

10<sup>th</sup> INTERNATIONAL CONFERENCE  
ON ENVIRONMENTAL EFFECTS ON BUILDINGS AND PEOPLE:  
ACTIONS, INFLUENCES, INTERACTIONS, DISCOMFORT (EEBP X)

**GENERAL INFORMATION AND PROGRAM**

September 16-19, 2024, Cracow, Poland

**Co-organised by:**

- **Polish Association for Wind Engineering**  
Member Organisation of International Association for Wind Engineering
- **Wind Engineering Laboratory, Cracow University of Technology**
- **Polish Group for Snow Engineering**

**In cooperation with:**

-International Association for Wind Engineering



# FOREWORD

## DEAR PRESIDENTS, CHAIRPERSONS, EXECUTIVE OFFICERS, SECRETARIES OF THE WIND ENGINEERING COMMUNITY

The wind, snow and environmental engineering community in Poland is very pleased to cordially welcome you to Cracow, Poland, for the 10<sup>th</sup> International Conference on Environmental Effects on Buildings and People: Actions, Influences, Interactions, Discomfort (EEBP X), which is organised by Polish Association for Wind Engineering (PAWE), Member Organisation of International Association for Wind Engineering (IAWE), Wind Engineering Laboratory of the Cracow University of Technology and Polish Group for Snow Engineering (PGSE); in cooperation with International Association for Wind Engineering (IAWE).

Cracow as the former capital of Poland with a history lasting over a thousand years, still remains the spiritual heart of Poland. Cracow has traditionally been one of the leading centres of Polish scientific and cultural life. The intellectual environment of Cracow is created by 23 universities, nearly 20 000 academic lectures and 190 000 students. It is a major attraction for local and international tourists and welcomes seven million visitors annually. In 1978, UNESCO added Cracow historic centre to the list of World Heritage Sites.

Wind Engineering Laboratory with boundary layer wind tunnels, at the Cracow University of Technology, is well-known abroad. It is worth pointed out that our team have just finished realisation of new big

laboratory equipped with three wind tunnels: 1 – Big-size wind tunnel of building aerodynamics and wind power engineering; 2 – Big-size climatic wind tunnel of environmental engineering; 3 – Wind tunnel of flow visualization. In this laboratory will be conducted model tests and computer simulations regarding: wind action on buildings, wind powers, transmission lines; dynamic impact on smog and ventilation of urban areas; experimental studies of environmental and climatic influences on buildings and structures. Visiting of this new laboratory is planed during the conference as a special conference event.

In the past, Polish wind and snow engineering community organised three domestic and four international symposia as well as international conference on Environmental Effects on Buildings and People: Actions, Influences, Interactions, Discomfort (EEBP).

We hope that the 10<sup>th</sup> International Conference on Environmental Effects on Buildings and People: Actions, Influences, Interactions, Discomfort (EEBP X) in Cracow will be great event, success and outstanding opportunity to open the doors for better future professional and cultural cooperation. We encourage everyone to come to visit the beautiful country of Poland and its former capital city Cracow, a charming royal town in central Europe.

### **CONFERENCE CHAIRMAN: PROF. DR. SC. ENG. ANDRZEJ FLAGA**

- PRESIDENT OF THE POLISH ASSOCIATION FOR WIND ENGINEERING AND POLISH GROUP OF SNOW ENGINEERING
- FOUNDER AND FULL PROFESSOR AT THE WIND ENGINEERING LABORATORY OF CRACOW UNIVERSITY OF TECHNOLOGY
- CHAIRMAN OF THE SEVEN SYMPOSIA AND ONE CONFERENCE ON ENVIRONMENTAL EFFECTS ON BUILDINGS AND PEOPLE: ACTIONS, INFLUENCES, INTERACTIONS, DISCOMFORT (EEBP)



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# INTERNATIONAL SCIENTIFIC COMMITTEE

➤ **Co-Chairs:** Prof. Joanna Dulińska (Poland), Prof. Tim K.T.Tse (China)

