

## **Workshop Program**

**6<sup>th</sup> „Georgian – German School and Workshop in Basic Science“  
GGSWBS'14**

**July 6 – 12, Tbilisi, Georgia**

**– TEN YEARS OF GEORGIAN-GERMAN SCIENCE BRIDGE –**

### **Topics:**

1. Precision Experiments (with Hadronic Probes)
2. Condensed Matter Physics (with Photon and Neutron Probes)
3. Atmospheric Sciences (Chemistry and Models)
4. Medical Applications (Imaging)
5. Engineering Sciences (Simulation and Instrumentation)

### **Venue and general schedule of the meeting:**

**Sun, July 6:** Arrival (*early morning*); Tbilisi Tour (14:00 – 18:30)  
Registration & Welcome Reception (19:30 – 22:00)  
(*MUZA, 'Kusa Tba' road, Tbilisi*)

**Mon, Tue (July 7, 8):** Ivane Javakhishvili Tbilisi State University (TSU)  
(*Chavchavadze ave. 1, Main building*)

**Wed, July 9:** Social program (9:30 – 21:00)  
(*Excursion to **Dmanisi**, Archaeological site*)

**Thu, Fri (July 10, 11):** Georgian Technical University (GTU)  
(*Kostava str. 77, Administration building*)

**Sat, July 12:** Departure (*after midnight*)

July 7, Monday (TSU) 10<sup>00</sup> – 18<sup>30</sup>

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### Existing and Future Cooperation

#### **Plenary opening session I** (foyer of acting hall) (10:00 – 13:30)

- Welcome/Opening Address** – Vladimer Papava, Rector of TSU
- Representative of Ministry of Education and Science of Georgia
  - Representative of German Embassy in Tbilisi
  - Sulkhan Sisauri, Director General of SRNSF
  - Sebastian Schmidt, FZ-Jülich Board of Directors
  - Hans Ströher, Director of IKP/FZJ: „Scope of the Workshop“

**Ceremony session for signatures:** cooperation agreements between TSU and FZJ-Institutes

#### *Projects and Prospects in Basic Science (Overviews)*

- Sebastian Schmidt (FZJ) – „Forschungszentrum Jülich: Excellent Science and Technology“
  - Hans Ströher (FZJ) – „Examples from the Precision Frontier“
- 12:00 – 12:30 Coffee break (+ conference photo)
- Thomas Brückel (FZJ) – „Neutrons - a Special Gift of Nature“
  - Alexander Shengelaya (TSU) – „Condensed Matter Physics in TSU: Achievements and Perspectives“

13:30 – 15:00 Lunch break

→ **Parallel sessions: 1, 2, 3, and 4 (15:00 – 18:30)** (see next page)

**19<sup>30</sup> – 22<sup>00</sup> Social program** (Welcome dinner, „Old Metekhi“ restaurant)

July 8, Tuesday (TSU) 9<sup>30</sup> – 18<sup>30</sup>

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#### **Plenary session II** (auditorium 07) (9:30 – 13:00)

- Andreas Wahner (FZJ) – „Atmospheric Chemistry in Jülich“
  - Astrid Kiendler-Scharr (FZJ) – „Aerosols in the Atmosphere“
  - Hendrik Elbern (FZJ) – „Combining Atmospheric Models with Data“
- 11:00 – 11:30 Coffee break
- George Japaridze (Ilia Uni) – „Synthetic Helical Liquid in a Quantum Wire“
  - Ismat Shah (Delaware Uni, USA) – „Solar Energy“
  - Kazimierz Conder (PSI) – „Electrical Transport and Magnetic Interactions in 3d and 5d transition metal oxides“

13:00 – 14:30 Lunch break

→ **Parallel sessions: 5, 6, and 7 (14:30 – 17:00)** (see next page)

