

## **A**

### **Address**

Ruhr-Universität Bochum  
Universitätsstraße 150  
44801 Bochum

### **Airplane**

The closest and best connected airport is "Dusseldorf International (DUS)".

**Important Note:** There are two train stations at this airport. Do not proceed to "Dusseldorf Flughafen Terminal / Terminal Rail Station" but take the "SkyTrain" to its final stop which is "Dusseldorf Flughafen / Airport Rail Station" (about 5 minutes journey). Take a train there (either local or long-distance) in the direction of destinations such as Essen, Bochum, Dortmund, or Berlin and leave it at "Bochum Hauptbahnhof (Hbf)" after about 35 minutes.

### **American Physical Society (APS)**

Gold sponsor

### **Applied Materials, Inc.**

Silver sponsor

### **Architecture of the RUB**

#### The architect's idea

The architect Helmut Hentrich designed the Ruhr-Universität Bochum (RUB) as a harbor in the sea of knowledge. The buildings symbolize vessels which have moored at this port. In the center is the Audimax, the roof of which is reminiscent of a shell.

### **Art Exhibition and Antique Collection**

Antikenmuseum in den Kunstsammlungen der Ruhr-Universität Bochum

Open: Tuesday-Sunday 11:00-17:00

No entrance fee

### **ATM**

University library (Sparkasse Bochum)

Next to the University Library (Sparda Bank)

### **Audimax**

The Auditorium Maximum (Audimax) is the center and the architectural highlight of the Ruhr-Universität Bochum. Therefore, it is the place for large and prestigious university events like concerts or award ceremonies. The spacious foyer is the perfect location for exhibitions and receptions.

#### Major Hall

The Major Hall offers space for up to 1,750 people. It is equipped with a large stage and the well-known Klais organ. Live video and presentations are broadcasted to two lateral screens with a size of 8 x 6 meters. For large-scale presentations, we also provide an extendible screen with a size of 20 x 7 meters.

#### Technical facilities

The Audimax is equipped with state-of-the-art sound, light and media technology. Four high-performance projectors ensure the flawless presentation of your media content. On request,

we broadcast your event to other places at the campus or livestream your event on the internet.

The intelligent media control system allows a comfortable handling of the complex technology.

## **Audioguide**

### Discover the campus

A stroll through the Ruhr University holds many surprises: Only a few hundred meters away from the tranquility of the Botanical Garden you will find the pulsating campus life and works of famous artists.

We invite you to a tour across the campus: Explore the RUB on your own or follow one of the suggested routes and get a nice impression of the campus.

### Long or short route

Our extended tour (ca. 3.8 km, not barrier free) takes you from the center of the campus east to the buildings of the Natural Sciences and Engineering, through the Botanical Garden and Chinese Garden, and back to the central axis along the canteen and Audimax. Finally, we make a short detour to the west to visit the Social Sciences and Medicine.

The short tour (barrier free) concentrates on the center of the campus with the library, Audimax, canteen, art collections, and some additional stations.

Both routes are accessible outside the opening hours of the buildings. Nevertheless, please pay attention to the opening hours of the Botanical Garden and the operation hours of the elevators (barrier free route).

## **Audiovisual equipment**

The technical sessions will be equipped with an LCD projector and amplified sound. Dell Laptops will be provided for the oral sessions. All laptops will be equipped with Windows 7 Prof. 64bit, Acrobat Reader, PowerPoint 2013, Windows Media player 12 and VLC 2.1.1. Presentations need to be uploaded before the session to the laptop provided.

Experience shows that saving your presentation as a PDF file (with embedded fonts) avoids potential conversion problems between PC and Macintosh computers. If presenters wish/need to use their own computer, any setup delay will be counted against their allotted presentation time.

## **B**

### **Banquet and opening reception**

An opening reception will be held from 6:00 pm to 8:00 pm on Monday, October 10, in the Audimax Foyer. On Thursday evening, October 13, the banquet reception will be held at 6:00 pm, Henrichs, Gebläsehalle, Werksstraße 31-33, Hattingen, followed by the banquet from 7:00 pm to 11:00 pm featuring live entertainment. Prior to the banquet there are five guided tours to the old blast furnace. Please register for those at the information desk in the Audimax!

Bus transportation between RUB and Henrichs will be provided for all participants at 5:30 pm (for the guided tours) and 6:30 pm (for the banquet only) and after the banquet back to Bochum Main Station (city center). The cost of the banquet is included in the attendee's registration fee. Banquet guest tickets may be purchased for EUR 70 online. The GEC Awards for Best Student Oral and Poster Presentations will be presented during the banquet.

## **Bistro**

<http://www.akafoe.de/gastronomie/speseplaene-der-mensen/bistro-der-ruhr-universitaet-bochum/>

## **RUB Botanical Garden Tours**

Just south of the conference center (Veranstaltungszentrum VZ), you can find the Botanical Garden which includes some tropical houses and a Chinese garden. It can easily be reached when you have some free time during the GEC 2016.

