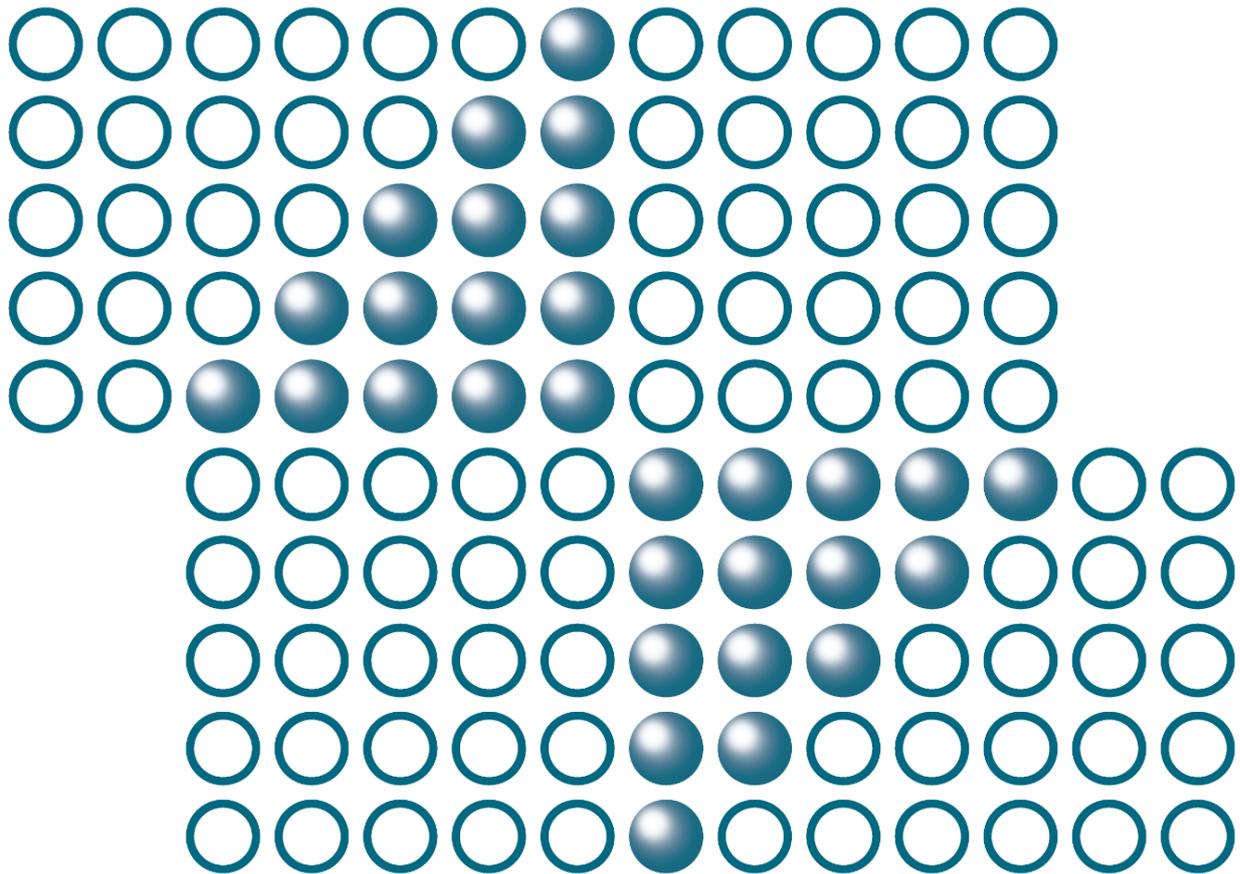


FINAL ANNOUNCEMENT & PROGRAMME
18TH INTERNATIONAL SYMPOSIUM ON METALLOGRAPHY,
FRACTOGRAPHY AND MATERIALS SCIENCE

METALLOGRAPHY & FRACTOGRAPHY 2022



APRIL 27 - 29, 2022

ATRIUM HOTEL***
NOVÝ SMOKOVEC
HIGH TATRA MOUNTAINS
SLOVAKIA

WELCOME TO METALLOGRAPHY & FRACTOGRAPHY 2022

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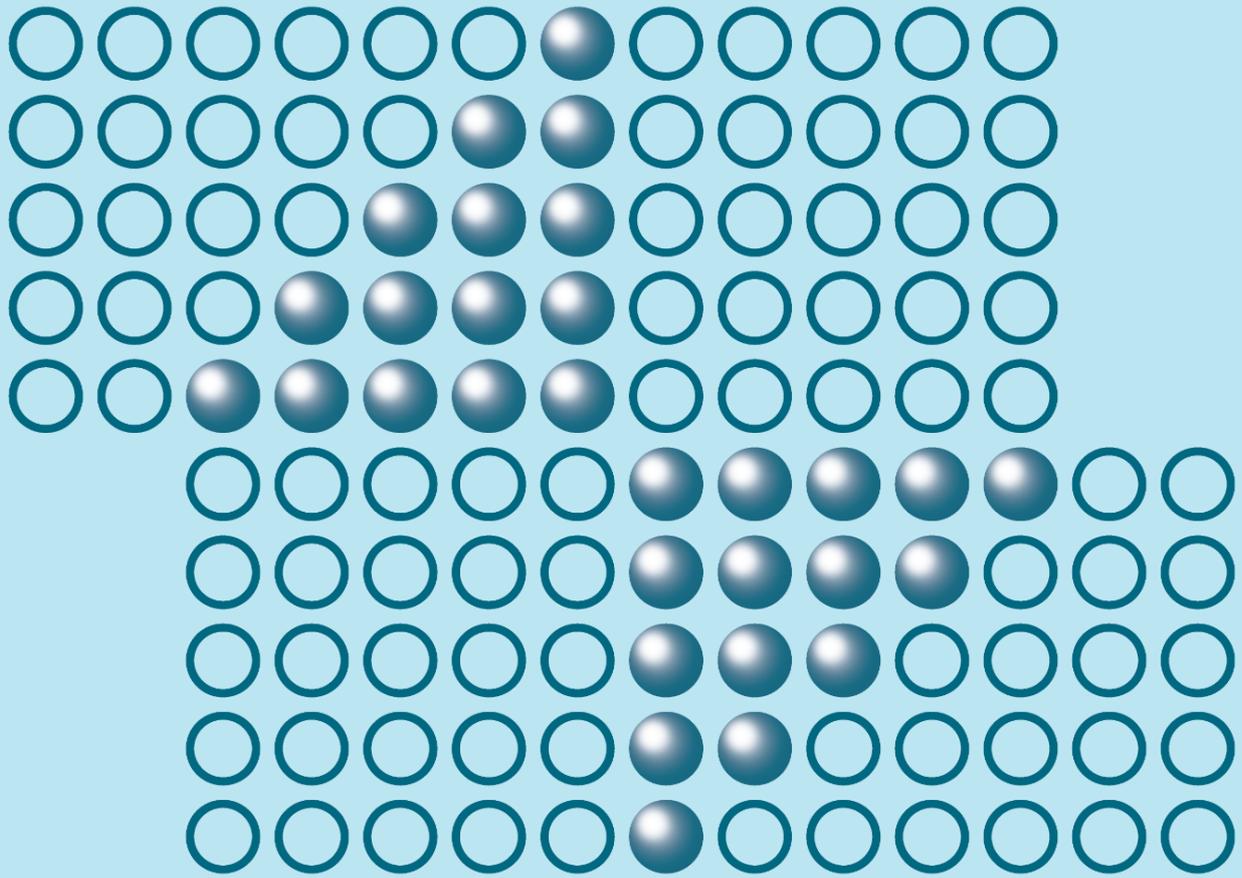
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WELCOME TO METALLOGRAPHY & FRACTOGRAPHY 2022