**Poster (students) session 1 (17:00 – 18:30)** (size of posters: A0 (841 x 1189 mm))

**18<sup>30</sup> – 19<sup>30</sup> Reception at TSU** (snack & beverage)

**19<sup>30</sup> – 20<sup>00</sup> Awarding ceremony** (acting hall)

**20<sup>00</sup> – 20<sup>30</sup> Public Lecture: Prof. Otto Schult (Jülich)** – „International Co-operation, driven by science and constrained by politics – Happy Periods in Life“

**20<sup>30</sup> – 22<sup>00</sup> Social program:** TSU GORDELA's performance (acting hall)

July 10, Thursday (GTU) 10<sup>00</sup> – 18<sup>30</sup>

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## Existing and Future Cooperation

### **Plenary session III (Nikoladze hall) (10:00 – 13:30)**

- Welcome Address** – **Archil Prangishvili**, Rector of GTU  
– **Representative** of Ministry of Education and Science of Georgia  
– **Hans Ströher** – „Georgian-German Science Bridge: status & outlook“

#### *Projects and Prospects in Basic Science (Overviews)*

- Jon Shah (FZJ) – „From the Basics of MRI and PET to Hybrid MR-PET Imaging“
- Ghaleb Natour (FZJ) – „Technology for Excellent Science“
- Giorgi Nabakhtiani (GTU) – „Radioactive Waste Management: problems & trends for developments“

12:00 – 12:30 Coffee break

- Paata Kervalishvili (GTU) – *Isotope Effects in Condensed Matter and Sensory Applications*
- Farida Grinberg (FZJ) – „Diffusion MRI and its Applications in Neurosciences“

13:30 – 15:00 Lunch break

→ **Parallel sessions: 8, 9, 10, and 11 (15:00 – 18:30)** (see next page)

**19<sup>30</sup> – 22<sup>00</sup> Social program** (Banquet of the Workshop, „Taglaura“ restaurant)

July 11, Friday (GTU) 9<sup>30</sup> – 18<sup>00</sup>

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### **Plenary session IV (Nikoladze hall) (9:30 – 13:00)**

- Alfons Khoukaz (Münster Uni)– „Recent and Future Internal Targets for Hadron Physics“
- Paolo Lenisa (Ferrara Uni) – „Silicon Detectors in Particle Physics“
- Irakli Keshelashvili (FZJ) – „Development of Low Noise/Low Power Preamplifier for Low Gain Photosensors“

11:00 – 11:30 Coffee break

- Jörg Wolters (FZJ) – „Simulation Driven Product and Process Development“
- Avto Tavkhelidze (Ilia Uni) – „Nanostructured Materials for Renewable Energy“
- Olga Tsursumia (GTU) – „Diversified Application of Corrosion Resistant Materials“

13:00 – 14:30 Lunch break

**Poster (students) session 2 (14:30 – 16:00)** (size of posters: A0 (841 x 1189 mm))

16:00 – 16:30 Coffee break

### **Plenary closing session V (Nikoladze hall) (16:30 – 18:00)**

- **Dieter Grzonka** (FZJ) – „Science Funding in Europe: HORIZON 2020“
- **Concluding remarks** („Summary of the Workshop and Forward Look“):  
**Germany:** Hans Ströher (FZJ)  
**Georgia :** Marine Chitashvili (TSU) / Ketevan Kotetishvili (GTU) / Avto Tavkhelidze (Ilia) / Irakli Noselidze (SRNSF) / **Representative** (of Science Ministry)
- **Awarding ceremony** (for students)

**End of Workshop**

July 7, Monday (TSU)