Open: 9:00-16:00

We offer guided tours in English on

Wednesday 13:45-14:45 (max. 25 people)

Thursday 12:45-14:45 (max. 25 people)

## **C**

### **Cafeterias**

<http://www.akafoe.de/gastronomie/kundeninformationen/oeffnungszeiten/>

### **Cloakroom**

Participants are asked to look carefully after their wardrobe, valuables, laptops, and other belongings for which the organizers are not liable.

A cloakroom for conference participants will be located at the Audimax. You can leave your jacket, bag or suitcase there.

It will be open

Monday 8:00 - 20:00

Tuesday 8:00 - 22:00

Wednesday 8:00 - 21:00

Thursday 8:00 - 19:00

Friday 8:00 - 13:00

### **Cigarettes**

Unicenter

Campus Center

### **Convention Centre/Conference Center**

Convention Centre is a modern venue, which offers an attractive view over the green Ruhr Valley due to its location on the southern edge of the campus. The light-filled rooms are situated on one level and provide ideal meeting conditions for up to 800 people.

#### Halls

The Convention Centre has four halls for 50 up to 430 people. All rooms have access to a spacious terrace. The largest hall can be divided by a built-in partition.

The foyer is ideal for exhibitions and presentations, as well as catering or reception area.

#### Equipment

The technical equipment meets all requirements:

Modern presentation tools, digital media management, and many more.

On request, we provide RUB's various presentation tools such as poster boards or flip charts.

Floorplan:

[http://www.ruhr-uni-bochum.de/mam/universaal/images/convention\\_centre.pdf](http://www.ruhr-uni-bochum.de/mam/universaal/images/convention_centre.pdf)

### **Conference Reception**

An opening reception will be held from 6:00 pm to 8:00 pm on Monday, October 10, in the Audimax Foyer.

## **D**

### **Deutsche Forschungsgemeinschaft (DFG)**

Gold sponsor

### **Dining Options**

Bistro

<http://www.akafoe.de/gastronomie/speiseplaene-der-mensen/bistro-der-ruhr-universitaet-bochum/>

(11:00 am – 4:00 pm)

Cafeteria "Edwards"

On campus / at main library (9:00 am – 8:00 pm)

Coffee bar

In direct vicinity of the conference rooms (8:00 am – 6:00 pm)

Mensa

<http://www.akafoe.de/gastronomie/speiseplaene-der-mensen/ruhr-universitaet-bochum/>

(11:00 am – 2:30 pm), directly next to the Audimax

Q-West

<http://q-we.st/q-day>

(9:00 am – 10:00 pm)

Other places to eat can be found in the shopping center (Uni-Center) near the university subway station.

### **Drinks**

During the breaks you get some drinks at the Audimax entrance.

## **E**

**Electrification of the chemical industry**, Richard van de Sanden, David Graves et al.:

Workshop 4

### **Organizing committee**

Richard van de Sanden, David Graves et al.

10:00 - 12:30 Session I.

10:00 Intro David Graves (UC Berkeley) and Richard van de Sanden (DIFFER, TU/e)

10:15 "The benchmark: Electrochemistry and fuel production", Anne Auch (DTU Kopenhagen, Denmark)

10:55 "Plasma as power transfer medium", Gerard van Rooij, CO<sub>2</sub> plasma activation (DIFFER)

11:35 "Nonequilibrium kinetics in N<sub>2</sub> and CO<sub>2</sub>", Vasco Guerra (IST, Portugal)

12:15 - 13:30 lunch break

13:30 - 15:30 Session II

13:30 "Fusion farming, fossil free fertilizer on the farm by Nitrogen fixation", Rune Ingels (N2 Applied AS, Oslo)

14:10 "Shell activities on renewable energy and chemical conversion", Sander van Bavel, (Shell, The Netherlands)

14:50 "Direct decarbonization of methane by thermal plasma for the co synthesis of carbon black and hydrogen", Laurent Fulcheri (Paris tech, France)

15:30 - 16:00 coffee break

16:00 - 17:20 session III

16:00 "Advanced control of cold atmospheric plasmas", Ali Mesbah (UC Berkeley)

16:40 "Plasmabased Synthesis of Nitrogenoxid - Enabler for CO<sub>2</sub>-free Fertilizer Production", Jürgen Lang (Evonik, Germany)

17:20 Closure of workshop

### **Emergency number**

0234 32 23333

## **F**

### **Foundation Talk 2016**

#### **"Playing with charged particles: a way to understand kinetic effects in transport and in low-temperature plasmas"**

Dr. Zoltan Donko, Department of Complex Fluids, Institute for Solid State Physics and Optics, Wigner Research Center for Physics, Hungarian Academy of Sciences, Budapest / Hungary

#### **Abstract:**

Particle-based simulations have been aiding for some time the understanding of fundamental phenomena in plasma physics. The rapid development of computational resources allows execution of precise simulations at the level of elementary processes. Details of particle kinetics in transport phenomena, in gas breakdown, as well as in low-temperature plasmas can be explored to great details in such studies, some of which (electron kinetics in the Franck-Hertz experiment and in drift tubes, gas breakdown under radio-frequency field, power absorption modes, particle kinetics, pattern formation, control of ion properties, and effects of surface coefficients in low-pressure capacitive plasmas) will be highlighted in the talk. As a rigorous test of the computational results comparisons will be given with the results of relevant recent experiments.