➤ **Members:**

Prof. Alexandru Aldea (Romania)	Prof. Gregory A. Kopp (Canada)
Dr Srinivasan Arunachalan (India)	Prof. Holger Koss (Denmark)
Prof. Chris Baker (UK)	Dr Hrvoje Kozmar (Croatia)
Prof. Gianni Bartoli (Italy)	Prof. Kenny Kwok (Australia)
Prof. Jeroen van Beeck (Belgium)	Dr Guy Larose (Canada)
Prof. Jan Benčat (Slovakia)	Prof. Zhu Le-Dong (China)
Prof. Ewa Błazik-Borowa (Poland)	Prof. Chris W. Letchford (USA)
Prof. Claudio Borri (Italy)	Prof. Tomasz Lipeccki (Poland)
Dr Ileana Calotescu (Romania)	Prof. Arcir M. Loredo-Souza (Brazil)
Prof. Shuyang Cao (China)	Prof. Mariusz Maślak (Poland)
Prof. Xinzhong Chen (USA)	Prof. Hans J. Niemann (Germany)
Prof. Tadeusz Chmielewski (Poland)	Dr Felix Nieto (Spain)
Prof. Ashraf El Damatty (Canada)	Prof. Luisa Pagnini (Italy)
Prof. Vincent Denoël (Belgium)	Prof. Stanislav Pospišil (Czech Republic)
Prof. Maciej Dutkiewicz (Poland)	Prof. Francesco Riccardelli (Italy)
Prof. Andrzej Flaga (Poland)	Prof. Fabio Rizzo (Italy)
Dr Olivier Flamand (France)	Prof. Krzysztof Rogowski (Poland)
Prof. Richard Flay (New Zealand)	Dr Jonas Snaebjörnsson (Iceland)
Prof. Chris Geurts (The Netherlands)	Prof. Ted Stathopoulos (Canada)
Prof. Piotr Górski (Poland)	Prof. Mark Sterling (UK)
Dr Rajeew Gupta (India)	Dr Paweł Sulik (Poland)
Dr Hassan Hemida (UK)	Prof. Yukio Tamura (China)
Prof. Rüdiger Höffer (Germany)	Prof. Thomas Thiss (Norway)
Dr Stanislav Hračov (Czech Republic)	Prof. Yoshihide Tominaga (Japan)
Prof. Michail Iancovici (Romania)	Prof. Takuya Tsutsumi (Japan)
Dr Peter Irwin (Canada)	Prof. Yasushi Uematsu (Japan)
Prof. Sungmoon Jung (USA)	Dr Wojciech Węgrzyński (Poland)
Prof. Janusz Juraszek (Poland)	Prof. Qingshan Yang (China)
Prof. Roman Kinasz (Poland/Ukraine)	Prof. Alberto Zasso (Italy)
Prof. Katarzyna Klemm (Poland)	Prof. Xuanyi Zhou (China)

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## AUSPICES

- Prof. Andrzej Szarata – Rector of the Cracow University of Technology
- Dr Aleksander Miszański – President of the Cracow City
- Prof. Maria Kaszyńska – President of the Polish Association of the Civil Engineers and Technicians
- Prof. Joanna Dulińska – President of the Civil Engineering Committee of the Cracow Branch of the Polish Academy of Sciences
- Prof. Lucyna Domagała – Dean of the Faculty of Civil Engineering, Cracow University of Technology
- MSc. Eng. Mirosław Boryczko - President of the Chamber of Civil Engineers of Małopolska District
- MSc. Eng. Antoni Szlagor – Mayor of the Żywiec City
- Prof. Filip Pachla – President of the Polish Association of Civil Engineers and Technicians of Małopolska District

In cooperation with:

- International Association for Wind Engineering

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## CONFERENCE ORGANISERS

- Polish Association for Wind Engineering  
Member Organisation of the International Association for Wind Engineering
- Wind Engineering Laboratory at the Cracow University of Technology
- Polish Group for Snow Engineering

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## LOCAL ORGANISING AND HOST COMMITTEE

- Chair – Prof. Andrzej Flaga
- Vice Chair – Prof. Tomasz Lipecki
- Secretary – Dr Maciej Pilch
- Members - Dr Łukasz Flaga, Dr Renata Kłaput, Dr Aleksander Pistol, MSc Joanna Obłój

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## CONTACT

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- Website: [www.psiw.org.pl](http://www.psiw.org.pl)
- E-mails: [t.lipecki@pollub.pl](mailto:t.lipecki@pollub.pl), [maciej.pilch@pk.edu.pl](mailto:maciej.pilch@pk.edu.pl)

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## SPONSORS



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# ABSTRACTS AND FULL PAPERS

Abstracts will be published in the EEBP X Conference Proceedings, together with the keynote lectures.

