

39th APCOM Conference:  
**MINING GOES DIGITAL**  
Wrocław, 3rd-7th of June 2019

**Program**



# Welcoming address

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The abbreviation "APCOM" stands for "Applications for Computers and Operations Research in the Minerals Industry". When the conference started in 1964, it was an informal meeting of scientists from different universities in the USA together with the "Society of Mining Engineers" (SME) of the United States. During the years the APCOM conference was performed in a mostly bi-annual rhythm. Up to today APCOM maintained its original logo formed around a punch card clearly remembering the historic origin of the conference from the times prior to the revolution caused by the era of semiconductors.

In the beginning, APCOM focused on the optimization of geostatistics and resource estimation and a number of methods used in these fields were initially presented and discussed on APCOM conferences. This field still today is an important part of any APCOM. During the years, information technology has dramatically developed, new algorithmic methods evolved and the entire fields of electronic communication, machine automation, autonomous machines and process optimization developed. Consequently, today, APCOM is much more than a meeting of specialists in geostatistics and resource estimation: The APCOM has expanded to a conference covering all kinds of Information and Communication Technology in the mineral industry: Already in 2005 on the conference in Tuscon/AZ, the term "Mining Process Optimization" was presented as the next paradigm shift in mining after mechanization and automation, which marked another example of the continued innovative impact of the APCOM. Well ahead of the current discussions about "Digital Transformation".

In this tradition the 39th APCOM 2019 is performed in Wrocław (Poland), a town with innovative tradition from the early times of industrialization when the town was German Breslau. A few examples can only give a glimpse of the importance of the town's historic industrial and academic achievements:

- 10 Nobel prize winners (out of 102 Germans) were born or working in Breslau.
- The first publicly owned electric power station in Germany went in operation in 1882.
- Electric public trams were introduced 1892.
- The world's biggest free span concrete hall ("Jahrhunderthalle" - "Hala Stulecia") was built in 1912 (it is an Unesco world cultural heritage site today).
- Diesel electric fast trains "Flying Silesian" featuring a top speed of 205 km/h were developed 1935 at Linke-Hoffmann Werke in Breslau, running abt. 500 km Berlin-Bytom (Beuthen) in 4 hrs 17 min!

Today Wrocław again is a leading innovation hub in Middle-Eastern Europe hosting the internationally highly acknowledged Wrocław University of Technology. A large number of big and small innovative companies are active not only in the area of Information and Communication Technology, but also in Chemistry, Biotechnology and Engineering. World known names like Google, Nokia, IBM, Bombardier or Volvo Buses are just few examples. Also KGHM as a world leading copper producer operates a research center in the city. In this tradition the 39th APCOM conference titled "Mining Goes Digital" presents innovative IT related papers from Resource estimation and geostatistics, Mine Planning, Robotics, equipment automation, autonomous guidance and many other integrative aspects of digital transformation in the minerals industry. A few papers also provide inputs from other industries into the mining community to create potential synergies. This evolution of the APCOM from its origins in resource estimation to a general mining IT related conference also emphasizes the importance of a holistic view on the optimization of the overall mining operations from the resource to the preparation plant in the era of digital transformation.

In this view, the APCOM conference in Wrocław also marks a change in the appearance of the conference logo: The original APCOM logo was changed slightly: The attentive reader may have observed that the original punchcard was exchanged by a more up-to-date symbolic PCB layout and an upgraded font set. So the APCOM can be recognized as "the" leading international event for Information Technology in mining for many years to come.