### **Future Challenges in Plasma Physics, Uwe Czarnetzki et al.: Workshop 1**

#### **Schedule:**

13.00 – 13.10 Welcome, **Uwe Czarnetzki** (Ruhr-University Bochum)

Session I, Chair: **Bill Graham**

13.10 – 13.30 **Gerrit Kroesen** (TU Eindhoven), "Plasma regimes: An exploration of physics challenges"

13.30 – 13.50 **Pascal Chabert** (Ecole Polytechnique), "What could be the role of numerical simulations in our field?"

13.50 – 14.10 **Igor Kaganovich** (Princeton Plasma Physics Laboratory), "Overview of Report on Frontiers of Plasma Science Sponsored by the U.S. Department of Energy, Office of Fusion Energy Sciences"

14.10 – 14.30 **Luís Alves** (Instituto Superior Técnico), "Low-temperature plasmas: old drives, new directions"

14.30 – 15.00 Coffee break

Session II, Chair: **Gerrit Kroesen**

15.00 – 15.20 **Bill Graham** (Queen's University Belfast), "Is there any new plasma physics to be found in low temperature plasmas?"

15.20 – 15.40 **Peter Bruggeman** (University of Minnesota), "Key scientific questions on the path to saving the world with plasmas: A personal perspective"

15.40 – 16.00 **Michel Bonitz** (CAU Kiel), "When a solid meets a plasma - challenges for theory"

16.00 – 16.20 **Thomas Sunn Pedersen** (Max-Planck-Institute for Plasma Physics), "From low to high - plasma physics at the edge of fusion plasmas"

16.20 - 16.35 Short break

Session III, Chair: **Peter Bruggeman**

16.35 – 16.55 **Masaru Hori** (Nagoya University), "Challenge towards controlling atomic level interactions of plasma with surfaces"

16.55 – 17.15 **Yi-Kang Pu** (Tsinghua University), "Role of education in advancing plasma science"

17.15 – 17.45 **Mark Kushner** (University of Michigan), "The path forward: Summary and Discussion"

## **G**

### **GEC history**

The GEC is a special meeting of the Division of Atomic, Molecular and Optical Physics (DAMOP) of the American Physical Society (APS). It promotes the exchange of scientific information and viewpoints concerning basic phenomena in the field of gaseous electronics. GEC has been held annually since 1948. Since then it is only the fourth time that the meeting takes place outside the US, after Montreal/Canada 1993, Bunratty/Ireland 2004, and Paris/France 2010.

For 68 years, the GEC has been an invaluable resource to the plasma and collision community, and continues to have a leadership presence in traditional areas such as plasma phenomena, low pressure processes, plasma chemistry, surface interactions, atomic and molecular interactions, simulation, and diagnostics. In recent years, the GEC has also taken a leadership role in the emerging areas of plasma science such as biological and environmental applications and atmospheric plasma systems.

## **H**

## I

### **Internet**

Wi-Fi access is complimentary in the conference center. You will receive a personalized login account on your confirmation of registration. The account is valid October 10–14. If your home organization provides "eduroam" access, you can use the same configuration like at home. Just open your laptop and start surfing. Attendees who do not have "eduroam" access use the personalized login account on your confirmation of registration and follow these instructions:

- WPA-Type: WPA/WPA2 Enterprise
- Key-Type: TKIP or AES
- EAP-Method: TTLS
- Authentication-Type: PAP
- Anonymous identity: anonymous@ruhr-unibochum.de

You can find more information about our wireless access on the web:

[www.rz.ruhr-uni-bochum.de/dienste/netze/wlan](http://www.rz.ruhr-uni-bochum.de/dienste/netze/wlan)

## J

## K

### **Klais Organ concert**

14:15-14:45 Audimax

**Markus Breker** plays the following organ-pieces:

Prelude in a-minor (Johannes Brahms)

Overture and Adagio (Leos Janacek)

Cantilena (Josef Rheinberger)

## L

### **Lab tours**

There will be four lab tours on Tuesday, October 11, 7:30 pm, and four lab tours on Wednesday, October 12, 7:00 pm. Each tour takes 60 minutes and covers two different laboratories. The groups hosting the lab tours are:

- Experimental Physics II: Chair for "Physics of Reactive Plasmas" and Research Group "Coupled Plasma-Solid State Systems"
- Experimental Physics V: Chair for "Plasma and Atomic Physics"
- Chair for "Electrical Engineering and Plasma Technology"
- Research Group "Biomedical Applications of Plasmas"

Register for the lab tours at the info board, located in the Audimax Foyer next to GEC registration.

### **LAM Research Corporation**

Silver sponsor

## **Lockers**

Free of charge lockers can be found at the central library "UB".  
Regular lockers can be found at the main station "Bochum Hauptbahnhof".