PREFACE

It is our pleasure to welcome you to our regular traditional Conference on Metallography, Fractography, and Materials Science “Metallography & Fractography 2022” which will take place between 27th – 29th April 2022 in the High Tatra Mountains in the Slovak Republic.

We have the pleasure to invite you to participate in this traditional event where materials specialists from various parts of the world have been meeting and exchanging their latest insights at three-yearly intervals. The conference has featured as an important event for the presentation of results achieved in materials science and engineering. The conference focus widened long ago to cover not only the field of metallic materials but also numerous modern materials and technologies as well. The participants come from universities, academic research institutions, and different branches of industry not only from all corners of Europe but from overseas as well with an interest in materials science and engineering. Exhibitions of instruments and equipment make it possible for the participants to acquaint themselves with recent achievements in research and investigation technology. Now in this conference, we would like to expand the programme to cover new advanced materials and technologies as well as to intensify international contacts.

The Conference Committee wishes to acknowledge the assistance and support that we have received from several individuals and organizations in the preparation of this event.

The Scientific and Organizing Committee wishes to create a successful conference in order to spread professional experience in the wider international community of materials scientists and exhibitors.

We strongly believe that through this conference you will acquire many new insights and inspirations for your research. May the latter continue to flourish, furthering the development of new materials, and may the former continue to be a place for meetings and making new contacts for mutual cooperation, in the sincere spirit which has always been traditional for this event.

We would like warmly welcome you and wish all of you fruitful discussions and a useful stay in the High Tatra Mountains during the 18th International Conference on Metallography, Fractography and Materials Science.

Peter Horňák

Chair of the Symposium

THE CONFERENCE IS ORGANIZED BY

ORGANIZERS

Institute of Materials and Quality Engineering
Faculty of Materials, Metallurgy and Recycling
Technical University of Košice, Slovakia
Letná 1/9
042 00 Košice-Sever
Slovakia
+421 55 602 2543
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metalo@konferencie.net
www.konferencie.net/metalo

Institute of Materials Research of the Slovak Academy of Sciences, Košice, Slovakia

Lumakon, s.r.o., Košice, Slovakia

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Institute of Experimental Physics of the Slovak Academy of Sciences, Košice, Slovakia

Research & Development USSE, Košice, Slovakia

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BOOK OF THE CONFERENCE PROGRAMME

ORGANIZING INFORMATION

Date of the Conference

April 27 – 29, 2022

Place of the Conference

Atrium Hotel***, Nový Smokovec, High Tatra Mountains, Slovakia

Conference Site

The conference will be held at the Atrium Hotel situated in Nový Smokovec, in the heart of the beautiful High Tatra mountains in Slovakia. Accommodation for all participants is reserved directly in the Atrium Hotel. There are also accommodation possibilities in other hotels or guesthouses in the vicinity, which are situated quite near the Atrium Hotel.

The Atrium Hotel in the town of Nový Smokovec is a notable venue not only for its specific circular architecture but also thanks to its location at the foot of the peak Slávkovský štít. From the hotel rooms as well as the restaurant with a panoramic view, a marvelous vista of the Tatra Mountains or the sun-lit valley Podtatranská kotlina may be admired. The immediate surroundings of the hotel contain a lot of attractive places for tourists. Only a couple of steps away from the hotel there is the funicular railway Starý Smokovec – Hrebienok, which is the starting point for many hiking paths. Sports possibilities and various forms of non-traditional entertainment can be taken advantage of both in the summer and the winter seasons.

April is the beginning of the spring season in the High Tatras, so there may still be snow at higher altitudes and therefore opportunities for skiing in the mountains (e.g. at Lomnické sedlo). This part of the High Tatras is a well-known winter sports center. The average temperature in April is between +2 and +9 °C.

Conference topics

The 18th International Symposium “Metallography & Fractography 2022” features some special sessions on areas of current interest, and will focus primarily on practical aspects and advances in microstructural characterization techniques, including quantitative evaluation of microstructures, TEM, SEM, EBSD, and

other microanalyses; mathematical modelling and process simulation, stereological and statistical methods in the area of evaluating of microstructure and the process of failure; solidification and solid-state transformations, including segregation and precipitation processes; prediction of microstructures and inter-relationships between microstructure and material properties, with no limitation to classes of materials and technology; welding and joining of materials; fractures, the theory of material failure, defects and material degradation; the utilization of fractography in engineering practice; fatigue and creep, corrosion and oxidation; nonferrous alloys, shape memory alloys; nanostructures and nanocrystalline materials; superconductors, composites, intermetallic, amorphous materials, biomaterials, powder metallurgy and ceramics; coatings and surface engineering; metallography in archaeology (archaeometallurgy).