Dr. Christoph Mueller  
*Chairman of the 39th APCOM 2019*

# Sponsors

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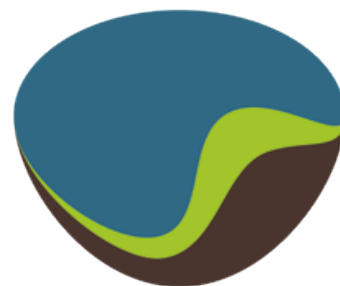


# Supporters

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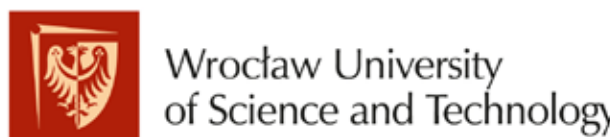


## A-La-Carte Sponsors:

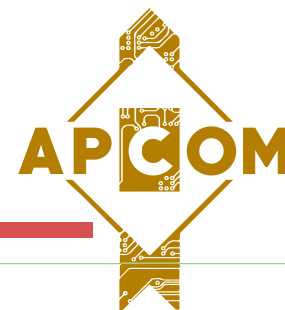


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## Supporters:



# General Program



## 03.06.2019, Monday

- 10:00-16:00** IREDES Workshops  
IBIS Styles Hotel, Conference level 1st floor
- 17:00-20:00** Pre-registration and welcoming reception  
IBIS Styles hotel, Conference level 1st floor

## 04.06.2019 Conference Day 1, Tuesday

- Congress Center of Wrocław University of Science and Technology (WUST)
- from 8:00** Registration
- 09:00-10:30** Opening Plenary
- 10:30-11:00** Coffee break
- 11:00-13:00** Technical sessions
- 13:00-14:00** Lunch
- 14:00-15:30** Technical sessions
- 15:30-16:00** Coffee break
- 16:00-17:30** Technical sessions

### Partner Program:

- 10:00-16:00** Historic town walk and Odra River cruise (start: place: Congress Center of WUST)

### Social Event:

- 20:00-23:00** Official Conference Dinner (separate Ticket)  
IBIS Styles Hotel, Conference level 1st floor

## 05.06.2019 Conference Day 2, Wednesday

- Congress Center of Wrocław University of Science and Technology (WUST)
- from 8:30** Registration
- 09:00-10:30** Plenary Session
- 10:30-11:00** Coffee break
- 11:00-13:00** Technical sessions
- 13:00-14:00** Lunch
- 14:00-15:30** Technical sessions
- 15:30-16:00** Coffee break
- 16:00-17:30** Technical sessions

### Partner Program:

- 09:00-16:00** Tour of Lower Silesia  
In front of the IBIS Styles Hotel

### Social Event:

- 20:00-23:00** Casual Conference Barbecue (incl. in conference price)  
Letnia, ZOO Wrocław, Service Entrance on Zoo Tram Station

## 06.06.2019 Conference Day 3, Thursday

- Congress Center of Wrocław University of Science and Technology (WUST)
- from 8:30** Registration
- 09:00-10:30** Plenary Session
- 10:30-11:00** Coffee break
- 11:00-13:00** Technical sessions
- 13:00-14:00** Lunch
- 14:00-15:30** Technical sessions
- 15:30-16:00** Coffee break
- 16:00-17:00** Journalist summary of the APCOM 2019 and panel discussion
- 17:00-17:15** Presentation of the APCOM 2021 host city
- 17:15-17:30** Closing of the conference

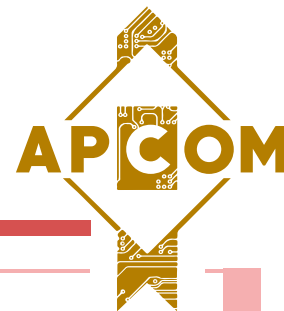
## 07.06.2019 Field Trips (starting from hotels - see page 15)

## 08.06.2019 - 10.06.2019 APCOM Post Conference hike in the Karkonosze mountains

Departure: 08:00am at the IBIS Styles Hotel

# Technical program

## Tuesday, 4th of June



### Room 10AC, Opening plenary

Christoph Mueller

9:00	Welcome and opening	Dr Christoph Mueller
9:30	State-of-the-Art Mechatronic Systems for Mining developed in Poland	Dr Małgorzata Malec
10:00	Industrial Internet of Things and Gamification Applied to Fleet and Personnel Management	Dr Sean Dessureault