Full papers should not exceed 10 pages. Electronic version of the full paper should be sent to the Organizing Committee just before the Conference.

Full papers after two reviews could be printed past the EEBP X in the journals:

- Technical Transactions (<https://sciendo.com/journal/TECHTRANS>)
- Building and Architecture (<https://ph.pollub.pl/index.php/bia/index>)

Electronic version of EEBP X Conference Proceedings as well as of this Booklet are available on [www.pk.edu.pl](http://www.pk.edu.pl)

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## REGISTRATION FEES AND PAYMENT

Registration fee	Price
Participant (early)	500
Participant (standard)	550
PAWE Members	400
Student (early)	250
Student (standard)	300
Accompanying person	300
Day visitor	200

### Payment details:

➤ **For euro payment:**

Beneficiary: Cracow University of Technology

IBAN: PL40 2490 0005 0000 4600 3419 4146

BIC/SWIFT: ALBPPLPW

Beneficiary address: ul. Warszawska 24, 31-155 Cracow

Bank / Payment institution: ALIOR BANK

Bank / Payment institution address: ul. Lopuszanska, 02-232 Warsaw

➤ **For PLN payment:**

Beneficiary: Cracow University of Technology

IBAN: 09 2490 0005 0000 4600 1012 1826

BIC/SWIFT: ALBPPLPW

Beneficiary address: ul. Warszawska 24, 31-155 Cracow

Bank / Payment institution: ALIOR BANK

Bank / Payment institution address: ul. Łopuszańska, 02-232 Warsaw

After sending your registration payment by bank wire transfer, scan the bank receipt and attach the PDF file in an email to: [joanna.obloj@pk.edu.pl](mailto:joanna.obloj@pk.edu.pl)

# EEBP X PROGRAM

Day 1: Monday 16.09.2024		
Location: WEL CUT		
16:00 – 19:00	<b>Registration</b>	
17:00 – 19:00	<b>Welcome reception</b>	
Day 2: Tuesday 17.09.2024		
Location: AULA C04		
8:00 – 9:00	<b>Registration</b>	
9:00 – 9:45	<p style="text-align: center;"><b>Opening Ceremony:</b></p> <ul style="list-style-type: none"> <li>Prof. Andrzej Flaga – Chairperson of the Organising Committee</li> <li>Prof. Joanna Dulińska – Chairperson of the International Scientific Committee</li> <li>Prof. Claudio Borri (on-line) – President of the International Association for Wind Engineering</li> </ul>	
9:45 – 10:30	<p><b>Keynote Lecture 1</b> Chairperson: Prof. Lucyna Domagała</p>	
	Dr Łukasz Flaga, Prof. Andrzej Flaga (Poland)	New big-size wind tunnels of the Wind Engineering Laboratory of Cracow University of Technology and their research potential in wind, snow and environmental engineering
10:30 – 11:00	<b>Coffee break</b>	
11:00-12:00	<p><b>Plenary Session 1</b> <i>Urbanised areas dynamic and natural ventilation</i> Chairperson: Prof. Maciej Dutkiewicz</p>	
	11:00 – 11:15	Agnieszka Flaga-Maryańczyk, Andrzej Flaga, Łukasz Flaga
	11:15 – 11:30	Łukasz Flaga, Andrzej Flaga
	11:30 – 11:45	Andrzej Flaga, Łukasz Flaga
	11:45 – 12:00	Łukasz Flaga, Andrzej Flaga
Location: WEL CUT		
12:00 - 13:00	<b>Lunch</b>	
Location: AULA C04		
13:00 – 13:45	<p><b>Keynote Lecture 2</b> Chairperson: Prof. Tadeusz Chmielewski</p>	
	Prof. Yukio Tammura (Japan – China)	Damping devices for suppressing wind-induced vibrations of buildings
13:45 – 14:45	<p><b>Plenary Session 2</b> <i>Dampers, damping and human perception of vibrations</i> Chairperson: Prof. Tadeusz Chmielewski</p>	
	13:45 – 14:00	Piotr Wielgos
	14:00 – 14:15	Michał Polak
	14:15 – 14:30	Alicja Kowalska-Koczwara, Filip Pachla
14:30 – 14:45	Jacek Szulej	Determining the level of vibration damping of the John Paul II Bridge in Puławy in two phases of bridge construction based on the collocation method
14:45 – 15:15	<b>Coffee break</b>	

