Workshop Program

6th „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 (a*fter midnight*)

July 7, Monday (**TSU**) **10^{00} – 18^{30}**

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 (30')*
- **Hans Ströher (FZJ)** – *Examples from the Precision Frontier (30')*

12:00 – 12:30 Coffee break (+ conference photo)

- **Thomas Brückel (FZJ)** – *Neutrons - a Special Gift of Nature (30')*
- **Alexander Shengelaya (TSU)** – *Condensed Matter Physics in TSU: Achievements and Perspectives (30')*

13:30 – 15:00 Lunch break

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

19^{30} – 22^{00} Social program (Welcome dinner, „Old Metekhi" restaurant)

July 8, Tuesday (**TSU**) **9^{30} – 18^{30}**

Plenary session II (auditorium 7) **(9:30 – 13:00)**

- **Andreas Wahner (FZJ)** – *Atmospheric Chemistry in Jülich (30')*
- **Astrid Kiendler-Scharr (FZJ)** – *Aerosols in the Atmosphere (30')*
- **Hendrik Elbern (FZJ)** – *Combining Atmospheric Models with Data (30')*

11:00 – 11:30 Coffee break

- **George Japaridze (Ilia Uni)** – *Synthetic Helical Liquid in a Quantum Wire (30')*
- **Ismat Shah (Delaware Uni, USA)** – *Solar Energy (30')*
- **Kazimierz Conder (PSI)** – *Electrical Transport and Magnetic Interactions in 3d and 5d transition metal oxides (30')*

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)

18^{30} – 19^{30} Reception at TSU (snack & bevarage)

19^{30} – 20^{00} Awarding ceremony (acting hall)

20^{00} – 20^{30} Public Lecture: Prof. Otto Schult (Jülich) – *„**International Co-operation, driven by science and constrained by politics** – Happy Periods in Life"*

20^{30} – 22^{00} Social program: TSU GORDELA's performance (acting hall)

July 10, Thursday (GTU) **10^{00} – 18^{30}**

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 (30')*
- **Ghaleb Natour (FZJ)** – *Technology for Excellent Science (30')*
- **Giorgi Nabakhtiani (GTU)** – *Radioactive Waste Management: problems & trends for developments (30')*

12:00 – 12:30 Coffee break

- **Paata Kervalishvili (GTU)** – *Isotope Effects in Condensed Matter and Sensory Appl.s (30')*
- **Farida Grinberg (FZJ)** – *Diffusion MRI and its Applications in Neurosciences (30')*

13:30 – 15:00 Lunch break

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

19^{30} – 22^{00} Social program (Banquet of the Workshop, „Taglaura“ restaurant)

July 11, Friday (GTU) **9^{30} – 18^{00}**

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

- **Alfons Khoukaz (Münster)** – *Recent and Future Internal Targets for Hadron Physics (30')*
- **Paolo Lenisa (Ferrara Uni)** – *Silicon Detectors in Particle Physics (30')*
- **Irakli Keshelashvili (FZJ)** – *Development of Low Noise/Low Power Preamplifier for Low Gain Photosensors (30')*

11:00 – 11:30 Coffee break

- **Jörg Wolters (FZJ)** – *Simulation Driven Product and Process Development (30')*
- **Avto Tavkhelidze (Ilia Uni)** – *Nanostructured Materials for Renewable Energy (30')*
- **Olga Tsurtsumia (GTU)** – *Diversified Aplication of Corosion Resistant Materials (30')*

13:00 – 14:30 Lunch break

Poster (students) session 2 **(14:30 – 16:00)**

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“ (30')*
- **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. 7) **(Topic 1: JEDI project): Convener – M. Nioradze (15:00 – 18:30)**

- **Jordy de Vries (FZJ)** – *EDM theory and motivation for JEDI (30')*
- **Ralf Gebel (FZJ)** – *From COSY to a dedicated EDM storage ring (30')*
- **Helmut Soltner (FZJ)** – *Precision beam monitors for COSY-Jülich (30')*

16:30 – 16:50 Coffee break

- **Fabian Hinder (FZJ)** – *EDM study at COSY: recent results (20')*
- **Sebastian Mey (FZJ)** – *An RF- ExB dipole for spin manipulation (20')*
- **Andrea Pesce (Ferrara Uni)** – *Spin tracking studies for EDM search in storage rings (20')*
- **Andrzej Magiera (Jagellonian U)** – *Effects of fields gradients on the spin precession (20')*

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 (30')*
- **Aurel Radulescu (FZJ)** – *Neutrons and soft matter (30')*
- **Vladimir Hutanu (RTWH)** – *Spherical neutron polarimetry as a powerful method for the precise magnetic structure determination (30')*

16:30 – 16:50 Coffee break

- **Zurab Guguchia (PSI)** – *Novel oxygen isotope effects in the stripe phase of cuprates (30')*
- **Davit Nozadze (Missouri Uni, USA)** – *Smeared phase transitions in substitutional alloys A1-xBx (30')*
- **Vitali Gogoberidze (Ilia Uni)** – *Numerical experiments on nanograting layers (30')*

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

- **Ramaz Botchorishvili (TSU)** – *Numerical schemes for advection reaction equation (30')*
- **Hendrik Elbern (FZJ)** – *Atmospheric chemistry modelling* ***(Lecture)*** *(40')*