### 10:30 Coffee break

	Room 10B, Session S04 General Aspects of Digital Transformation: Trends in Digitalization and Education Jörgen Appelgren	Room 10AC, Session S03 Resource Estimation and Geostatistics: New Technologies in Geostatistics Prof. Antonio Nieto	Room 10D, Session S02 Mine Planning in Digital Transformation: Geomechanic Risk in Mine Planning Marek Andrzejewski
11:00	Digital technology trends and their implementation in the mining industry Lars Barnewold	Evolving estimation techniques for an evolving world class stratiform copper deposit at Kamo-a-Kakula, Democratic Republic of the Congo George Gilchrist	Economic Optimization of Rib Pillar Placement In Underground Mines Alexandre Barbosa Andrade
11:30	Investing in engineering, research and education in Africa to derive a roadmap for ensuring local digital mining success. Winfred Assibey-Bonsu	Recursive Convolutional Neural Networks in a Multiple-Point Statistics framework Sebastian Avalos	A Data Science Model on Production Level Pillar Stability at El Teniente Mine Ricardo Quevedo Caro René Quezada Castañeda
12:00	Virtual Reality Mine: a vision for digitalised mining engineering education Rudolf Suppes	Application of machine learning classification to geochemical and geophysical data Dr Katherine Silversides	Incorporation of mineralisation risk into underground mine planning Rafael Rosado
12:30	Development of Optimized Processes in Construction Management Supported by Building Information Modeling (BIM) with special Focus on Procurement Klaus Boede	Critical Review of Mineral Resource Classification Techniques in the Gold Mining Industry Prof. Kadri Dagdelen	Parametric analysis of the optimal depth of an open-pit gold mine Dr Régis Motta

### 13:00 Lunch

## Lunch

	<b>Room 10B, Session S07</b> Scheduling and Dispatch: Optimization of Dispatch and Scheduling <b>Oleg Nagovitsyn</b>	<b>Room 10AC, Session S06</b> Resource Estimation and Geo- statistics: Drilling Data in Resource Classification <b>Prof. Kadri Dagdelen</b>	<b>Room 10D, Session S05</b> Mine Planning in Digital Trans- formation: Mine Planning <b>Marek Andrzejewski</b>
14:00	Improvements in plan-driven truck dispatching systems for surface mining  Dr Mehran Samavati	Multivariate Gaussian Process for distinguishing geological units using measure while drilling data  Dr Katherine Silversides	Multi Stage Dumping Sequence – A New Approach for Waste Disposal  Mr Bruno Kuckartz
14:30	A two-stage solution approach for a shift scheduling problem with simultaneous assignment of machines and workers  Cinna Seifi	Optimal Drill Spacing For Resource Classification - Practical Suggestions from historical Literature  Marek Nowak	A procedure to generate optimized ramp designs using mathematical programming  Dr Nelson Morales
15:00	Framework of optimal opera- tional indices for the open pit mines production scheduling problems  Mohammad Reza Moghadam	Influence of drilling spacing on the mineral resources uncertainty  Carlos José Evangelista Silva	Understanding Plan's Priori- ties: Short Term Scheduling Optimization  Alexandre Barbosa Andrade