The Conference Language

The official language of the conference is English. In exceptional circumstances, Slovak and Czech may also be feasible. Lectures, posters, abstracts, and papers must be in the English language.

Registration and Reservation

Participants should register themselves using the Binding Registration Form available on the website konferencie.net/metalo and reserve accommodation at the Atrium Hotel as well.

Accommodation

For the participants in the Metallography & Fractography 2022 Symposium, we have reserved accommodation in the Atrium Hotel. All reservations of the participants in the Atrium Hotel are arranged by the organizer of the conference. For detailed information about reservations of accommodation, contact us by email at metalok@konferencie.net or on mobile phone at +421 903 249 123.

There is a swimming pool, wellness center, and sauna in the hotel. Entry to these is included in the room price. Because of its facilities and appealing range of services, the Atrium Hotel is considered an ideal choice not only for holidaymakers spending their family time together but also for business

clients who make use of the complete congress center and unique premises suitable for organizing conferences, education sessions, seminars, or workshops. The unique hotel premises offer guests plenty of fun and relaxation in any kind of weather. The hotel facilities include, both for accommodated and non-accommodated guests, relax zones for absolute relief of both your body and your mind, 4 Elements Wellness, 4 Elements Aqua and relax zone with a pool bar, energizing wellness facilities, a bowling bar with bowling lanes, and a Wine, Coffee & Tea Lounge.

All requested information about Atrium Hotel is available on www.atriumhotel.sk.

Accommodation Fee

Accommodation and meals beyond the scope of the conference should be arranged with the conference organizers, on the day before the beginning of the conference and on the day after the conclusion of the conference are agreed on the same prices as during the conference. The price list from April 26 – 29, 2022 in the Atrium Hotel is as follows:

Single room: 92 €/person/night
 Double room: 52 €/person/night

Prices of accommodation include breakfast, local tax and unlimited entrance to the relax/spa center and pool.

Conference Fee

The conference fee includes participation in all conference activities, the Abstract Booklet printout available at the Conference Registration Desk, the Conference Proceedings in the indexed journal of “scientific.net” publisher available after a review process of papers, morning and afternoon refreshments, lunches, and dinners during the conference.

The Conference fee	Base / VAT 20 % / Together
Until March 31, 2022*	391.67 €/78.33 €/470.00 €
After April 1, 2022*	416.67 €/83.33 €/500.00 €
For PhD. Students*	291.67 €/58.33 €/350.00 €
For accomp. persons*	125.00 €/25.00 €/150.00 €

Options Item	Base / VAT 20 % / Together
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Additional payment for exhibitors, exhibition table, per 3 days*	200.00 €/40.00 €/240.00 €
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Advertising publication of the company name with the logo on the cover of the Conference Proceedings “Metallography & Fractography XVIII” with the “advertising partner” marking*

500.00 €/100.00 €/600.00 €

One-page black & white advertising of the company in the Abstract Booklet*

150.00 €/30.00 €/180.00 €

One-page colored advertisement of the company in the Conference Proceedings*

500.00 €/100.00 €/600.00 €

Location of the company logo (banner) in the congress hall during the conference*

200.00 €/40.00 €/240.00 €

Conference tour St. Jacob church in Levoča, the ascent to the church tower, bus transport & ticket included

12.50 €/2.50 €/15.00 €

* 0% VAT applies only to organizations that are registered for VAT in their own country, outside of the Slovak Republic. This means it applies to VAT-registered organizations from countries within and outside of the European Union.

All necessary information regarding Payment and VAT will be provided by Mr. Lukáč by phone: +421 903 249 123, or by e-mail: metalo@konferencie.net

Food and beverages

For all participants the catering is as follows:

April 26, 2022	Welcome drink & small snack
April 27, 2022	Lunch and Dinner
April 28, 2022	Lunch and Conference Dinner
April 29, 2022	Lunch

Accommodated participants have breakfast included in the price for accommodation.

Beverages during lunches are not included in the conference fee, and participants should pay for these themselves. Lunches and dinners beyond the scope of the given catering schedule are paid for individually by the participants.

Payment

Please send your payment with the registration application by April 1, 2022. Exceptionally, it is possible to pay the Conference Fee at the Conference Registration Desk in the Atrium Hotel. The application form together with confirmations of Conference fees paid is to be returned online via our website, or by e-mail to metalo@konferencie.net. After April 1, 2022 participants must pay an increased conference fee of 416,67 €/person + 20 % VAT.

Bank details: Fio banka, a.s., Slovak Republic, IBAN: SK22 8330 0000 0023 0081 5059, SWIFT CODE: FIOZSKBAXXX, in favour of Lumakon, s.r.o. Košice, Na Šajbe 1A, 040 01 Košice (company ID No: 47082577, VAT Reg. No.: SK2023759925, registered for VAT). Please remember to include the name of the organization and of the participant in the transfer order.

Cancellation

It is regretted that no refund can be made, or invoices canceled for non-attending conference participants. In this case, the printout of Conference Proceedings "Metallography & Fractography XVIII" in the indexed journal of "scientific.net" publisher will be mailed to non-attending participants. An exchange of conference participants is possible at any time, but information for organizers is required.

We ask authors to note that their accepted papers will be published in the indexed journal of "scientific.net" publisher only after payment of the appropriate conference fee will be received.

For cancellation of the accommodation, the same conditions which apply in the Atrium Hotel are valid.

Conference Registration Desk

The Conference Registration Desk will be open in the lobby of the Atrium Hotel at the following hours:

Tuesday, April 26, 2022	17.00 – 22.00
Wednesday, April 27, 2022	07.00 – 14.00
Thursday, April 28, 2022	08.00 – 10.00

Scientific Programme

Specialist activities will begin on Wednesday, April 27, 2022. Contributions will be presented as invited lectures, conference lectures and in the form of posters.