## Parallel sessions

### *Workshop group meetings and Topical lectures*

#### **Parallel session 1 (aud. 07) (Topic 1: JEDI project): Convener – M. Nioradze (15:00 – 18:30)**

- Jordy de Vries (FZJ) – „EDM theory and motivation for JEDI“
- Ralf Gebel (FZJ) – „From COSY to a dedicated EDM storage ring“
- Helmut Soltner (FZJ) – „Precision beam monitors for COSY-Jülich“
- 16:30 – 16:50 Coffee break
- Fabian Hinder (FZJ) – „EDM study at COSY: recent results“
- Sebastian Mey (FZJ) – „An RF- ExB dipole for spin manipulation“
- Andrea Pesce (Ferrara Uni) – „Spin tracking studies for EDM search in storage rings“
- Andrzej Magiera (Jagellonian Uni) – „Effects of fields gradients on the spin precession“

#### **Parallel session 2 (aud. 20) (Topic 2): Convener – A. Shengelaya (15:00 – 18:30)**

- Sultan Demirdis (FZJ) – „SANS study of vortex lattice structural transition on optimally doped BaKFeAs“
- Aurel Radulescu (FZJ) – „Neutrons and soft matter“
- Vladimir Hutanu (RTWH) – „Spherical neutron polarimetry as a powerful method for the precise magnetic structure determination“
- 16:30 – 16:50 Coffee break
- Zurab Guguchia (PSI) – „Novel oxygen isotope effects in the stripe phase of cuprates“
- Davit Nozadze (Missouri Uni, USA) – „Smeared phase transitions in substitutional alloys  $A_{1-x}B_x$ “
- Vitali Gogoberidze (Ilia Uni) – „Numerical experiments on nanograting layers“

#### **Parallel session 3 (aud. 21) (Topic 3): Convener – R. Botchorishvili (15:00 – 18:30)**

- Ramaz Botchorishvili (TSU) – „Numerical schemes for advection reaction equation“
- Hendrik Elbern (FZJ) – „Atmospheric chemistry modelling (Lecture)“
- 16:30 – 16:50 Coffee break
- Bezhan Chankvetadze (TSU) – „TSU projects in physical and analytical chemistry“

#### **Parallel session 4 (aud. 107) (Topic 4): Convener – K. Kotetishvili (15:00 – 18:30)**

- Lukas Breuer (FZJ) – „Investigating the spatio-temporal dynamics of neuromagnetic activity by using magnetoencephalography“
- Nino Kobalia (GTU) – „General aspects of radiation therapy“
- Zviad Mgaloblishvili (GTU) – „Computer based device for ionophores and galvanization“
- Vakhtang Chkheidze (Medulla clinic) – „Main principles of the management of oncology patients: “MEDULLA“ Clinic experience“
- 16:30 – 16:50 Coffee break
- Giorgi Gigilashvili (GTU) – „Computer analyzer for field of vision“
- Archil Chirakadze (GTU) – „Phyto- and bioremediation of radioactive Cs-polluted soils and complex utilization of generated hazardous waste“
- Dito Shergelashvili, Mikheil Kelenjeridze, Tamar Khechiashvili (GTU students): –  
– „Experience gained during the intership program at INM-4 (FZJ)“
- Elene Iordanishvili (TS Mediacal Uni) – „The role of CT and MRI in evaluation of Osteoid Osteoma“

July 8, Tuesday (TSU)

## **Parallel sessions**

### *Workshop group meetings and Topical lectures*

#### **Parallel session 5 (aud. 07) (Topic 1, ANKE exp.): Convener – M. Nioradze (14:30 – 17:00)**

- Erhard Steffens (Erlangen Uni) – „Spin as a tool for storage ring experiments“ (**Lecture**)
- David Mchedlishvili (TSU/FZJ) – „Double-polarized np-scattering experiments at ANKE“
- Zara Bagdasarian (TSU/FZJ) – „Recent results from pp-elastic experiment at ANKE“
- Ralf Engels (FZJ) – „Polarized fusion“

16:00 – 16:20 Coffee break

- Akaki Rusetsky (Bonn Uni) – „Lattice QCD and the Effective Field Theories“ (**Lecture**)

#### **Parallel session 6 (aud. 107) (Topic 2): Convener – A. Shengelaya (14:30 – 17:00)**

- Raphael Hermann (FZJ) – „Thermoelectrics“
- Manuel Angst (FZJ) – „Ordering phenomena“
- Benedikt Klobes (FZJ) – „Structural materials“