## **Lost property office**

Lost property office at Infopoint UV  
Ruhr-Universität Bochum  
Building: Universitätsverwaltung (UV)  
Ebene 0, Foyer  
Universitätsstr. 150  
44780 Bochum  
Office hours: Mon-Fri 8am – 4:30pm

## **Lunch**

### Bistro

<http://www.akafoe.de/gastronomie/speiseplaene-der-mensen/bistro-der-ruhr-universitaet-bochum/>

(11:00 am – 4:00 pm)

### Cafeterias

<http://www.akafoe.de/gastronomie/kundeninformationen/oeffnungszeiten/>

### Cafeteria "Edwards"

on campus / at main library (9:00 am – 8:00 pm)

### Coffee bar

in direct vicinity of the conference rooms (8:00 am – 6:00 pm)

### Mensa

<http://www.akafoe.de/gastronomie/speiseplaene-der-mensen/ruhr-universitaet-bochum/>

(11:00 am – 2:30 pm), directly next to the Audimax

### Q-West

<http://q-we.st/q-day>

(9:00 am – 10:00 pm)

Other places to eat can be found in the shopping center (Uni-Center) near the university subway station.

## **LXCat discussion on Wednesday**

October 12th 2016, 19:00 - 21:00 in room 2B

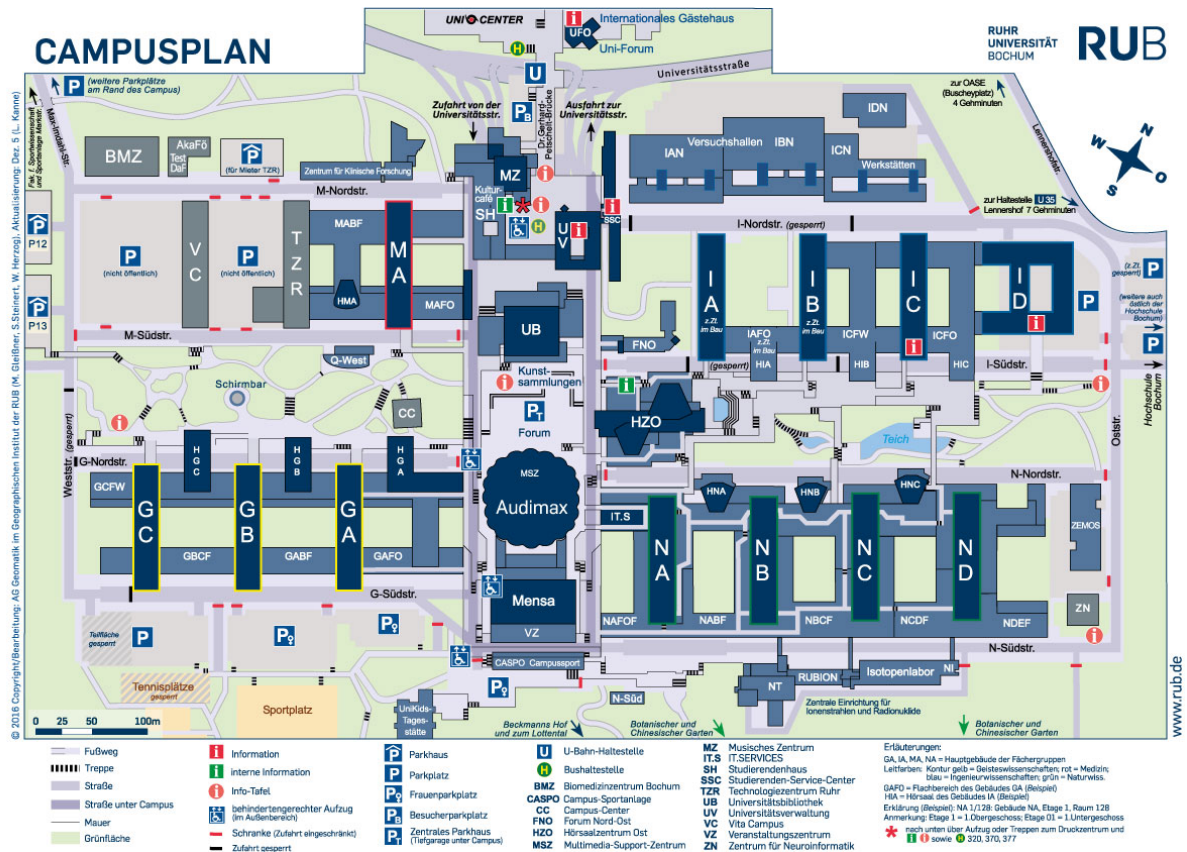
[LXCat \(www.lxcat.net\)](http://www.lxcat.net) is an open-access, web-based platform for storing, exchanging, and manipulating data needed for the electron and ion components in cold, non-equilibrium plasmas. Over 40 people from institutions around the world have so far contributed to this project, and the data are widely used by members of the GEC community. An informal meeting to discuss questions, suggestions and future plans for the LXCat project will be held



on Wednesday. Tentative program includes: LXCat news and updates, information about association "Data for modeling plasmas", discussion of plasma chemistry round-robin test (see announcement), and COST plasma chemistry initiative. If you are a current/future user or contributor, or if you are simply interested in knowing more about the project, please plan to attend. For further information or to suggest agenda items before the meeting, please contact Sergey Pancheshnyi at [sergey.pancheshnyi@ch.abb.com](mailto:sergey.pancheshnyi@ch.abb.com).