16:30 – 16:50 Coffee break

- **Bezhan Chankvetadze (TSU)** – *TSU projects in physical and analytical chemistry (1h,40')*

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 (30')*
- **Nino Kobalia (GTU)** – *General aspects of radiation therapy (20')*
- **Zviad Mgaloblishvili (GTU)** –*Computer based device for ionophores & galvanization (20')*
- **Vakhtang Chkheidze (Medulla clinic)** – *Main principles of the management of oncology patients:"MEDULLA" Clinic experience (20')*

16:30 – 16:50 Coffee break

- **Giorgi Gigilashvili (GTU)** – *Computer analyzer for field of vision (20')*
- **Archil Chirakadze (GTU)** – *Phyto- and bioremediation of radioactive Cs-polluted soils and complex utilization of generated hazardous waste (20')*
- **Dito Shergelashvili, Mikheil Kelenjeridze, Tamar Khechiashvili (GTU students)**: – *„Experience gained during the intership program at INM-4 (FZJ)" (30')*
- **Elene Iordanishvili (TS Mediacal Uni)** – *The role of CT and MRI in evaluation Osteoid Osteoma (20')*

July 8, Tuesday (**TSU**)

Parallel sessions

Workshop group meetings and Topical lectures

Parallel session 5 (aud. 7) **(Topic 1, ANKE exp.): Convener – M. Nioradze (14:30 – 17:00)**

- **Erhard Steffens (Erlangen)** – *Spin as a tool for storage ring experiments“* ***(Lecture)****(40')*
- **David Mchedlishvili (TSU)** – *Double-polarized np-scattering experiments at ANKE (15')*
- **Zara Bagdasarian (TSU)** – *Recent results from pp-elastic experiment at ANKE (15')*
- **Ralf Engels (FZJ)** – *Polarized fusion (20')*

  16:00 – 16:20 Coffee break
- **Akaki Rusetsky (Bonn U)** – *Lattice QCD and the Effective Field Theories* ***(Lecture)*** *(40')*

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

- **Raphael Hermann (FZJ)** – *Thermoelectrics (30')*
- **Manuel Angst (FZJ)** – *Ordering phenomena (30')*
- **Benedikt Klobes (FZJ)** – *Structural materials (30')*

  16:00 – 16:20 Coffee break
- **Karen Friese (FZJ)** – *Crystallography (20')*
- **Larissa Juschkin (RWTH)** – *Ligth for the nanoworld: applications of extreme ultraviolet radiation in nanostructuring and metrology (20')*

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

- **Franz Rohrer (FZJ)** – *Intr. to specific atmospheric chemistry mechanism“* ***(Lecture)*** *(45')*
- **Ramaz Gakhokidze (TSU)** – *TSU projects in organic and inorganic chemistry (45')*

  16:00 – 16:20 Coffee break
- **Students activity:** – *„Hands on chemistry process modeling“ (40')*

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 (10')*
- **Vito Carassiti (Ferrara)** – *Multipurpose detection systém for PAX (20')*
- **Dieter Eversheim (Bonn Uni)** – *TRIC experiment at COSY: status and preparation (30')*
- **Konstantin Tsigutkin (California Uni, Berkeley)** – *Atomic parity-violation effect (30')*

16:30 – 16:50 Coffee break

- **Andreas Nogga (FZJ)** – *Theory of 3-nucleon forces (30')*
- **Pia Thorngren (Stockholm)** – *Deuteron breakup studies at low energies (25')*
- **Susanna Bertelli (Ferrara)** – *Exp. study of deuteron breakup recation at Tp=50 MeV (15')*
- **Detlev Gotta (FZJ)** – *Ultimate precision spectroscopy of hadronic atoms (30')*

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 (30')*
- **Lili Nadaraia (GTU)** – *Spark plasma sintering of ultra high temperature ceramics (30')*
- **Malkhaz Jabua (GTU)** – *Ultimate resolution X-ray meas.s at the IKP Bragg spectrometer (30')*

16:30 – 16:50 Coffee break

- **Tamar Chelidze (TSU)** – *Coulumb impurities in semiconducting nanostructures (30')*
- **M. Mebonia (Ilia)** – *Electronic and thermoelectric propertiess of nanograting layers (25')*
- **Alexander Jishiashvili (GTU)** – *Growth of In_2O_3 nanowire networks for gas sensing device applications (25')*
- **G. Khazaradze (TSU)**– *Study of hexaferrite material (BaSrZnFeO) by EPR technique (25')*

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 (30')*
- **Ketevan Kasradze (Köln Uni)** – *Optimization for inverse modelling (30')*
- **Mariam Elizbarashvili (TSU)** – *Climate change tendencies in Georgia under global warming conditions (30')*

16:30 – 16:50 Coffee break

- **Students activity**: **Franz Rohrer, Astrid Kiendler-Scharr, Andreas Wahner** – *Questions and Answers for Atmospheric Chemistry Exercise (1h, 40)*

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

- **Jon Shah (FZJ)** – *Introduction to MRI and PET **(Lecture)** (45')*

16:30 – 16:50 Coffee break

- **Farida Grinberg (FZJ)** – *Introduction to Diffusion MRI **(Lecture)** (45')*