

School Program (Batumi)

[August 13, Monday \(BSU\)](#) 10⁰⁰ - 18³⁰

Opening session

- Welcome** – **Aliosha Bakuridze**, Rector of BSU
– **Gia Abuladze**, Minister of Education, Culture and Sport of Ajara AR
– **Irma Tsereteli**, Advisor for Migration and Diaspora Program "Migration for Development"
– **Hans Ströher** (FZ Jülich) - „*Scope of the School*“
– **Signature of LoI between IKP/FZ Jülich and BSU**

Topical lectures

Plenary session I (10:15 – 13:30)

- Lecture 1: **Hans Ströher** (FZJ) – „Structure of Matter“ (45')
Lecture 2: **Andreas Wahner** (FZJ) – „Climate, Environment“ (45')
11:45 – 12:00 Coffee break
Lecture 3: **Rudolf Maier** (FZJ) – „Accelerators“ (45')
Lecture 4: **Hendrik Elbern** (Köln Uni) – „Atmospheric Simulations“ (45')
13:30 – 15:00 Lunch break

Parallel sessions (15:00 – 18:30)

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| Session 1 (Topics 1 and 2):
Convener - M. Nioradze | Session 2 (Topic 3):
Convener - A. Shengelaya | Session 3 (Topics 4, 5, 6):
Convener – M. Koridze (BSU) |
| Sergey Mikirtychiants (FZJ) - „Data Acquisition Hardware and Triggering“ (45') | Avto Tavkhelidze (Ilia Uni) - „Quantum Size Effects in Nanostructures“ (45') | Ketino Natsarishvili (BSU) - „Researches in Biodiversity“ (30') |
| Giorgi Macharashvili (HEPI TSU) - „Data Analysis“ (45') | Olga Tsurtsunia (GTU) - „Modern Corrosion Resistant Materials“ (45') | Zoya Sikharulidze (BSU) - „Researches in Phytopathology“ (30') |
| | | Sophio Papanidze (BSU) - „Researches in Agrarian and Membrane Technologies“ (30') |

16:30 – 17:00 Coffee break

Tutorials for working group 1 Tutorials for working group 2 Tutorials for working group 3

[August 14, Tuesday \(BSU\)](#) 10⁰⁰ – 18³⁰

Topical lectures

Plenary session II (10:00 – 13:30)

- Lecture 5: **Frank Rathmann** (FZJ) – „Spin“ (45')
Lecture 6: **Erhard Steffens** (Erlangen Uni) – „Targets“ (45')
11:30 – 12:00 Coffee break
Lecture 7: **Kazimierz Conder** (PSI) – „101 Years of Superconductivity“ (45')
Lecture 8: **Sayavur Bakhtiarov** (New Mexico, USA) – „Self-Healing Materials: Myth or Reality?“ (45')
13:30 – 15:00 Lunch break

Parallel sessions (15:00 – 18:30)

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| Session 4 (Topics 1 and 2):
Convener - Andro Kacharava | Session 5 (Topic 3):
Convener - Olga Tsurtsunia | Session 6 (Topics 4, 5 and 7):
Convener - Ramaz Botchorishvili |
| Akaki Giginishvili (GTU) – „Thins Films and their Optical Properties“ (45') | Kazimierz Conder (PSI) - „Electronic and ionic conductivity in metal oxides“ (45') | To be announced |
| Zaur Jabua (GTU) - „Thin Films Technology“ (45') | Alexander Shengelaya (TSU) - „Oxygen isotope effects in novel superconductors“ (45') | |

16:30 – 17:00 Coffee break

Tutorials for working group 1 Tutorials for working group 2 Tutorials for working group 3

[August 16, Thursday \(BSU\)](#) 10⁰⁰ – 18³⁰

Topical lectures

Plenary session III (10:00 – 13:30)

