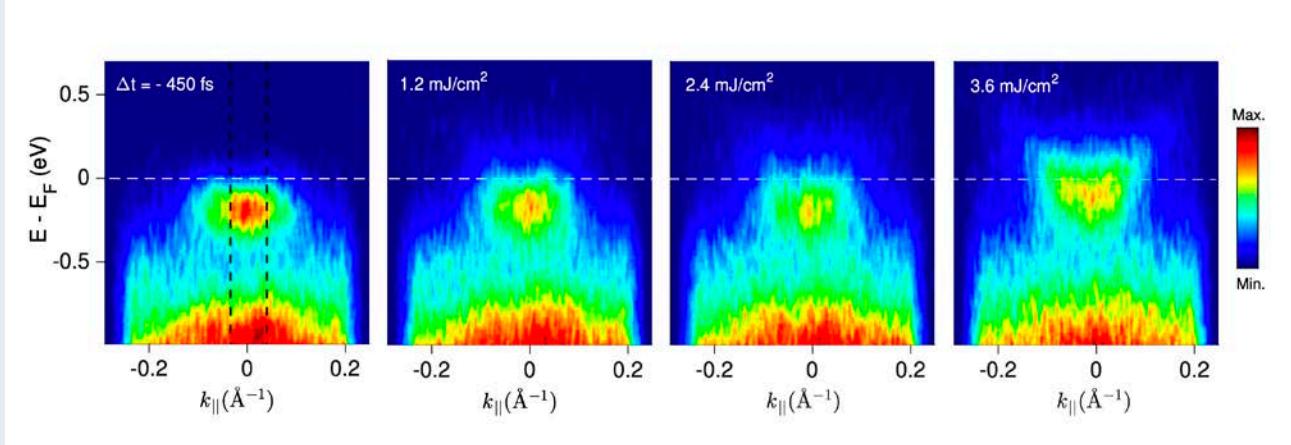
LKO focuses on investigating ultrafast response of electrons in semiconductors, topological insulators, superconductors, and metal/organic interfaces for use in electronics, spintronics, and energy harvesting. Furthermore, LKO uses X-rays at synchrotron radiation facilities for characterization of atomic and molecular structure of new functional nano-materials, and biological and environmental samples. The lab members actively participate in the development of the FERMI free-electron laser, one of the most powerful laser sources worldwide, which is opening new opportunities for exploring the structure and non-equilibrium states of condensed, soft and low-density matter.

**In year 2020 the laboratory activities of LKO were mainly focused on the following topics of research:**

The setup and first experiments on of the newly installed Magneto-optic Kerr effect (MOKE) set-up, the setup was installed in within the CITIUS light source and will open new possibilities for experiments for internal as well as external users. In this year the acquisition of initial measurements was performed using the High Harmonic Generation scheme to generate extreme ultra-violet pulses of light Ne and Ar gases in the generation cell. A general measurement of the demagnetization dynamics for Permalloy (Py: An alloy of 80% Ni and 20% Fe ) was carried out as a benchmark test and was found to be successful. The data acquired were in agreement with published literature. The dynamics were studied for both Fe and Ni elements specifically at their M-edges simultaneously. The first demagnetization signals for the iron and nickel elements are shown in the figure.



First ultrafast demagnetization curves (*Iron and Nickel*) on the picosecond scale obtained by the new MOKE setup at the LKO laboratory.



(Left-most image) an ARPES spectrum of the  $\text{Ta}_2\text{NiSe}_5$  in equilibrium at 100K, measured with a photon energy of 26.35eV, the remaining images show the response of the investigated material on very short temporal scale 150fs after the excitation, at three different pump fluences.

The time-resolved and angle-resolved photoemission investigation on a few correlated electron systems, namely  $\text{Ta}_2\text{NiSe}_5$  and  $\text{TaS}_2$ . The semiconductor  $\text{Ta}_2\text{NiSe}_5$  undergoes a structural phase transition at  $T_c = 328\text{K}$  and an ordered excitonic insulating phase sets in below  $T_c$ . Pump (excitation photon)-fluence dependent measurements were performed at 100K (excitonic phase) to investigate the evolution of the system after photo-excitation. A range from weak, to intermediate, to strong pump fluences were used to study the dependence of characteristic time-scales of the electron dynamics on pump fluence and to identify whether, a critical pump fluence exists above which the system can be driven across a non-equilibrium phase transition. Our experimental findings were further supported by a collaborative work with theoreticians. The di-chalcogenide,  $\text{TaS}_2$ , exhibits a charge density wave (CDW) and a Mott insulating state below  $T_c = 180\text{K}$ . In related systems, laser photo-excitation is known to cause, temporarily, metastable ordering and indeed, switching to a hidden metastable state in  $\text{TaS}_2$  can be achieved with an optical laser pulse. We performed tr-ARPES measurements at different pump fluences and at different temperatures below 180K. At a given sample temperature, the maximum transient temperature ( $T_e$ ) of the excited electron population was determined at different pump fluences and an abrupt increase in the slope of ' $T_e$  vs pump fluence' curve at a critical pump fluence provided an indication

that, perhaps, the system has been driven to a metastable state. Further experiments will be performed to confirm this observation.

Expanding the orbital tomography into the out of equilibrium regime. The angular distribution pattern of photoelectrons can be used to image molecular orbitals, this approach is termed photoemission tomography. While photoemission tomography technique has proved to be a success in the static domain, its widespread feasibility in the out of equilibrium regime is yet to be confirmed. With this aim an investigation into the possibility to perform orbital tomography on normally unoccupied molecular levels has been initiated. In 2020 the initial investigation on a particular crystalline thin films of sexiphenyl has been performed. This molecule forms ordered chain-like crystalline structures which makes it ideal for the study with orbital tomography due to its characteristic features in the angular distribution pattern. These first investigations were aimed at performing in situ growth of molecular chains as well as their preliminary characterization.

For characterization of atomic structure of different new functional nano-materials and biological and environmental samples with X-ray absorption spectroscopy (XAS) methods micro-XANES and EXAFS we obtained and realized in 2020 four international research projects at different European SR-laboratories (Elettra,

Trieste; PETRA III at DESY, Hamburg), in collaboration with research partners from Institute Jožef Stefan, National Institute of Chemistry, University of Ljubljana and University of Maribor. We performed in-operando XAS analysis of different cathodes materials for Li-ion, and Li-, Ca- and Mg-Sulphur batteries with high energy density, zeolite-based energy storage materials, different (photo)catalytic materials for water cleaning and catalysts for different large-scale technological process. Results elucidate the dynamics of electrochemical processes during battery operation and catalytic mechanisms crucial for optimization of their performance. With a combination of X-ray spectroscopy and sub-micron X-ray microscopy we explained the mechanisms of metal cations uptake, accumulation and detoxification in different nutrition plants and fungi, which can help to prevent the noxious metal cations transport to a food chain. We performed XAS study of multielectron co-excitations accompanying the photoeffect in the inner shells of elements of group 5p on hydrides and methyl compounds of these elements in the gaseous state which reveal collective quantum correlations in electronic motion in these atomic systems. In 2020 we published this research results in sixteen scientific articles in international journals with high impact factor.

# Center for Astrophysics and Cosmology

Head: Prof. Dr. Samo Stanič



The CAC colleagues Andrej Filipčič, Samo Stanič and Marko Zavrtanik received the 2020 Zois Award for exceptional achievements in the research of cosmic particles at extreme energies.

## Pierre Auger Collaboration

Our flagship project focuses on the research related to ultra-high energy cosmic particles with the world's largest cosmic ray detector, the Pierre Auger Observatory in Argentina. Huge showers of secondary particles, created upon collisions with nuclei of gases in the Earth's atmosphere, are used to identify the properties of incident primary cosmic particles. The observatory combines data from a grid of 1660 surface water Cherenkov detectors with data from four fluorescence telescope sites, observing excited nitrogen molecules along the shower path. Auger results support the hypothesis that extremely energetic cosmic particles accelerate at extragalactic astrophysical sites and that their flux is suppressed due to interactions with cosmic microwave background. In 2020, our experimental focus was on the application of machine learning techniques for the classification of cosmic rays and the implementation of a

Complementary studies of the phenomena on the extremely large and the extremely small scales via astrophysical observations of the Universe provide a more complete, unified picture of matter and its interactions. Combining the information carried by different cosmic messengers, such as charged cosmic particles, photons, neutrinos and gravitational waves is the key to better understanding of physical processes in the Universe. Our activities take place within international research collaborations Pierre Auger, Cherenkov Telescope Array, Fermi-LAT, Gaia, Liverpool telescope and Vera C. Rubin Observatory, and are focused on the searches for extremely energetic astrophysical sources, transient astrophysical phenomena, dark matter and possible mechanisms responsible for the matter – anti-matter asymmetry in the Universe. In 2020, three of our colleagues, prof. dr. Andrej Filipčič, prof. dr. Samo Stanič and prof. dr. Marko Zavrtanik, received the highest national (Zois) award for their exceptional achievements in the research of cosmic particles with extreme energies.



Simulation of a tidal disruption event when a star approaches sufficiently close to a supermassive black hole and is pulled apart by the black hole's tidal force.

real-time ultra-high energy photon search with the surface detector of the observatory. As shifters, we also contributed to successful operation of the observatory's fluorescent detector.

#### **Cherenkov Telescope Array Consortium**

Studies of very high-energy cosmic gamma rays provide crucial information on non-thermal Universe. Contrary to charged cosmic particles, photons are not affected by magnetic fields, so they can point back to their production sites. Our research was coordinated within the Cherenkov Telescope Array (CTA) consortium, which prepares instrumentation, observation strategies and software for the construction of a new generation observatory for the detection of high energy photons with energies between 20 GeV and 100 TeV. In 2020, the first step towards establishing the CTAO ERIC, the legal entity that will construct and operate the observatory, was made. Our main research activities were performed in collaboration with international partners, as we were involved in the development of a Raman lidar system for atmospheric characterization (U. Autònoma de Barcelona), which was in December deployed to the northern observatory site, identification procedures for ultra-high energy cosmic ray sources amongst active galactic nuclei (U. of Innsbruck) and sensitivity studies for the search of dark matter in the Galactic center (U. of Oslo).

#### **Fermi Large Area Telescope Collaboration**

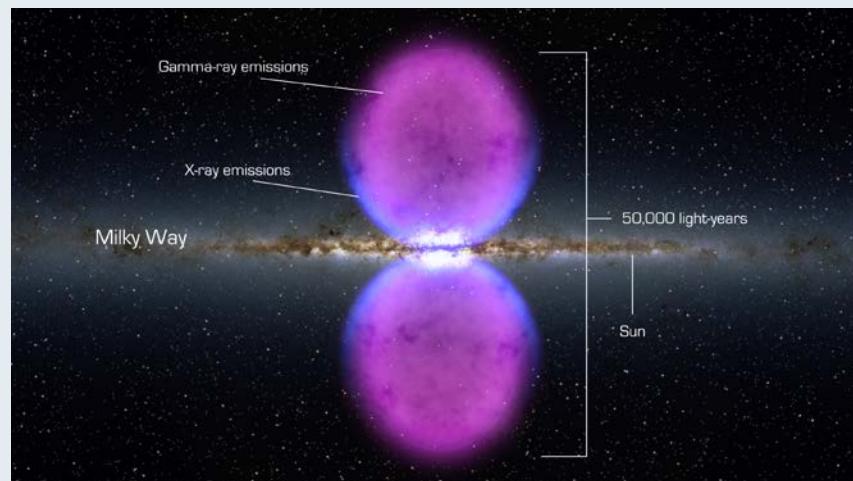
Fermi Large Area Telescope (LAT) is the main detector onboard the Fermi Gamma ray Space Telescope, leading space laboratory for the high energy gamma ray research since 2008. In the energy range between 20 MeV and more than 300 GeV, Fermi LAT so far discovered more than 5000 gamma ray sources, which is more than an order of magnitude more than what was previously known. Unexpectedly, it also discovered a large bubble-like structure stemming from the center of the Milky Way above and below the Galactic plane, called the Fermi bubbles, that are almost as tall as half of the whole Galactic disk radius. It also provided strong constraints on the nature of dark matter particles by investigating their decay or annihilation signatures in astrophysical objects. Starting from 2019, the results of Fermi LAT experiments provided crucial information for a series of multi-messenger discoveries, in particular related to the origin of ultra-high energy neutrinos and high energy emissions from the gamma ray bursts.



The first completed large telescope (LST-1) of the CTA North observatory at La Palma, with the Galactic center in the background.

#### **Astrophysical transients**

Our team is active in international collaborations studying astrophysical transient sources, which include gamma ray bursts, gravitational wave events, tidal disruption events and supernovae. In 2020, most of our activities were related to the NSF Vera C. Rubin Observatory, which will provide the most extensive sky survey so far and is expected to detect numerous transient events. In particular, we estimated the expectations for the Rubin Observatory of detecting tidal disruption events and strongly lensed supernovae. By using explosions of core-collapse supernovae, we posed limits on a dark matter candidate, the so-called axion-like particles. We also successfully concluded the ESA Prodex project Gaia Transients.



From end to end, the Fermi bubbles discovered in 2010 (magenta) extend roughly half of the Milky Way's diameter. Hints of the bubbles' edges were first observed in X-rays (blue) by ROSAT, a Germany-led mission operating in the 1990s.



The upgraded surface detector stations of the Pierre Auger observatory with a plastic scintillator on top, providing composition sensitivity of primary particles. An additional antenna will enhance composition sensitivity at large zenith angles.