Lecture Sessions

The speakers of invited lectures will be allowed to talk for 25 minutes, while other conference lectures will have a max. 10 minutes. After each lecture approx. 5 minutes of discussion time are planned, and there may be a general discussion at the end of each section. With this in mind, and as there is only a short time for each presentation of each lecture, please be careful in the preparation of your lecture. For your presentation, you can use a data projector.

It is fully recommended to give the presentation of the lecture presentation to the technician the day before the presentation on a flash key, at least in the morning on the date of the presentation.

Poster Sessions

Those who have applied to present a poster will exhibit their results in Lounge S1 during sessions according to the scientific programme. Visits to poster exhibition sessions include personal discussions with authors and are followed by a more formal chaired discussion session. The panel (poster snap frame) with dimensions of 0.7 m wide and 1.0 m high will be available. The posters are divided in line with the conference programme into two sessions. Authors are urged to use pictures and

texts which are clearly visible, and to avoid excessively long texts.

The Best Poster Competition is included in the programme of the symposium. Three best posters will be adjudicated for each Poster Session.

The Best Metallographic & Fractographic Photo Competition is included in the symposium programme, too. Please apply for this competition at the Conference Registration Desk. This competition will be in two sections: The Best Scientific Photograph and The Most Interesting Curiosity. It is necessary to bring high-resolution printed competition photographs. The technical and aesthetic quality of the pictures will be considered in the judging. The photographs will be displayed on the poster board during the conference.

Exhibition

During the conference, an exhibition of instruments and devices from various companies will be organized. The list of companies taking part in the exhibition, and which also sponsor this symposium, is as follows:

General Advertising Partners:

TESCAN ORSAY HOLDING, a.s.
JEOL Europe SAS
ŽP Research & Development Center s.r.o.

Advertising Partners:

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VUJE, a.s.
Evonik Fermas s.r.o.
ZENA-R Slovakia, s.r.o.
Magna PT s.r.o.

Conference Social Programme

April 26, 2022

Welcome Reception

There will be a Welcome Reception in the Lounge Bar of the Atrium Hotel at 19.00 on Tuesday, April 26, 2022. All registered participants are invited to attend. The reception includes a small snack (not dinner). Dress code – casual.

April 27, 2022

Dinner

The dinner will be held on Wednesday, April 27, 2022 at 19.00. It will be an informal occasion with a minimum of speeches. Dress code – casual.

April 28, 2022

Conference Tour – St. Jacob Church in Levoča

The Roman-Catholic St Jacob church is one of the most important sacral buildings in Slovakia. Its wooden main altar of St. James is the tallest of its kind in the world.

This originally Gothic church was built during the 14th century on the site of an older church. The Gothic St. George chapel is of the same period. The tall slender tower of St. Jacob from the first half of the 19th century is the most distinct feature of the city's silhouette. Especially precious is the interior of the church, which is in fact a unique museum of medieval sacral art.

The Late Gothic main altar of St Jacob at a height of 18.6 m is the tallest of its kind in the world. Made of lime wood in 1507 – 1517 in the workshop of Master Pavol of Levoča the carving, by the Master himself, is of extraordinary high artistic value, whilst the board paintings are attributed to the painter Hans. Part of them is based on the patterns of the wood carvings of Lucas Cranach.

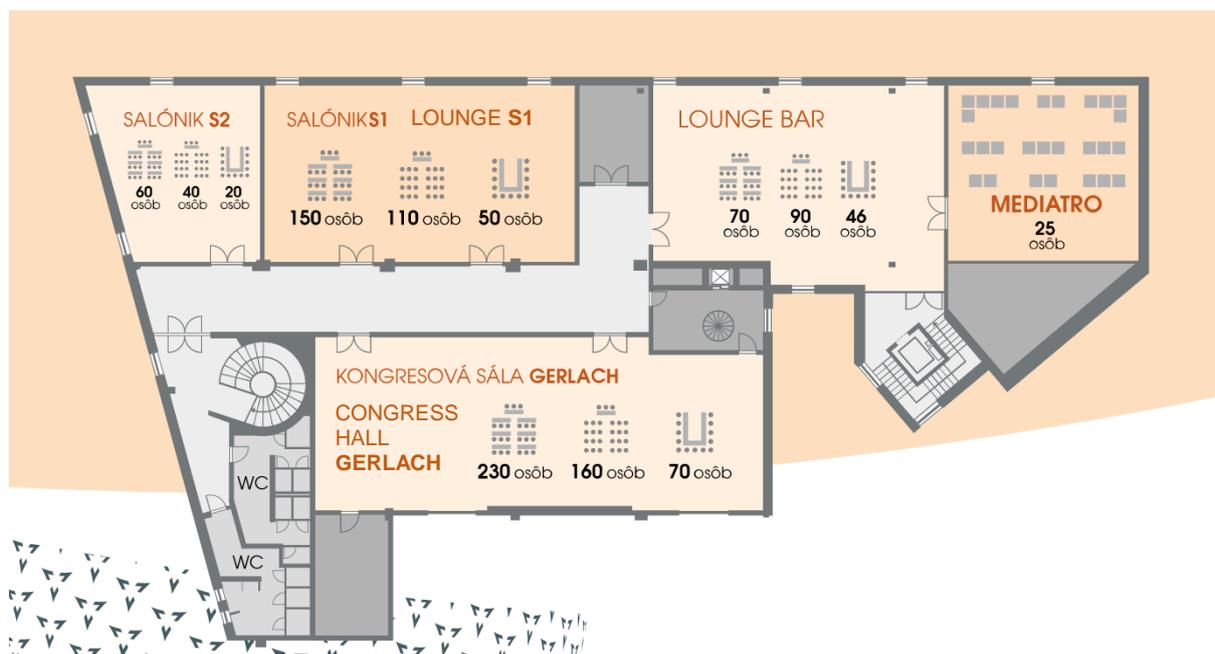
All required information about St. Jacob Church in Levoča is available on <https://slovakia.travel/en/st-jacob-church-levoča>

This Conference tour is for all the participants who ordered it in their Binding Registration Form. The departure of the bus is planned at 14.00 from the parking lot in front of the Atrium Hotel. Exceptionally, you can decide to apply for the Conference tour at Conference Registration Desk, but we are limited by the capacity of the bus. The Conference tour costs 15.00 € (VAT included). The price covers transport by bus and entry ticket.