15:30

## Coffee break

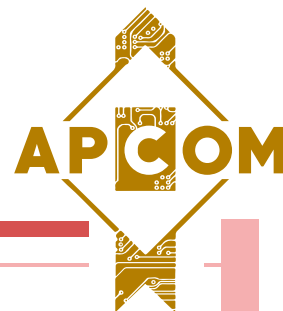
	<b>Room 10B, Session S10</b> Mine Safety in Digital Transfor- mation: S10 - New Systems in Coal Mine Safety <b>Prof. Oliver Langefeld</b>	<b>Room 10AC, Session S09</b> Resource Estimation and Geostatistics: Resource Modeling and Simulation <b>Prof. Kadri Dagdelen</b>	<b>Room 10D, Session S08</b> Internet of Things and Robotics UAV Applications in Mining <b>Prof. Marek Jaszczuk</b>
16:00	Proximity Detection of Explo- sive Methane Clouds in Long- wall Mines  Prof. Jürgen F. Brune	Multivariate Geostatistical Simulation using Principal Component Analysis  Maria Bolgkoranou	High-resolution modeling of open-pit slopes using UAV and photogrammetry  Prof. Javad Sattarvand
16:30	A sensitive carbon monoxide monitoring system for fore- casting coal spontaneous combustion  Dr Zhaowei Wang	Covariance table and PPMT: a fast automatic spatial continui- ty mapping to multiple correlated variables  Jonas Kloeckner	Lithological Hyperspectral Characterisation for UAV Sensor Selection  Mr Filipe Beretta
17:00	Application of laser methane sensor in on-line monitoring of gas pipeline  Hui Meng	Application of Multivariate Localized Uniform Conditioning and Conditional Simulation for a high complex Stockwork Niobi- um Deposit in Brazil  Laercio Guedes Bertossi	Enhancement of Explosive Energy Distribution using UAVs and Machine Learning  Prof. Javad Sattarvand

**20:00-23:00** Social Event: Official Conference Dinner (separate Ticket)

Conference Dinner (extra ticket needed!) at the IBIS Styles Hotel with legendary Polish food, drinks and world known music by European artists touring the world with a well known tribute show

# Technical program

## Wednesday, 5th of June



### Room 10AC, Plenary Session S11

#### From Geostats to Human Machine Interaction, Dr Sean Dessureault

- 9:00 Application of Locally Varying Anisotropy (LVA) Kriging at the Grasberg Porphyry Cu-Au-Ag Deposit, Papua, Indonesia  
Andrzej Issel
- 9:30 Performance assessment of antithetic random fields in a stochastic mine planning model  
Gonzalo Nelis
- 10:00 Interaction of man and machine in highly automated equipment: Lessons learned from aviation  
Finn Hovgaard

10:30

### Coffee break

#### Room 10B, Session S13

Mine Planning in Digital Transformation: Uncertainty in Mine Planning and Scheduling

Prof. Antonio Nieto

- 11:00 Generating Pushbacks Using Direct Block Mine Production Scheduling Algorithm

Dr Kadri Dagdelen

- 11:30 A spatial clustering algorithm for orebody classification and boundary setting

Prof. Mustafa Kumral

- 12:00 Incorporating grade uncertainty into sublevel stope sequencing

Yuksel Asli Sari

- 12:30 Underground Mine Planning Optimization Process to Improve Values and Reduce Risks

Dr Hongliang Wang

#### Room 10AC, Session S14

Mine Operation and Equipment: Mine Equipment in Digital Transformation

Prof. Håkan Schunnesson

- Monitoring of a stoping operation, digital transformation in practice

Olav Kvist

- Approach of mining equipment performance with simulation of the use of autonomous trucks

Walter Felsch Jr.

- Evaluation of trackless mobile machine collision management systems

Dr Herman A. Hamersma

- An Integrated Simulation Model for Opportunistic Maintenance

Dr Onur Golbasi

#### Room 10D, Session S12

General Aspects of Digital Transformation: Optimized Economy of Mining Operations

Klaus Boede

- The application of correlation models for the analysis of market risk factors of KGHM capital group

Prof. Agnieszka Wyłomańska

- The so called „Green Paradox-on“

Dr Ansgar Bendiek

- Improvement of investment processes in mining company by implementation of Project Management System

Maciej Wach

- Human factors obstacles in the implementation of new technologies and automation in the mining industry: Chilean perspective

Dr Eleonora Widzyk - Capehart

13:00

### Lunch



## Lunch

### **Room 10B, Session S16** Mine Safety in Digital Transformation: New Technology for Underground Safety **Prof. Christoph Dauber**

