



GEORGIANS at FZJ

Forschungszentrum Jülich

May 3, 2010 | Andro Kacharava (IKP/JCHP FZ-Jülich)

Outline

- Introduction (IKP/FZJ)
- History of collaboration (HEPI TSU and IKP)
- Georgian contribution to COSY/ANKE experiment
- Ongoing projects and existing groups
- Financing scheme
- Future plans

Introduction: Institute for Nuclear Physics (IKP)

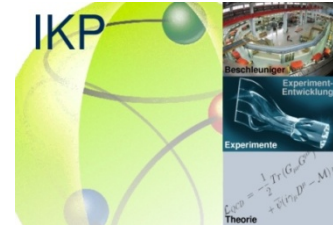
- IKP has been established in 1968

IKP-1: Experimental Hadron Structure (*Prof. James Ritmann*)

IKP-2: Experimental Hadron Dynamics (*Prof. Hans Ströher*)

IKP-3: Theoretical Nuclear Physics (*Prof. Ulf -G Meissner*)

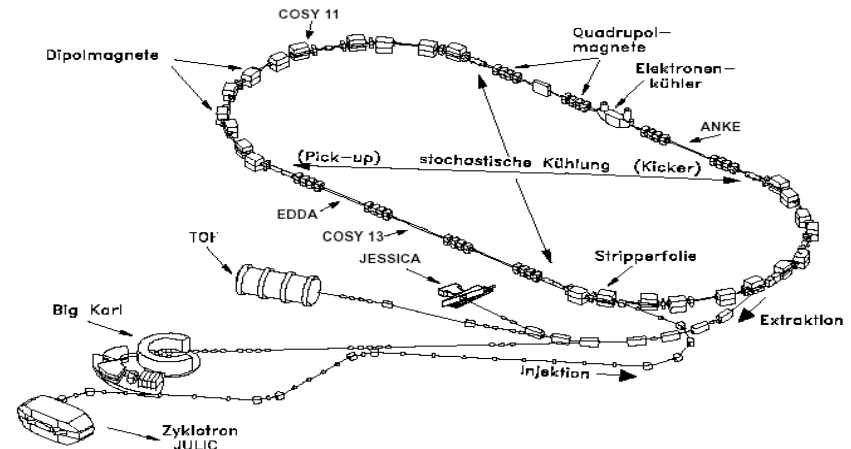
IKP-4: Large-Scale Nuclear Instruments (*Prof. Rudolf Maier*)



- Accelerator COSY (Cooler Synchrotron) commissioned in 1993



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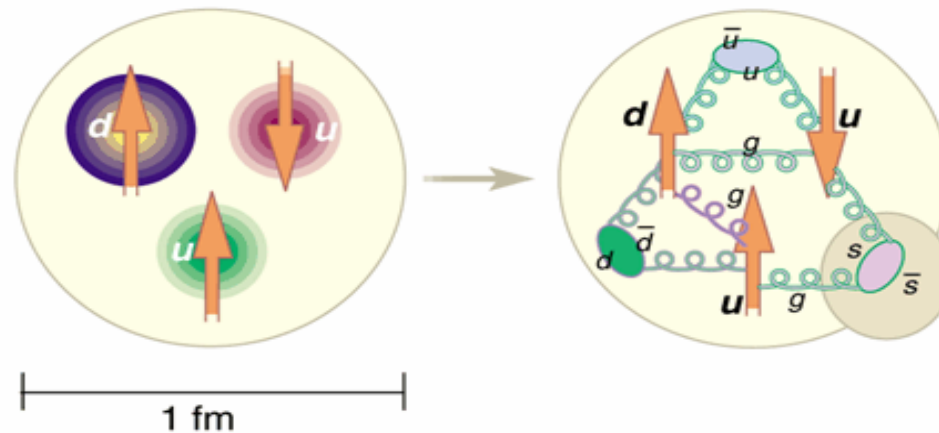
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Introduction: Institute for Nuclear Physics (IKP)

Hadron Physics: Understanding of all matter
 comprised of quarks and gluons:

How does QCD (Nature) *make* hadrons (Us)?