# Center for atmospheric research

Head: Prof. Dr. Griša Močnik



*Measurements of aerosols, water droplets and ice crystals in clouds at the Otlica observatory.*

The Center for Atmospheric Research (CAR) focuses on the study of physical processes in the atmosphere – the lower part of the atmosphere, using remote sensing and in-situ measurements. Modeling of atmospheric phenomena adds to these efforts. Our research activities include the investigation of aerosol sources, their dispersion in the atmosphere and vertical profiles. We investigate atmospheric structures and the impact of atmospheric conditions on astrophysical observations and how aerosols interact with the clouds. The key question is, how aerosols influence the atmospheric optical properties through scattering and absorption of solar radiation. Scattering cools the atmosphere, while absorption warms it – aerosol black carbon is the second most important climate forcer.

The Center is located at the University of Nova Gorica Ajdovščina site. It runs the atmospheric observatory at Otlica and is involved in the activities of the European Space Agency, the Pierre Auger Collaboration, the Cherenkov Telescope Array Observatory and field campaigns around the globe.

## Lidar research

The lidar measures the laser light backscattered on aerosols. With lidar measurements we monitor regional aerosol transport and local processes in the planetary boundary layer. The Center for Atmospheric Research currently uses two lidar systems: the mobile elastic lidar with the capability of three-dimensional scanning of the atmosphere, and the stationary polarization Raman lidar, in operation at the CAR laboratory in Ajdovščina enabling aerosol characterization in terms of size and morphology. We have been using concurrent lidar and *in-situ* measurements to investigate optical and physical aerosol properties and the dynamics of their spatial distribution, separating different sources of air pollution. After a successful defense of her PhD, Marija Bervida started working on comparing the Doppler lidar measurement of Bora wind with the models she developed during her previous work.

## In-situ research

Measurements in Ajdovščina and Otlica above it enable characterization of the pollutant dispersion. Pollutant concentrations are influenced by the activity of emitting sources and the atmospheric dynamics – weather. If we want to determine the activity of sources, we need to characterize the atmospheric dynamics on the time scale identical to the one of the pollutant concentration measurements. Black carbon is a primary pollutant and as such a direct tracer for source activity. We measured also other pollutants, including natural ones – such as Saharan dust, which is mixed with anthropogenic pollution (Drinovec et al., 2020; Yus et al., 2021). We were involved in development of new measurement techniques of aerosol light absorption



*A black carbon layer in the atmosphere.*

(Visser et al., 2020; Bernardoni et al., 2020). The source specific emission rates were determined for Ajdovščina and Ljubljana (Gregorič et al., 2020). Additionally, we were involved in quality control of aerosol measurements (Alas et al., 2020; Cuesta et al., 2021). The source apportionment activities were conducted in Slovenia (Kanal ob Soči), France (Zhang et al., 2020), and New Delhi region, India (Tobler et al., 2020; Lalchandani et al., 2021). We determined the source specific atmospheric heating rates of different light-absorbing aerosols and cloud influence on this phenomenon (Ferrero et al., 2020).

In cooperation with the Aarhus University we have started a project on the characterization of the particles which are involved in the generation of clouds, either through ice nucleation or water condensation. The experiments were conducted at the Otlica observatory in-situ, while the determination of the cloud type was performed remotely – we have used the depolarization of the back-scattered light from the

Raman lidar to separate warm and ice clouds and identify the type of clouds at the Otlica observatory.

Calibration and validation of the Aeolus satellite mission will be performed in Cape Verde islands within the European Space Agency funded project. We have developed a new inlet and instrumentation payload for the ultra-light aircraft flown by Matevž Lenarčič in close cooperation with the industrial partners, for measurements of aerosol absorption and scattering, and size distributions. Aerosol absorption in different size fractions will be used to differentiate between fine and coarse aerosol absorption – soot and Saharan dust (an extension of Drinovec et al., 2020).

#### Applied research

The observatory at Otlica above Ajdovščina (965 m above sea level) is a node in the national grid of meteorological and environmental stations, administered by the Slovenian Environment

Agency, and a member of the European Virtual Alpine Observatory, with continuous monitoring of temperature, humidity, wind speed and direction, ozone concentration and solar irradiation, all available on line at the Agency's and Center's web portals. The observatory also hosts a filter photometer for black carbon measurements (in collaboration with Aerosol d.o.o.), light pollution monitor (in collaboration with Universidad Compultense de Madrid) and three passive remote sensing devices investigating climate change related stratospheric processes at about 90 km above the ground (in collaboration with Earth Observation Center of the German Aerospace Agency – DLR).

# Wine Research Centre

Head: Doc. Dr. Melita Sternad Lemut



Pot experiment set-up for performing irrigation experiment with treated waste water.

Wine Research Centre (CRV) is uniting the researchers and multidisciplinary research activities that are related to the fields of viticulture and enology (plant physiology, biochemistry and pathology; viticulture and wine-making technologies; sustainable viticulture; fruits, grape and wine analytics; microbiology and molecular biology of yeasts, grapes and wine; biotechnology). We operate in the laboratories of Lanthieri Mansion in Vipava and in the fields, including the University's own vineyard. Our primary studied plant is grapevine (with the processing of grapes to wine) but we also focus to some fruit plants, olives and apple wine (cider). We deal with both applicative research, addressing current problems in the field, as well as expert, more future-oriented research.

In 2020, the Wine Research Centre (WRC) members completed the work on the Interreg project between Slovenia and Italy AGROTUR II »Sustainable agriculture and tourism development in the cross-border Karst region«. As a part of the closing event in Štanjel, we presented the final results and participated in the proceedings' preparation and publication.

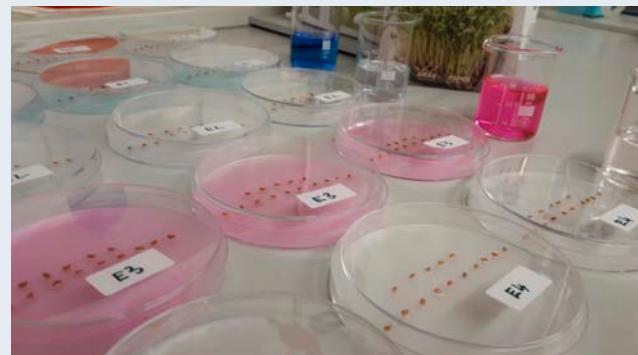
Also the EnViRoS project is in the last stages of implementation. Thus, in 2020 we performed genomic DNA isolation from the remaining soil and vine root samples for the needs of microbiome analyses.

We continued with the work within the ARRS bilateral project Israel-Slovenia by repeating the 2019 pot experiment with irrigation, but we used the purified wastewater in 2020. In addition to monitoring and sampling as done in 2019, in the year 2020, we also focused on soil analysis. We introduced a microrespiration method to determine the microbial community's physiological profile in the soil.

As part of the applied research project (ARRS) entitled »Improvement of Slovenian white wines through better expression of varietal aroma«, we performed in 2020 an enzymatic characterization of yeasts using a series of qualitative tests to determine glycosidase,  $\beta$ -lyase, and sulfite reductase activity. Extracellular and cellular glycosidase activity was then quantified on yeast selection using pNPG substrate and cysteine- $\beta$ -lyase activity by converting pyruvate to lactate and then determining NADH consumption. In a microvinification experiment, we performed fermentation of Sauvignon must using three test yeasts.

In the second year of its implementation, there was also an industrial research project entitled Cidersmack, in which WRC plays the role of an external partner supporting NIBIO (Norwegian partner) in establishing a control system for production and analysis of the final product - cider from Hardanger area, as well as nitrogen needs in spontaneous fermentations and detailed chemical analysis of various products in the field (aromatic and phenolic compounds, sugars, acids). Due to the COVID-19 situation, many Slovenia and Norway activities were hampered, which resulted in the project being extended by one year. In 2020, we included in the project a new doctoral student and a new postdoctoral associate - an analyst, who will take care of the development of new analytical methods on WRC analytical equipment.

In the second half of the year 2020, we launched a new 3-years lasting international project NFM (Norwegian Financial Mechanism) »Uncorking rural heritage: indigenous production of fermented beverages for local cultural and environmental sustainability«, funded by Iceland, Liechtenstein and Norway through EEA and Norway Grants Fund for Regional Cooperation. The project aims to encourage rural development by improving joint research capacities and knowledge transfer, which is related to the usage of »terroir« approach for wine and cider production in selected areas



*Lepidium sativum* germination test with model waste water, treated by using an electrochemical approach (done in MRL lab).



Performance of the microrespiration test on soil samples.

of Slovenia, Croatia, Northern Macedonia and Norway. WRC UNG is the lead partner. Within the project, WRC is thus responsible for coordinating the project at the overall level as well as for setting up a research point to determine the typical aromatic and sensory properties of wines and ciders. WRC will also take care of setting up an e-platform for knowledge transfer on local wines, ciders and on sustainable and smart grape growing.

In addition, the purchase of a gas chromatograph in combination with various methods of sampling and sample preparation (SPME, direct incision, thermal desorption) started in 2020, for which WRC received 30% co-financing from ARRS (Package 18). The equipment will be used for the needs of the NFM project.

In 2020 another new bilateral (Slovenia-Austria) research project entitled »Exploring the grapevine metabolic plasticity under drought« (PlasticGrape), led by the BOKU University in Vienna, has started. In this project, we have begun preparations for a two-year experiment, which will be, for the Slovenian part of the project, led by WRC UNG. We also carried out Erasmus+ mobility at BOKU University (Tulln, Austria), where we studied the adaptability and response of some existing grapevine rootstocks to drought stress.



Allium test with waste water, treated by using an electrochemical approach (done in MRL lab).

# Center for Information Technologies and Applied Mathematics

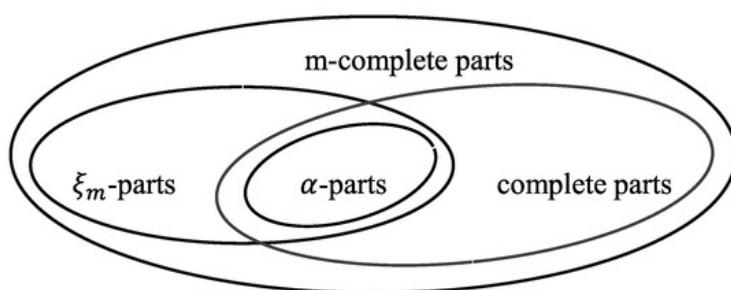
Acting Head: Prof. Dr. Irina Elena Cristea

The Centre for Information Technologies and Applied Mathematics is an interdisciplinary dynamic research group, developing its activities at the intersection of computer science and informatics, mathematics, systems theory, and control systems technology. It focusses on novel approaches to model and solve a wide range of problems, from industrial engineering practice to education, biomedicine, theoretical and applied mathematics. Methods for intelligent data analysis are being developed and applied to the domains where IT support is required for knowledge discovery aiming at understanding complex diseases, phenomena in the environment, or problem solving in various complex domains, especially in engineering. In the mathematical area, we contribute with new studies in hypercompositional and ordered algebra.

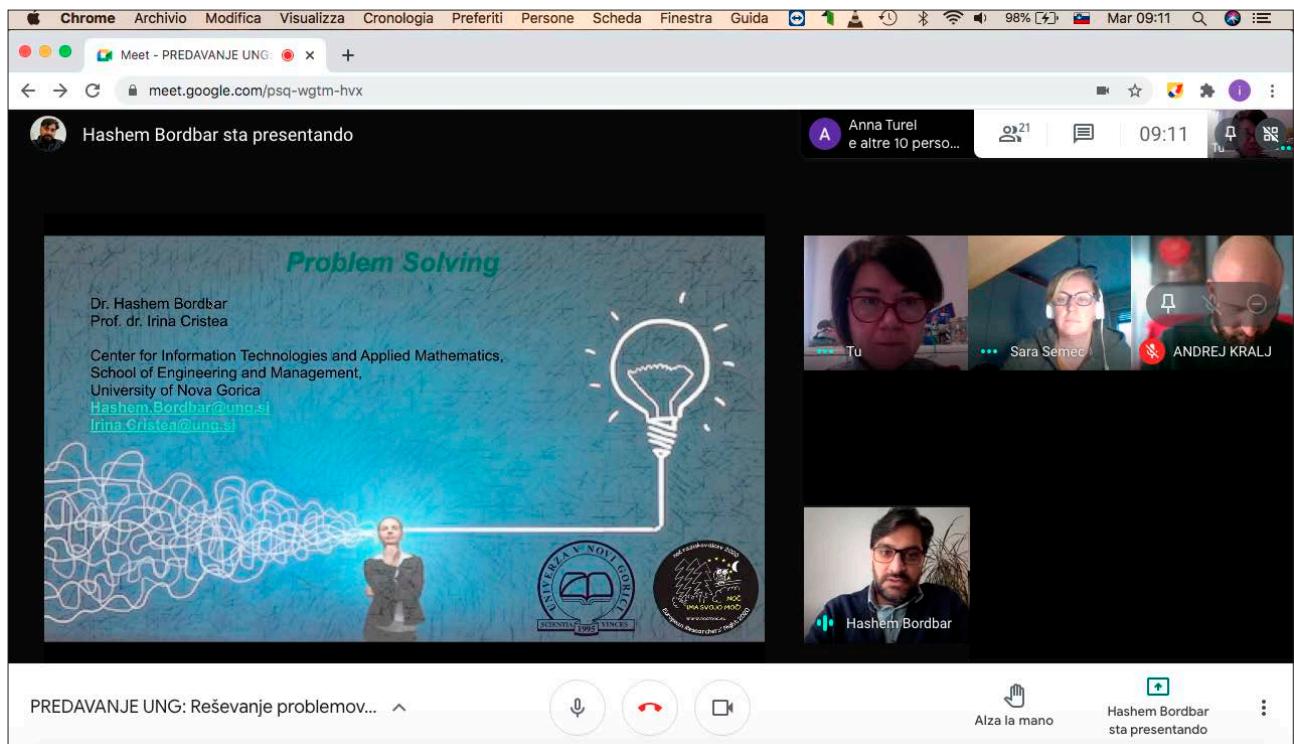
In 2020 the Centre employed 5 researchers, working on different topics in the framework of knowledge discovery, open education, hypercompositional and ordered algebra, Gaussian-process models, and renewable energy sources.