14:00 Increased Safety in Deep Mining with IoT and Autonomous Robots

Franziska Günther

14:30 Development of Blast-Induced Ground Vibration Wireless Monitoring System

Prashanth Ragam

15:00 Fibre Optic Sensors For Coal Mine Combustion Detection

Dr Tongyu Liu

### **Room 10AC, Session S15** Resource Estimation and Geostatistics: Ore grade estimation **Winfred Assibey-Bonsu**

Multi-located cokriging: an Application to Grade Estimation in Mining Industry

Dr Nasser Madan

MILP framework for open pit and underground mining transitions evaluation

Bright Oppong Afur

Grade estimation in a tabular deposit using unstructured grids

Dr Marcel Antonio Arcari Bassan

### **Room 10D, Session S17** Scheduling and Dispatch: Scheduling I **Ernest Baafi**

Simulation and optimization framework for evaluating the mining operations

Prof. Hooman Askari-Nasab

Mine Schedule Optimization and Mine Operational Realities: Bridging the Gap

Dr Andrea Brickey

Short-Term Production Scheduling of Multiple Mines using Genetic Algorithms

Pranjal Pathak

## Coffee break

### **Room 10B, Session S18** Mine Operation and Equipment: LHD Operation in Digital Transformation **Dr Małgorzata Malec**

16:00 Comprehensive, experimental verification of the effects of the lock-up function implementation in LHD trucks in the deep underground mine

Tomasz Kaniewski

16:30 Analysis of dynamic external loads to Haul Truck machine subsystems during operation in a deep underground mine

Justyna Hebda-Sobkowicz

Selection of variables acquired by the on-board monitoring system to determine operational cycles for haul truck vehicle

Paweł Śliwiński

17:00 From machine construction to mechatronic system design: Digital Transformation is changing the way of thinking!

Szymon Kochanik

### **Room 10AC, Session S19** Resource Estimation and Geostatistics: MWD Data Analysis and Drill Spacing **Dr Ansgar Bendiek**

Rock mass characterization using MWD data and photogrammetry

Sohail Manzoor

Ore Grade Prediction Using Informative Features of MWD Data

Samaneh Liaghat

An Approach for Drilling Pattern Simulation

Gustavo Usero

### **Room 10D, Session S20** Scheduling and Dispatch: Scheduling II **Dr Ernest Baafi**

Optimization model for rostering and crew assignment for train transportation

Dr Jorge Amaya

Short-term open-pit mine production scheduling with hierarchical objectives

Fabián Manríquez

The simulation of the excavation sites of coal mines

Prof. Sergey Kubrin

## **19:30-23:30 Social Event: Casual Conference Barbecue**

Casual Barbecue with a live music at the Letnia Restaurant in the Wrocław Zoo. Free access for all regular conference attendees (included in registration fee).



# Technical program

## Thursday, 6th of June

### Room 10AC, Plenary: Day 3

Winfred Assibey-Bonsu

9:00	Rethinking mining transport: Trackless trains for mass transport in mining	Mateusz Juźwiak
9:30	Coupled CFD-DEM modelling of mine dust dispersion in underground roadway	Lihai Tan
10:00	Recoverable resource estimation mixing different quality of data	Christianne Mariz

10:30

### Coffee break

#### Room 10B, Session S23

Mine Operation and Equipment: Optimization of operations and products

Dr Violetta Sokola Szewiola

11:00 Optimization of material logistics by using leading edge electronic Information and Communication Technologies (ICT) in underground coalmine

Dr Max Thomas Stoettner

11:30 Development of a Machine Vision System Based on Deep Learning Algorithm for Automated Quality Monitoring of Iron Ores

Dr Amit Kumar Gorai

12:00 Comparison between regression models and neural networks applied to forecast geometallurgical variables

Fernanda Gontijo Fernandes Niquini

12:30 Development assumptions of a data and service management centre at KGHM S.A.