## M

### Map of the university



### Menlo Systems GmbH

Bronze sponsor

### Mensa

<http://www.akafoe.de/gastronomie/speiseplaene-der-mensen/ruhr-universitaet-bochum/>

### Museum

Mining museum: <http://www.bergbaumuseum.de/de/>

Folkwang Museum: <https://www.museum-folkwang.de/>

### Music

Klais Organ concert

Wednesday: 14:15-14:45 Audimax

**Markus Breker** plays the following organ-pieces:

Prelude in a-minor (Johannes Brahms)

Overture and Adagio (Leos Janacek)

Cantilena (Josef Rheinberger)

Rawsome Delights

Monday: 18:00-20:00 opening Reception

<http://www.rawsome-delights.de/start.php>

## **Musical**

Starlight Express: [http://www.musicals.com/starlight-](http://www.musicals.com/starlight-express/tickets.html?adtyp=B_Erlebnis_Momente&addate=20140707&tn=5231&tn=5231&gclid=CJP4-KHNw88CFQqNGwodx-4J8Q)

[express/tickets.html?adtyp=B\\_Erlebnis\\_Momente&addate=20140707&tn=5231&tn=5231&gclid=CJP4-KHNw88CFQqNGwodx-4J8Q](http://www.musicals.com/starlight-express/tickets.html?adtyp=B_Erlebnis_Momente&addate=20140707&tn=5231&tn=5231&gclid=CJP4-KHNw88CFQqNGwodx-4J8Q)

## **N**

### **National Science Foundation (US)**

Gold sponsor

## **Nightlife**

Musical Starlight Express: [http://www.musicals.com/starlight-](http://www.musicals.com/starlight-express/tickets.html?adtyp=B_Erlebnis_Momente&addate=20140707&tn=5231&tn=5231&gclid=CJP4-KHNw88CFQqNGwodx-4J8Q)

[express/tickets.html?adtyp=B\\_Erlebnis\\_Momente&addate=20140707&tn=5231&tn=5231&gclid=CJP4-KHNw88CFQqNGwodx-4J8Q](http://www.musicals.com/starlight-express/tickets.html?adtyp=B_Erlebnis_Momente&addate=20140707&tn=5231&tn=5231&gclid=CJP4-KHNw88CFQqNGwodx-4J8Q)

Bermuda Dreieck: lots of bars and restaurants; near Bochum HBF

## **O**

### **Opening reception and banquet**

An opening reception will be held from 6:00 pm to 8:00 pm on Monday, October 10, in the Audimax Foyer. On Thursday evening, October 13, the banquet reception will be held at 6:00 pm, Henrichs, Gebläsehalle, Werksstraße 31-33, Hattingen, followed by the banquet from 7:00 pm to 11:00 pm featuring live entertainment. Prior to the banquet there are five guided tours to the old blast furnace. Please register for those at the information desk in the Audimax!

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## **P**

### **Planetarium Show**

20:00 exclusive show for the GEC in the Planetarium\_Bochum: "Time Travel - From the Big Bang to Humankind"

The Planetarium is close to Bochum Main Station and can be reached from there with just one stop of the tram lines 308 and 318 in direction Schürbankstraße/Gerthe (the stop is called 'Planetarium'). More detailed information about how to get there can be found online (German only). <http://www.planetarium-bochum.de/>

**Plasma Kinetics**, Toshiaki Makabe et al. : Workshop 2

"New directions of charged particle kinetics in low temperature plasmas"

- more precision, more exploration, more discovery -

**Organizing committee**

Prof. Satoshi Hamaguchi (Osaka Univ, Osaka)

Prof. Ralf Brinkmann (RUB, Bochum),

Prof. Ronald White (James Cook Univ, Townsville)

Prof. Zoran Petrovic (IOP, Belgrade)

Dr. Peter Ventzek (Tokyo Electron America, Austin)

Prof. Toshiaki Makabe (Keio Univ, Tokyo)

**Workshop purpose**

This workshop will address modeling of charged particle kinetics in low-temperature plasmas focusing on techniques associated with the Boltzmann equation. A small number of specialists in the development of theoretical and numerical methods for the solution of collisional kinetic equations will come together to discuss the current developments in the field and its role in low-temperature plasmas. An outcome will be a vision for future directions in the quest for more precise methods leading to new physics.