In the context of knowledge discovery, we cooperated with the Jozef Stefan Institute by studying semantic data mining for linked open data. We were looking for possibilities of interdisciplinary connections and potential applications in open education.

We continued researching the process of transformation of educational activities towards more flexible and open forms. We published an article in International journal of innovation and learning, where we presented an experimental analysis of chosen web conferencing tools with the aim of evaluating their potential and compatibility with the e-learning platform already used at our university. We further analysed introduction of e-learning to a traditional university from different aspects and published a comprehensive review of our findings in a book chapter. Although our work was done before the corona virus epidemics, the situation after the publication has additionally proved its relevance.



The relationship between various types of complete parts in hyperrings (Paper in Symmetry, 2020).



Live webinar »Problem solving«.

We continued to develop an innovative model of open education, which we are testing in practice in the Open Education for a Better World program (OE4BW). In particular, we focused on managing complexity, as hugely increased needs present new challenges to this field. Open Education Global, an international organization with about 200 institutional members from around the world, awarded the OE4BW program with the Open Collaboration Award for Excellence in 2020.

In the framework of the theory of hypercompositional algebra, we extended several important results from classical algebra, by defining and studying factorizable semihypergroups, m-idempotent hyperrings (Figure 1), injective and projective hypermodules, or the support of the hypermodules. Our studies covered also the fuzzy aspect of this theory: we have initiated a new study on the fuzzy reducibility of the hypergroups and on the fuzzy quasi-ideals of ordered semigroups. Besides, we focussed on the development of some arithmetic functions, as the fuzzy degree and the commutativity degree of complete hypergroups, with applications in determining the class equation

of hypergroups. We have also initiated a new study on the applications of algebraic structures in coding theory, with the aim to obtain some codes generated by BCK-algebras and BL-algebras. The linearity and cyclicity properties of these codes have been studied. In this context, the centre was collaborating with researchers from Iran, Czech Republic, Romania, Montenegro, Korea and United States.

The research on modelling of dynamic systems and applications of these models was pursued in the framework of research projects at Jozef Stefan Institute. Research activities were pursued in the direction of the hybrid modelling with Gaussian-process models as well as modelling with entirely data-driven methods. The methods were utilised for the modelling of atmospheric humidity, wastewater treatment plants and in medicine. We participated also in the research of automatic equation discovery.

We have been participating in the integral project LIFE CARE4CLIMATE (LIFE17 IPC/SI/000007), in which we are implementing environmental strategies to reduce the anthropological impact on the formation and to mitigate climate change. We continued to

participate in international research projects related to the development of energy supply systems for buildings and the adjustment of fiscal policy measures to promote the use of renewable energy sources. We participate in the Slovenian Institute for Standardization and help co-create standards in the fields of energy, systems and buildings. We continued to participate in the committee of the Gorizia Region Development Council in the preparation of the Regional Development Program. We have been supplementing our professional work with advising the RS ministries on the development/implementation of activities and applications, as well as with more demanding studies in the field of efficient use of energy and renewable energy resources.

This year our university joined the European Researchers' Night project »Noč ima svojo moč« as a third partner and our centre was the main UNG coordinator. For the first time, all the activities were carried out online and our centre also participated with a live webinar, by the title »Problem solving«, hosted by the Slovenian School Centre in Gorizia, Italy (Figure 2).

# Research Centre for Humanities

Marec-November 2020

Acting Head: Doc. Dr. Eda Čufer Conover

December 2020-

Acting Head: Prof. Dr. Katja Mihurko Poniž

The Research Center for Humanities works in the fields of literary sciences, cultural history, women studies, visual culture, intercultural studies and digital humanities. The common basis of research areas and their research methodologies is the focus on exploring forms of complex living conditions and human creativity through a historical perspective. The research projects explore past, modern and contemporary communication systems, forms of coexistence and displacement, human creativity and forms of solidarity. All these phenomena are measured, valued and interpreted through the optic of current technological challenge and planetary ecological crisis. Research approaches complement each other - comparative research into literary media, for example, provides reflection on the complexity of interpersonal communication throughout history, while cultural history expands historical research into questions of modern and contemporary cultural practice. A further common thread that connects the research topics and approaches of the researchers active in the Research Center for the Humanities is also the historically, culturally and literarily rich and ethnically and politically complex border area of the North Primorska region and Nova Gorica / Gorizia as a divided city.

Research topics: the roles of women writers in literary cultures; literature at the crossroads; digital humanities as a methodology for research in literary history, art and culture (distant reading, blended learning, multimedia ...); history of transformation of scientific institutions/ history of Slovenian academic institutions; visual culture and media (photography, film, new media) in Central and Eastern Europe; cultural anthropology, migration and the study of ethnic minorities; environmental awareness; women's studies and the future of humanities in the digital era (digital humanities)

Dr. Giustina Selvelli participated at the international Conference *Humanitas* organized by Incontro Culturale Mitteleuropeo, Gorizia.



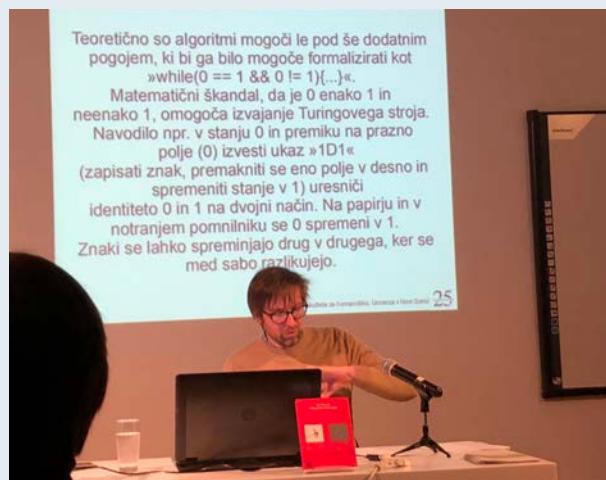
In 2020, the Research Center for Humanities acquired two new researchers in the field of cultural history, dr. Giustina Selvelli joined the team as a researcher in the fields of cultural anthropology, migration and intercultural relations, and dr. Eszter Polonyi, for the study of and research on the cultural history of visual and digital media.

In the field of literary sciences, the work was organized into several research units, carried out by prof. dr. Katja Mihurko Poniž, assoc. prof. dr. Ana Toroš and assoc. prof. dr. Aleš Vaupotič. In 2020 prof. dr. Katja Mihurko Poniž continued her research at the intersection of women's literary authorship, gender studies and digital humanities. She also continued to participate in the COST Action Distant Reading for European Literary History, in the DARIAH Women Writers in History Working Group. 2020 Research focus of assoc. prof. dr. Ana Toroš was on multicultural and multilingual literature in the border areas between Slovenia, Italy and Croatia (Trieste, Venetian Slovenia, Resia, Istria). She considered the latter from the point of view of comparative studies of minority literature, literary imagology, cross-border didactics of literature, and studies of trauma and literature. Assoc. prof. dr. Aleš Vaupotič in 2020 continued the research of culture and art after the digital turn. In his coordination, an experimental augmented reality project took place, which introduced information about the cultures and people of the real living spaces of the Slovenian and Italian border areas into the virtual forms, objects and spaces of cyberreality.

Doc. dr. Željko Oset in 2020 continued his research in the history and transformation of scientific institutions with the special focus on the research of the history of Slovenian academic institutions. Part of the research in this field was published in the monographic study *The University of Nova Gorica and the Slovenian Academic Community*, published by the University of Nova Gorica University Press in September 2020.

In 2020, researchers from the Research Center for Humanities attended a number of international conferences. Prof. dr. Katja Mihurko Poniž participated in two conferences (*International Conference on the Computational Processing of Portuguese; Language Technologies and Digital Humanities*) and published two papers in conference proceedings. She also participated in the workshop *Rethinking Intimacy at the Peripheries of Europe* organized by the University of

Teoretično so algoritmi mogoči le pod še dodatnim pogojem, ki bi ga bilo mogoče formalizirati kot »while( $0 == 1 \&& 0 != 1$ ){...}«.  
Matematični škandal, da je 0 enako 1 in neenako 1, omogoča izvajanje Turingovega stroja. Navodilo npr. v stanju 0 in premiku na prazno polje (0) izvesti ukaz »D1« (zapisati znak, premakniti se eno polje v desno in spremeniti stanje v 1) uresniči identiteto 0 in 1 na dvojni način. Na papirju in v notranjem pomnilniku se 0 spremeni v 1. Znaki se lahko spreminjajo drug v drugega, ker se med sabo razlikujejo.



Gothenburg, the University of Turku and the Christian University Dimitrij Cantemir. She also organized three webinars within the CEPUS network Women Writers in History.

Assoc. prof. dr. In 2020, Aleš Vaupotič worked as a member of the Scientific Council of the Biennial Conference on *Language Technologies and Digital Humanities*. Within the Slovenian Society for Comparative Literature, where he is a member of the executive committee, he participated in the international conference *Classical Literature, Comparative Literature: influences and methods*.

Doc. dr. Željko Oset participated in the conferences *100 Years of Slovene and Serbian Mathematics: Great Mathematicians Josip Plemelj and Mihailo Petrović Alas* organized by Slovenska matica; *Urban-related Sensoria: Environments, Technologies, Sensobiographies*, organized by the University of Eastern Finland

and the conference *Universities and Their Cities. Visual Traces of Universities and Scholars in University Cities across Eras* (organizer: University of Bologna in European Society for the History of Science).

Dr. Giustina Selvelli attended the international conference *Humanitas* organized by the Institute for Central European Cultural Meetings in Gorizia and the online discussion on protests in Bulgaria organized by the East Journal portal.

Dr. Eszter Polonyi participated in the conference of the Association for Slavic, Eastern European and Eurasian Studies (ASEEES) and in the conference of the Association of Archivists of Moving Images (AMIA), both taking place in Washington D.C.. She published a conference article about the literary origins of the film scenario, entitled »Writing with Light» in a special edition of the film and media journal *Apertura*.



M. Khrapkovskii, "Uzkoe mesto" [Bottleneck], Kino, October 16, 1931, 4. On the left, there are "500 Films." On the right, the banner reads "Soyuzkino Thematic Plan." The scroll in the middle reads "Screenplay."

In November 2020, dr. Eszter Polonyi participated in the *Association for Slavic, East European and Eurasian Studies* conference in Washington DC, where she presented the results of her research on Soviet film from the early 20th century, when filmmakers understood film script as a completely new form of literary canon.

# Center for Cognitive Science of Language

Head: Doc. Dr. Rok Žaucer

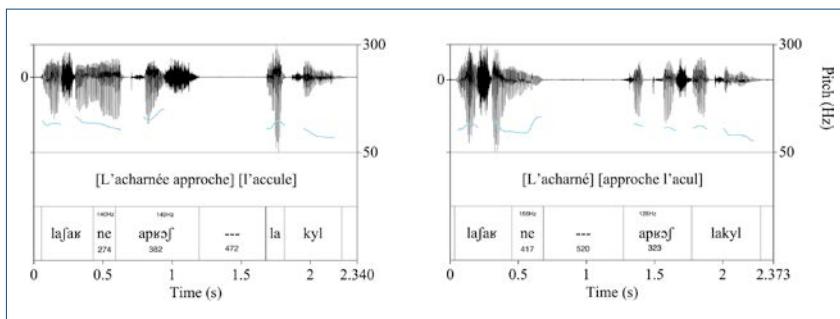
Center for Cognitive Science of Language is an interdisciplinary research center of the University of Nova Gorica. Our core expertise is in formal generative linguistics, which we use as a foundation for engaging in other domains of language-related cognitive science – especially language processing, language acquisition, bilingualism and the relation between language and other cognitive abilities.

At the focus of our research are investigations of theoretically relevant syntactic and semantic/pragmatic aspects of different languages. We strengthen the reliability of our data and analysis assessments with the use of corpora, large judgment samples, and various behavioral experimental methods (e.g., sentence completion, reaction times, developmental tasks, eye tracking, ERPs).

The Center for Cognitive Science of Language group specializes in formal generative linguistics, especially syntax and semantics/pragmatics, and uses this as a foundation for engaging in other domains of language-related cognitive science – especially language processing, language acquisition and bilingualism.

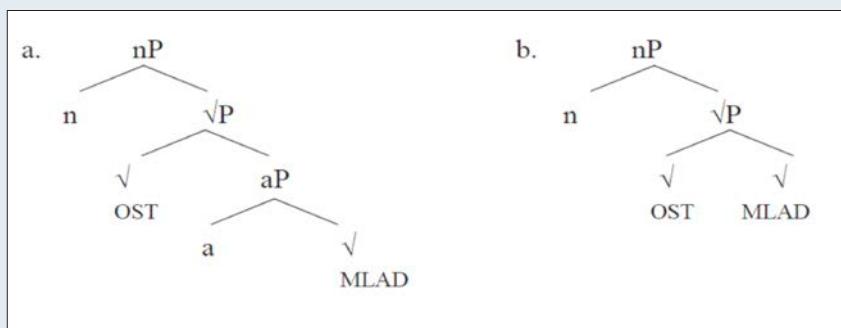
**Basic research** topics recently investigated in the Center include the following:

Our main focus in 2020 was on two projects financed by the Slovenian Research Agency. The first of these is 'Development of a standardized test of the sentence comprehension ability in Slovenian-speaking adults'; in which we are trying to measure standards reactions in language comprehension under normal circumstances, with which we wish to make possible a comparison with and the understanding of language use in special circumstances, specifically, in i) language acquisition in children, ii) multilingualism, iii) ageing, iv) language disorders. This research included the study reported on in our article in Plos ONE, which was selected as the top 2020 linguistics research achievement stemming from Slovenian Research Agency-financed projects ('Excellent in Science 2020').



