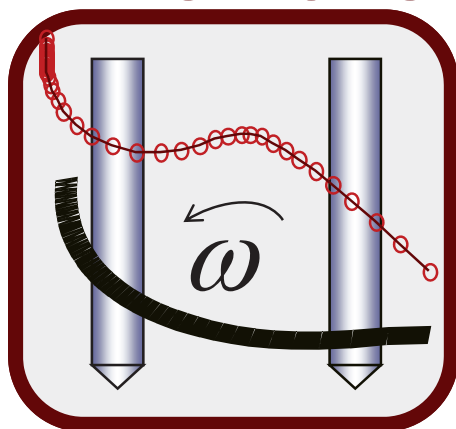


Program Book

International Workshop on Impedance Spectroscopy

IWIS 2013



September 25-27, 2013
Chemnitz University of Technology
Germany

Chairman's Welcome Message

Encouraging the active scientific dialogue between specialists in the field of Impedance Spectroscopy from different backgrounds and fields of science and technology is the aspired aim of the international workshop on impedance spectroscopy (IWIS).

Scientists working in different fields of research, such as electro chemistry, material science, biology and medicine, electronics and sensors meet together and present recent developments and findings. Tutorials give a good overview of special basics all around the method and make this challenging measurement method better accessible. An exhibition informs about the latest news concerning measurement equipment and devices. These are the main components of this annual international workshop taking place at Chemnitz University of Technology.

The IWIS workshop has established itself as a platform for promoting experience exchange and networking in the scientific and industrial field. In its sixth edition the IWIS workshop includes more than sixty contributions from 10 countries in 11 sessions, three plenary talks and seven tutorials. Selected contributions from the workshop are published within the book series Lecture Notes on Impedance Spectroscopy by Taylor & Francis. The peer reviewed series aims to highlight new advances and presents different approaches in dealing with impedance spectroscopy including modeling, measurement and applications.

In IWIS 2013 a group of experts for Impedance Spectroscopy will be launched to build a network of outstanding specialists and professionals from science and industry.

The organization of the workshop has requested a considerable effort of the organizing team from the chair for measurement and sensor technology which makes it possible to organize this international event actually within Chemnitz University of Technology. Additionally the Workshop was co-organized by the Chemnitz School of Metrology (CSM e.V.), whose support for the event is highly acknowledged.

We thank the IEEE Instrumentation and Measurement Chapter Germany for the technical assistance of the event.

We would like to thank you for choosing IWIS 2013 and for coming to Chemnitz!

Prof. Olfa Kanoun
General Chair

IWIS 2013 Organizers

General Chair

Olfa Kanoun

Honory Chair

H.-R. Tränkler

Program Committee

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Contact Information

Chair for Measurement and Sensor Technology

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General Information

The City of Chemnitz

Chemnitz, more than 800 years old, is situated in the heart of Saxony. The city is the third-largest in Saxony and is designated as "City of Modernity". Developed at the time of Classical Modernism, it became the "Manchester on Saxony", giving impulses to the development of business and science. The influences of the cultural and architectural Modernism are visible so that Chemnitz is today city with many interesting facets. Fascinating architecture reflects the changing times and spirit of those things which have shaped the city: industrial monuments, redeveloped Gründerzeit residential quarters such as Kassberg, Villa Esche or the city centre, which has been completely modified since reunification, constructed by Helmut Jahn, Hans Kollhoff and Christoph Ingenhoven, bridge the gap from yesterday to today and to tomorrow.



Bars & Restaurants

If you want to spend one evening in the modern city-center of Chemnitz, there is a couple of nice bars and restaurants around. You may want to try the following:

Tillmanns – Brückenstraße 17, www.tillmanns-chemnitz.de
Turm Brauhaus – Neumarkt 2, www.turmbrauhaus.de
La Bouchée – Innere Klosterstraße 9, www.la-bouchee.de
Buono – Theaterstraße 7, www.bouno-chemnitz.de
Henrics – Theaterstraße 11, www.henrics-lounge.de
Janssen – Schloßstraße 12, www.janssen-restaurant.de
Brazil – Innere Klosterstraße 10, www.restaurant-brazil.de
Café Moskau – Straße der Nationen 56, www.cafemoskau-chemnitz.de
Diebels Fasskeller – An der Markthalle 3, www.fasskeller.de
Ratskeller – Markt 1, www.ratskeller-chemnitz.de
Bar Mozart – Strasse der Nationen 56, www.mozartbar-chemnitz.de
Esperanto – Carolastraße 7, www.esperanto-network.de
Maroon – Ulmenstraße 16, www.maroon-bar.de
City Pub – Brückenstraße 17, www.tower-pub.de
Schalom Restaurant – Carolastraße 5, www.schalom-chemnitz.de
Weinerts – Jakobikirchplatz 4, www.weinerts-chemnitz.de