16:00 – 16:20 Coffee break

- Karen Friese (FZJ) – „Crystallography“
- Larissa Juschkina (RWTH) – „Light for the nanoworld: applications of extreme ultraviolet radiation in nanostructuring and metrology“

#### **Parallel session 7 (aud. 101) (Topic 3): Convener – R. Botchorishvili (14:30 – 17:00)**

- Franz Rohrer (FZJ): „Introduction to specific atmospheric chemistry mechanism“ (**Lecture**)
- Ramaz Gakhokidze (TSU) – „TSU projects in organic and inorganic chemistry“

16:00 – 16:20 Coffee break

- Students activity: – „Hands on chemistry process modeling“

July 10, Thursday (GTU)

## Parallel sessions

### *Workshop group meetings and Topical lectures*

#### **Parallel session 8 (Nikoladze) (Top.1, PAX/TRIC): Convener – A. Kacharava (15:00 – 18:30)**

- Paolo Lenisa (Ferrara) – „Introduction to PAX experiment“
  - Vito Carassiti (Ferrara) – „Multipurpose detection system for PAX“
  - Dieter Eversheim (Bonn Uni) – „TRIC experiment at COSY: status and preparation“
  - Konstantin Tsigutkin (California Uni, Berkeley) – „Atomic parity-violation effect“
- 16:30 – 16:50 Coffee break
- Andreas Nogga (FZJ) – „Theory of 3-nucleon forces“
  - Pia Thorngren (Stockholm) – „Deuteron breakup studies at low energies“
  - Susanna Bertelli (Ferrara) – „Exp. study of deuteron breakup reaction at  $T_p = 50$  MeV “
  - Detlev Gotta (FZJ) – „Ultimate precision spectroscopy of hadronic atoms“ (**Lecture**)

#### **Parallel session 9 (aud. 401) (Topic 2): Convener – A. Tavkhelidze (15:00 – 18:30)**

- David Jishiashvili (GTU) – „Development of new oxide-assisted technology for nanostructures“
  - Lili Nadaraia (GTU) – „Spark plasma sintering of ultra high temperature ceramics“
  - Malkhaz Jabua (GTU) – „Ultimate resolution X-ray measurements at the IKP Bragg spectrometer“
- 16:30 – 16:50 Coffee break
- Tamar Chelidze (TSU) – „Coulomb impurities in semiconducting nanostructures“
  - Mikheil Mebonia (Ilia) – „Electronic and thermoelectric properties of nanograting layers“
  - Alexander Jishiashvili (GTU) – „Growth of  $In_2O_3$  nanowire networks for gas sensing device applications“
  - Giorgi Khazaradze (TSU) – „Study of hexaferrite material ( $BaSrZnFeO$ ) by EPR technique“

#### **Parallel session 10 (aud. 326) (Topic 3): Convener – R. Botchorishvili (15:00 – 18:30)**

- Teimuraz Davitashvili (TSU) – „On numerical modelling of regional atmospheric processes over the caucasus“
  - Ketevan Kasradze (Köln Uni) – „Optimization for inverse modelling“
  - Mariam Elizbarashvili (TSU) – „Climate change tendencies in Georgia under global warming conditions“
- 16:30 – 16:50 Coffee break
- Students activity: Franz Rohrer, Astrid Kiendler-Scharr, Andreas Wahner – „Questions and Answers for Atmospheric Chemistry Exercise“

#### **Parallel session 11 (meeting room ) (Topic 4): Convener – K. Kotetishvili (15:00 – 18:30)**

- Jon Shah (FZJ) – „Introduction to MRI and PET (**Lecture**)“
- 16:30 – 16:50 Coffee break
- Farida Grinberg (FZJ) – „Introduction to Diffusion MRI (**Lecture**)“