In the project 'Hyperspacing the Verb: The interplay between prosody, morphology and semantics in the Western South Slavic verbal domain', which we are conducting together with the University of Graz, Austria, we are trying to map out in detail the morphology landscape of verbs and verbal derivatives in western South-Slavic languages, including any effects of interaction between verbal and deverbal morphology on the one hand and phonology, semantics, and syntax on the other hand.

In the second half of 2020, we started work on two new Slovenian Research Agency-funded projects. 'Development of a standardized test of the sentence comprehension ability in Slovenian-speaking adults' is a joint project with the University of Geneva and the University of Reading in which we are addressing the psycholinguistic aspects of the processes of syntactic feature assignment; these processes have been well-researched from a theoretical-linguistics perspective, but not from a psycholinguistic perspective. 'Linguistic transfer in the pragmatic domain: Slovenian speakers in a multilingual environment' is a project that investigates negative transfer of pragmatic features in language acquisition in multilinguals. One of the ways in which we approach this is by contrasting the semantics/pragmatics of the plural number in languages with a singular-plural grammar and in languages with a singular-dual-plural grammar, and the looking for possible transfer in multilingual speakers.



Condition	Statement	Objects presented
Number	"The Bicket has one button/balloon/cup."	
	"The Bicket has two buttons/balloons/cups."	
	"The Bicket has four buttons/balloons/cups."	
Morphology	"The Bicket has a button/balloon/cup."	
	"The Bicket has buttons/balloons/cups"	

**Other work** recently conducted in the Center includes the following:

We have renewed our agreement with the University of Edinburgh that allows us to continue running the outreach center 'Vecjezičnost velja' (<http://vecjezicnost.ung.si/>). This is the Slovenian branch of Bilingualism Matters, established in 2008 in Edinburgh, and targets families, teachers and anyone else who might have questions about raising bilingual children or about an adult life with more than one language. The center offers individual counseling and organizes public events with which we disseminate information and new, science-based findings about multilingualism.

The Center collaborates in the multipartner project 'Development of Slovene in a Digital Environment', which was launched in 2020 and whose main goals include meeting the needs for products and services in the field of Slovenian language technologies, both for companies and the public at large.

In addition to its basic-research orientation, the project 'Development of a standardized test of the sentence comprehension ability in Slovenian-speaking adults' also has a distinctly applied dimension to it, since proper understanding of typical and impaired language use is itself a precondition for eventual successful language intervention.

Two members of the Center served their third year as joint editors-in-chief of the Journal of Slavic Linguistics, which is published by the Slavic Linguistics Society and aims to be the primary outlet for reporting research findings in any subdiscipline of Slavic linguistics.



# Pedagogical Work

In 2020, the pedagogical work at the University of Nova Gorica was done within seven schools: School of Environmental Sciences, School of Engineering and Management, School of Science, School of Humanities, School for Viticulture and Enology, School of Arts, and Graduate School.



# School of Environmental Sciences

Dean: Prof. Dr. Matjaž Valant



Group project of second year students.

The study program Environment, Level I is an undergraduate program to obtain a university degree. The program offers all important contents from natural sciences and technical and social subjects related to environmental issues such as pollution of water, air and soil, environmental monitoring, waste management and environmental protection, management and economics. The basic goal of the program is to educate experts that will be able to conduct work on research, technical and managerial fields related to environment. This goes for different industrial sectors, lawmaking and law executing area on national and local levels.

## Study Programmes:

- Bachelor's Study Programme Environment (First Level)**
- Master's Study Programme Environment (Second Level)**

School for Environmental Sciences educates in the field of research, preservation and management of environment. The university study program Environment was according to the Bologna Directives modernized in changes into study programs Environment, Level I and Environment, Level II. The I. and II. level programs received public accreditation with declaration of Directorate for Higher Education of Republic of Slovenia on date 12. 10. 2007 and 15. 2. 2008, respectively. Continuously, we are modernizing the contents of the both study programs. In 2017/18, we have introduced obligatory practical training for the I. level students and substitute a diploma thesis with a diploma seminar. In 2018/19 we introduced courses on climate issues. In addition, we have introduced up-to-date contents among mandatory courses on the II. Level.

In 2020/2021 school year we enrolled fourteenth generation of students in the study program Environment, Level I. Beside mandatory and selective courses the students had an opportunity within their field trips, excursions and group projects to see waste landfills, experimental stations and institutes, industrial facilities, power plants and regional parks.



Work on PKP project 'PROMENADUS-CEMENTI'.

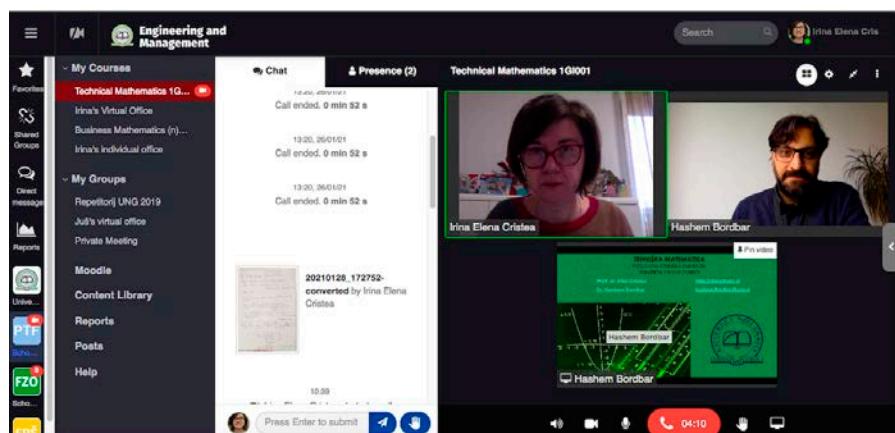
A uniqueness of our study program Environment Level I is a course called Group project, which introduces a modern approaches to education through project work. Emphasizes are on solving practical problems related to environment and working in a multidisciplinary group. During 2020, students took part in the PKP project 'PROMENADUS-CEMENTI': 'Extraction of raw materials for agriculture and industry from the waste products of the cement industry'. By working with the industrial partner, Salonit Anhovo, students investigated how a by-product of the cement manufacturing process may obtain new value by extracting selected chemical elements for use in agriculture. The results suggest that by regulating easily variable parameters such as e.g. extraction time, pH and temperature, the extraction of specific elements for use in fertilizers with a safe impurity content may be possible through alkaline leaching, the most economically efficient extraction method currently available. Reducing the amount of by-product that needs to be transported to landfills would have a significant societal benefit, both due to the favorable environmental impact of reducing the amount of landfilled waste and reducing the carbon footprint of waste transport.

The study at the Environment, Level II takes four semesters to complete and is exceptionally interdisciplinary. It offers courses from all important fields of environmental sciences but also enables students to deepen their knowledge in their fields of interest by choosing from a large selection of the selective courses. On the Level II the project work is performed individually within a course Individual project. In 2020 six new students have enrolled in the master program.

For study achievements we awarded the student Anja Petra Bencek with Alumnus Optimus.

# School of Engineering and Management

Dean: Prof. Dr. Tanja Urbančič



## Study Programmes:

- Bachelor's Study Programme Engineering and Management (First Level)**
- Master's Study Programme Engineering and Management (Second Level)**
- Master's Study Programme Master in Leadership in Open Education (Second Level)**

Bachelor's and Master's Programme of Engineering and Management are pursued at the School of Engineering and Management. Graduates have interdisciplinary knowledge of technology, economics and organisation. They are educated to identify and solve a broad spectrum of problems when supporting efficient and sustainable business and industry operation. Student projects and theses typically focus on concrete situations in companies, in various organisations or local communities. This is important to maintain good connections between the school and its environment, contributing to the very high employability rate of its graduates. In the year 2020, the school enrolled first students also into a new international Master's study program, entitled Leadership in Open Education.

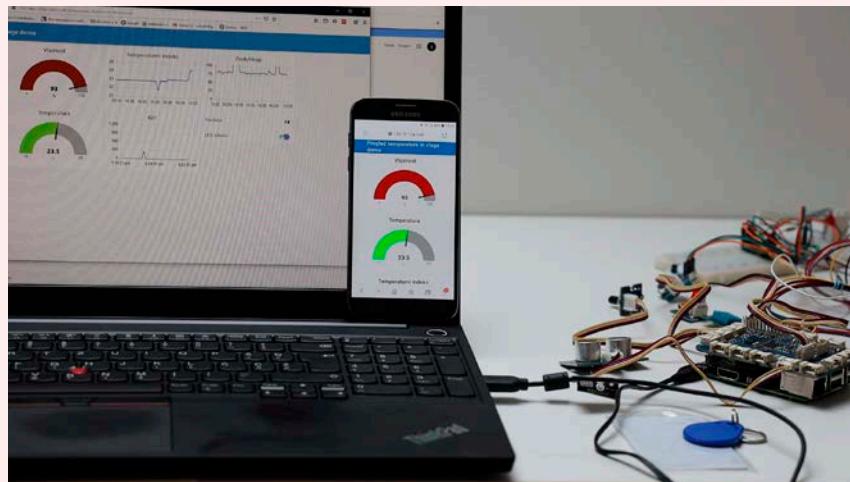
The fourteenth generation was enrolled to the first level study programme Engineering and Management, while the fifteenth generation came to the Master's programme Engineering and Management in 2020. In cooperation with national and international experts, a new Master's study program entitled Leadership in Open Education was launched in 2020.

122 students were enrolled in academic year 2019/2020, out of which 78 students to the Bachelor's programme and 44 students to the Master's programme. Similarly to previous years, a high proportion of students came from abroad. A possibility to learn Slovenian language was organised for them. In addition to the course for beginners, also the course at the continuation level was offered in 2020 for the second time.



In the previous years, the curricula of study programmes Engineering and Management were updated so as to include more information technologies due to the trends of digitalisation in business and industrial companies. Competences for working in an international environment were also included, and special attention was paid to pedagogical methods with more active student engagement. In 2020, we added the possibility of hybrid implementation of study processes, partly in lecture halls and partly online if needed due to special circumstances.

Educational activities of the school were carried out in the Lanthieri Mansion in Vipava. When needed due to the COVID-19 related measures, we switched to online and hybrid way. The programme was implemented in accordance with the specifications. Elective courses are offered in two-year cycles for two generations at the same time. In 2020, the elective courses at the first degree programme (first semester of the 2020/21 academic year) were the following: *Human Resource Management, Mobile Technologies, English, and Information security*. At the Master's degree, elective courses in 2020 (second semester of the 2019/20 academic year) included *Robotics, Optimisation of Resources and Processes, Open Source Information Systems, Advanced materials, Data Mining, Business English and Internet of Things*.



The School of Engineering and Management is very active in the development and introduction of new methods and information technology support into the study process. This, together with the introduction of e-learning and open education elements contributes to a better accessibility of the courses. Consequently, the study activities are mitigated for those students that are active athletes or part-time employed, or need additional flexibility for other reasons.

27 students successfully finished their study at the School of Engineering and Management in year 2020. Out of them, 17 graduates come from the Bachelor's programme Engineering and Management, and 10 from the Master's programme Engineering and Management. Cumulative number of the graduates of this school increased to 585 at the end of the year 2020. Their broad profile ensures an excellent employability rate that additionally increased in the last year. Taking into account the last three generations of graduates, the employability in 6 months after graduation is 93,88 % while in one year after graduation it comes to 94,29 %. The employability of graduates is enhanced by the competences that students acquire through project work within or outside the study program. For spreading awareness among potential employers, also in the year 2020 the school organized and recorded a round table where successful graduates presented their professional profile and working experience. But most importantly, high employability is obtained by maintaining good cooperation between the school and companies, mainly through student internships. In the year 2020, internships were enabled by the companies Bolton Adriatic d.o.o., Vitanest d.o.o., Mahle d.o.o. Alpe-Panon d.o.o., Goap d.o.o., Tokens d.o.o., Parcom d.o.o., Primorski tehnološki park d.o.o., TIP95 d.o.o. In Fast pris move AB for their internships. The school also collaborates with Primorska Technology Park in encouraging and preparing the students for entrepreneurship.

# School of Science

Dean: Prof. Dr. Sandra Gardonio



## Study programmes:

**Bachelor's Study Programme Physics and astrophysics (First Level)**

**Master's Study Programme Physics and astrophysics (Second Level)**

**Master's Study Programme Materials Science (Second Level)**

Physics addresses the phenomena in nature at its most fundamental levels on a variety of dimensional and energy scales. The goals of physics are to build on the current understanding of nature, using both experimentation and theoretical analysis, and to extend our understanding to more complicated systems, such as molecules, fluids, solids and galaxies. School of Science, supported by five research laboratories and centers of the University of Nova Gorica, provides research oriented programs »Bachelor in Physics and Astrophysics«, »Master in Physics and Astrophysics« and »Master in Materials Science«. We actively promote student creativity, originality and versatility; we consider the studies to be the competitive edge that may help our graduates in their professional careers. Our advantages are individual approach to students, international research experience, and a young, dynamic academic team.

We welcome foreign students, as all our lectures and other teaching activities are available in English. Pursuing Bachelor studies in physics and astrophysics requires no tuition for students from Slovenia, other EU member states, and countries signatories of bilateral agreements that waive tuitions in higher education (Serbia, Montenegro, Macedonia, Bosnia and Herzegovina, Kosovo and others). The school's involvement in the ERASMUS+ program provides a convenient possibility for students from Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine to pursue physics studies at the University of Nova Gorica. Our study programs are accredited by the Slovenian Quality Assurance Agency for Higher Education and our graduates obtain officially recognized academic degrees and diplomas, including the diploma supplement, prepared according to standards agreed to by the European Commission, the Council of Europe and UNESCO.