Conference Venue

The International Workshop on Impedance Spectroscopy will take place at the Campus of Chemnitz University of Technology. You can find it at:

Technische Universität Chemnitz
Neues Hörsaal und Seminargebäude
Room N113
Reichenhainer Straße 90
09126 Chemnitz

Social Event – Discover Saxon Castles

04:20 - 10:00 PM

After the last lecture on Wednesday a bus is waiting at 16:10 for the ones who want to take part in the trip to Hunting Lodge Augustusburg. Sitting on top of the Schellenberg, Augustusburg castle is widely visible. Due to its special architecture and roof design it is called the crown of the ore mountains. After a short bus trip we will arrive at 5:15 pm at the village Erdmannsdorf and then use a gondola to go up to the castle. We then have two choices: one is to go on a guided tour through the castle, the other is to go for the summer luge track and enjoy the 570 m ride down the Schellenberg.

At 7:00 pm we'll have a hearty wine and dine at the cellar Augustus. This was the old magazin of the castle which, in ancient ages, holds large amounts of beer, wine, ham, venison and all the things that are necessary for a 'King-size' life at the castle.



Jagdschloss Augustusburg (©Schlösserland Sachsen)

After the dinner our bus will go back to Chemnitz at around 9:00 pm.

Special Dinner – Schloss Rabenstein

7:30 - 11:00 pm

Our Special Dinner will be held at the baroque castle Rabenstein close to Chemnitz. Build as a manor house in 1776 by Johann Georg Siegert for his only daughter Rahel Amalie as the castle was soon surrounded by a park in the English style. Since then the castle was owned by various people and since 1950 it is property of the city of Chemnitz. After multiple restaurations it is now part of the Schlossbergmuseum Chemnitz. The bus tranfer to the castle will make three stops: 6:30 pm at the university, 6:40 pm at the Seaside hotel, 6:50 pm at the Chemnitzer Hof and 7:00 pm at the hotel Mercure. The bus will leave castle Rabenstein at around 11:00 pm.

The buffet and water is included into the conference fee, all other beverages must be paid by yourself.



Castle Rabenstein (©Hotel Schloss Rabenstein)

Travel to Chemnitz

You can reach Chemnitz University of Technology via car and train.

By Car from Autobahn A72:

- Take the motorway exit 'Chemnitz Süd'
- Use B173 / Neefestraße direction 'Stadtzentrum'
- After 1 km turn right on the B169 / 'Südring'
- After 5.5 km use exit 'Reichenhainer Straße' direction 'Technische Universität'
- You'll reach campus after 1.5 km, the conference venue is on the left side

By Car from Autobahn A4:

- Take the motorway exit 'Chemnitz Mitte'
- Use B95 and go straight ahead until B95 turns left - don't turn left
- Go ahead on 'Gustav Freytag Straße' and turn right at the 'Reichenhainer Straße'
- After 1.3 km you'll reach campus, the conference venue is on the right side

By train:

- Get off at Chemnitz central station and use tram 6 or 522 direction 'Zentralhaltestelle'
- Get off the tram at Station 'Roter Turm'
- Use Bus 51 direction 'Altchemnitz' or 'Reichenhain'
- Get off at 'TU Campus Reichenhainer Straße'

Airport:

- The next nearby Airports are Dresden and Leipzig
- From airport Dresden go A4 direction Chemnitz/Erfurt.
- From airport Leipzig-Halle go on A14 direction Dresden, at 'Dreieck Nossen'
go on A4 direction Chemnitz/Erfurt. Proceed as described above.

Taxi

If you need a taxi in Chemnitz call: +49 371 369 000

Getting Around in Chemnitz

All buses and trams in Chemnitz meet at the Central Bus Station ('Zentralhaltestelle').