# EEBP X PROGRAM

Location: WEL CUT

15:30 – 17:30

Visit in WEL CUT

**Day 3: Wednesday 18.09.2024**

Location: AULA C04

8:00 – 9:00

**Registration**

9:00 – 9:45

**Keynote Lecture 3**

Chairperson: Prof. Andrzej Flaga

Prof. Fabio Rizzo (Italy)

Cable net roofs with hyperbolic-paraboloid shape: structural behaviour aerodynamics and aeroelasticity

9:45 – 10:45

**Plenary Session 3**

*Ice load of structures*

Chairperson: Prof. Roman Kinasz

9:45 –  
10:00

Michał Rządkosz, Łukasz Flaga, Andrzej Flaga

De-icing and anti-icing methods for overhead power line conductors and their use in Polish conditions

10:00 –  
10:15

Michał Rządkosz, Łukasz Flaga, Andrzej Flaga

Study of power lines damages and collapses caused by natural disasters of icing in Poland over the last 25 years

10:15 –  
10:30

Łukasz Flaga

Measurements of an ice load contour of a power line cables with the use of photogrammetric method and a drone

10:30 –  
10:45

Roman Kinasz, Jaroslav Huck, Wiesław Bereza

Calculation of outdoor air temperature parameters in the territory of Transcarpathian region of Ukraine

Location: WEL CUT

10:45 – 12:30

**Lunch**

Location: AULA C04

12:30 – 13:15

**Keynote Lecture 4**

Chairperson: Prof. Joanna Dulińska

Prof. Ashraf El Damatty (Canada)

Wind tunnel tests and standardization problems of tornado actions and downburst actions on power lines and other engineering structures

13:15 – 14:30

**Plenary Session 4**

*New measuring techniques of environmental effects on buildings and people*

Chairperson: Prof. Jan Benčat

13:15 –  
13:30

Andrzej Brzenk

Innovative design solutions of cascade fan installation with regard to aerodynamic flow in wind tunnel for building aerodynamics and power engineering (TA1) and climatic wind tunnel for an environmental engineering (TA2)

13:30 –  
13:45

Andrzej Brzenk

Innovative design solutions of cascade fan installation with regard to vibration isolation in wind tunnel for building aerodynamics and power engineering (TA1) and climatic wind tunnel for an environmental engineering (TA2)

13:45 –  
14:00

Paweł Byrski

Design and dynamic issues of the rotary tables in the TA-1 wind tunnel at the Cracow University of Technology

14:00 –  
14:15

Paweł Byrski, Tomasz Kula

Structural and dynamic issues of the guide vanes in the TA-1/TA-2 wind tunnels of the Cracow University of Technology

14:15 –  
14:30

Maciej Pilch, Roman Popielarz, Andrzej Flaga

Preliminary tests of new Pressure Sensitive Paints for the development of advanced spectroscopic measurement systems for precise testing of building structures' resistance to wind during aerodynamic model tests