- Lecture 9: **Detlev Gotta** (FZJ) – „Detectors“ (45')
Lecture 10: **Dieter Evesheim** (Bonn Uni) – „Electronics“ (45')
11:30 – 12:00 Coffee break

- Lecture 11: **Torsten Markus** (FZJ) – „Energy Frontier“ (45')
Lecture 12: **Levan Chkhartishvili** (GTU) – „Studying Nanomaterials: Current Trends“ (45')

13:30 – 15:00 Lunch break

Parallel sessions (15:00 – 18:30)

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| Session 7 (Topic 3):
Convener - A. Shengelaya | Session 8 (Topics 4 and 5):
Convener - G. Goletiani | Session 9 (Topic 7):
Convener - R. Botchorishvili |
| Zurab Guguchia (TSU/PSI) - „Muon spin rotation technique and its applications in superconductivity & magnetism“ | David Tavkhelidze (GTU) - „Development of mechanical engineering“ (45') | Ramaz Botchorishvili (TSU) - „Numerical Modelling I“ (45') |
| Tamar Chelidze (TSU) - „Coulomb interaction in quantum structures“ | Mariam Elizbarashvili (TSU) - „Climate Change“ (45') | Ramaz Botchorishvili (TSU) - „Numerical Modelling II“ (45') |

16:30 – 17:00 Coffee break

Tutorials for working group 1 Tutorials for working group 2 Tutorials for working group 3

[August 17, Friday \(BSU\)](#) 10⁰⁰ – 12⁰⁰

Topical lectures

Plenary session IV (10:00 – 12:00)

- Lecture 13: **Vahtang Gogohia** (RMKI, Budapest) – „Theory of QCD“
Lecture 14: **Ketevan Kotetishvili** (GTU) – „Medical Physics: the Science of XXI Century“ (45')
11:30 – 11:45 Coffee break
Summary/Concluding remarks: Hans Ströher (FZJ)
Aliosha Bakuridze (BSU)

End of School !



5th Georgian-German School and Workshop in Basic Science GGSWBS'12

Workshop Program: (August 6 – 10), Tbilisi, Georgia

- Day 1, 2:** Ivane Javakhishvili Tbilisi State University (TSU)
(Chavchavadze ave. 1, Main building)
Day 3: Social program (Excursion)
Day 4, 5: Georgian Technical University (GTU)
(Kostava str. 77, Administration building)

School Program: (August 13 – 17), Batumi, Georgia

- Day 1, 2:** Shota Rustaveli Batumi State University (BSU)
Day 3: Social program (Excursion)
Day 4, 5: Shota Rustaveli Batumi State University (BSU)

Topics:

- Existing and Future Physics Projects at Large-Scale Facilities: COSY, FAIR, and LHC
- Search for Electric Dipole Moments (EDMs) at Storage Rings
- Solid State Physics and Materials Science
- Bio- and GeoScience
- Engineering Science
- Neuroscience and Medicine
- Information Technology and Advanced Computing

[August 6, Monday \(TSU\)](#) 10⁰⁰ - 18³⁰

Existing and Future Cooperation

Plenary session I (10:00 – 13:30)

- Welcome** – **Alexander Kvitashvili**, Rector of TSU
– **Sulkhan Sisauri**, Director General of SRNSF
– **Hans Ströher** (FZJ) - „*Scope of the Workshop*“

Projects and Prospects in Basic Science (Overviews)

- Hans Ströher** (FZJ) - „*From Hadron Physics to the Precision Frontier*“
- Rudolf Maier** (FZJ) - „*The FAIR Project at Darmstadt*“
- Farida Grinberg** (FZJ) - „*Inst. of Neuroscience & Medicine: Medical Imaging Physics*“

12:00 – 12:30 Coffee break

- Giorgi Ghvedashvili** (TSU) – „*Overview of scientific activity at TSU*“
- Alexander Shengelaya** (TSU) - „*Condensed Matter Physics and Materials Science at TSU: Past, Present and Future Perspectives*“