To provide high quality education and optimal conditions for either further studies or employment in the field of physics and astrophysics, the bachelor level program introduces general theoretical and experimental topics in a broad spectrum of physics fields, and gradually involves the students in actual research. The master level program in physics and astrophysics aims at profiling the students into narrower research fields, such as astrophysics and physics of materials, providing additional in-depth knowledge each of the modules. The students are also encouraged to become involved in international research collaborations and student exchanges with other universities and institutions. From 2018, Master program »Materials Science«, an

interdisciplinary and research-oriented 2-year study program was also offered. The common point of all programs is scientific excellence, direct individual approach in teaching and research and collegial relations between students.

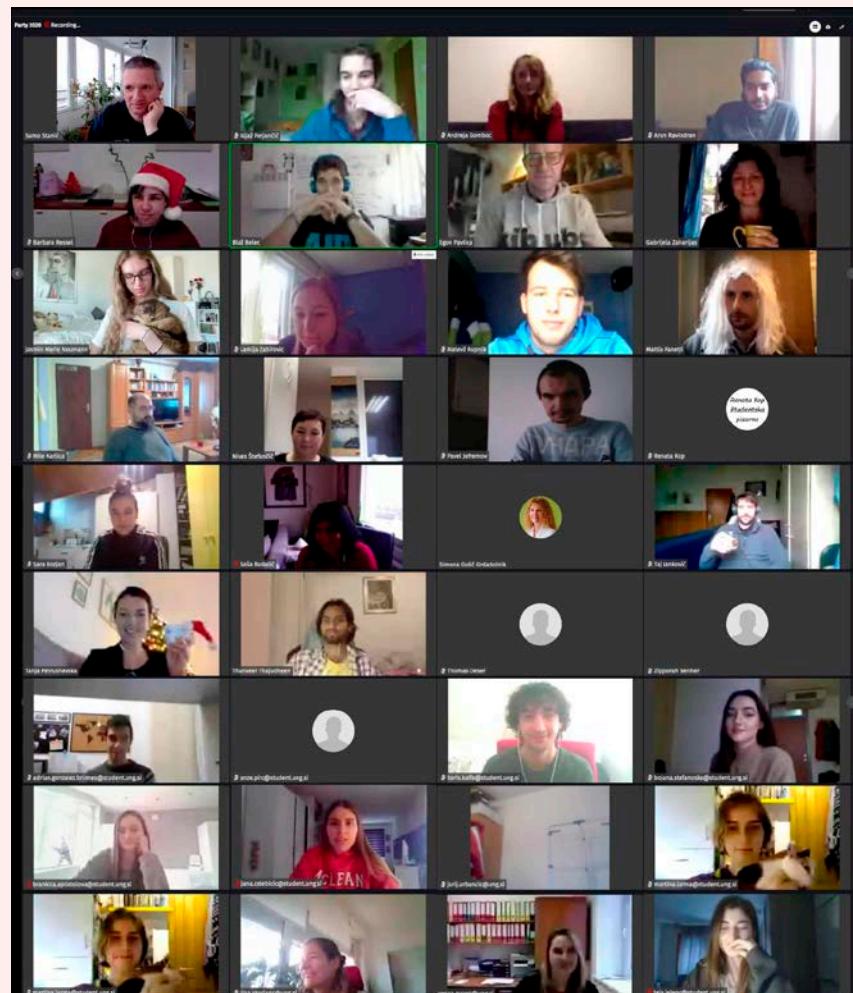
School of Science is also active in dissemination activities promoting science among the youth. It co-organizes Slovenian high-school and elementary school level competitions in astronomy, provides support to the national team at international competitions, is involved in managing the Slovenian version of the popular science »Portal to the Universe« and organizes public lectures. Our students are welcome to participate. The service they give is very rewarding, as they obtain invaluable experience with giving lectures and presenting scientific ideas to general public.

### **Bachelor program »Physics and astrophysics«**

The duration of the bachelor program »Physics and astrophysics« is three years, requiring a total of 180 ECTS points. The courses aim to provide general theoretical and experimental knowledge in a broad spectrum of physics fields, required for research work, and to gradually involve the students in actual research. Theoretical courses are complemented with research activities in laboratories and centers of the University of Nova Gorica. Although general orientation of the program is towards astrophysics and solid state physics, it nevertheless provides a broad enough knowledge base for the graduates to be able to pursue further studies or employment in any field of physics.

### **Master program »Physics and astrophysics«**

Master studies of »Physics and astrophysics« provide specialist knowledge in the fields of astrophysics and solid state physics. The program's duration is two years and requires a total of 120 ECTS points. Student activities within research laboratories and centers of the University of Nova Gorica are the basis for their master theses, which are often published in international scientific journals. Hands-on experience in international environment and with state-of-the-art technologies is pursued to increase the competitiveness of our graduates in their further careers.



### **Master program »Materials Science«**

Master program »Materials Science« is an interdisciplinary and research-oriented 2-year study program, requiring a total of 120 ECTS points, that is being offered from academic year 2018/2019. It is based on research excellence of the University of Nova Gorica and its partner, National Institute of Chemistry from Ljubljana, in the fields of physics and chemistry of materials, materials characterization, as well as materials technologies and development of innovative products and services, including the protection of intellectual property.



# School of Humanities

Dean: Doc. Dr. Eda Čufer Conover



Public presentation of the project Digitization of the cultural heritage of the women from Primorska and Notranjska, regions, June 29, 2020, Mostovna, Nova Gorica.

Study programmes:

**Bachelor's Study Programme Slovene Studies (First Level)**

**Bachelor's Study Programme Cultural history (First Level)**

**Master's Study Programme in Slovene Studies: Linguistics (Second Level)**

**Master's Study Programme in Slovene Studies: Literary Science (Second Level)**

**European Master in Migration and Intercultural Relations (Second Level)**

The School of Humanities abides by the following motto: »We bring together the humanist tradition and contemporary knowledge with the future in mind«. In collaboration with the Research Centre for Humanities, the Centre for Cognitive Science of Language and multiple partners, we combine top scientific research with teaching to introduce students to research and professional practice.

The covid-19 pandemic, which swept through the world in 2020, also left its mark on studies and research activities at the Faculty of Humanities of the University of Nova Gorica. In the year 2020, most activities at the School of Humanities were revised to meet the most advanced technical and professional standards for the implementation of distance learning and research activities.

The School of Humanities offers study programmes at the Bachelor and Masters degree level. The two undergraduate study programs are Slovene Studies and Cultural History. By encompassing the fields of linguistics and literary theory and history, Slovene Studies graduates obtain the professional title of a graduate in Slovene (UN). At the University of Nova Gorica, Slovene Studies has updated the traditional focus of the Slovene Studies curriculum on linguistic and literary contents by introducing mandatory and elective courses in the field of general linguistics, literary theory, visual culture, film and the performing arts, and the new field of digital humanities.

The Cultural History program develops a broadly defined humanist knowledge in students. Additional attention is paid to the specifics of the cultural and political environment in which the program was created, that is, in the border area of the North Primorska region, as well as further focus on the region's role in the main historical developments of Central and South-Eastern Europe. The graduate of the Cultural History study program obtains the professional title of a graduate historian (UN). In the 2019/2020 academic year, the School of Humanities offered three Master degree study programs: Slovene Studies with an optional specialization in Linguistics/Literary Studies and

the International Master's Program in Migration and Intercultural Relations (Erasmus Mundus). The two distinct masters degree study programs involving Slovene Studies (Linguistics and Literary Studies) develop knowledge of the Slovene language, of general linguistics and of Slovene literature, as well as securing a basic understanding of literary and linguistic theory and methodology. In 2020, the Linguistics study program was upgraded with an agreement between the University of Nova Gorica and Ca' Foscari University in Venice, which in the current academic year 2020/2021, enables students enrolled in this program to obtain a double degree. The acquired professional title in both study fields is master of Slovene Studies. The Master's degree program in Migration and Intercultural Relations is an international program that focuses on human rights, democratic values, the welfare state and the labor market, and the challenges facing both Member States of the European Union and the globalizing world. The program is implemented with the support of an elite program for international cooperation and exchange of students and professors in the field of higher education called the Erasmus Mundus. The professional title of the graduate of this program is a master of Migration and Intercultural Relations. The course of study, which takes place at several European universities, is held in English.

After completing the MA study programs, candidates have the opportunity to continue their studies at the University in Nova Gorica in the study programs designed for obtaining a doctorate of science. Within the Faculty of Postgraduate Studies at the University in Nova Gorica, students can choose between two PhD study programs: Cognitive Sciences of Language, and Humanities, within which they can pursue either of the two modules of Literary Sciences or Migration.

The School of Humanities also conducts language courses in various foreign languages as well as the Slovene language for non-Slovene speaking students.

At the School of Humanities, we pay special attention to extracurricular projects in which students can acquire additional knowledge and practical skills. Under the leadership of prof. dr. Katja Mihurko Poniž, the School of Humanities in the year 2019/2020 carried out the project »Digitization of the cultural heritage of women from Primorska and Notranjska regions«. In the project, which was funded under the program scheme »Project work with non-profit and non-profit sector - Student innovative projects



Public presentation of the project Digitization of the cultural heritage of the women from Primorska and Notranjska, regions, June 29, 2020, Mostovna, Nova Gorica.



At the Walk along the Heritage of Ljubka Šorli and France Bevk t prof. dr. Katja Mihurko Poniž presented a scientific monograph on Ljubka Šorli published by University of Nova Gorica Press.



In 2020, the Faculty of Humanities researched the possibilities of effective and mutually satisfying distant learning.

for social benefit 2016-2020«, a group of mentors and students were dedicated to solving the problems of how to process historical sources (correspondence) using modern approaches in the field of digital humanities and how to make them available to the interested public and for purposes of further research. The project involved students and mentors from the University of Nova Gorica and happened in cooperation with the Association for the Preservation of Cultural Heritage Aleksandrink. Materials are available on the website <http://sipk-pisma.ung.si/>.

In the 2019/2020 academic year the School of Humanities, under the leadership of prof. dr. Katja Mihurko Poniž, also acquired the CEEPUS (Central European Exchange Program for

University Studies) network Women Writers in History (<https://ceepuswwih.ung.si>) with the goal to study Central European women writers with digital materials and tools. The projects of the CEEPUS network will also include educational activities in regular university programs and summer schools.

In cooperation with various partners from the local environment members of the Faculty of Humanities organized the event A Walk along the Heritage of Ljubka Šorli and France Bevk which took place on 19 September 2020. At the event prof. dr. Katja Mihurko Poniž presented a scientific monograph on Ljubka Šorli.

# School for Viticulture and Enology

Dean: Prof. Dr. Branka Mozetič Vodopivec

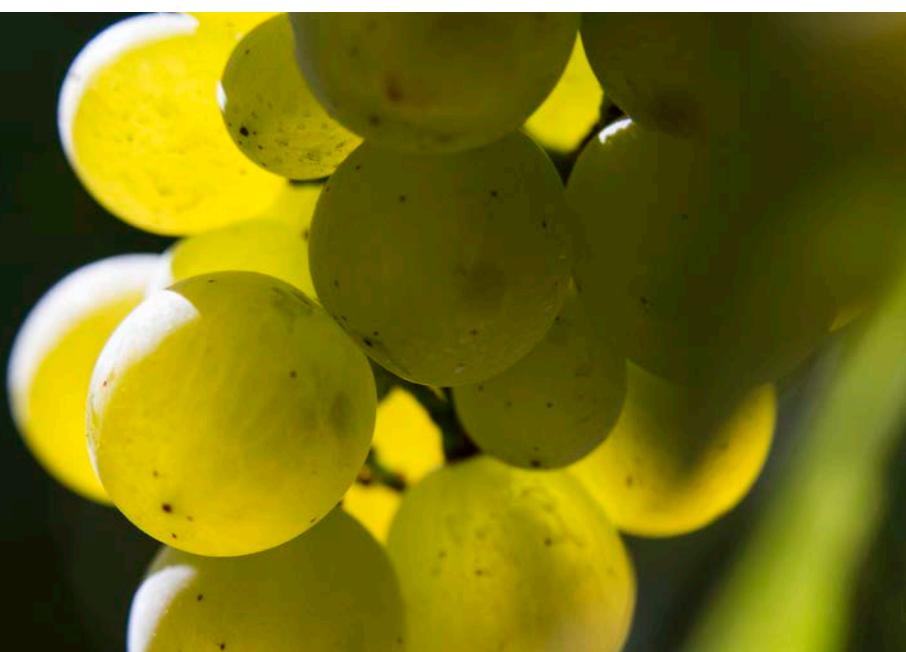
Study programmes:

**Bachelor's Study Programme Viticulture and Enology (First Level)**  
**Master's Study Programme Viticulture and Enology (Second Level)**

The School of Viticulture and Enology offers practically oriented study programs that combine the contents of viticulture, enology and wine marketing. We have been running the first level Viticulture and Oenology program (BSc) since 2005/2006 and the Master's program (MSc) from 2019/2020. The programs are modeled on similar programs in Italy, France and Australia and follow the OIV recommendations for the training of oenologists. Lecturers are top experts in the field with a wide range of practical and research experience. Students can enhance their theoretical knowledge with practical knowledge within the University Estate and by working with renowned winemakers in the local and wider area, and will also be involved in current research at the University Wine research centre.

The School of viticulture and enology conducts a professional 1<sup>st</sup> cycle (BSc) course Viticulture and enology, and since 2019/20 also the 2<sup>nd</sup> cycle (MSc) Viticulture and enology program. At the beginning of 2020 we have changed our status in the Faculty for viticulture and enology and became the first of a kind among Slovenian higher education institutions.

Both programs are held in Vipava, in the modern lecture halls and laboratories of Lanthierij Mansion, which were supplemented in the 2019/20 academic year by a new fermentation lab, where different size fermentors of Wine research centre has been placed and being on disposal for our students as well. In the 2019/20 we have also initiated the procurements for the upgrade of our lecture halls with additional modern audio-video equipment, to support hybrid teaching process in a new study year, with which students can follow as well as actively participate to study process, which takes place in lecture halls, as well online.