14:30 – 15:00

**Coffee break**

# EEBP X PROGRAM

15:00 – 16:00	<b>Plenary Session 5</b> <i>Selected problems of environmental effects on buildings and people</i> Chairperson: Prof. Alicja Kowalska-Koczwara		
	15:00 – 15:15	Jarosław Bęc, Ewa Błazik-Borowa	Dynamic analysis of facade scaffolding subjected to seismic action
	15:15 – 15:30	Karol Skiba, Roman Kinasz	Influence of radiation exposure on concrete in nuclear energy facilities
	15:30 – 15:45	Jan Benčat, Michal Lukáč	Turbulent water dynamic action on hydrotechnical structures
	15:45 – 16:00	Mateusz Rociński	Actual state of technology and prospects for the development of wind energetics in Poland
16:00 – 16:30	Bus transport for Galla Dinner		
16:30 – 19:00	<b>Galla Dinner</b> Avangarda Restaurant Mikołaja Zyblikiewicza 1, 31-029 Kraków		
<b>Day 4: Thursday 19.09.2024</b>			
Location: AULA C04			
8:00 – 9:00	<b>Registration</b>		
9:00 – 9:45	<b>Keynote Lecture 5</b> Chairperson: Prof. Tomasz Lipecki		
	Prof. Andrzej Flaga (Poland)	Similarity criteria for wind tunnel tests and standardisation problems of snow loads in conditions of snow precipitation and snow redistribution	
9:45 – 11:15	<b>Plenary Session 6</b> <i>Selected problems of snow and wind engineering</i> Chairperson: Prof. Janusz Juraszek		
	9:45 – 10:00	Andrzej Flaga, Marian Gwóźdź	Study of snow-ice loads contributions in disaster of large-size steel structure building hall
	10:00 – 10:15	Roman Kinasz, Wiesław Bereza	Control of the safety of the building facility by monitoring snow load
	10:15 – 10:30	Tadeusz Chmielewski, Piotr Bońkowski	Different methods analysis of extreme wind speeds in Poland
	10:30 – 10:45	Agnieszka Padewska-Jurczak	Vehicle buffeting on road gantries
	10:45 – 11:00	Tomasz Lipecki, Iwona Szer	Thermal sensations of scaffolding workers
11:00-11:15	Marcin Tatara, Piotr Górski, Stanislav Pospíšil, Arsenii Trush	Selected results of experimental studies on the effect of icing on the aerodynamics of bridge cables	
11:15 – 11:45	<b>Coffee break</b>		
11:45 – 12:00	<b>Closing Ceremony</b>  Chairpersons: <ul style="list-style-type: none"> <li>• Prof. Andrzej Flaga - Chairperson of the Organising Committee</li> <li>• Prof. Joanna Dulińska – Chairperson of the International Scientific Committee</li> </ul>		



# Conference venue

## Conference Venue:

CUT Kraków-Czyżyny  
campus

**Al. Jana Pawła II 37,  
31-864 Cracow (Poland)**

## New Wind Engineering Laboratory at the CUT



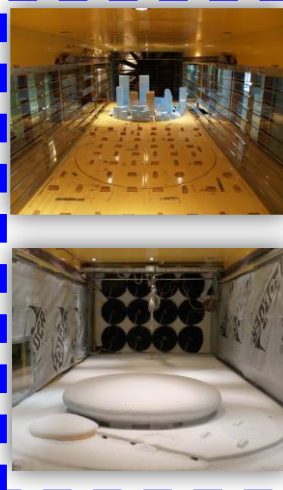
Wind Engineering  
Laboratory – building O



Main CUT campus

Wind Engineering Laboratory  
– building F

Al. Jana Pawła II



**Conference Venue:**  
CUT Kraków-Czyżyny  
campus

Mechanical  
Department  
(AULA C04)

## Hotel Justyna



al. Jana Pawła II 70,  
31-571 Kraków



The keynote lectures and plenary sessions will be held in AULA C04 Mechanical Department of CUT.

The other conference events, meetings and lunches will be held in WEL CUT.

Proposed nearest hotel (30 rooms booked for conference participants):

