Chairman's Welcome Message

The exchange of ideas and concepts over different fields of science is an important first step to find innovative solutions for the future and present problems of mankind. It is the aspired aim of the international workshop on impedance spectroscopy (IWIS) to assemble innovative and experienced scientists and different countries to discuss on methods, instrumentation and results of the recent research work in the fields of electro chemistry, material science, biology and medicine, electronics and sensors. Tutorials provide a good overview of special basics all around the method and make this challenging measurement method better accessible for young scientists. An exhibition informs about the latest news concerning measurement equipment and devices. These are main components of this annual international workshop taking place at Technische Universität Chemnitz.

In its ninth edition the IWIS workshop includes more than 55 contributions from 17 countries in 10 sessions, four plenary talks and seven tutorials. Selected contributions from the workshop will be published as post conference proceedings within the second volume of the book series "Progress Reports on Impedance Spectroscopy: Measurements, Modeling and Application" by Degruyter. 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 2016 the Circle of Experts in Impedance Spectroscopy (CEIS) will be meeting again to discuss novel topics together within 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 Technische Universität Chemnitz.

We thank the IEEE Instrumentation and Measurement Chapter Germany for the technical assistance of the event. The workshop was co-organized by the Chemnitz School of Metrology (CSM e.V.), whose support for the event is highly acknowledged.

We would like to thank you for choosing IWIS 2016 and for coming to Chemnitz

Prof. Olfa Kanoun & Dr. Norbert Wagner
General Chairs

IWIS 2016 Organizers

General Chairs

Olfa Kanoun Norbert Wagner

Honory Chair

H.-R. Tränkler

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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.


Rathaus, Neumarkt(©CWE - Chemnitz)

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

Turmbrauhaus – 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

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 – Heinrich-Zille-Straße 15, www.schalom-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
Reichenhainer Straße 90
09126 Chemnitz

Social Event – Historic weaving mill

This year we will follow the red thread to the oldest handcraft of human beeing. The historic weaving mill "Historische Schauweberei Braunsdorf"will be our aim. This is located at the wonderful and romantic river valley of the Zschopau. In the partial original conserved fabrication hall the process of classical weaving technic initiating by the thread forward to the point of finished clothes will be shown.

Afterwards we enjoy a dinner in a nearby restaurant before returning to Chemnitz by bus.

- The bus transport will depart at 4:00 pm from the conference site Reichenhainer Straße 90.
- Arrival in Chemnitz will be at 10:00 pm in Chemnitz.

Special Dinner – Tavern in the castle of Lichtenwalde

For the Conference Dinner we change our route to the other side of the River. There is the baroque castle Lichtenwalde located, which has a beautiful baroque garden. Nearby this beautiful building, the castle guesthouse would be our first aim on this evening, where we would like to have our dinner.

After our excellent dinner, there will be the possibility to enjoy a guided tour through the historical rooms of the baroque castle. You can rest in the guesthouse or enjoy the garden by night till we get back to Chemnitz by bus.

- The bus transport will depart at 6:30 pm from the conference site Reichenhainer Straße 90.
- Arrival in Chemnitz will be at 11:00 pm in Chemnitz.

Travel to Chemnitz
You can reach *Technische Universität Chemnitz* 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:

- Due to several construction sites within the city it is recommendet to redirect using motorway A72 and follow instructions above

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:

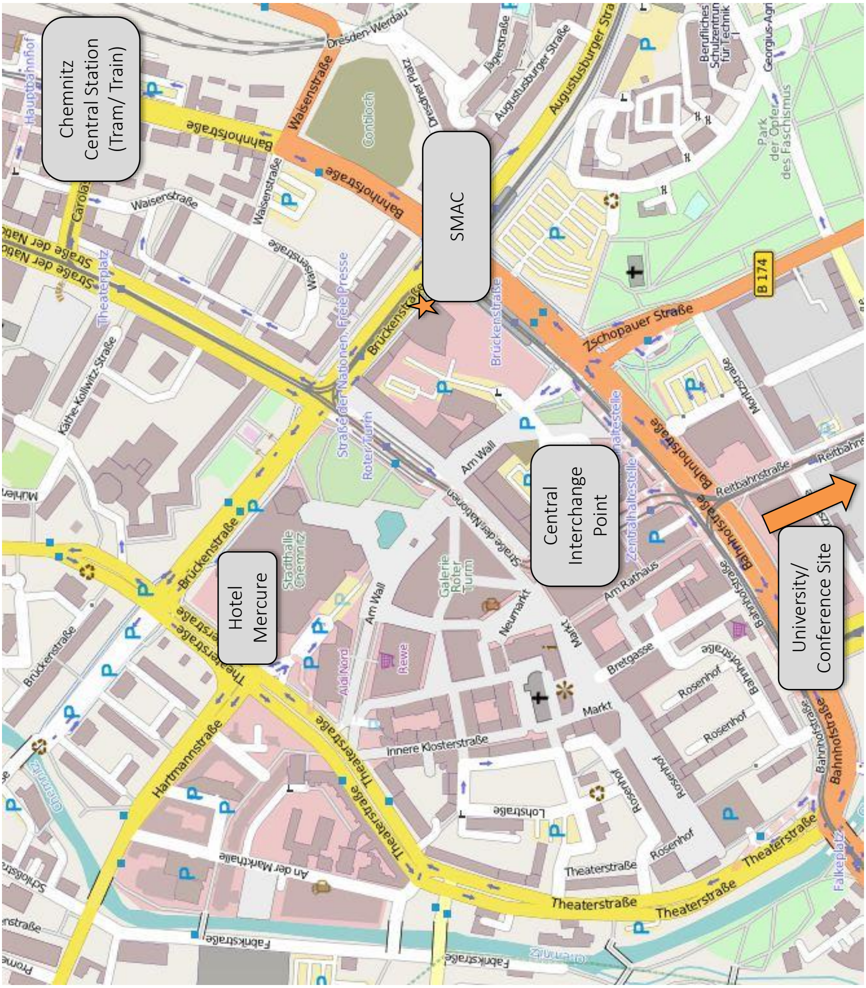
- The next nearby Airports are Dresden and Leipzig
- From airport Dresden go A4 direction Chemnitz/Erfurt.
- From airport Leipzig-Halle go on A14 direction Dresden, at 'Dreieck Nossen'
  go on A4 direction Chemnitz/Erfurt. Proceed as described above.

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.öpnvkarte.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.



Map of the City Centre Chemnitz

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 – "`IWIS2016`"

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

Exhibition

During the workshop the following exhibitors will be present:

Program

Monday, September 26th, 2016

The workshop takes place in the central lecture hall.

8:00 – 9:00	**Registration (Registration Desk)**
9:00 – 9:50	**Tutorial 1** Fundamentals of Biosensing Prof. Nicole Jaffrezic-Renault
10:00 – 10:50	**Tutorial 2** Check of causality of measured EIS and modeling using DRT and equivalent circuits Dr. Werner Strunz
11:00 – 11:50	**Tutorial 3** Multisine-based fast EIS measurements in dynamic biomedical systems Prof. Ramon Bragos
12:00 – 13:00	**Lunch, Exhibition (Mensa)**
13:00 – 13:50	**Tutorial 4** Impedance measurement in microfluidic systems: between simple and hopeless Prof. Uwe Pliquett
14:00 – 14:50	**Tutorial 5** Publish or perish? Hinweise zum richtigen Veröffentlichen (Tutorial in German Language) Prof. Jens Lienig
16:00 – 22:00	**Social Program**

Tuesday, September 27th, 2016

8:00 – 8:30	**Registration (Registration Desk)**
8:30 – 8:45	**Opening *Chair:* Olfa Kanoun**
8:45 – 9:30	**Plenary Talk** Nanomaterial Based Impedimetric Biosensors; Prof. Nicole Jaffrezic-Renault, UMR, CNRS, France
09:30 – 10:00	**Coffee Break (Foyer)**

Session 1 - Signal Processing I

10:00 – 11:20	Notes On Signals For Simultaneous Multipoint Impedance Spectroscopy; *Eiko Priidel; Paul Annus; Mart Min* Impedance Analyser Module For Impdance Spectroscopy Using Under Sampling; *Rohan Munjal; Frank Wendler; Olfa Kanoun* Effect Of Noise In Voltage And Current Measurement For Impedance Spectroscopy; *Thomas Günther* A Novel Multi Sine Excitation Procedure For Impedance Spectroscopy Supports Automatic Drift Correction And Online Error Determination; *Werner Strunz; Carl-Albrecht Schiller; Peter Beckhaus; Ulrich Misz; Mike Szesny; Steffen Fröba; Sebastian Feihl; Michael Multerer*
11:20 – 12:20	**Lunch(Mensa)**
12:20 – 13:00	**Plenary Talk** Impedance Spectroscopy in the Characterization of Solar Cells; Dr. Francisco Fabregat-Santiago, Universitat Jaume I, Spain
13:00 – 13:45	**Exhibitors Presentations** Zahner Messsysteme, PalmSens, ScioSpec, Zurich Instruments, rhd instruments;

Session 2 - Signal Processing II

13:45 – 14:45 Frequency Resolved Admittance Spectroscopy For Semiconductor Power Devices; *Marcus Kell; Jens Kowalsky; Lukas Tinschert; Eric Pertermann; Josef Lutz*