Conference Dinner

You are kindly invited to the Conference Dinner which will be held in the restaurant of the Atrium Hotel from 19.00 to 24.00. Dress code – business formal.

Hotel Atrium Floor Plan



PROGRAMME AT A GLANCE

TUESDAY, APRIL 26, 2022

- 17.00 – 22.00 Registration (Conference Registration Desk)
- 19.00 – 20.30 Welcome Reception (Lounge Bar)

WEDNESDAY, APRIL 27, 2022

- 07.00 – 09.00 Registration (Conference Registration Desk)

MORNING SESSIONS

- 09.00 – 09.30 Opening Ceremony of the Symposium (Congress Hall Gerlach)
- 09.30 – 10.00 Plenary Session 1 (Congress Hall Gerlach)
- 10.00 – 10.30 Coffee/Tea Break
- 10.30 – 11.30 Exhibitor Presentations 1 (Congress Hall Gerlach)
- 11.30 – 12.30 Poster Session 1, Visit of the Exhibitions (Lounge S1)
- 12.30 – 14.00 Lunch

AFTERNOON SESSIONS

- 14.00 – 14.30 Exhibitor Presentation 2 (Congress Hall Gerlach)
- 14.30 – 16.00 Conference Session 1 (Congress Hall Gerlach)
- 16.00 – 16.30 Coffee/Tea Break
- 16.30 – 17.30 Poster Session 2, Visit of the Exhibition (Lounge S1)
- 19.00 – 22.00 Dinner

THURSDAY, APRIL 28, 2022

MORNING SESSIONS

- 08.30 – 09.30 Plenary Session 2 (Congress Hall Gerlach)
- 09.30 – 10.00 Exhibitors Presentation 3 (Congress Hall Gerlach)
- 10.00 – 10.30 Coffee/Tea Break
- 10.30 – 12.15 Conference Session 2 (Congress Hall Gerlach)
- 12.30 – 14.00 Lunch

AFTERNOON ACTIONS

- 14.00 – 18.00 Conference Tour (St. Jacob Church in Levoča)
- 19.00 Conference Dinner

FRIDAY, APRIL 29, 2022

MORNING SESSIONS

- 09.00 – 09.30 Plenary Session 3 (Congress Hall Gerlach)
- 09.30 – 10.00 Coffee/Tea Break
- 10.00 – 11.15 Conference Session 3 (Congress Hall Gerlach)
- 12.00 – 12.30 Closing Ceremony of the Symposium (Congress Hall Gerlach)
- 12.30 – 14.00 Lunch

**SCIENTIFIC PROGRAMME OF THE
18TH SYMPOSIUM ON METALLOGRAPHY,
FRACTOGRAPHY AND MATERIALS SCIENCE**

Wednesday, April 27, 2022

- 08.00 – 19.00 **Registration**
(Conference Registration Desk)
- 09.00 – 09.30 **Opening Ceremony of the
Symposium**
(Congress Hall Gerlach)

MORNING SESSIONS

Congress Hall Gerlach

**PLENARY SESSION 1
INVITED LECTURE**

Chairs: P. Šajgalík, P. Horňák

**09.30 Materials for hydrogen absorption
storage**

K. SAKSL^{1,2,3}, KUŠNÍROVÁ¹,
L. OROSZOVÁ¹ and D. VARCHOLOVÁ^{1,2}

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³ Faculty of Science, Pavol Jozef Šafárik
University in Košice, Košice, Slovakia

10.00 Coffee/Tea Break

EXHIBITOR PRESENTATIONS 1

Chairs: P. Hvizdoš, P. Horňák

**10.30 From data to information with selective
BSE contrast methods of TESCAN's
CLARA Field-Free UHR-SEM**

I. MORAVČÍK

TESCAN ORSAY HOLDING, a.s., Brno,
Czech Republic

11.00 JEOL latest development in SEM

L. GUILLAUME

JEOL Europe SAS, Croissy-sur-Seine,
France

Lounge S1

**POSTER SESSION 1
VISIT OF THE EXHIBITIONS**

Chairs: B. Ballóková, J. Pokluda

11.30 Posters No.: P01 – P14

12.30 Lunch

AFTERNOON SESSIONS

Congress Hall Gerlach

EXHIBITOR PRESENTATION 2

Chairs: P. Horňák, P. Hvizdoš

14.00 Microstructural changes simulated by quenching dilatometry and high temperature thermal analysis

J. KOLEJKA

Waters Gesellschaft m.b.H., organizační složka, Praha, Czech Republic

CONFERENCE SESSION 1 ADVANCED MATERIALS, NONFERROUS MATERIALS

Chairs: K. Saksl, M. Fujda

14.30 Development of materials for solid state hydrogen storage

K. KUŠNÍROVÁ¹, L. OROSZOVÁ¹, K. SAKSL^{1,2,3}, D. VARCHOLOVÁ^{1,2}, M. LAZÁR⁴, L. TÓTH⁴, N. JASMINSKÁ⁴ and T. BRESTOVIČ⁴

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³ Faculty of Science, Institute of Physics, Pavol Jozef Šafárik University in Košice, Košice, Slovak Republic

⁴ Faculty of Mechanical Engineering, Technical University of Košice, Košice, Slovak Republic

14.45 Light-weight high-entropy alloys for hydrogen storage

D. VARCHOLOVÁ^{1,2}, K. KUŠNÍROVÁ¹, L. OROSZOVÁ¹ and K. SAKSL^{1,2,3}

¹ Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovakia

² Faculty of Materials, Metallurgy and Recycling, Technical University of Košice, Slovakia

³ Faculty of Science, Pavol Jozef Šafárik University in Košice, Slovakia

15.00

Comparison of microstructure and properties of Monel 400 nickel-copper alloy prepared by casting and laser powder bed fusion process

A. CHLUPOVÁ, I. ŠULÁK, I. KUBĚNA and T. KRUML

Institute of Physics of Materials, Academy of Sciences of the Czech Republic, Brno, Czech Republic