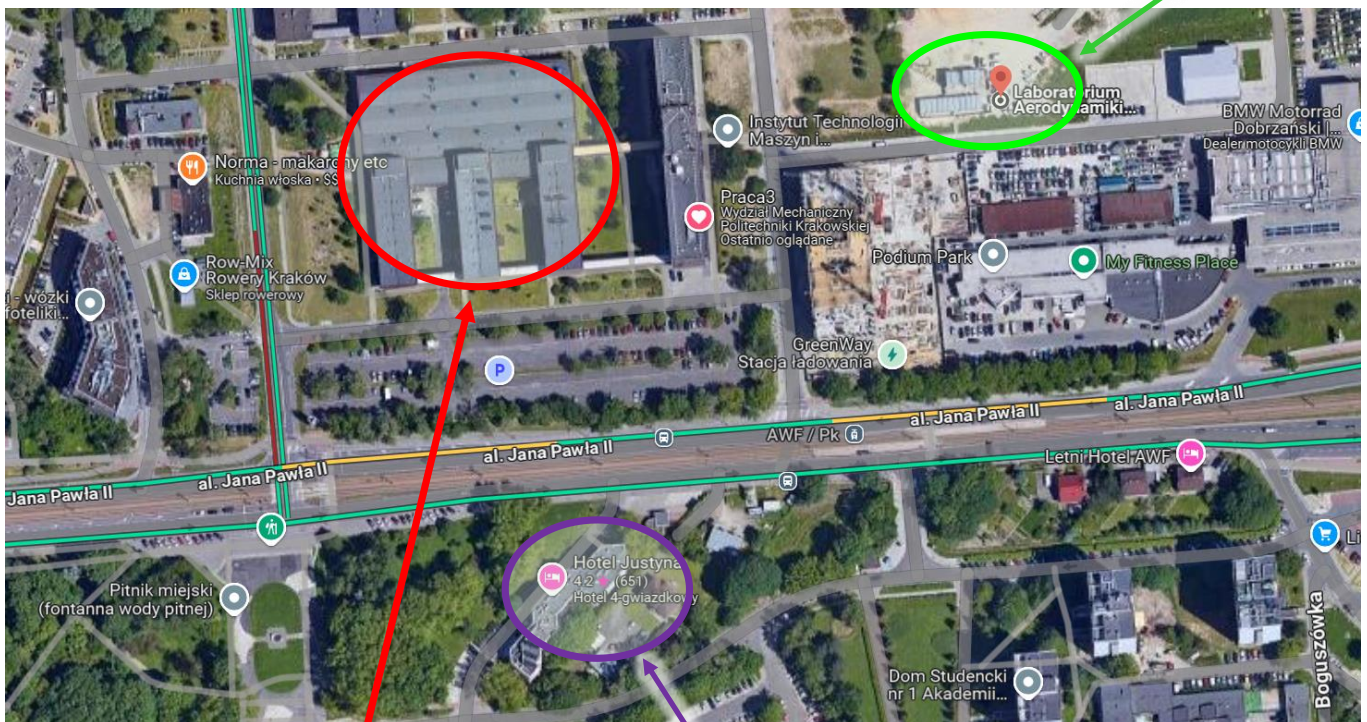
Hotel Justyna: al. Jana Pawła II 70, 31-571 Kraków

# Conference venue

## New Wind Engineering Laboratory at the CUT



Wind Engineering Laboratory – building O



**Conference Venue:**  
CUT Kraków-Czyżyny  
campus  
  
Mechanical  
Department  
(AULA C04)

**Hotel Justyna**  
★★★★★  
al. Jana Pawła II 70,  
31-571 Kraków

## Brief info about Poland

Member state of the European Union since 2004

6<sup>th</sup> largest Economy in the European Union and 23<sup>rd</sup> in the World

Population - over 38 million people + 20 million Poles living abroad

Total area – 312,696 km<sup>2</sup> (120,733 sq mi)

60% of young Poles study at the university level, which is above the EU average.



## Famous Polish people



- Mikołaj Kopernik (Nicolaus Copernicus) (1473-1543), the father of modern astronomy;
- Fryderyk Chopin (1810-1849), famous composer and virtuoso pianist;
- Maria Skłodowska-Curie (1867-1934), physicist and chemist, 2-times Noble Prize winner in physics and chemistry, 1<sup>st</sup> woman to win Noble Prize;
- Karol Wojtyła (1920-2005), former archbishop and cardinal of the Cracow Metropoly, pope John Paul II in the Roman-Catholic Church;
- Andrzej Wajda (1926-2016), film director, lifetime Academy Award and Palme d'Or winner;
- Robert Lewandowski (born 1988), a Polish football player currently playing for FC Barcelona, considered one of the best strikers of all time.