13:30 – 15:00 Lunch break

Georgian ↔ German Coop. Examples (Int., GEO-local, GEO-abroad)

Parallel session 1 (Topic 1 & 2)

Convener: M. Nioradze (15:00 – 18:30)

Gela Davidze (HEPI TSU) - „Beyond of Standard Model (SM)“

Tamar Jobava (HEPI TSU) - „The ATLAS experiment and Georgian contributions“

David Chiladze (FZJ/TSU) - „Overview of NN-scattering study at ANKE/COSY“

David Mchedlishvili (FZJ/TSU) - „The pn-system study at internal ANKE experiment“

Mirian Tabidze (HEPI TSU) - „The PAX project and HEPI TSU Contribution“

16:30 – 17:00 Coffee break

Alexander Nass (FZJ) - „Instrumentation for PAX experiment at COSY“

Andrea Pesce (FZJ/Ferrara Uni) - „Spin dynamics studies in storage rings“

Greta Guidoboni (FZJ/Ferrara Uni) - „EDM study at COSY: spin coherence time“

Irakli Keshelashvili (Basel Uni/TSU) - „Experiments at electron accelerators“

19³⁰ – 22⁰⁰

Social program (dinner organized by TSU)

August 7, Tuesday (TSU) 9³⁰ – 18⁰⁰

Projects and Prospects in Basic Science (Overviews)

Plenary session II (09:30 – 13:00)

• **Raphael Hermann** (FZJ) – „Lattice Dynamics in Functional Materials at the Jülich Centre for Neutron Science“

• **Paolo Lenisa** (Ferrara Uni) - „Polarized Antiproton Experiment: Why and How?“

• **Yuri Valdau** (Bonn Uni/FZJ) - „Time Reversal Invariance Experiment at COSY“

11:00 – 11:30 Coffee break

• **Alexander Gamkrelidze** (TSU) – „Algorithms and Data Structures for Low Dimensional Topology“

• **Mariam Elizbarashvili** (Iliia Uni) – „Projected Climate Change Influence on Vine Agroecosystems (example of Kakheti)“

13:00 – 14:30 Lunch break

Student Presentations of Ongoing and Future Activities

Plenary (students) session III (14:30 – 18:00)

Convener: Alexander Shengelaya (TSU)

• **Manuchar Gvaramia** (PhD TSU) - „Investigation of structure of water confined micelles by using of instrumental methods“

• **George Khazaradze** (Magister TSU) - „Synthesis and magnetic properties of BiFeO₃ multiferroic oxide“

• **Zara Bagdasarian** (Magister TSU) - „Spin filtering experiment at COSY“

• **Tinatin Bukia** (PhD TSU) - „Synthesis and properties of adamantane containing new peptides via ugi-reaction“

• **Jarji Khmaladze** (Magister TSU) - „ZnO nanodots and nanowires“

16:30 – 16:50 Coffee break

• **Giorgi Gambashidze** (Magister TSU) - „Effect of pressure on stripes magnetism in La_{2-x}BaxCuO₄“

• **Konstantin Muradov** (Magister TSU) - „Very large DB management system“

• **Bagrat Kikvadze** (PhD TSU) - „Regional climate model and Georgia“

Parallel session 2 (Topic 3, 4 & 7)

Convener: Shengelaya/Boch. (15:00 – 18:30)

Manuel Angst (FZJ) - „Multiferroicity from charge ordering? A case study“

Yves Dumont (Versailles Uni) - „Magnetic oxide Fe_{2-x}Ti_xO_{3-d} as spintronics material“

Ekaterina Chikoidze (Versailles Uni) - „Oxides for electronics: problem of electrical transport“

Tamar Chelidze (TSU) - „Electric field-induced emission int. modulatuon in single nanowires“

Zurab Guguchia (Zurich Uni/TSU) - „Effect of pressure on stripes formation in cuprates“