Paweł Pyda

#### Room 10AC, Session S22

Resource Estimation and Geostatistics: Resource Estimation

Winfred Assibey-Bonsu

Decluster Weights as a Measure of Average Sample Spacing Applications in Mineral Resource Classification

Dr Rex Bryan

Transforming Exploration Data Through Machine Learning

Ian Whitehouse

Geostatistical simulation with heterotopic soft data without the LMC

Cristina Araujo

#### Room 10D, Session S24

Enabling Technologies and Synergies from other Industries: New Equipment Technology

Dr Sean Dessureault

Designing Top Layer in Internet of Things for Underground Mines

Dr Shimin Feng

Version control system applied to resource modeling projects

Dr Camilla Silva

Development of a low-cost proximity warning system for mine equipment using smartphone and Bluetooth beacons

Jieun Baek

The concept of walking robot for mining industry

Artur Muraszkowski

13:00

### Lunch

## Lunch

**Room 10B, Session S27**  
Enabling Technologies and Synergies from other Industries: Technology for Coal Mining  
**Prof. Christoph Dauber**

14:00 The Digital Mine eco-system

Willem Fourie

14:30 An Operational Data Based Framework for Longwall Shearer Performance Measurement

Enver Yilmaz

15:00 Application of DEM-FEM methods in tests of loads on idlers

Błażej Doroszuk

**Room 10AC, Session S26**  
Mine Operation and Equipment: Optimization of operations  
**Dr Jürgen Brune**

Mineberry – Remote Monitoring of Abandoned Shaft Openings

Prof. Bernd vom Berg

Artificial Intelligence Using Real Time Data

Louis-Pierre Campeau

LTE, 4G and 5G - Broadband Mobile Communication in Mining Applications

Wesley Santos

**Room 10D, Session S25**  
Mine Planning in Digital Transformation: Modelling in Mine Planning and Operation  
**Dr Małgorzata Malec**

Break line and shotpile surfaces modeling in design of large-scale blasts

Oleg Nagovitsyn

Modelling and forecasting geometallurgical recovery at a phosphate mine

Laura Buarque Andrade

Application of a digital model of deposit in Polish hard coal mines on the example of Polish Mining Group Ltd.

Dr Violetta Sokoła-Szewioła

15:30

## Coffee break

### Room 10AC: APCOM Conference Summary and Closing

Carly Leonida, Paul Moore

16:00 Journalist summary of the APCOM 2019 and panel discussion

Carly Leonida, Paul Moore

17:00 Presentation of the APCOM 2021 host city

Surprise

17:15 Closing of the conference

Dr Christoph Mueller

# Submitting questions



This block shows the Slido website and its mobile app interface. The website features a dark background with a play button icon and the text "Every Question Matters. The Ultimate Q&amp;A and Polling Platform for Company Meetings and Events". It includes navigation links for Product, Customers, Pricing, and Resources, along with Log In and Sign Up buttons. A form for entering an event code is visible. The mobile app interface shows the same event code entry screen with a home button and a user profile icon.

## To submit electronic questions:

1. Go to: [www.sli.do](https://www.sli.do) on your PC or mobile
2. Enter:  
**APCOM-AC** to ask speaker in room AC,  
**APCOM-B** to ask speaker in room B,  
**APCOM-D** to ask speaker in room D
3. Type your question in the field assigned to it.  
You can do this anytime, during his presentation or after.
4. Read questions from other attendees, choose the questions you also like
5. Speaker can read and answer questions just after his presentation!

This block shows the Slido app interface and an event banner. The app interface includes a home button, the Slido logo, and a search bar with the placeholder text "# enter code here". Below the search bar is a link to the Acceptable Use Policy. The event banner is dark blue with white text that reads "Join at slido.com #APCOM-AC". It also features a user profile icon and the name "Jak".