# The City of Cracow



- Former capital and Royal City (1038-1596);
- Second largest city in Poland (780 000 in the city, 1 725 000 in metropolitan area);
- Major national academic and cultural centre, one of the most important economic hubs in Poland;
- Classified as a global city by GaWC and cited as one of Europe's most beautiful cities, approved in 1978 for UNESCO World Heritage List, famous for its Gothic, Renaissance and Baroque architecture;
- With a history lasting over a thousand years, Cracow still remains the spiritual heart of Poland. The intellectual environment of Cracow is created by 23 universities, nearly 20 000 academic lecturers and 190 000 students. It is a major tourist attraction that welcomes seven million visitors annually.



# Famous people from Cracow



**Joseph Conrad** (1857-1924)

Polish-born English writer and master mariner. Conrad is regarded as one of the greatest novelists in the English literature.

**Stefan Banach** (1892-1945)

Polish mathematician considered as one of the world's most important and most influential 20th-century mathematicians



**Krzysztof Penderecki** (1933-2020)

Famous contemporary Polish composer and conductor

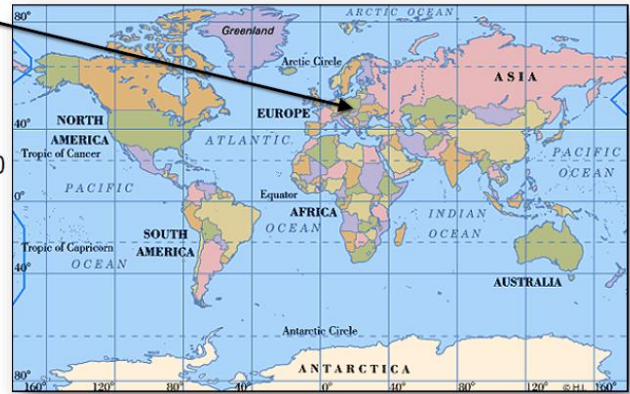
# Cracow University of Technology



Tadeusz Kościuszko Cracow University of Technology (CUT) is a public autonomous state university founded in 1945, reporting to the Polish Ministry of Education and Science

Cracow University of Technology

- Academic staff: 1 155
- Administrative staff: 900
- Students: 17 400



## Faculties of CUT

- Faculty of Architecture;
- Faculty of Computer Science and Telecommunications;
- Faculty of Electrical and Computer Engineering;
- Faculty of Civil Engineering;
- Faculty of Materials Engineering and Physics;
- Faculty of Environmental Engineering and Energy;
- Faculty of Chemical Engineering and Technology;
- Faculty of Mechanical Engineering;
- Doctoral School.



## International cooperation of CUT

Cooperation with academic and industrial centres around the world, including universities from USA, China, United Kingdom, Canada, Germany, France, Norway, Switzerland, Italy, Ukraine, Australia, Japan, South Korea, India, Egypt, Ethiopia, Brasil, Chile, Colombia, Croatia, Czech Republic, Finland, Romania, Hungary, Mexico, Malaysia, Singapore, Morocco, Turkey.



## Kraków John Paul II International Airport

- 2<sup>nd</sup> busiest airport in Poland in terms of volumes of passengers served annually (over 3 million passengers per year);
- Located 11 km from the city centre in the village of Balice;
- Connected to the city with railway line and a number of bus lines with easy and fast transport possibilities.



### Destinations:

- Europe: main cities;
- USA: Chicago;
- Asia: Tel Aviv, Dubai, Abu Dhabi, Amman, Kutaisi;
- Africa: Agadir, Hurghada.

## Post-conference tours proposals

Walking through the **Royal Route**, you can take delight in the most important and splendid Cracow's monuments such as churches, Cloth House, buildings and streets. It leads along the historic road from the main entrance gate into the city.



**Ojców National Park** is located in Southern Poland. It embraces valleys of two small rivers and neighbouring fragments of Jurassic plateau and is the smallest National Park in Poland.

The **Wieliczka Salt Mine** is thought to have been created by the forces of nature around 15 million years ago. Visitors can admire many chambers with carvings and statues. It is worth seeing a salt lake that holds more than 300 g of salt per one litre.



## New Wind Engineering Laboratory at the CUT