Information about public transport and timetables you can find here:

www.cvag.de

www.opnvkarte.de

Getting from the Hotel Mercure to the university:

Take a 5 to 10 minute walk to the bus station 'Roter Turm', closely located to the hotel Mercure and take the bus line 51 or E51 into direction 'Chemnitz, Altchemnitz' or 'Chemnitz, Reichenhain'. The station at the university is named 'TU Campus' and is directly in front of the entrance to the university.

Internet Access

During the event wireless network is available at the campus site. Please use the following registration information to login:

Network name – special

WPA2 key – iwis2013

If you have problems connecting to the network please ask organizers for help.



Map of City Centre

Exhibition

During the workshop the following exhibitors will be present:



Agilent Technologies

AMETEK[®]

BELLTEC

Ing. Büro Glocke

Messtechnik für Forschung und Industrie

EKTechnologies

Zukunftsweisende Messtechnik zu fairen Preisen

elko

**scio
spec**
scientific instruments

sai **Scribner Associates**
Incorporated
ADVANCED PRODUCTS FOR ELECTROCHEMICAL RESEARCH

ZAHNER

M E S S Y S T E M E

Program

Wednesday, September 25th, 2013

The workshop takes place in the central lecture hall room N113.

8:00 - 8:30 **Registration**

8:30 - 9:20 **Tutorial 1**

Non-Linear Behavior of Biological Material – Channels and Electroporation

U. Pliquett, Institut für Bioprozess- und Analysenmesstechnik e.V.

9:30 - 10:20 **Tutorial 2**

An Overview of EIT

R. Bayford, Middlesex University

10:30 - 11:20 **Tutorial 3**

Properties of Coatings from the Point of View of EIS

W. Strunz, ZAHNER-Elektrik

11:30 - 12:20 **Tutorial 4**

Modeling of Impedance Spectra

U. Tröltzsch, Technische Universität Chemnitz

10:30 - 11:20 **Lunchbreak**

13:20 - 14:10 **Tutorial 5**

ZView: Cross Platform Impedance Data Analysis and Equivalent Circuit Modeling

K. Cooper, Scribner Associates Inc.

14:20 - 15:10 **Tutorial 6**

Impedance measurement methods from DC to THz

B. Schweiger, Agilent Technologies

15:20 - 16:10 **Tutorial 7**

Nonlinear Parameter Estimation

P. Büschel, Technische Universität Chemnitz

16:20 **Social program**

Thursday, September 26th, 2013

8:00 - 8:30 **Registration**

8:30 - 8:45 **Opening**

8:45 - 9:30 **Plenary Talk** - Impedance Spectroscopy for Measurement and Sensor Solutions; *O. Kanoun*

Session 1a - Batteries

Chair: N. Wagner

9:30 - 10:30 Influence of Relaxation Time Before EIS Measurements on Li-Ion Batteries; *F. Kindermann, P. Keil, A. Noel, A. Jossen*

Impedance Spectroscopy of Lithium-Ion Cells at Frequencies Down to μHz ; *A. D. Schmid, A. Gruhle*

Thermal Characterization of Li-Ion Batteries: Accelerating Thermal Impedance Spectroscopy; *P. Keil, K. Rumpf, A. Jossen*

Session 1b - Sensors

Chair: J. Himmel

9:30 - 10:30 3D Eddy Current Modelling for Non Destructive Crack Detection; *T. Morgenstern, R. Brodskiy, J. Weidenmüller, O. Kanoun, J. Himmel*

Impedimetric Titanium Dioxide Thin-Film Gas Sensors; *L. Ebersberger, A. Fischerauer, G. Fischerauer*

Online Detection of the Critical Micelle Concentrations of Commercial Detergents by Impedance Spectroscopy; *R. Gruden, W. Köbele, D. Tran, O. Kanoun*

10:30 - 11:00 **Coffee Break, Exhibition**

Session 1a - Batteries

Chair: N. Wagner

11:00 - 11:40 Physico-Chemical Modelling of Li-Ion Batteries: Parameter Analysis in the Frequency Domain; *S. Erhard, F. Spingler, A. Rheinfeld, S. Kosch, K. Rumpf, A. Jossen*

Effect of Phthalic Anhydride in a Non-Aqueous Electrolyte
in 1 Lithium Manganese Dioxide Battery; *J.-Y. Choi,*
G. Fehrmann, R. Staub