Nodar Tsvitvivadze (TSU) - „Preventive methods for Georgian sea coast erosion“

Ketevan Kasradze (TSU) – „4D-var assimilation of CRISTA-NF H20 and MLS ...“

Giorgi Burjanadze (TSU) – „Long-lasting stress, quantitative changes in nitric oxide ...“

Giorgi Mosidze (TSU) – „The influence of protein complex derived from adult rat brain ...“

Liana Ramishvili et al., (TSU) – „Prostate cancer epithelial cells and the changes ...“

• **M. Doliashvili, N. Nebulishvili, G. Rukhaia, L. Tarelashvili**, (Bachelor students, TSU) – „Cubed sphere simulator“

• **G. Bakradze, K. Natobaidze, T. Aslanishvili, N. Chumbadze, N. Qozashvili, B. Tsutskhvashvili** (Bachelor students, TSU) – „Icosahedral mesh simulator“

• **Ketevan Museridze** (Bachelor TSU) - „Determination of metal concentrations in surface waters and soils using atomic absorption spectrometer“

19³⁰ – 21³⁰

Social program at TSU (concert organized jointly by TSU and GTU)

August 9, Thursday (GTU) 10⁰⁰ – 18⁰⁰

Existing and Future Cooperation

Plenary session IV (10:00 – 13:30)

Welcome – Archil Prangishvili, Rector of GTU

– Nodar Surguladze, Deputy Minister of Education and Science

– Hans Ströher (FZ Jülich)

Projects and Prospects in Basic Science (Overviews)

• **Archil Prangishvili** (GTU) - „Trends in Georgian Engineering Developments“

• **Jörg Wolters** (FZJ) - „Projects at Central Institute of Technology (ZAT)“

• **Helmut Soltner** (FZJ) - „Selected Development Projects at ZAT“

12:00 – 12:30 Coffee break

• **Detlev Gotta** (FZJ) - „Exotic Atoms: The Quests for Experiment“

• **Ralf Schleichert** (FZJ) - „Silicon Detectors for Particle Physics“

13:30 – 15:00 Lunch break

Georgian ↔ German Coop. Examples (Int., GEO-local, GEO-abroad)

Parallel session 3 (Topic 3 and 4)

Convener: E. Kutelia (15:00 – 18:00)

Olga Tsurtsunia (GTU) - „Development of new coating materials for efficient and clean power plants“

Lili Nadaraia (GTU) - „Producing nanocrystalline composite materials via spark plasma sintering“

Ilhan Engin (FZJ) - „High intensity lasers for particle physics“

16:00 – 16:30 Coffee break

Christian Weidemann (FZJ) - „Spin-Filtering experiments: technical challenges“

Martin Gaisser (FZJ) - „Optimization of atomic beam sources for polarization experiments“

Sergo Petrosian (Magister Iliia) - „Study of nanostructured layers using electromagnetic analog circuits“

Vitali Gogiberidze (Mag. Iliia) - „Investigation of nanostructured layers using method of auxiliary sources“

Parallel session 4 (Topic 5 and 7)

Convener: D. Tavkheldize (15:00 – 18:00)

Revaz Tedoradze (GTU) - „Increasing of the productivity of auto trucks for the Georgian road trafics increasing of the productivity of auto trucks for the Georgian road trafics“

Maguli Bedineishvili (GTU) - „Biometrics myths and reality“

Giorgi Tsinamdzgvrishvili (Magister GTU) - „Traffic organization to improve the city road network, traffic flows and improve the ecological safety of the roads“

Giorgi Dzeladze (Bachelor GTU) -

„Variations“ on the programming topic“

Tinatin Goreziani (Bachelor GTU) - „To improve the rail way sorting station train ...“

Avtandil Danelia (Bachelor GTU) - „Rolling stock using an effective way“

David Getsadze (Bachelor GTU) - „Modern bridge management system“

Giorgi Darsalia (Bachelor GTU) – “Geo railway: management problems and solutions“