15.15

Development of biodegradable Zinc-based alloys for biomedical applications

W. MIŽENKOVÁ^{1,2}, Z. MOLČANOVÁ¹, B. BALLÓKOVÁ¹, K. SAKSL¹ and L. ZRODOWSKI³

¹ Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovakia

² Technical University of Košice, Faculty of Mechanical Engineering, Department of Biomedical Engineering and Measurement, Košice, Slovakia

³ AMAZEMET Sp.zo.o., Warsaw, Poland

15.30

Microstructure analysis of progressive secondary AISi7Mg0.6 alloy with higher Fe content using electron metallography techniques

L. PASTIEROVIČOVÁ, L. KUCHARIKOVÁ, E. TILLOVÁ and M. CHALUPOVÁ

University of Žilina, Faculty of Mechanical Engineering, Department of Materials Engineering, Žilina, Slovak Republic

16.00

Coffee/Tea Break

Lounge S1

POSTER SESSION 2 VISIT OF THE EXHIBITIONS

Chairs: A. Mašlejová, R. Konečná

16.30

Posters No.: P15 – P28

19.00

Dinner

POSTER SESSION 1

Chairs: B. Ballóková, J. Pokluda

METALLOGRAPHIC METHODS

P 01

Automation of metallographic sample etching process

O. AMBROŽ, J. ČERMÁK, P. JOZEFOVIČ and Š. MIKMEKOVÁ

Institute of Scientific Instruments of the CAS, Brno, Czech Republic

P 02

Identification of corrosion mechanisms of stainless steel with metallography cross sections

H. GEIPLOVA, M. VLACHOVA and A. PISKOVA

SVUOM Ltd., Prague, Czech Republic

P 03

Highly accurate structural analysis of austempered ductile iron using EBSD technique

P. KEJZLAR¹, Z. ANDRSOVA¹, M. PETRZILKOVA¹, B. SKRBEK¹ and D. MYSZKA²

¹ Technical University of Liberec, Liberec, Czechia

² Faculty of Production Engineering, Warsaw University of Technology, Warszawa, Poland

P 04

A study of cut surface after the abrasive water jet application on the MS1 material prepared by DMLS method

R. VANDZURA, V. SIMKULET, F. BOTKO and M. GELATKO

Department of Automobile and Manufacturing Technologies, Faculty of Manufacturing Technologies with a Seat in Presov, Technical University of Kosice, Presov, Slovakia

INTERRELATIONSHIP BETWEEN MICROSTRUCTURE AND MATERIAL PROPERTIES

P 05

Analysis of tribodegradation factors limiting the life of the molds

J. BREZINOVÁ¹, M. DŽUPON², J. VIŇÁŠ¹, J. BREZINA¹ and J. HAŠUL¹

¹ Technical University of Košice, Faculty of Mechanical Engineering, Košice, Slovakia

² Slovak Academy of Sciences, Institute of Materials Research, Košice, Slovakia

P 06

Stress-strain state and texture evolution in cold drawing of steel tubes

P. BURIK¹, P. BELLA¹ and P. KEJZLAR²

¹ ŽP Research and Development Centre, Podbrezová, Slovak Republic

² Technical University of Liberec, Institute for Nanomaterials, Advanced Technology and Innovation, Liberec, Czech Republic

P 07

Formation of sulphides in as-cast GOES thin strips

K. HRADEČNÝ, R. PALUPČÍKOVÁ, A. VOLODARSKAJA and V. VODÁREK
VSB – Technical University of Ostrava, Faculty of Materials Science and Technology, Ostrava–Poruba, Czech Republic

P 08

The effect of improper post bend heat treatment on microstructure and properties of a pipe bend made of 0.5Cr-0.5Mo-0.3V steel

Z. KUBOŇ¹, V. VODÁREK² and G. ROŽNOVSKÁ¹

¹ MATERIAL AND METALLURGICAL RESEARCH, Ltd., Ostrava–Vítkovice, Czech Republic

² VŠB – Technical University of Ostrava, Faculty of Materials Science and Technology, Ostrava–Poruba, Czech Republic

P 09

Correlation of magnetic structural and mechanical properties of selected classes of microwires

J. MILKOVIČOVÁ, O. MILKOVIČ, P. HVIŽDOŠ, R. SEDLÁK and T. CSANÁDI

Slovak Academy of Sciences, Institute of Materials Research, Košice, Slovakia

P 10

Optimization of the manufacturing process of sintered Fe-Mn-Cr-Mo-C steels using ANOVA

M. SULOWSKI, P. MATUSIEWICZ and P. KIJ

AGH University of Science and Technology, Faculty of Metals Engineering and Industrial Computer Science, Kraków, Poland

FRACTURE

P 11

Dynamic fracture characteristics of high-strength steel

M. KIANICOVÁ¹, I. DLOUHÝ², P. ŠANDERA³, J. HORNÍKOVÁ³ and J. POKLUDA^{1,3}

¹ Faculty of Special Technology, Alexander Dubcek University of Trencin, Trencin, Slovakia

² Institute of Physics of Materials AS CR, Brno, Czechia

³ Faculty of Mechanical Engineering, Brno University of Technology, Brno, Czechia

P 12

Metallography of fractured aluminium alloys for the transmission system's elements

K. KREISLOVA and L. TUREK
SVUOM Ltd., Prague, Czech Republic

P 13

Fracture Mechanisms of Austenitic Steel Caused by Dynamic Tests

M. UHRÍČIK, P. PALČEK, M. CHALUPOVÁ, L. KUCHARIKOVÁ, V. ZATKALÍKOVÁ, J. BELAN, M. ORAVCOVÁ and I. PASTIEROVIČOVÁ
University of Žilina, Faculty of Mechanical Engineering, Department of Material Engineering, Žilina, Slovakia

FATIGUE

P 14

The fractographic analysis of static and fatigue fracture surfaces in secondary A356 aluminum alloy with a higher concentration of iron