# City



## 1. Conference Venue:

Convention Center of the Wrocław University of Technology  
Centrum Kongresowe Politechniki Wrocławskiej  
Address: ul. Janiszewskiego 8, 50-372 Wrocław  
building D-20

## 2. Casual dinner (Wed, June 5):

Letnia  
ZOO Wrocław  
Address: ul. Wróblewskiego 1-5, 51-618 Wrocław

## 3-7. Hotels:

3. IBIS Styles Wrocław Centrum  
Conference hotel (**welcoming reception, conference dinner**):

Address: pl. Konstytucji 3 Maja 3, 50-083 Wrocław  
Phone: (+48) 71 733 48 00

## 4. Novotel Wrocław Centrum

Address: ul. Powstańców Śląskich 7, 53-332 Wrocław  
Phone: (+48) 71 733 48 00

## 5. Q-Hotel Plus Wrocław

Address: ul. Zaołziańska 2, 53-334 Wrocław  
Phone: (+48) 71 749 17 00

## 6. Radisson Blu Hotel

Address: ul. Purkyniego 10, 50-156 Wrocław  
Phone: (+48) 71 375 00 00

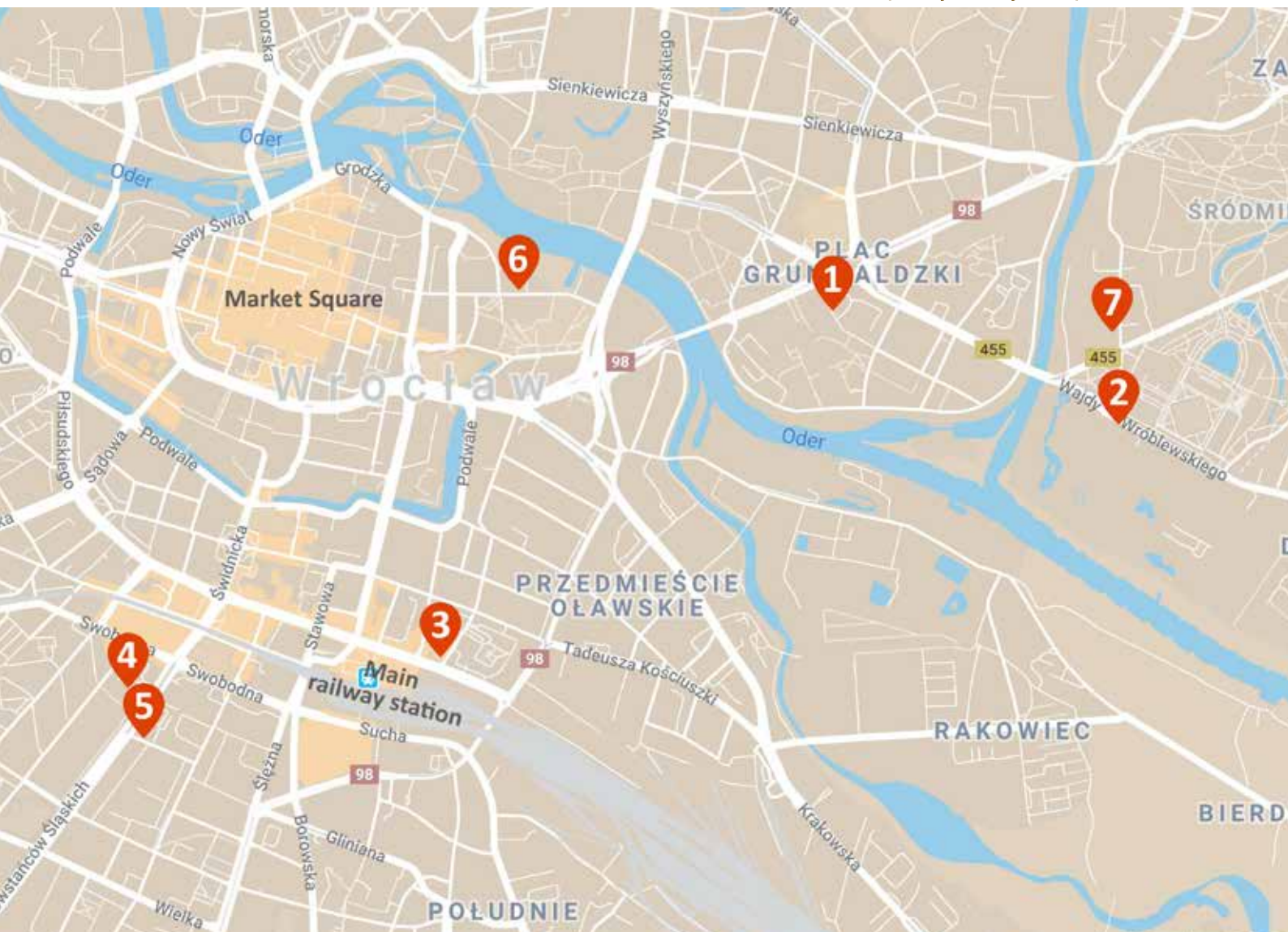
## 7. Grape Hotel & Restaurant

Address: ul. Parkowa 8, 51-616 Wrocław  
Phone: (+48) 71 73 60 400



Remember to validate your ticket!

Trams and buses routes planner:  
<https://jakdojade.pl/wroclaw>





# Casual barbeque



**Place: Letnia, Zoo Wrocław**

**Tram Station: Zoo**

**Tram lines: 1, 2, 4, 10**

Barbecue takes place at the Letnia Restaurant, which is located at center of the ZOO. Yes, you will be able to see giraffes and other animals while having fun with barbecue!

To get into the ZOO please use the Service Entrance - not Main Entrance as it will be closed at the time of event. It is located 100 meters right from main ZOO Entrance. After entering the ZOO please follow the signs to get into the Letnia Restaurant. Please see attached map for detailed route.

**You should have your Conference ID Card with you to be allowed to enter ZOO.**

Attraction of this barbecue is music by a Polish band - Percival - from Lubin, the hometown of KGHM, who performs real Slavic music.