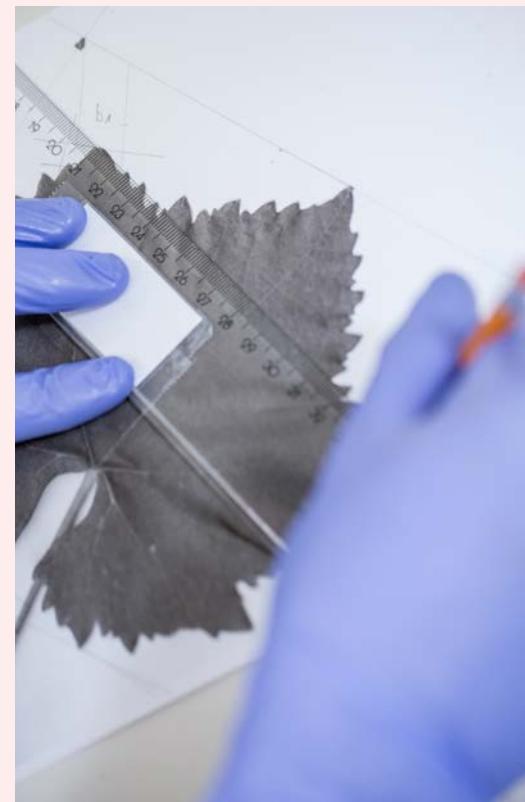


The BSc course prepares students for the independent organization, management and marketing of small wine estates and enables those who wish to take up employment in the larger wineries specializing either in viticulture or in enology and marketing. MSc course enables students to acquire knowledge that will enable them to master the more demanding and responsible work processes in viticulture and enology - in the production and processing of grapes and wine, in analytical and research laboratories and in administrative and control areas. Students are well prepared also for academic or research career.

The school also has a university estate in the nearby Manče (1.2 hectares of vineyards of the Zelen and Pinela varieties), and we currently work with more than 30 partner companies / wineries, wine shops and various wine analyzing labs in practical training of students. We regularly invite experts to give lectures as well. Last year our students could listen the lectures of mag. Francois Botton and Nicolas Neve of the Laffort (the first one also Domaine Slapšak estate), mag. Janja Klanjčar Žajdela - wine production HACCP specialist from Pukavec Family Wines and also dr. Dejan Bavčar, the head of Central laboratory at Slovenian agricultural institute. In the winter semester we hosted through Erasmus exchange also a well-known and respectable viticulture expert prof. dr. Alain Deloire from Montpellier SupAgro, France in the Advanced viticulture course.

This academic year was significantly impacted by the Covid 19 coronavirus epidemic, which in early March 2020 moved the entire study process from lecture halls to a virtual environment for three months. We were able to do this virtually overnight, thanks to past investments UNG in our IT infrastructure and also faculty training to deliver distance lectures. We have moved the study process to the modern MiTeam platform, with the addition of other videoconferencing systems such as Zoom, Moodle, and Google meet in the summer semester. We also moved online all regular meetings of the newly elected Faculty Senate at the end of 2019, the Academic Affairs Committee, and also thesis defenses. Within the faculty, we also introduced temporary changes to the knowledge assessment method, which ran at a distance throughout the academic year, combining written and oral exams. At the end of the semester, in May 2020, we allowed students to do the practical training at our estate, and at the beginning of June 2020, the missing exercises in the laboratories of the Lanthierij Castle also started.

The practical content related to participation in the annual summer semester wine festivals and field visits to winemakers/estates was severely curtailed due to Covid-19. We also had to postpone our 13th Student Wine Festival, like all other organizers of such events.



The staff of the Center for Wine Research contributes a lot to the recognition of our faculty on a national and international level with their scientific and professional contributions as well as numerous research projects in which we also involve our students.



# School of Arts

Dean: Prof. Boštjan Potokar



Sound Haiku workshop sensitizes the students towards diverse ambient sounds; mentors Boštjan Perovšek, Ivan Antić, februar 2020.

After 2008, when we prepared the first study programme in the field of arts, the school saw a gradual but firm development into an art academy:

The Programme structure at the UNG School of Arts enables combining media and fields thereby opening a range of professional pathways, from becoming an author to developing a distinct professional identity. In 2009 we opened the Bachelor's programme in Digital Arts and Practices. Our MA programme was developed within ADRIART, an EU supported project, together with partners from Croatia, Austria and Italy. As leading partner of the ADRIART project at the UNG School of Arts we were in 2012/13 able to offer our BA graduates a continuing of education - the MA programme - Media Arts and Practices, with a pilot run in that year and a full launch the following year.

## Study Programmes:

**Bachelor's programme in Digital Arts and Practices**

**Master's programme in Media Arts and Practices**

(Programme director: prof. René Rusjan)

University of Nova Gorica School of Arts has been educating in the field of arts since 2009. Within the University it started functioning as a BA school and in seven years developed into a fully accredited Academy. This is the first university level academy in Slovenia in 71 years. In English it retains the naming as the *School of Arts*. BA and MA programmes cover the following fields:

- Animation (*animated film, animation in creative industries*)
- Videofilm (*fiction, documentary, experimental film, art video*)
- Photography (*author, functional*)
- New Media (*creative use of new technologies*)
- Scenographic Spaces (*film, theatre scenography*)
- Contemporary Art Practices (*combination of different media*)
- Art-Science-Technology (*connecting diverse fields*)



Shooting for  
Postproduction  
& Visual Effects  
courselet with  
mentors Luka  
Leskovšek and Jan  
Perovšek, januar  
2020.

In the 2020/21 study year 62 students are immatriculated at the UNG School of Arts. The student structure is international – on BA level more than half of the students are foreign, while the MA level is distinctly international as the majority of the students are foreigners. Several are from EU countries while some come from more distant parts of the world. Within the study year 2019/2020 we moved from Palazzo Alvarez in the center of Gorizia, Italy, into existing spaces of University of Nova Gorica in Rožna Dolina, Nova Gorica. All educational activities are now run from these premises. Through various projects and co-production activities we have in recent years been able to acquire the much needed equipment for film, animation and photography production and postproduction. Students thus now have a contemporary studio environment where they can work throughout the day.

In addition to individual careers of mentors and other UNG School of Arts collaborators, all of whom are nationally and internationally renowned artists, a lot of energy is invested in cooperations with various festivals and other ways of presenting student work.

Because of the pandemic a part of the semester was conducted online. Similarly most of the festivals and exhibitions were held online.

- At the 23rd edition of the Festival of Slovenian Film we took part with 3 films, in the student competition programme and six in panorama programme.
- DSAF Slovene Animated Film Association awarded several of our students:  
 Best Student Animated Film Award – Miha Reja, *Behind closed shutters*  
 Special mention for Student Animated Film – Jošt Šeško, *Geomancy*  
 Special mention for Student Animated Film – Larisa Nagode, *Elsie*  
 Special mention for Student Animated Film – Katarina Blažič, *Five Hour Conversation*  
 DSAF Award for Best Animated Project in Development – Amadeja Kirbiš, *Dysmorphia*
- At the Isola Cinema Festival we presented an exhibition of students' works; several student films were also accepted into the Video on the Beach programme section.

- Tribute to a Vision Festival, Nova Gorica/Gorica – exhibition, presentation of the school and screening of films within the selected programme First Crossings/Prvi poleti.
  - At the Speculum Artium Festival in Trbovlje our films formed one slot within the DigitalBigScreen programme.
  - At the FeKK Short Film Festival in Ljubljana two films of our students were shown;
  - The diploma film *Elsie* by our graduate Larisa Nagode was selected into student competition programme at the Balkanima European Animated Film Festival, Belgrade.
  - At the ANIMATEKA 2020 International Festival of Animated Film in Ljubljana University of Nova Gorica has, together with University of Ljubljana, sponsored the »Young Talent Award« for the best European student film.
- Three films of our students were selected for the Student Competition Programme and one was shown within the Panorama section.

We believe our most important showcase are our students and graduates – their products are valued high enough by professionals to represent Slovenia at diverse exhibitions, festivals and selections around the globe.



From Idea to Film is a regular entry workshop into film directing process for first year students but was this year postponed due to the pandemic and conducted at the end of September. Mentors: Boštjan Vrhovec & Martin Turk (directing), Radovan Čok (camera), Boštjan Perovšek (sound), Matjaž Jankovič (editing), september 2020.

# Graduate School

Dean: Prof. Dr. Iztok Arčon

Doctoral Study Programmes (Third Level):

## **Environmental Sciences**

(Programme director: Prof. Dr. Anton Brancelj)

## **Karstology**

(Programme director: Prof. Dr. Martin Knez)

## **Physics**

(Programme directress: Prof. dr. Gabrijela Zaharijas)

## **Materials**

(Programme directress: Prof. Dr. Nataša Novak Tušar)

## **Humanities**

(Programme directress: Prof. Dr. Ana Toroš)

## **Cultural Heritage Studies**

(Programme directress: Prof. Dr. Saša Dobričič)

## **Molecular Genetics and Biotechnology**

(Programme directress: Doc. Dr. Martina Bergant Marušič)

## **Cognitive Science of Language**

(Programme director: Prof. Dr. Artur Stepanov)

Graduate School at the University of Nova Gorica (UNG) hosts and carries out all doctoral study programmes (third level), regardless of their scientific discipline. All study programmes are internationally orientated and closely linked to UNG's research laboratories and centres, and to other research institutions in Slovenia and abroad, which enables graduate students to conduct their research work required by their studies and to participate in international research activities and projects.

Graduate School at the University of Nova Gorica (UNG) hosts and carries out all doctoral study programmes (third level), regardless of their scientific discipline. Such a closely connected and homogeneous organization of graduate school proved to be very effective, enabling high electiveness and interdisciplinarity in designing individual doctoral study programmes. Students are also allowed to perform part of their study obligations in related study programmes at other universities in Slovenia and abroad, which encourages the mobility of students. In this way, each student's programme can be designed on an individual basis.



Cyanobacteria *Microcystis aeruginosa* as an antigen source for the recombinant antibody production.



Exploring Karst Phenomena in the South China Karst: Swallow Cave in Jianshui, Yunnan Province, China.

All study programmes are internationally oriented and closely linked to UNG's research units, and to other research institutions in Slovenia and abroad, where graduate students can conduct their research work required and can participate in international research projects. Among many external partners we should point out those with which we have established long term collaborations. The programme *Karstology* is carried out in close association with the Karst Research Institute of the Centre of the Slovenian Academy of Sciences and Arts. The links between the two institutions were further strengthened in 2014 with the establishment of the UNESCO Chair on Karst Education at UNG. Doctoral programme *Cultural heritage Studies* is implemented in close cooperation with Università IUAV di Venezia, and offers a possibility of double doctoral diploma, and a one-year specialization (second-level Master). We closely collaborate and run two EU Horizon H2020 projects with several European universities. Doctoral programme *Molecular Genetics and Biotechnology* is carried out in collaboration with the International Centre for Genetic Engineering and Biotechnology (ICGEB) from Trieste, Italy. The new doctoral program Materials was prepared and is carried out in close collaboration with National Institute of Chemistry.

We continuously improve and upgrade all our doctoral programs, to guarantee the quality and topicality of the contents and teaching methods, and to provide doctoral students necessary up-to-date knowledge and skills for solving new challenges in science.

The interest in the doctoral programmes is high. In academic year 2019/2020 there were a total of 57 students enrolled in all doctoral programmes, of which 61% were from abroad. Number of international student exchanges and number of visiting professors and mentors from foreign universities and research institutions is also very high. The language of dissertation is English, to ensure that all doctoral students gain necessary language competences, to be able to present sovereignly and independently their research results to international audience in English. The committee for the assessment of doctoral dissertation always includes at least two members from foreign universities to assure that the quality of doctoral degrees is comparable to international standards. Internationalisation of doctoral studies remains one of the central strategic directions of graduate school also in the future.

All programmes are conducted successfully, in a high-quality manner and effectively, which is visible in the success of students in their studies and individual research work. The quality of gra-

duate studies is reflected in successful defences of high-quality doctoral theses, and in numerous publications of student research results in reputable international scientific journals: 52 scientific and professional articles, 80 contributions at international scientific conferences, and 11 other scientific publications in the academic year of 2019/2020. In this year UNG promoted 10 new Doctors of Science.

Implementation of doctoral study programmes is financed through tuition fees. Premises and equipment for the implementation of graduate study programmes are adequate. Director with Scientific Board of the programme is the expert head of an individual programme.



Cultural heritage studies: Co-Design process for reactivation of Historic Urban Landscape.



# Other Activities

For the researchers, students, and general public, all the professional (research) and study literature is available at the very modern *University Library*, while the *Publisher of UNG* is in charge of the publication of text books, lecture notes, collections of scientific papers and other works. The university also has a *Student Office* that helps both undergraduate and graduate students, as well as all those interested in obtaining information about the study at the UNG. The *International and Project Office* is there for coordinating international projects and gives administrative support for carrying out international projects. Apart from that, the University of Nova Gorica also has a *Career Center* that creates a link between the university, the students and potential employers. Lastly, there the *Alumni Club* that joins alumni from all generations of graduates, of both graduate and undergraduate programs. It basically connects all individuals who have contributed in any way to the development of the University of Nova Gorica.



# University Library

Head: Vanesa Valentinčič Murovec

University library of University of Nova Gorica is open to all students and staff, as well as to all other visitors who are interested in the materials offered by the library. We collect material from all areas of science, mostly for educational and research activities of UNG.



Library collection includes more than 24.000 book titles, 50 titles of periodicals, 700 items of non-book materials and e-edition of scientific journals, reachable over services like ScienceDirect, Springer-Nature, APS Journals, EIFL Direct-podatkovne zbirke EBSCOhost, ACS Publications, JSTOR, ORP-index, CREDO online, »Window of Shanghai« e-book service. Our users can access databases such as Web of Science, Scopus, MathSciNet itn. In 2020 we have got access to the IOPscience, Taylor & Francis – Science & Technology. We included approximately 1400 units of material from the Academy of Arts in the library collection. We reduced the purchase of printed journals and increased the number of electronic journals.