**Keynote speaker (60 min talk including discussion):**

Professor Emeritus, Helge R. Skullerud (Trondheim Univ. of Technol.), "Developments in the kinetic theories of ion and electron swarms in the 1960's and 70's"

**Schedule for the workshop sessions:**

Session I, Chair, [Prof. Satoshi Hamaguchi](#) (Osaka University, Osaka)

11:00-11:30, (1) Prof. Ronald White (JCU, Townsville), "Challenge for more precise e- and ion-transport in gases and liquids"

11:30-12:00, (2) Dr. G.J.M.Hagelaar (Univ. of Toulouse, Toulouse), "Effect of Coulomb collisions on low temperature plasma characteristics"

12:00-13:30, Lunch break

Session II, Chair, [Prof. Zoran Petrovic](#) (Institute of Physics, Belgrade),

13:30-14:30, (3) Keynote: Professor Emeritus, Helge R. Skullerud (Trondheim Univ. of Technol.) "Developments in the kinetic theories of ion and electron swarm in the 1960's and 70's - in retrospect"

14:30-15:00, (4) Dr. Sasa Dujko (IOP Belgrade), "Kinetic and fluid descriptions of charged particle swarms in gases and nonpolar fluids: Theory and applications"

15:00-15:30, Coffee break

Session III, Chair, [Dr. Peter Ventzek](#) (Tokyo Electron America, Austin),

15:30-16:00, (5) Dr. Jens Oberrath (Leuphana Univ., Lüneburg), "Kinetic modeling of active plasma resonance spectroscopy"

16:00-16:30, (6) Dr. Lee Chen (Tokyo Electron America, Austin), "Paradigm shifts in plasma processing and application of fundamental kinetics to problems targeting 5 nm technology device technology"

16:30-17:00, Final discussion with participants

### **Plasma Lab Tours**

There will be four lab tours on Tuesday, October 11, 7:30 pm, and four lab tours on Wednesday, October 12, 7:00 pm. Each tour takes 60 minutes and covers two different laboratories. The groups hosting the lab tours are:

- Experimental Physics II: Chair for "Physics of Reactive Plasmas" and Research Group "Coupled Plasma-Solid State Systems"
- Experimental Physics V: Chair for "Plasma and Atomic Physics"
- Chair for "Electrical Engineering and Plasma Technology"
- Research Group "Biomedical Applications of Plasmas"

Register for the lab tours at the info board, located in the Audimax Foyer next to GEC registration.

### **Poster size**

The poster size is Din A0: 84,1 x 118,9 cm.

The orientation of the poster should be portrait.

### **ProgrammMonday:**

08:00 - 18:00 Registration

Workshop 1, 13:00 - 17:30: **Future Challenges in Plasma Physics**, *Uwe Czarnetzki et al.*

Workshop 2, 11:00 - 17:00: **Plasma Kinetics**, *Toshiaki Makabe et al.*

Workshop 3, 11:00 - 17:00: **Pulsed high power plasmas for the synthesis of nanostructured thin films**, *Peter Awakowicz et al.*

Workshop 4, 10:00 - 17:30: **Plasma-chemistry to electrify the chemical industry**, *Richard van de Sanden, David Graves et al.*

18:00 - 20:00 Opening Reception, Music Rawsome Delights

### **Tuesday:**

08:30 - 17:30 Talks GEC 2016

17:30 - 19:30 Poster sessions, Audimax Foyer

19:30 - 20:30 Four lab tours at RUB

20:00 Exclusive show for the GEC in the Planetarium Bochum: "Time Travel - From the Big Bang to Humankind"

The Planetarium is close to Bochum Main Station and can be reached from there with just one stop of the tram lines 308 and 318 in direction Schürbankstraße/Gerthe (the stop is

called 'Planetarium'). More detailed information about how to get there can be found online (German only).

### **Wednesday:**

08:30 - 10:00 Talks GEC 2016

10:30 - 11:30 RUB Rector Welcome and GEC Foundation Talk at Audimax: Zoltan Donko, "Playing with charged particles: a way to understand kinetic effects in transport and in low-temperature plasmas"

11:30 - 12:00 Group photo

12:00 - 13:00 GEC Business Meeting

13:45 - 14:45 Guided Tour Botanical Garden / Chinese Garden

14:15 - 14:45 Klais Organ concert, Audimax

15:00 - 17:00 Talks

17:00 - 19:00 Poster sessions, Audimax Foyer

18:00 - 23:00 GEC ExCom Meeting (Room 2, Level 01)

19:00 - 20:00 Lab tours at RUB

19:00 - 21:00 LXCat workshop

### **Thursday:**

08:30 - 12:30 Talks GEC 2016

12:45 - 13:45 Guided Tour Botanical Garden / Chinese Garden

14:00 - 17:30 Talks GEC 2016

19:00 Conference Dinner at Henrichs Hattingen with Triton Jazzband

### **Friday:**

08:30 - 12:30 Talks GEC 2016

### **Presentation format**

Papers that have been accepted for presentations are listed in the scientific program. Invited talks are allotted 25 minutes, with 5 additional minutes for questions and discussion. Oral contributed talks are allotted 12 minutes, with 3 additional minutes for questions and discussion. Poster boards in Audimax will contain two posters on each side, each poster with a size of 84,1 x 118,9 cm (size DinA0). The posters may remain on display throughout the day and have to be removed at the close of each day (Tuesday and Wednesday evenings by 8:00 pm).