Vakhtang Tkeshelashvili (Bachelor GTU) – “Status and perspective for Georgian ports“

Natia Kupradze (Bachelor GTU) – “Credit problems in banking business in Georgia“

Avtandil Danelia (Bachelor GTU)) – “Roling stick using an effective way“

Giorgi Sivsivadze (Bachelor GTU) – “Efficient use of working capital“

David Getsadze (Bachelor GTU) – “Modern bridge management“ system“

David Chafodze (Bachelor GTU)) – “Developing constructions for drying processes“

Mariam Melkadze (Bachelor GTU) – “Making Technology of red paint“

19³⁰ – 22³⁰

Social program (Banquet of Workshop)

August 10, Friday (GTU) 9³⁰ – 18³⁰

Projects and Prospects in Basic Science (Overviews)

Plenary session V (09:30 – 13:00)

• **Andreas Wahner** (FZJ) - „Institute of Energy and Climate Research (IEK)“

• **Hendrik Elbern** (Cologne Uni/FZJ) - „Numerical Simulations of Atmospheric Compounds“

• **Manuel Angst** (FZJ) - „Complex Ordering Phenomena in Multifunctional Oxides at the Peter Grünberg Institute.“

11:00 – 11:30 Coffee break

• **Sayavur Bakhtiarov** (USA) - „Mars Science Laboratory Mission: Safety Review“

• **David Tavkheldize** (GTU) - „The Prospects of Developments of Mechanical Engineering Specialities at GTU“

• **Ramaz Botchorishvili** (TSU) - „Partial Differential Equations for Data Compression and Encryption“

13:00 – 14:30 Lunch break

Student Presentations of Ongoing and Future Activities

Plenary (students) session VI (14:30 – 18:30)

Convener: Ketevan Kotetishvili (GTU):

• **Malkhaz Jabua** (PhD, GTU) - „Readout upgrade for the local plane detector of Jülich spectrometer“

• **Sergo Samkharadze** (PhD, GTU) - „Research and optimization of the processes of briquetting for ecological clean bio-fuel by usage universal briquetting device“

• **Mariam Razmadze** (PhD, GTU) - „Kinematic and dynamic analysis of multi-link mechanisms with two and more degrees of freedom“

• **Giorgi Kukhalashvili** (Magister GTU) - „The core-shell type carbon magnetic nanoparticle formation on the metallic substrate: it’s structure and thermodynamics“

• **Vladimir Samkharadze** (Magister GTU) - „Fabrication of NdSd and Nd5Sb3 plates their physical properties“

• **Tamar Leshkashvili** (Magister GTU) - „Investigation of plasma anodized silica plates“

• **Levan Khutsaidze** (Magister GTU) - “Partitioned systems of the monitoring and control“

16:30 – 16:50 Coffee break

• **Mikheil Kelendjiradze** (Bachelor-2) - „Quantum Therapy“

• **Dito Shergelashvili** (Bachelor-2) - „Nitrat Noxometry“

• **Vladimer Tvaliashvili** (Bachelor-2) - „Investigation of RC circuit“

• **David Khutsishvili** (Bachelor-2) - „Device for Investigation of Coulumb Low“

• **Beqa Buadze** (Bachelor-2) - „Device for Investigation of Coulumb Low“

• **Tamar Khechiasvili** (Bachelor-2) - „Fullerence as Carbon allotropically alteration“

• **Valerian Khutsishvili** (Bachelor-2) - „Radiation effect on living body“

• **Teona Gvazdabia** (Bachelor-3) - „Can we transfer info by light speed protons?“

• **Tengiz Kardava** (Bachelor-3) - „Triplet emitters for OLEDs“

Concluding remarks:

• **Germany** – Hans Ströher

• **Georgia** – David Tavkheldize (GTU), Ramaz Botchorishvili (TSU)

End of Workshop

19⁰⁰ - 22⁰⁰

Social program (free day/ tour in city)