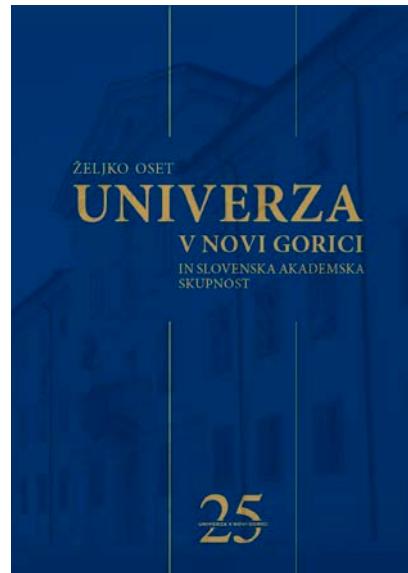
Library collection is almost completely open access and organized by UDC classification. We offer on-line searches from databases and through interlibrary loan we provide material that is not in our collection. We provide bibliographic service for our researchers and other institutions. The library is full member of the Slovene library co-operative online bibliographic system & service, COBISS. Through our website we offer e-learning of search skills. We also provide information literacy courses. The library is open 48 hours per week. Users can use a reading room with 50 reading places, 5 computers in the computer room and there is option to connect to Wi-Fi their own devices for easier access to electronic materials, archives and databases. Students from the dislocated faculties can use library loan by the courier service. Repository of the University of Nova Gorica (RUNG) is one of the Open Science Slovenia portal's »openaccess.si« partners. In 2020 we rearranged the reading room and books in the library. By withdrawal of old material and material we have electronic access, we obtained space for more up-to-date material. We performed evaluation of the library organization and management. Based on the results we prepared a plan for improvements and updates.

# Publisher of UNG

Head: Mirjana Frelih

University of Nova Gorica started its publishing activity in 2001. We publish textbooks and study materials for the academic courses available at our institution, as well as research and scientific works. Publishing is regulated by the *Rules of publishing activities*, for quality is responsible Commission for publishing.

So far, we have published 49 publications. Among them there are teaching materials with instructions for exercises for undergraduate students of the University of Nova Gorica, university textbooks for students and professors, conference proceedings, scientific and other monographs.



In 2019 we published the scientific monograph »Porajanje Jugoslavije. Doživljaji Ljubljancana (Miljutina Zarnika) leta 1918« by Željko Oset and Kristina Ferk. The print edition of the book was published with the support of the Slovenian Research Agency.

The first reprint of the medieval knight novel »Parzival / Wolfram von Eschenbach« translated by Simon Širca was published, only a year after the first edition, as the book edition from 2019 was already sold out.

On the occasion of the twenty-fifth anniversary of the founding of the University of Nova Gorica, the scientific monograph »The University of Nova Gorica and the Slovenian Academic Community« by Željko Oset was published.

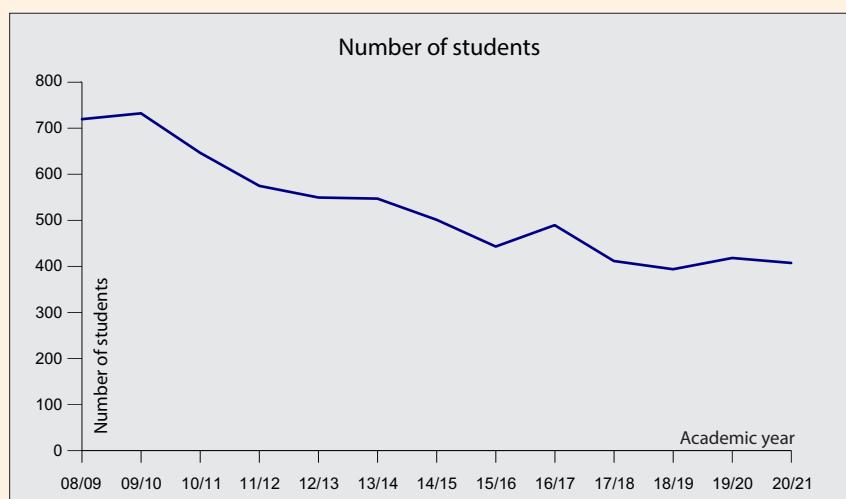
# Student Office

**Head:** Renata Kop

Student Office of University of Nova Gorica was founded in the year 2002 and serves both undergraduate and postgraduate students as well as those interested in information about the studies at our institution. The objective of the Student Office is to support students and candidates for study in academic and extracurricular activities. The Student Office has an office available in Nova Gorica and Vipava. Part of the Student Office is also Higher Education Application-Information Service, which was founded in the year 2007.

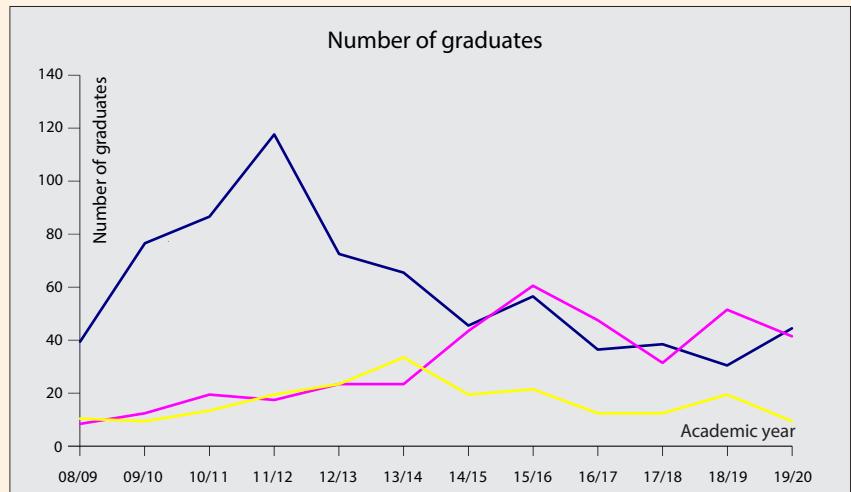
Student Office offers information about enrolment, conditions for enrolment, information about academic programmes, and other information concerning studies at University of Nova Gorica; arranges application and selection procedures and organizes and implements call for enrolment, application and enrolment processes; issues certificates and prepares diploma papers; manages and regulates student databases; processes and analyzes students data; organizes medical examinations for students, assists in finding accommodation including organization of housing in Lanthieri Mansion Student Dorm; manages the processes and prepares decisions of recognition of education for the purpose of access to education.

In the academic year 2020/2021 we enrolled 405 students, 254 students on first level study programmes, 91 students on second level study programmes and 60 students on third level study programmes.

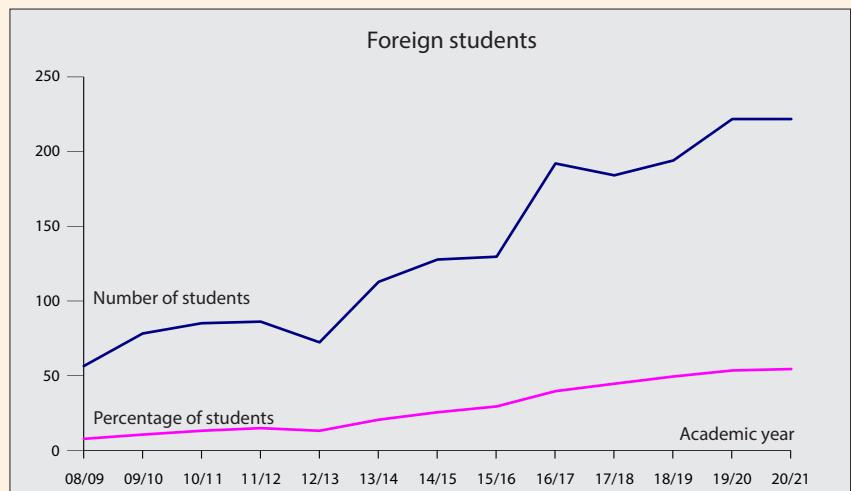


Number of graduates by level of programme in academic year 2019/2020:

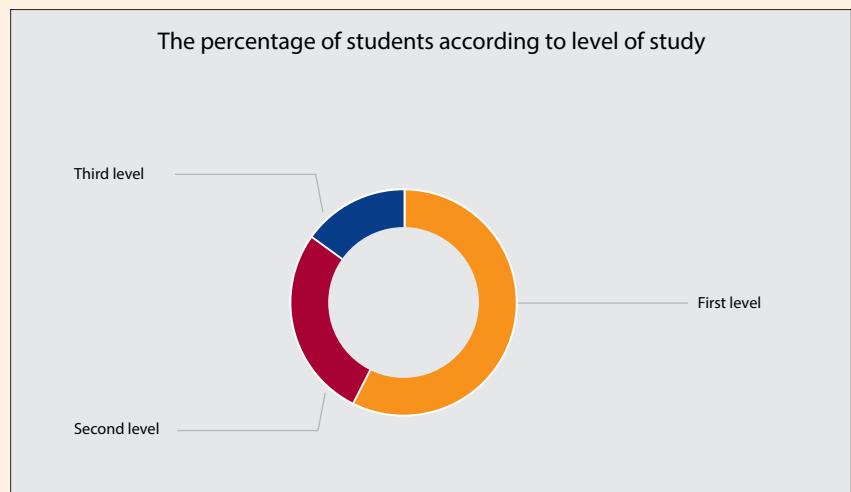
- 45 on bachelor's study programmes,
- 42 on master's study programmes,
- 10 on doctorate's study programmes.



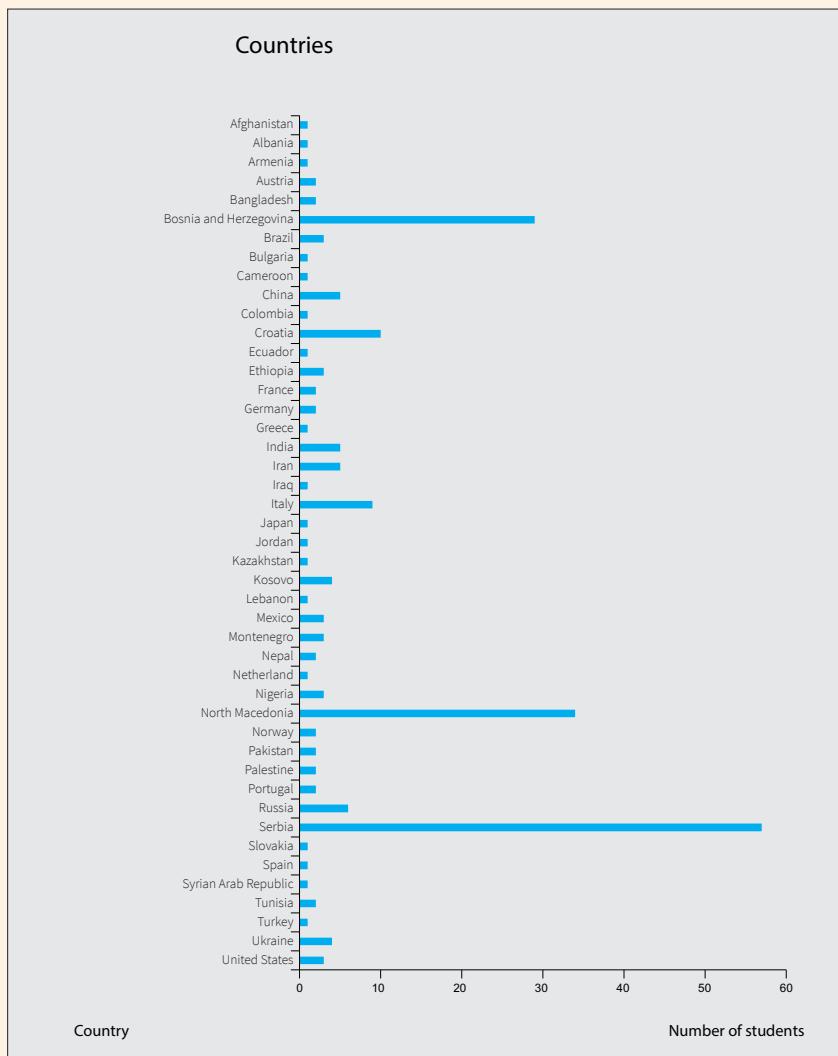
The number of foreign students in academic year 2020/2021 is the same compared to academic year 2019/2020, higher is also the percentage of foreign students according to the total number of students, this is 55%.



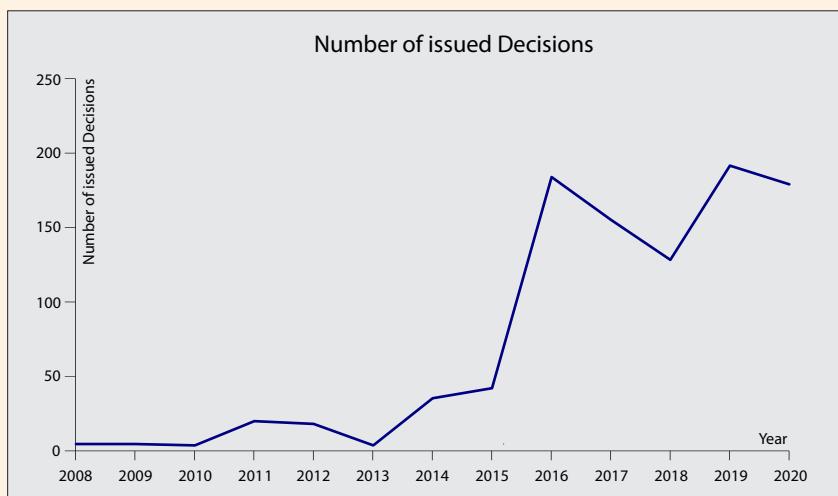
The majority of foreign students in academic year 2020/2021 study on bachelor's (first level) study programmes, in particular on Bachelor's study programme Engineering and Management (first level)



In academic year 2020/2021 foreign students come from 45 different countries:



The Student Office completed 188 processes of recognition of education for the purpose of access to education and issued 116 positive decisions in year 2020.