### **Public transport**

All recommended hotels can be reached with the ticket "Preisstufe A". You will get a five-day-ticket at the registration desk together with your registration bag, so you only need to buy a single ticket to get to RUB (once) on Monday morning. Tickets can also be bought at the ticket machines at every station. There you can also buy single tickets or day tickets. Each participant will receive a ticket for free use of public transport (subway, bus, tram) from their hotel to RUB and back for the full length of the meeting (October 10–14). It takes about 9 minutes from the central railway station "Hauptbahnhof" to the university by subway line U35 (direction: Bochum Hustadt). Please get off at "Ruhr-Universität".

**Pulsed high power plasmas for the synthesis of nanostructured thin films, Peter Awakowicz, Ante Hecimovic et al.: Workshop 3**

**Organizing committee**

Peter Awakowicz, Ante Hecimovic

**Workshop purpose**

The driving force behind this Workshop is to discuss latest findings in the field of HiPIMS. HiPIMS is a cutting edge PVD technology used for deposition of thin films with advanced properties. Focus of the workshop will be on properties of the HiPIMS plasma and on the thin film growth process under a high ion flux irradiation. In particular the correlation of plasma characteristics to thin film performance will be addressed. The talks will encompass all aspects of the HiPIMS process, from plasma diagnostic and plasma modelling, to the growth processes at the substrate.

**Schedule / Invited speakers (each talk, 30 min including discussion)**

11.00 Arutiun Ehasarian (Sheffield Hallam University, UK), High Power Impulse Magnetron Sputtering - the Age of Adolescence

11.30 Diederik Depla (Ghent University, Belgium), Lessons from modelling DC reactive magnetron sputtering for HIPIMS users

12.00 Lunch

13.30 Grzegorz Greczynski (Linköping University, Sweden), Synchronized metal-ion irradiation as a way to control growth of transition-metal nitride alloy films during hybrid HIPIMS/DCMS co-sputtering

14.00 Kostas Sarakinos (Linköping University, Sweden), Control of nanoscale atomic arrangement in multicomponent thin films by temporally modulated vapour fluxes

14.30 Coffee break

15.00 Tiberiu Minea (University Paris Sud, France), What can we learn about HiPIMS process from the multidimensional plasma modeling?

15.30 Christian Maszl (Ruhr-Universität Bochum, Germany), Localized travelling ionization zones and their importance for the HiPIMS process

16.00 Nikolay Britun (University of Mons, Belgium), Visualizing the ground state particle dynamics in HiPIMS discharges

16.30 Concluding remarks

**Q**

**Q-West**

<http://q-we.st/q-day>

**R**

**Rawsome Delights**

**Registration**

The registration desk will be located at the Audimax.

Registration hours are:

Monday, October 10, 8:00 am to 6:00 pm

Tuesday, October 11, 8:00 am to 5:30 pm

## **Robeko, Magpuls, Plasus**

Gold sponsor

## **RUB**

### First university in the Ruhr area

The RUB was the first university in the Ruhr area, and the founding fathers wanted it to compensate for the declining industrial sectors in the 60s with a first-class education offensive. In its basic orientation and its size, the RUB was to set itself apart from the established universities. Built on a green field site, it was easiest to reach via a six-lane motorway and by rail. The main catchment area of the RUB has always been the whole Ruhr Metropolis. With the programme UniverCity, the connection between the city centre of Bochum and the RUB is to be upgraded.

### **RUB Botanical Garden Tours**

Just south of the conference center (Veranstaltungszentrum VZ), you can find the Botanical Garden which includes some tropical houses and a Chinese garden. It can easily be reached when you have some free time during the GEC 2016.

Open: 9:00-18:00

We offer guided tours in English on  
Wednesday 13:45-14:45 (max. 25 people)  
Thursday 12:45-14:45 (max. 25 people)

## **S**

### **Sandia National Laboratories and the Department of Energy / DOE (US)**

Gold sponsor

### **Session numbering scheme**

Each session code consists of a letter and a number. The first letter indicates the number of that session in the program, e.g. A for 1, B for 2 etc. The second letter indicates the day of the week: M for Monday, T for Tuesday, W for Wednesday, R for Thursday, and F for Friday. The last number (1-4) is the index used to distinguish the concurrent sessions (see table below for room assignments). The plenary session on Wednesday will take place in the Auditorium Maximum (Audimax), and the poster sessions will be held in the Audimax (Foyer).

### **Session index --> Room**

- 1 --> room 1
- 2 --> room 2a
- 3 --> room 2b
- 4 --> room 3

### **Special events**

#### **Monday: Conference Reception**

An opening reception will be held from 6:00 pm to 8:00 pm on Monday, October 10, in the Audimax Foyer.

### **Tuesday: Planetarium Show**

20:00 exclusive show for the GEC in the Planetarium Bochum: "Time Travel - From the Big Bang to Humankind"

The Planetarium is close to Bochum Main Station and can be reached from there with just one stop of the tram lines 308 and 318 in direction Schürbankstraße/Gerthe (the stop is called 'Planetarium'). More detailed information about how to get there can be found online (German only).