Session 1b - Sensors

Chair: J. Himmel

- 11:00 - 11:40 Impedance Measurements in the Paper Industry; *S. Päßler,*
F. Gerlach, K. Ahlborn, W. Vonau, U. Rother, T. Kuhnke
Contactless Impedance Sensor for Droplet Sensing;
B. Cahill, S. Wiedemeier, G. Gastrock
- 11:40 - 12:20 **Plenary Talk** - Potential of Impedance Spectroscopy for
Cable Diagnostics; *Q. Shi*
- 12:20 - 13:20 **Lunch, Exhibition**
- 01:20 - 02:05 **Exhibitors Presentations**
- 02:05 - 02:15 **Short Break**

Poster Presentation

- 02:15 - 03:15 Intermodulated Differential Immittance Spectroscopy: Physical
Fundamentals and Instrumental Setup;
A. Battistel, F. La Mantia
Electrical Properties of 5% Sn-Doped $\text{Ba}_{0.75}\text{Sr}_{0.25}\text{Ti}_{0.95}\text{O}_3$
Perovskite; *R. Brahem, H. Rahmouni, N. Farhat,*
J. Dhahri, K. Khirouni
Fabrication and Applications of 3 Dimensional Interdigital
- Structures; *I. Tobehn, K. Hasche, T. Frank, K. D. Preuß,*
R. Tüschner, H. Wünscher, A. Steinke
Theoretical Analysis of the Effective Masses, Bonding and
Optical Properties of Zinc-Blende Cadmium Chalcogenides;
S. Ouendadji
Electrochemical Impedance Spectroscopy Evaluation of Sol-
Gel Coating Doped by Hydroxyapatite; *M. F. Pinheiro,*
G. de Vargis Brião, V. R. Roque, C. G. Dariva,
A. P. J. Roquete, A. Galio

Measurements of Temperature Dependency of Graphene Oxide/Carbon Nanotube Films by Electrical Impedance Spectroscopy; *A. Al-Hamry, S. Vijayaragavan, R. Sharma, C. Müller, O. Kanoun*

Comparison Between the High Temperature Thermoluminescence Spectra in Annealed LiF:Mg,Cu, LiF:Mg,Si and LiF:Mg,Cu,Si; *M. Halimi, A. Kadari, D. Kadri, I. Missoum*

Nonresonant Raman Spectrum of C₇₀@BNNT Peapods; *F. Fergani, A. Rahmani*

Highlighted of Defects in Alumina α -Al₂O₃ and Their Characterization by Auger Electron Spectroscopy, Cathodoluminescence and Thermoluminescence; *M. Ghamnia*

Characterization for Layers Hot Galvanized of Low Carbon Steel Obtained by Different Immersion Times; *L. Darsouni, A. Khettache, S. Atailia, M. Z. Touhami, M. Baccouche*

The Effects of Chromatic Dispersion in the Optical Transmission; *K. Saliha, B. Badra, L. Bachir*

Characterization of Spinel Zinc Cobalt Oxide Thin Films, in the Range of X From 0 to 1, Prepared by a Facile Spray Pyrolysis Technique Using Perfume Atomizer; *C. Tarek, E. Hassan, L. Ahmed, E. S. Bachir*

Modeling Li-Ion Conductivity in LiLa(PO₃)₄ Powder; *M. Ferhi, K. Horchani-Naifer, K. Ben Saad, M. Ferid*

Thermoelectric Properties of Semi Conducting Sb_{71.22}Co_{2.97}Fe_{20.77}Ce_{5.04}; *M. Chitroub*

Electrochemical Impedance Spectroscopy of Quantum Dot Solar Cells; *R. Milan, I. Concina, A. Vomiero, G. S. Selopal, G. Sberveglieri*

Feature Extraction for Meat Characterisation; *M. Guermazi, O. Kanoun, N. Derbel*

AC-Study of Electrochemical Properties of Multi-Walled Carbon Nanotubes/PEDOT:PSS Composites; *A. Benchirouf, A. Sanli, C. Müller, O. Kanoun*

Monitoring Cole Parameters of Red Blood Cell Concentrates During Storage; *O. M. Can, Y. Ülgen, H. Bilgen*

Crystal Structure, Vibrational Spectra and Electrical Properties of Tetrapropylammonium Dihydrogenmonoarsenate Bis Arsenic Acid; *I. Dhouib, T. Mhiri, Z. Elaoud*

Session 4 - Theory I

Chair: P. Büschel

03:05 - 04:25 Developing Impedance Models Based on Model Classes;
U. Tröltzsch, O. Kanoun