A Highly Scaleable Fpga Implementation For Cross-correlation With Up-sampling Support; *René Schmidt; Stephan Blokzyl; Wolfram Hardt*

A Recursive Least Squares-based Multi-frequency Demodulation Method For Impedance Measurement; *Xiangyu Liu; Zhang Cao; Shijie Sun; Lijun Xu*

Session 3 - Bioimpedance Spectroscopy I

13:45 – 14:45 Energy Efficient Pulses For Deep Brain Stimulation; *Rauno Gordon; Mart Min; Raul Land*

Novel Impedimetric Aptasensor For Bacillus Anthracis Detection; *Fabiana Arduini; D. Neagu; V. Mazzaracchio; A. Porchetta; D. Moscone; G. Palleschi; A. Pomponi; G. Faggioni; F. Lista*

Biosensor In A Tube: Ultrasensitive Dna Detection; *Mariana Medina Sánchez; Bergoi Ibarlucea; Nicolás Pérez; Dmitriy D Karnaushenko; Sonja M Weiz; Larysa Baraban; Gianaurelio Cuniberti; Oliver G. Schmidt*

14:45 – 15:30 **Plenary Talk**
Biomedical Applications of Fast-EIS for Dynamic In-Vivo Tissues; Prof. Ramon Bragós, Universitat Politécnica de Catalunya, Spain

15:30 – 16:20 **Poster Presentation & Student Best Poster Award Competition**

Circle of Experts Impedance Spectroscopy (CEIS)

Session 4 - Bioimpedance Spectroscopy II

16:20 – 18:00

How Many Frequencies To Use In Electrical Bioimpedance Measurement?; *Jaan Ojarand; Raul Land; Mart Min; Marek Rist*

Dynamic Volume Measurement Of Right Ventricle Using Impedance Spectroscopy And Multi Electrode Intraventricular Catheter; *Andres Kink; Marek Rist; Raul Land; Hip Kiõv; Mart Min*

Dose Response Of C. Vaccinii To Cuso4 In Microfluidic Droplet Detected Using Impedance Sensors; *Nobu Karippai; Jialan Cao; Stefan Schneider; Stefan Wiedemeier; Thomas Nacke; Gunter Gastrocke; Johann Michael Köhler; Brian P Cahill*

Mixed-level Simulation Tool For Design Optimization Of Electrical Impedance Spectroscopy Systems; *Achraf Lamlih; Vincent Kerzérho; Serge Bernard; Fabien Soulier; Mariane Comte; Michel Renovell; Tristan Rouyer; Sylvain Bonhommeau*

Monitoring Process Of Meat Quality; *Mahdi Guermazi; Olfa Kanoun; Nabil Derbel; Faouzi Derbel*

18:30 – 23:00

Special Dinner (Registration Desk)
Schlossgasthaus Lichtenwalde
Schlossallee 5, 09577 Niederwiesa
Bus starts at 18:30 o'clock at TU-Chemnitz
Bus arrival in Chemnitz at 23 o'clock

Friday, September 28th, 2016

8:00 – 8:30 **Registration (Registration Desk)**

08:30 – 09:15 **Plenary Talk**
Analysis of Li-Ion Batteries: Electrochemical Impedance Spectroscopy vs. Nonlinear Frequency Response Analysis; Prof. Dr.-Ing. Ulrike Krewer, TU Braunschweig, Germany;

Session 5 - Battery

9:15 – 10:30 Application Of Electrochemical Impedance Spectroscopy For Characterization Of Post Li-ion Batteries; *Norbert Wagner; Dennis Wittmaier; Kaspar Andreas Friedrich*

State Of Charge Estimation On Lithium-sulfur-batteries Using Impedance Spectroscopy; *Erik Berendes; Sebastian Socher; Claudius Jehle; Ulrich Potthoff*

Impedance Based Time-domain Modelling Of Lithium-ion Batteries; *Sophia Gantenbein; Michael Weiss; Ellen Ivers-Tiffée*

Lifetime Analysis Of High Energy Lithium-ion Batteries By Impedance Measurement; *Michael Dippon; Michael Weiss; Sophia Gantenbein; Ellen Ivers-Tiffée*

Session 6 - Sensors I

9:15 – 10:30 Parallel Impedance Measurement With Micro Electrode Array; *Uwe Pliquett; Danny Echtermeyer*

Eddy Current Corrosion Measurement Of Steel; *Olev Märtens; Mart Min; Raul Land; Marek Rist; Marju Ferenets; Andres Käsper*

Impedimetric Microtomography; *Sonja M Weiz; Mariana Medina Sánchez; Oliver G. Schmidt*