L. KUCHARIKOVÁ, E. TILLOVÁ, M. CHALUPOVÁ, M. UHRÍČIK, L. PASTIEROVIČOVÁ and J. BELAN
University of Žilina, Faculty of Mechanical Engineering, Department of Materials Engineering, Žilina, Slovakia

POSTER SESSION 2

Chairs: A. Mašlejová, R. Konečná

ADVANCED MATERIALS

P 15

Microstructure characterization of Fe-based nanomaterials by high-energy X-ray scattering techniques

A. BALDOVSKÝ¹, D. YUDINA¹, V. GIRMAN¹, M. LISNICHUK¹, P. SOVÁK¹ and J. BEDNARČÍK^{1,2}

¹ Institute of Physics, Faculty of Science, P. J. Šafárik University in Košice, Košice, Slovakia

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P 16

Thermal shock resistance of ultra high temperature ZrB₂ ceramic composites

M. IVOR^{1,2}, A. KOVALČÍKOVÁ² and J. Dusza²

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² Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovakia

P 17

Ceramic nano/microfibers as filler for composites

I. KORIBANICH^{1,2}, E. MUDRA¹, A. KOVALCIKOVA¹, I. SHEPA¹, V. GIRMAN³, M. HRUBOVCAKOVA¹, D. PAVLINAK⁴, M. BALAZ⁵ and J. DUSZA¹

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⁴ Department of Physical Electronics, Masaryk University, Brno, Czechia

⁵ Institute of Geotechnics, Slovak Academy of Sciences, Kosice, Slovak Republic

P 18

Microstructural analysis of EuBCO bulks with and without holes

V. KUCHAROVÁ¹, P. DIKO¹, M. LOJKA^{2,3}, T. HLÁSEK² and V. PLECHÁČEK²

¹ Institute of Experimental Physics, Slovak Academy of Sciences, Kosice, Slovakia

² CAN Superconductors, Kamenice, Czech Republic

³ Faculty of Chemical Technology, University of Chemistry and Technology, Prague, Czech Republic

P 19

Influence of ligands on physicochemical characteristics of magnetic nanoparticles

J. SZUCSOVA¹, A. ZELENKOVA¹, L. NAGY¹, M. BARUTIAK¹, E. BENOVA², V. ZELENKOVA² and V. ZAVISOVA³

¹ Department of Condensed Matter Physics, P. J. Safarik University in Kosice, Kosice, Slovakia

² Department of Inorganic Chemistry, P. J. Safarik University in Kosice, Slovakia

³ Institute of Experimental Physics, SAS, Kosice, Slovakia

P 20

Processing and mechanical properties of (Hf-Ta-Zr-Nb-Ti)C

L. TIMKOVA^{1,2}, T. CSANADI¹, M. HRUBOVCAKOVA², A. KOVALCIKOVA², A. NAUGHTON DUSZOVA², I. VASKOVA¹ and J. DUSZA²

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P 21

Microstructure of YBCO bulk samples grown via 45°-twin-seeds

K. ZMORAYOVA¹, P. DIKO¹ and X. YAO²

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² Shanghai Jiao Tong University, Sch Phys & Astron, Key Lab Artificial Struct & Quantum Control, State Key Lab Met Matrix Composites, Minist Educ, Shanghai, Peoples R China

NONFERROUS MATERIALS

P 22

Development and research of copper filter for full face masks prepared by powder metallurgy technology

B. BALLÓKOVÁ¹, Z. MOLČANOVÁ¹, T. BRESTOVIČ², N. JASMINSKÁ², Š. MICHALIK³ and K. SAKSL¹

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³ Diamond Light Source Ltd., Harwell Science and Innovation Campus, Didcot, United Kingdom

P 23

Formation of alpha-case layer during oxidation of Ti6Al4V surface by annealing at 1050 °C and change of microstructure after different cooling rates

J. BELAN, M. UHRÍČIK, L. KUCHARIKOVÁ, E. TILLOVÁ and L. PASTIEROVIČOVÁ

Department of Materials Engineering, Faculty of Mechanical Engineering, University of Žilina, Žilina, Slovakia

P 24

Direct production of tin bronzes from copper and cassiterite

R. HAUBNER and S. STROBL

Technische Universität Wien, Institute of Chemical Technologies and Analytics, Vienna, Austria

P 25

Influence of cavitation in seawater on the etching attack of manganese-aluminum-bronzes (MAB)

P. LINHARDT¹, M. V. BIEZMA², S. STROBL¹ and R. HAUBNER¹

¹ Technische Universität Wien, Institute of Chemical Technologies and Analytics, Vienna, Austria

² University of Cantabria, Dique de Gamazo, 1, Santander, Spain

P 29

Influence of oxide dispersoids content on the structure and thermal structure stability of copper nanocomposite

F. KROMKA^{1,2}, K. ĎURIŠINOVÁ¹, J. SZABÓ¹, J. ĎURIŠIN¹, M. FÁBEROVÁ¹ and O. MILKOVIČ^{1,3}

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³ Institute of Experimental Physics of Slovak Academy of Sciences, Košice, Slovak Republic

BIOMEDICAL MATERIALS

P 26

The yttrium substitution impact on the mechanical properties of

biodegradable Mg₆₆Zn₃₀Ca₄ alloy

Z. MOLČANOVÁ¹, B. BALLÓKOVÁ¹, W. MIŽENKOVÁ^{1,2}, M. DŽUPON¹, D. ZALKA^{1,3} and K. SAKSL^{1,3}

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DIGITAL IMAGE PROCESSING METHODS

P 27

Evaluation of sample preparation importance for digital image correlation during cold deformation

T. BRLIĆ, I. JANDRLIĆ and L. MRKOBRAĐA

Faculty of Metallurgy, University of Zagreb, Sisak, Croatia

Creep resistance and microstructure evolution in HR3C–P92 heterogeneous welds

V. VODÁREK¹, Z. KUBOŇ², P. VÁŇOVÁ¹,
R. PALUPČÍKOVÁ¹ and S. LANGER¹

¹ VŠB – Technical University of Ostrava,
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**SCIENTIFIC PROGRAMME OF THE
18TH SYMPOSIUM ON METALLOGRAPHY,
FRACTOGRAPHY AND MATERIALS SCIENCE**