- → **at COSY** Experimental programs with electromagnetic and **hadronic probes**

History of collaboration: **HEPI TSU** and **IKP**

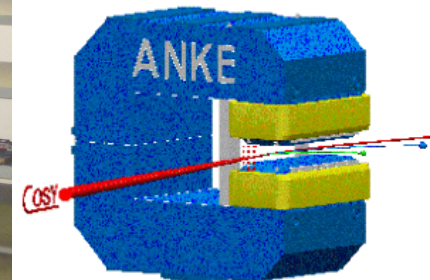
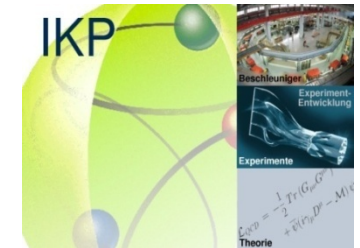
- High Energy Physics Institute of Tbilisi State University (**HEPI TSU**) and **IKP**: close collaboration since 1993 (Prof. Otto Schult / Prof. Mikheil Nioradze)
- First common publication in 1996 – “Monte-Carlo Simulation of the ANKE/ COSY Experiment”
- Cooperation agreement signed in September 10, 1998
- Bilateral agreement will be extended up to 2015 during this workshop



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History of collaboration: **CGSWHP workshops**



2004



2006



Present: (2008 shifted in) **2010**

Georgian expertise: **ANKE experiment**

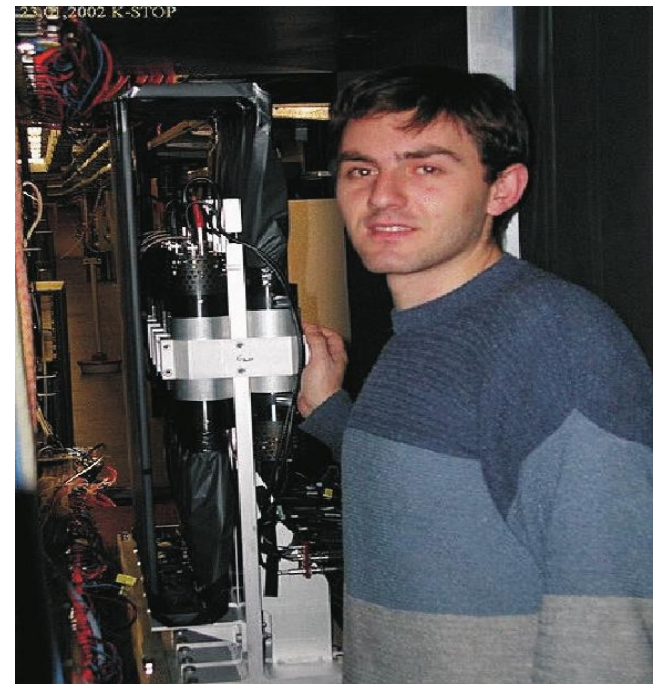
Strong contribution to: Hardware & Software & Analysis in Hadron
Physics Experiments at COSY

- Few examples from ANKE: **Cherenkov detectors proposed and manufactured by HEPI TSU**



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Georgian groups at FZJ (IKP): Nuclear physicists

Guest scientists at IKP from HEPI TSU:

Experiment: Prof. M.Nioradze, Dr. B.Chiladze, Dr. G.Macharashvili, Dr. N.Lomidze,
Dr. M.Tabidze , Dr. Z. Modebadze ...+ MS students

Theory: Prof. G.Devidze, Prof. A.Liparteliani, Prof. A.Khelashvili, Prof. A.Kvinikhidze,
Dr. Z.Merabishvili ... + MS students

PostDoc's and PhD students at IKP from HEPI TSU:

Andro Kacharava : 2001 – 2007 (PostDoc); since 2008 permanent staff in IKP

Irakli Keshelashvili: 2001 – 2007 (Dip., PhD, PosD); since 2008 PostDoc in Basel Uni

David Chiladze: 2003 – 2008 (Diploma, PhD); since 2009 PostDoc in IKP

Archil Garishvili: 2005 – 2008 (PhD); now in USA (Tennessee Univerisity)

