

# **The future of the *Georgian-German Science Bridge (GGSB)***

## **Strengthening and Extending Education, Research and Knowledge Transfer**

(June 2021)

### **Background**

For more than 20 years, the Helmholtz Research Centre in Jülich (Forschungszentrum Jülich (FZJ), Germany) successfully cooperates with a consortium of Georgian universities (Agricultural University of Georgia (AUG), Georgian Technical University (GTU), Ilia State University (ISU), Iv. Javakishvili Tbilisi State University (TSU) and recently Kutaisi International University (KIU)). It started in the early 1990s with a collaboration between the Nuclear Physics Institute (Institut für Kernphysik, IKP) of FZJ and a small group of TSU scientists (High Energy Physics Institute, HEPI TSU), based on a joint research program at the COSY accelerator in Jülich. This international collaboration has been extended later by other FZJ institutes: Energy and Climate Research (IEK), Neuroscience and Medicine (INM), Bio- and Geo-Sciences Research (IBG), and Electronics and Mechanical Engineering (ZEA). In 2004 the **Georgian-German Science Bridge (GGSB)** was founded. The GGSB also involves the German universities of Aachen, Bonn and Cologne via the Jülich institute directors. More details are given in the GGSB brochure (see: <http://collaborations.fz-juelich.de/ikp/cgswhp/cgswhp20/downloads/>).

The GGSB cooperation comprises three pillars:

#### **1. Education**

Georgian students are participating various educational programs, e.g., internship programs at FZJ and block-lectures at Georgian universities.

#### **2. Research**

Georgian students together with their supervisors are actively involved in diverse common research projects for their Master and PhD projects.

#### **3. Knowledge transfer**

Georgian outstanding young scientists are supported to return back to universities of the consortium. Within this effort, two SMART|Labs were established (2016-2017) at TSU in the research fields of Particle Physics (SMART|EDM\_Lab) and Atmospheric Chemistry & Simulations (SMART|AtmoSim\_Lab).

Up to now, all activities are funded by the Georgian government (Ministry of Education and Science via Shota Rustaveli National Science Foundation) and FZJ institutes.

### **Future Developments**

The GGSB cooperation, after detailed discussions with all Georgian and German colleagues, has recently decided to evolve in two directions:

#### **1. Establish **GGSB-PLUS** with a focus on „**Health as a Global Challenge**“.**

GGSB-PLUS will unite and extend, but also partially redirect, the efforts of the existing GGSB-groups and the established SMART|Labs - in particular in view of the proposed hadron therapy project at KIU. This facility will also require the establishment of new scientific groups in Georgia via SMART|Labs to create the scientific and technological competences.

A proposal has been submitted to the German Ministry of Education and Science (BMBF) (via DLR Projektträger): the project was approved recently and will be financed for 3 years (2021 - 2024).

2. Attract **additional partners** in Germany and Georgia in order to promote GGSB-PLUS and to extend the scope of the cooperation.

In spite of the restrictions due to the pandemic, GGSB members have been active to discuss with potential new groups and institutions, comprising the following non-exhaustive list:

(i) Helmholtz Centres:

- Helmholtz-Zentrum Dresden-Rossendorf (HZDR) (Contact: Sebastian Schmidt, Barbara Schramm)
- GSI Helmholtz Centre for Heavy Ion Research (GSI) (Contact: Paolo Giubellino, Christian Schmidt)
- Helmholtz Institute Jena of GSI at the FSU Jena (Contact: Thomas Stöhlker)

(ii) Universities:

- University of Cologne (UzK) (Contact: Axel Freimuth, Stefan Bildhauer)
  - UzK Institut für Radiochemie und Experimentelle Molekulare Bildgebung (IREMB) (Contact: Bernd Neumaier, Heike Endepols, Boris Zlatopolsky)
- Friedrich Schiller University of Jena (FSU) (Contact: Walter Rosenthal, Thorsten Kowalke)
  - Institute of Pharmacy at the FSU Jena, Pharmaceutical/Medicinal Chemistry (Contact: Gerhard Scriba)
- RWTH Aachen University (Contact: Ulrich Rüdiger, Achim Stahl)
- University of Bonn (Contact: Ulf-G. Meißner, Akaki Rusetsky)

**The goals** is to establish a sustainable Georgian-German cooperation in the following areas:

- Fundamental Research
  - Participation in particle physics projects (e.g. CPEDM search, GSI/FAIR Exp.s)
- Applied Research
  - Support plans for the Hadron Therapy Center (HTC) in Kutaisi (KIU)
  - Redirect the SMART|EDM\_Lab towards „Equipment Development for Medicine“
  - Establish SMART|Labs in Medicine (SMART|BMI\_Lab (BioMedical-Imaging)) and computer modeling (SMART|Data\_Lab (Machine Learning))
- Technology
  - Establish a SMART|Tech\_Lab (Simulation, Engineering and Technology)
- Other
  - Education: establish a SMART|SmR\_Lab („School meets Research“) to foster early education in STEM disciplines at Georgian schools
  - ...

The **GGSB vision** is to combine the available resources and to connect the interdisciplinary (thematically distinct) SMART|Lab's into one structural unit (a **SMART|Hub**), hosted at one Georgian university campus, but open to all interested parties

## Appendices

- A. GGSB-PLUS project: „Health as a Global Challenge“
- B. Progress report on srEDM project carried out in SMART|EDM\_Lab in Tbilisi
- C. Updated plans for SMART|Labs in Georgia (poster)