Reconstruction of Causal Impedance Spectra;
W. Strunz; M. Multerer

Application of Intermodulated Differential Immittance Spectroscopy to the Nonlinear Analysis of Electrochemical Systems; *A. Battistel, F. La Mantia*

Non-Linear Analysis: Studying the Kinetics of Fe(ii) / Fe(iii) Cyanide Complex Through the Intermodulated Differential Immittance Spectroscopy; *A. Battistel, F. La Mantia*

04:25 - 04:40 **Short Break**

Session 5 - Theory II

Chair: R. Bayford

04:40 - 05:20 An Approach for Computing and Tracking the Impedance Spectrum of Time-Variant Systems Using Regular Operation Signals; *M. Schoenleber, E. Ivers-Tiffée*

Data Analysis in Impedance Spectroscopy: From Single Spectra to Large Experimental Datasets; *A. Bandarenka*

Investigation of the Sensitivity of an Analytical Eddy Current Model for Data Analysis;
F. Wendler, P. Büschel, O. Kanoun

07:30 - 11:00 **Special Dinner**

Friday, September 27th, 2013

8:30 - 9:15 **Plenary Talk** - What can System Identification Offer to Impedance Spectroscopy?;
R. Pintelon, E. Louarroudi, J. Lataire

Session 6 - Biomedical I

Chair: U. Pliquet

9:15 - 10:35 Bis: A Early Warning System for Decompensation?;
S. Weyer, M. Zink, S. Leonhardt

Estimation of Blood Alcohol Content With Bioimpedance Spectroscopy; *M. Ulbrich, M. Czaplík, A. Pohl, M. Zink, S. Leonhardt*

A Cell-Impedance Sensor Chip for Breast Cancer Cells Detection With Single Cell Resolution;
T. A. Nguyen, T.-I Yin, G. Urban

Miniaturized Wound Sensors for Chromatin Detection;
A. Schröter, G. Gerlach, A. Rösen-Wolff, J. Wendler, A. Nocke, C. Cherif

Session 7 - Interfaces

Chair: W. Strunz

9:15 - 10:35 The Constant Phase Element Reveals 2d Phase Transitions in Adsorbate Layers at the Electrode/Electrolyte Interfaces;
J. Tymoczko, W. Schuhmann, A. Bandarenka

Materials Investigations of Anodic Oxide Layers on Aluminium by EIS; *C. Lämmel, M. Schneider*

Sol-Gel Coatings on Ti Grade 4 Implants for Corrosion Protection in Medical Applications; *M. Catauro, F. Bollino, P. Papale, C. Landi, M. Luiso, D. Gallo, A. Rosano*

Interface Behavior of PbO₂ Layer Deposited on Different SiO_x Interlayers Using Stainless Steel as a Substrate;
H. Baccour-Akrout, I. Elaissaoui, S. Grassini, L. Bousselmi

10:35 - 11:00 **Poster Session, Exhibition, Coffee Break**

Session 10 - Measurement Systems I

Chair: T. Günther

11:00 - 12:20 High Temperature Ultra Broadband Impedance Spectrometer; *A. Kezionis, S. Kazlauskas*

Measuring Dielectric Properties of Pcb Material in the Two-Digit GHz-Range; *G. Gold, K. Helmreich*

Low-Cost Impedance Spectroscope for Metal Oxide Gas Sensors; *M. Schüler, T. Sauerwald, J. Walter, A. Schütze*

Miniaturized Impedance Analyzer Using AD5933;
G. Lentka, J. Hoja

Session 11 - Biommedical II

Chair: M. Ulbrich

11:00 - 12:20 Impedimetric Biosensor Based on Polymer Electrospun for the Detection Of Urea; *M. Braiek*

Modeling the Dynamics of Lung Tissue With Pulsating Blood-Flow in Pulmonary Arteries for Bioimpedance Simulation; *R. Gordon, P. Annus*

Characterization of the Encapsulation Process of Uni- And Bipolar Deep Brain Stimulation Electrodes Using Electrical Impedance Spectroscopy in the Rat; *K. Badstübner, T. Kröger, I. Weber, C. Schmidt, E. Mix, U. Gimsa, U. van Rienen, R. Benecke, J. Gimsa*

Impedance Measurements of the Osteogenic Differentiation in a Stem Cell-Based 3d-Model;
C. Hildebrandt, E. Weiß, H. Thielecke