10:30 – 11:00 **Poster & Coffee Break (Foyer)**

Session 7 - Sensors II

11:00 – 12:00 Humidity Sensitivty Invetigation Of Reduced Graphene Oxide By Impedance Spectroscopy; *Ammar Al-Hamry; Christian Müller; Olfa Kanoun; Renato da Veiga Torres*

Meaurement Of Electrical Parameters Of Electrolytic Capacitors Using Real-world Drive Waveforms For State-of-health Determination; *David Hewitt; James Green; Jonathan Davidson; Martin Foster; David Stone*

Impedimetric Investigation Of Low-potential Electrowetting On Dielectric; *Yingjia Li Li; Brian Cahill*

Session 8 - Materials I

11:00 – 12:00 Impedance Study Of Ni-cr Alloy In Contact With A Biologic And Organic Solution Using Constant Phase Element.; *Noureddine Leguedani; My Mustapha Hafid; Yousra Kessad*

Electronic Characterization Of Cocrmo Alloy Electrode Used For Dental Applications In Presence Of Artificial Saliva, Serum And Tea; *Noureddine Leguedani; My Mustapha Hafid*

Comparatif Equivalent Electrical Circuits To Study The Effect Of Transition-metal Oxide Coo On Metaphosphate Glass System.; *Driss Lembarki; Noureddine Leguedani; My Mustapha Hafid*

12:00 – 13:00 **Lunch, Exhibition(Mensa)**

13:00 – 13:45 **Plenary Talk**
Time Domain Dielectric Relaxation Behavior of Hydrogen Bonded Liquids, Prof. Dr. Ashok Kumbharkhane, Marathwada University, India;

Session 9 - Sensors III

13:45 – 15:25 Cnt Enhanced Carbon Electrodes For Nitrite Detection And Water Analysis; *Paul Aurosmit; Frank Wendler; Olfa Kanoun*

Temperature Influence On Impedance Of Premium Summer Diesel Fuel Measured With The Use Of Impedance Spectroscopy; *Łukasz Macioszek; Ryszard Rybski*

Study Of The Humidity Effect On The Electrical Impedance Of Mwcnts/epoxy Nanocomposites; *Abdulkadir Sanli; Vinesh Jayaraman; Abderrahmane Benchirouf; Christian Müller; Olfa Kanoun*

Interface Circuit For Oil Quality Measurement Considering Dielectric Losses And Stray Capacitances; *Ahmed Fendri; Racem Jribi; Olfa Kanoun; Hammadi Ghariani*

Session 10 - Materials II

13:45 – 15:25 Determination Of Coal Ash Sintering Temperatures By Means Of Impedance Spectroscopy; *Ronny Schimpke; Steffen Krzack; Bernd Meyer*

Electrochemical Impedance Spectroscopy Of Graphene Oxide/polyvinyl Alcohol Composites; *Ammar Al-Hamry; Kumar Prosenjit; Renato Veiga de Torres; Christian Müller; Olfa Kanoun*

Superior Performance Of Borocarbonitrides, Bxcynz, As Stable, Low-cost Metal-free Electrocatalysts For The Hydrogen Evolution Reaction.; *Manjeet Chhetri; Somak Maitra; Himanshu Chakraborty; Umesh V. Waghmare; Chintamani Nagesa Ramanchandra Rao*

Electrochemical Impedance And Galvanostatic Charge-discharge Study Of Polyaniline-graphene Oxide Hybrid Structure With A Novel Binder For High Performance Supercapacitor; *Salma Bilal; Irum Firdous; Muhammad Fahim*

Cyclic Voltammetry And Electrochemical Impedance Spectroscopy Of Ni Impregnated Conducting Polymer Coated Platinum And Graphite Electrodes For Electrooxidation Of Methanol; *Anwar-ul-Haq Shah; Nabila Yasmeen*

15:25–15:35 **Closure *Chair:* Olfa Kanoun**

Publications series

O. Kanoun (Ed.)

Progress Reports on Impedance Spectroscopy

Vol. 1, ISBN 978-3-11-044756-9, 2016

Lecture Notes on Impedance Spectroscopy: Measurement, Modeling and Applications

Vol. 5, ISBN 978-1-138-02754-1 (Hbk), 2015
Vol. 4, ISBN 978-1-138-00140-4 (Hbk), 2014
Vol. 3, ISBN 978-0-415-64430-3 (Hbk), 2012
Vol. 2, ISBN 978-0-415-69838-2 (Hbk), 2012
Vol. 1, ISBN 978-0-415-68405-7 (Hbk), 2011

Selected contributions from the IWIS 2016will be published in new volume of *Progress Reports on Impedance Spectroscopy*.