# Field trips - 7th of June



All Field Trips start on 7th of June at IBIS Styles hotel:

**Departure at 4:00 a.m.:**

KGHM Rudna Mine

KGHM Lubin Mine

KGHM Polkowice Mine



# KGHM

POLSKA MIEDŹ

**Departure at 7:00 a.m.:**

KGHM Smelter in Glogow



# HOCHTIEF

**Visits in Wrocław:**

**10:00 Hochtief VASTINT construction site in Wrocław**

**14:00 Hochtief VASTINT construction site in Wrocław**

It is at: Business Garden, Legnicka 48, 50-001 Wrocław, Tram Station "Zachodnia" and then walk to the west on the left side (outbound from the city) along the main road ("Legnicka") underneath the train bridge. The VASTINT construction site by HOCHTIEF POLSKA is directly behind the train bridge on the southern side of Legnicka street - left side when walking outbound! (Look for the HOCHTIEF logos)

All additional info will be provided separately - instructions together with the mobile phone number of the particular guide



# Exhibitors

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**KOMATSU**



**MobileTronics**



**MT-Silesia**

**MineTronics**



**Geovariances**  
Where no one has gone before

**Journalists:**



**GEORESOURCES**  
Portal for Mining, Tunnelling, Geotechnics and Equipment



**Inżynieria  
Górnicza**  
KWARTALNIK SPECJALISTYCZNY





## **Emergency contacts:**

**112**

to call an emergency service please dial 112 for all services: Ambulance, Fire Brigade, Police, Municipal Wardens (Straż Miejska)

As soon as the call is connected, you will be transferred to the appropriate service.

**+48 668 464 616**

Organizers first contact, polish/english, 24hrs

**Please note: The organizers do not provide participants with accident insurance, health insurance, third-party liability insurance or any other forms of insurance.**