12:20 - 13:20 **Lunch, Exhibition**

Session 12 - Measurement Systems II

Chair: U. Tröltzsch

13:20 - 14:40 A Embedded Impedance Spectroscopy for Lab-On-Spoon Realization in Living Assistance Systems and Intelligent Environments; *H. Pekmezci, D. Los Arcos, A. König*

Electrical Cell-Substrate Impedance Spectroscopy (ecis) Measurements Based on Oscillation-Based Test Techniques;
*G. Huertas, A. Maldonado, A. Yufera,
A. Rueda, J. L. Huertas*

Minimized Bioimpedance Analyzer Based on AD5933;
R. Sommer, S. Voigt, J. Mehner

Can Impedance Spectroscopy Serve in an Embedded Multi-Sensor System to Improve Driver Drowsiness Detection?;
L. Li, T. Bölke, A. König

Session 13 - Materials & Semiconductors

Chair: N. Wagner

13:20 - 14:20 Electrochemical Characterization of Silver Gas Diffusion Electrodes During Oxygen Reduction in Alkaline Solution;
N. Wagner

Interplay Between Structure, Mechanical and Electrochemical Relaxations Based on Inorganic Additives PFSA Composite Proton Conducting Membranes;
B. Agrawal, M. Willert Porada

Detection of Deep Energy Levels in Diodes Using Impedance Spectroscopy; *M. Kell, E. Pertermann, J. Lutz, F. Wendler, P. Büschel, O. Kanoun, M. Arnold*

14:40 - 14:55 **Closure**

14:55 **End of Conference**

Publications series

O. Kanoun (Ed.)

Lecture Notes on Impedance Spectroscopy: Measurement, Modeling and Applications

Vol. 4, ISBN 978-1-138-00140-4 (Hbk), 2013

Vol. 3, ISBN 978-0-415-64430-3 (Hbk), 2012

Vol. 2, ISBN 978-0-415-69838-2 (Hbk), 2011

Vol. 1, ISBN 978-0-415-68405-7 (Hbk), 2011

A book of the same series will be published based on selected contributions from the IWIS 2013.

We are looking forward to seeing you at the next
International Workshop on Impedance Spectroscopy
September 24th - 26th, 2014

	Wednesday, Sept. 25 th	Thursday, Sept. 26 th		Friday, Sept. 27 th	
08:30 AM 09:00 AM	8:30 - 9:20 AM Tutorial 1	Opening		8:30 - 9:15 AM Plenary	
09:00 AM 10:00 AM		8:45 - 9:30 AM Plenary			
10:00 AM 11:00 AM	9:30 - 10:20 AM Tutorial 2	9:30 - 10:30 AM Batteries	9:30 - 10:30 AM Sensors	9:15 - 10:35 AM Interfaces	9:15 - 10:35 AM Biomedical I
11:00 AM 12:00 AM					
12:00 AM 01:00 PM	10:30 - 11:20 AM Tutorial 3	Coffee Break		Poster Session	
01:00 PM 02:00 PM	11:30 - 12:20 AM Tutorial 4	11:00 - 11:40 AM Batteries	11:00 - 11:40 AM Sensors	11:00 - 12:20 AM Measurement- systems I	11:00 - 12:20 AM Biomedical II
02:00 PM 03:00 PM		11:40 - 12:20 AM Plenary			
03:00 PM 04:00 PM	12:20 AM - 01:20 PM Lunch	12:20 AM - 01:20 PM Lunch, Exhibition		12:20 AM - 01:20 PM Lunch, Exhibition	
04:00 PM 05:00 PM	1:20 - 2:10 PM Tutorial 5	01:20 - 02:05 PM Exhibitors Presentations		01:20 - 02:40 PM Measurement- systems II	01:20 - 02:20 PM Materials & Semi-conductors
05:00 PM 06:00 PM	2:20 - 3:10 PM Tutorial 6	Short Break			
06:00 PM 07:00 PM		Poster Session	Expert Group (closed)	Closure	
07:00 PM ↓	3:20 - 4:10 PM Tutorial 7	03:05 - 04:25 PM Theory I			
08:00 PM 09:00 PM					
09:00 PM 10:00 PM		Short Break			
10:00 PM 11:00 PM		04:40 - 05:40 PM Theory II			
11:00 PM 12:00 AM	04:30 - 11:00 PM Social Program				
12:00 AM ↓					
12:00 AM ↓		07:00 - 11:00 PM Special Dinner			