### **Tuesday/Wednesday: Plasma Lab Tours**

There will be four lab tours on Tuesday, October 11, 7:30 pm, and four lab tours on Wednesday, October 12, 7:00 pm. Each tour takes 60 minutes and covers two different laboratories. The groups hosting the lab tours are:

- Experimental Physics II: Chair for "Physics of Reactive Plasmas" and Research Group "Coupled Plasma-Solid State Systems"
- Experimental Physics V: Chair for "Plasma and Atomic Physics"
- Chair for "Electrical Engineering and Plasma Technology"
- Research Group "Biomedical Applications of Plasmas"

Register for the lab tours at the info board, located in the Audimax Foyer next to GEC registration.

20:00 Exclusive show for the GEC in the Planetarium Bochum: "Time Travel - From the Big Bang to Humankind"

The Planetarium is close to Bochum Main Station and can be reached from there with just one stop of the tram lines 308 and 318 in direction Schürbankstraße/Gerthe (the stop is called 'Planetarium'). More detailed information about how to get there can be found online (German only). <http://www.planetarium-bochum.de/>

### **Wednesday/Thursday: RUB Botanical Garden Tours**

Just south of the conference center (Veranstaltungszentrum VZ), you can find the Botanical Garden which includes some tropical houses and a Chinese garden. It can easily be reached when you have some free time during the GEC 2016.

Open: 9:00-18:00

We offer guided tours in English on

Wednesday 13:45-14:45 (max. 25 people)

Thursday 12:45-14:45 (max. 25 people)

Please register at the information desk for those tours.

### **Wednesday: Klais Organ concert**

14:15-14:45 Audimax

**Markus Breker** plays the following organ-pieces:

Präludium a-moll (Johannes Brahms)

Overture and Adagio (Leos Janacek)

Cantilena (Josef Rheinberger)

Improvisation (variations on a theme by N. Paganini)

### **Thursday: Conference Banquet & Reception (and guided tours)**

On Thursday evening, October 13, the banquet reception will be held at 6:00 pm, Henrichs, Gebläsehalle, Werksstraße 31-33, Hattingen, followed by the banquet from 7:00 pm to 11:00 pm featuring live entertainment. Prior to the banquet there are five guided tours to the old



blast furnace. Please register for those at the information desk in the Audimax!  
Bus transportation between RUB and Henrichs will be provided for all participants at 5:30 pm (for the guided tours) and 6:30 pm (for the banquet only) and after the banquet back to Bochum Main Station (city center). The cost of the banquet is included in the attendee's registration fee. Banquet guest tickets may be purchased for EUR 70 online. The GEC Awards for Best Student Oral and Poster Presentations will be presented during the banquet.

Important: The cost of the banquet is included in the attendee's registration fee. Nevertheless, you still need to register for it. Additional banquet guest tickets may be purchased for EUR 70 online. Please note that the caterer for the conference banquet needs to know the exact number of participants well in advance of the event. Therefore, only a very limited number of tickets will be available after September 28. Please register in time!

### **Art Exhibition and Antique Collection**

Antikenmuseum in den Kunstsammlungen der Ruhr-Universität Bochum

Open: Tuesday-Sunday 11:00-17:00

No entrance fee

### **Sponsors**

#### **Gold sponsors**

American Physical Society (APS)

Deutsche Forschungsgemeinschaft (DFG)

National Science Foundation (US)

Robeko, Magpuls, Plasus

Tokyo Electron, Inc.

Sandia National Laboratories and the Department of Energy / DOE (US)

#### **Silver sponsors**

LAM Research Corporation

Applied Materials, Inc.

#### **Bronze sponsors**

Menlo Systems GmbH

### **Sponsoring packages**

There are various sponsoring opportunities available.

**Gold:** > 4,000 Euro (plus 19% tax)

Company name listed on conference website

Company logo listed on third announcement

Company logo in large size on sponsor poster located in exhibitor area

Highlighted at the conference dinner as Gold Sponsor

2 complementary registrations

**Silver:** 2,000-3,999 Euro (plus 19% tax)

Company name listed on conference website

Company logo in medium size on sponsor poster located in exhibitor area

1 complementary registration

**Bronze:** 1,000-1,999 Euro (plus 19% tax)

Company name listed on conference website

Company logo in small size on sponsor poster located in exhibitor area

## **T**

### **Tokyo Electron, Inc.**

Gold sponsor

## **U**

## **V**

### **Vending Machine**

<http://www.akafoe.de/gastronomie/automatenstationen/>

## **W**

### **Will Allis Prize**

The prize consists of \$10,000 and a certificate citing the contributions made by the recipient. An allowance will be provided for travel expenses of the recipient to the meeting of the Society at which the prize is bestowed. The prize is awarded in even-numbered years.

### **Workshops**

Overview:

Workshop 1: Future Challenges in Plasma Physics, Uwe Czarnetzki et al.

Workshop 2: Plasma Kinetics, Toshiaki Makabe et al.

Workshop 3: Pulsed high power plasmas for the synthesis of nanostructured thin films, Peter Awakowicz, Ante Hecimovic et al.

Workshop 4: Electrification of the chemical industry, Richard van de Sanden, David Graves et al.

## **X**

## **Y**

## **Z**