# International and Project Office

Head: Aljaž Rener

University of Nova Gorica organized a single support service in 2020 to support and develop internationalization, i.e. an International and Project Office. The Office is intended for the management and organization of international activities and the coordination of international (and domestic) UNG educational projects. It is intended for students, professors, researchers and other employees. It takes care for incoming and outgoing mobility under the Erasmus + program, under CEEPUS, Bilateral Scholarships and for mobility carried out under various interinstitutional agreements or arrangements. It also provides support in concluding interinstitutional agreements.

The office also provides administrative support for applications for tenders and the implementation of international projects. It is in charge of monitoring published tenders and informing persons within UNG about open tenders. The office provides support to researchers and other employees in preparing applications for tenders, primarily from a financial, administrative and legal-formal point of view. For ongoing projects, the office ensures the preparation of financial reports for international research projects and provides support and advice in the implementation of projects.

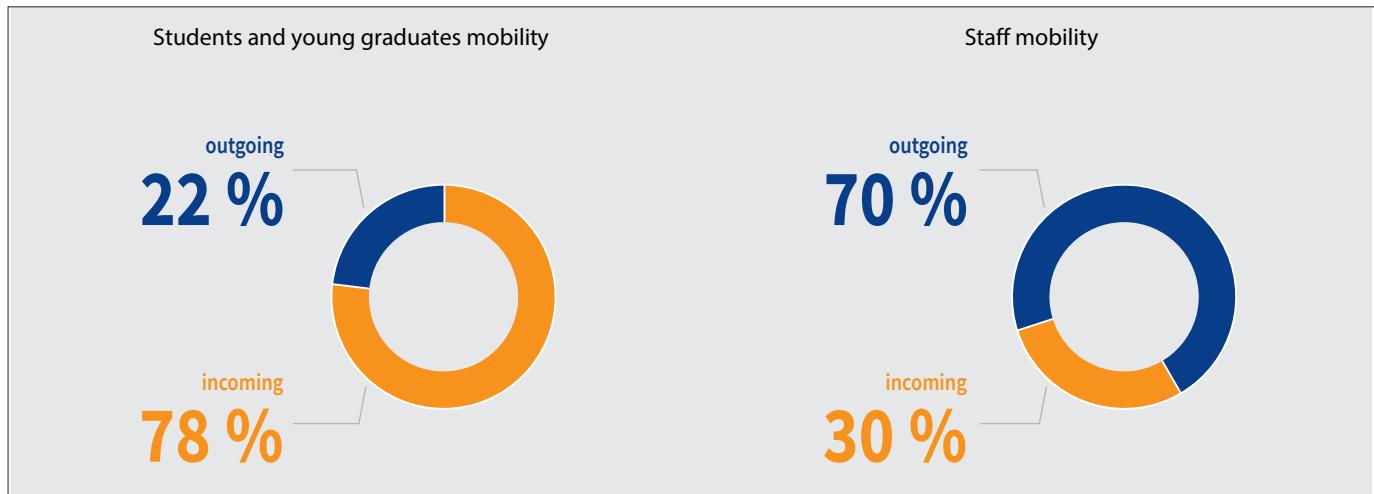
The office employs three people (Office Manager, Project Coordinator and Mobility Coordinator).

The University of Nova Gorica has been actively participating in various programs that support international mobility and inter-institutional projects in the field of education and training for many years.

In 2019/2020, the Office coordinated the implementation of seven projects in the field of education and training, and in others it provided various administrative support for applications and reporting as well as for the organization of mobility.

Mobility projects implemented during the academic year 2019/2020

- MIZŠ, Tuji strokovnjaki in prožne oblike učenja za boljše znanje, spretnosti in kompetence ter boljšo zaposljivost študentov Univerze v Novi Gorici (2019 - 2022),
- Erasmus+ 2019, KA107: Mobilnost v visokošolskem sektorju: Visokošolsko izobraževanje med programskimi in partnerskimi državami (2019 - 2022),
- Erasmus+ 2019, KA103: Mobilnost v visokošolskem sektorju: Visokošolsko izobraževanje med državami programa (2019 - 2020),
- Erasmus+ 2018, KA107: Mobilnost v visokošolskem sektorju: Visokošolsko izobraževanje med programskimi in partnerskimi državami (2018-2020),
- Erasmus+ 2018, KA103: Mobilnost v visokošolskem sektorju: Visokošolsko izobraževanje med državami programa (2018 – 2020),
- Ad-futura za študijske obiske študentov v okviru programa Erasmus+ v tujino za leto 2018 (2018 – 2019),
- CEEPUS, Multi-messenger Astrophysics in Central Europe – Astro.CE (2019 – 2020),
- CEEPUS, Multi-messenger Astrophysics in Central Europe – Astro.CE, Umbrella (2018 – 2019),
- CEEPUS, Advanced Trends in Education and Research of Biochemistry, Biophysics and Biotechnology of Macromolecules (2019 – 2020),
- CEEPUS, Advanced Trends in Education and Research of Biochemistry, Biophysics and Biotechnology of Macromolecules, Umbrella (2018 – 2019),
- CEEPUS, Food Safety for Healthy Living, Umbrella (2019 – 2020),
- CEEPUS, Food Safety for Healthy Living (2018 – 2019),
- CEEPUS, ADRIART.CE (2018 - 2019, 2019 – 2020),
- CEEPUS, Education of Modern Analytical and Bioanalytical Methods (2018 - 2019, 2019 – 2020),
- CEEPUS, Research and Education in the Field of Graphic Engineering and Design (2018 - 2019, 2019 – 2020),
- CEEPUS, Multidisciplinary Approach to Education and Research in the Field of Digital Media Production (2018 - 2019, 2019 – 2020),
- Erasmus+, KA2: Strategic Partnerships, EMINDS – Development of an Entrepreneurial MindSet in Higher Education (2017 – 2020),
- Erasmus+ 2017, Visokošolsko izobraževanje med programskimi in partnerskimi državami (2017 – 2019),
- Erasmus+, KA2: Strategic Partnerships, CDICAE – Collaboration to Design an Innovative Curriculum for Animation Education (2017 – 2019).



68 exchanges of students, young graduates and staff were realized. The Office provided all the necessary support to all participants before, during and after the mobility – providing information and with organization.

The Office also informed UNG staff about open calls within the programs for which it is responsible, provided support in concluding inter-institutional agreements and took care of the promotion of programs and projects and their results.

The Office regularly edited the internal database »Projects and Contracts«, a list of agreements and international memberships on the UNG website, a blog »UNG Mobility Blog« and a website, where interested parties can get general information on international activities.

The work in the office in 2020 in the field of international research projects took place mainly to support the implementation of acquired projects. In 2020 we had 4 ongoing projects in certain periods in which we were in the role of the leadin partner or coordinator.

The office also supported the preparation of new project proposals for tenders.

In 2020 14 project proposals were submitted to international tenders:

- 7 proposals under Horizont 2020 program,
- 7 proposals for various other European programs or initiatives.

In 2020, the International and Project Office provided administrative and financial support in the implementation of the following projects and in the preparation of financial reports:

- NFFA EUROPE - Integration and opening existing national and regional research infrastructures of European interest (Horizont 2020)
- EnViRoS - Opportunities for environmentally friendly viticulture: optimization of irrigation and introduction of new genotypes of wines (ERA-NET ARIMNET2)
- EcoLamb - Holistic Production to Reduce the Ecological Footprint of Meat (ERA-NET SUSAN)
- NanoElMem – Designing new renewable nano-structured electrode and membrane materials for direct alkaline (M.ERA-net)
- MX OSMOPED – MXene organic semiconductor blends for high-mobility printed organic electronic devices (FLAG ERA JTC)
- DIMAG - Electrically controlled ferromagnetism in 2-dimensional semiconductor (FLAG ERA JTC)
- PROSPECT PatteRned cOatings based on 2D materials benzoxazine reSin hybrids for broad range Pressure detection (FLAG ERA JTC)
- CLIC - Circular models Leveraging Investments in Cultural heritage adaptive reuse (Horizont 2020)
- URBINAT – Healthy corridors as drivers of social housing neighbourhoods for the co-creation of social, environmental and marketable NBS (Horizont 2020)
- RETINA - Opening research laboratories to innovative industrial applications (INTERREG V-A Slovenija – Avstria)
- AGROTUR II - Sustainable development of agriculture and tourism on crossborder Kras (INTERREG V-A Slovenija – Italija)
- MAST – Master Module in Art, Science and Technology (EC DG Connect Pilot Call)
- HERMES-SP - High Energy Rapid Modular Ensemble of Satellites (Horizont 2020)
- KONS – Platform for contemporary research art (call of Ministry RS for Culture)
- Uncorking rural heritage: indigenous production of fermented beverages for local cultural and environmental sustainability (NFM Fund for regional cooperation)
- Biological remediation of water contaminated with heavy metals (Call of MIZŠ Researchers at the beginning of their careers 2.0)
- Metalization of polymer surfaces using algae (Call of MIZŠ Researchers at the beginning of their careers 2.0)

# Career Center

(Head: Nives Štefančič)



## Activities in 2020:

Activities in the context of practical training;  
Participation in online presentations of interim reports of the practical training of students of School of Engineering and Management in companies Vitanest, d.o.o., Parcom, d.o.o., Tokens, d.o.o., TIP95, d.o.o. and Mahle Letrika, d.o.o. For few students due to the Covid19 epidemic interim presentations were not conducted.

Contacts with employers; 5 online meetings with employers - participation at the 5 presentations of interim reports of the practical training of students of School of Engineering and Management. Online meetings with representatives of the HR department of the companies Banka Slovenije, Gen-l, d.o.o., Iskraemeco, d.o.o., Mahle Letrika, d.o.o. Informing students and graduates of suitable job vacancies, internships, current events, tenders; published over 150 job vacancies, which correspond to profiles of UNG graduates. We released 2 career news, sent to 640 e-mail addresses of students and graduates. Periodically checking the employability of graduates six months and one year after graduation; in January 2020, March 2020, May 2020, July 2020, September 2020, November 2020 (graduates from 2016 to 2020).

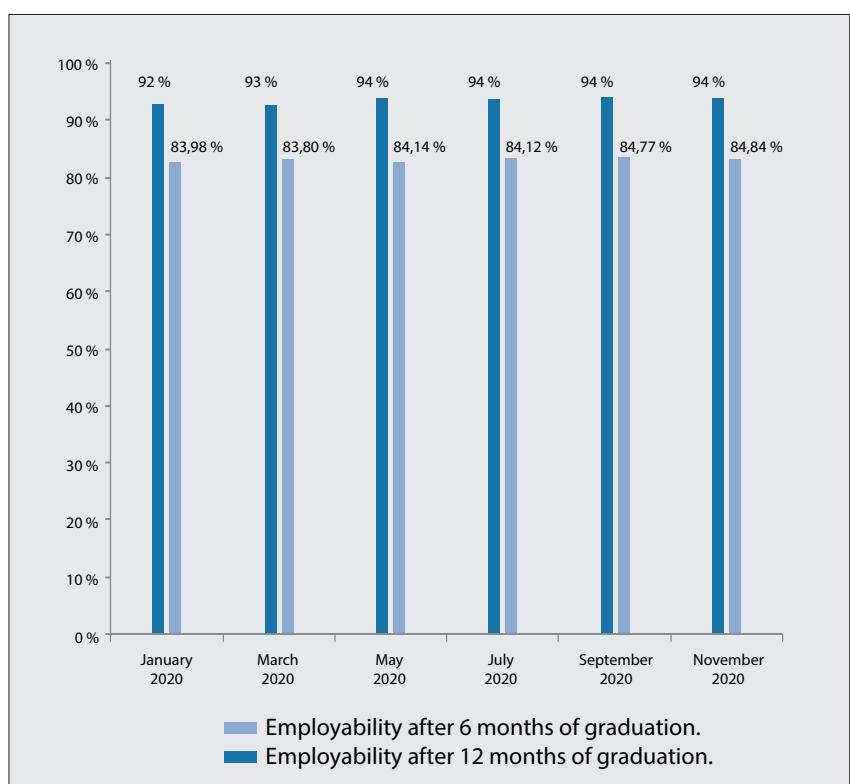
## Organisation and participation at following events:

- organisation of Informativa 2020,
- organisation of Info. Days for 1st and 2nd level study in February, and online Info. Days in May and September 2020,
- participation at the virtual career fair Moje Delo
- participation at the virtual career fair – a fair of professions and education for high schools,
- coordination of online round table at School of Engineering and Management titled »Economic engineer - profession of the future«,

- organization of the online chat »The importance of practical experience during studies«.

## Education:

- Participation in an online working meeting with representatives of other Career Centers,
- Participation in an online event on Ethical Guidelines in Career Centers in Higher Education. Presentation was conducted by the Employment Service in Slovenia.



Graphical presentation of the employability of graduates UNG 6 and 12 months after graduation (2020).

# Alumni Club

Head: Nives Štefančič



Alumni Club of the University of Nova Gorica in 2020 continued with activities to increase connection between University and Alumni:

- We upgraded informations about Alumni and informed them about activities of Alumni Club,
- we invited them to become promotori within their schools, at variety promotional events.
- we informed Alumni about scholarships, competitions, opportunities for postgraduate studies at home and abroad.
- we informed them about the possibility of acquiring the Diners Club FUNG Card.
- We informed them about job vacancies and other events suitable for individual profiles of graduates.
- We invited them to different events of the University of Nova Gorica (scientific evenings, information days, semester and annual exhibitions, etc.).
- In may 2020, we planned an alumni meeting of all faculties and academy, but we were forced to cancel it due to the Covid19 epidemic.





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