Thursday, April 28, 2022

- 08.00 – 10.00 **Registration**
13.00 – 14.00 (Conference Registration Desk)
- 10.00 – 14.00 **Visit of the Exhibitors**
(Lounge S1)

MORNING SESSIONS

Congress Hall Gerlach

**PLENARY SESSION 2
INVITED LECTURES**

Chairs: J. Dusza, P. Horňák

- 08.30** **Slag from modern copper production
found in Bergwerk, Burgenland, Austria**
R. HAUBNER and S. STROBL
Technische Universität Wien, Institute
of Chemical Technologies and
Analytics, Vienna, Austria

- 09.00** **Metallography and fractography of high
entropy ceramics**
J. DUSZA
Institute of Materials Research,
Slovak Academy of Sciences, Košice,
Slovak Republic

EXHIBITOR PRESENTATION 3

Chairs: P. Horňák, M. Fujda

- 09.30** **Thermal characterization of Metals and
Alloys (KEP SETARAM) / EM sample
preparation and observation (Hitachi,
Leica-microsystems)**
J. GOLDA and M. BAČÍK
SPECION, s.r.o., Prague, Czech Republic

- 10.00** **Coffee/Tea Break**

**CONFERENCE SESSION 2
INTERRELATIONSHIP BETWEEN
MICROSTRUCTURE AND MATERIAL
PROPERTIES, FATIGUE, BIOMEDICAL
MATERIALS**

Chairs: S. Pytel, J. Kasl

- 10.30** **Characterization of a San Mai steel
composite for the manufacture of
knives**
S. STROBL and R. HAUBNER
Technische Universität Wien, Institute of
Chemical Technologies and Analytics,
Vienna, Austria

10.45

Microstructure and fatigue behavior of high performance aluminum alloy Al2024 produced by Laser Powder Bed Fusion

R. KONEČNÁ¹, T. VARMUS¹, F. URIATI² and G. NICOLETTO²

¹ University of Zilina, Zilina, Slovakia

² University of Parma, Parma, Italy

11.00

High-temperature low cycle fatigue of nickel-based superalloy IN738LC

I. ŠULÁK, A. CHLUPOVÁ and K. OBRTLÍK

Institute of Physics of Materials, Academy of Sciences of the Czech Republic, Brno, Czech Republic

11.15

Investigation of fatigue failure in electric locomotive axle

S. PYTEL

Institute of Technology, State University of Applied Sciences, Nowy Sącz, Poland

11.30

Analysis of cracks of thermostats casings made of brass

J. KASL, D. AIŠMAN and R. FIKRLOVÁ

VZÚ Plzeň, Plzeň, Czech Republic

11.45

Structure and properties of FeGaX (X=Tb, Y) alloys

V. MILYUTIN, R. BUREŠ, M. FÁBEROVÁ and Z. BIRČÁKOVÁ

Institute of Materials Research, Slovak Academy of Sciences, Kosice, Slovak Republic

12.00

Microstructure-properties characterization of selective laser melted biomedical Co-28Cr-6Mo alloy

B. EFREMENKO¹, V. ZURNADZHY², Y. CHABAK², A. G. LEKATOU³, P. HORNAK⁴, M. VOJTKO⁵ and V. EFREMENKO²

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² Pryazovskyi State Technical University, Department of Physics, Mariupol, Ukraine

³ University of Ioannina, Department of Materials Science and Engineering, Ioannina, Greece

⁴ Faculty of Materials, Metallurgy and Recycling, Technical University of Kosice, Kosice, Slovakia

⁵ Slovak Academy of Sciences, Institute of Materials Research, Kosice, Slovakia

12.30

Lunch

AFTERNOON ACTIONS

14.00

Conference Tour (St. Jacob Church in Levoča)

19.00

Conference Dinner

**SCIENTIFIC PROGRAMME OF THE
18TH SYMPOSIUM ON METALLOGRAPHY,
FRACTOGRAPHY AND MATERIALS SCIENCE**

Friday, April 29, 2022

MORNING SESSIONS

Congress Hall Gerlach

**PLENARY SESSION 3
INVITED LECTURE**

Chairs: J. Dusza, P. Horňak

09.00 **Influence of surface machining on development of stress corrosion cracking of distribution wheels of main circulation pump in nuclear power plants**

M. DOMÁNKOVÁ¹, K. BÁRTOVÁ¹,
V. MAGULA², P. BRZIAK², B. NOVÁK²,
T. KICKA³ and V. JURČO³

¹ Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava, Slovakia

² Welding Research Institute, Bratislava, Slovakia

³ Science and Research Centre Ltd, Kalná nad Hronom, Mochovce, Slovakia

09.30 **Coffee/Tea Break**

**CONFERENCE SESSION 3
PROCESS SIMULATION, METALLOGRAPHIC
METHODS, WELDINGS**

Chairs: M. Dománková, R. Haubner

10.00 **Numerical simulation of the welding process during the main circulation pump impeller repair**

M. BALÁŽ
Welding Research Institute, Bratislava,
Slovakia

10.15 **Technology influence on the quality of cladding layers**

J. VIŇÁŠ, J. BREZINOVÁ, J. BREZINA
and H. SAILER
Technical University of Košice, Faculty
of Mechanical Engineering, Košice,
Slovakia

10.30 Carbon fibers doped by binary phosphides as an electrocatalytic layer for PEM electrolyzers

C. BERA^{1,2} and M. STREČKOVÁ¹

¹ Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovakia

² Faculty of Materials, Metallurgy and Recycling, Technical University of Košice, Košice, Slovakia

10.45 Application of copper powder in manufacturing of composite filament in 3D printings

A. DZINDZIORA, D. DZIENIAK and M. SULOWSKI

AGH University of Science and Technology in Kraków, Poland

11.00 Optimization of raster point deposition methodology for deformation analyses

A. DUCHAC^{1,2} and P. KEJZLAR²

¹ Centrum výzkumu Řež s.r.o., Husinec – Řež, Czechia

² Technical University of Liberec, Liberec, Czechia

12.00 Closing Ceremony of the Symposium (Congress Hall Gerlach)

12.30 Lunch