David Mchedlishvili: 2009 – 2012 (PhD); doctoral program with TSU

David Iamanidze: 2006 – 2007 (Diploma), now in Georgia (computing company)

Georgian groups at FZJ (ZAT): Engineers

Guest scientists at Central Technology Division (ZAT & IKP) from Georgian CAD/CAM Engineering Centre (**GCCEC**) working on nuclear physics projects:

Prof. Alexander Sharmazanashvili – **new collaboration have started in Oct. 2007**

Nikoloz Sharmazanashvili – **MS student from GTU, 1 year training (2009) at ZAT/IKP**

David Tushishvili – **Diploma engineer from GCCEC (short visit in 2009)**

Beso Kekelia – **Diploma engineer from GCCEC (short visit in 2009)**



Georgian groups at FZJ (IEF): **Material science**

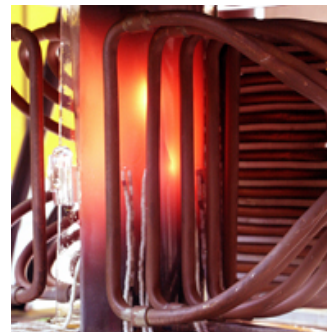
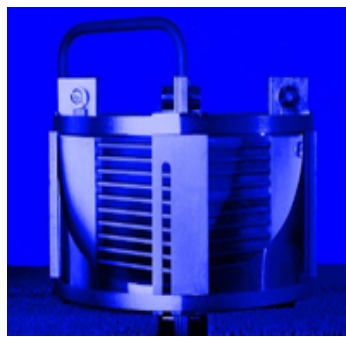
Guest scientists starting collaboration at Institute of Energy Research (IEF-2)

(group of Dr. Torsten Markus)

Dr. Olga Tsurtsumia from **GTU – Humboldt Fellow** (Jan., 2009)

Prof. Elguja Kutelia from **GTU** – first visit in Summer, 2010

Topic: Investigation of New Materials Technologies for Different Energetic Applications



Georgian groups at FZJ (IEF): **Environment**

Scientists from **TSU (Prof. Ramaz Botchorishvili)** starting collaboration at Institute of Chemistry and Dynamics of the Geosphere (ICG)

(Prof. Andreas Wahner and Prof. Hendrik Elbern) –

future collaboration have been discussed during visit at ICG (March 2010)

Topic: Expertise in numerical solvers for differential equations at TSU and atmospheric modelling applications at ICG-2



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Georgian groups at FZJ (IFF): **Solid state research**

Scientists from **TSU (Prof. Alexander Shengelaya)** starting collaboration
at Institute of Solid State Research **(IFF) (group of Prof. Manuel Angst)**

Topic: Study of Novel Superconducting and Magnetic Materials using Muon
Spin Rotation Technique



**Nobel Prize in Physics – 2007:
Discovery of Giant Magnetoresistance**

Roadmap of collaboration: **FZJ & TSU ,GTU, ...**

Recent Visit of Georgian Delegation at FZJ (September, 2009):

- To **expand cooperation** into the new areas of basic science
- To work out the **concept of Virtual Institute for Basic Science (GGVIBS)**
- Memorandum of Understanding (**MoU**) between JÜLICH and GEORGIA



Financing scheme: **FZJ/Georgia**

In total around 25 researchers/students from GEORGIA are collaborating with different institutes at FZJ !!!

COSY project: 3 PostDoc and 4 PhD position have been financed

from External R&D program of the Research Center Jülich granted to the Tbilisi State University (since 2003)

COSY project: 10 senior scientists with 3 months duration have been financed via **DAAD** program in Georgia:

DAAD Deutscher Akademischer Austausch Dienst
German Academic Exchange Service

COSY project: Since 2006 participation of Georgian physicists in ongoing spin physics experiments at ANKE/



been financed by **Georgian National Science**

Foundation

(GNSF grant –ST06/4-108) ; new project just started in

2010 !

Future: GEORGIA participates in FAIR ?

FAIR: Facility for Antiproton and Ion Research (*Darmstadt, GERMANY*)

Official invitation from Dr. Annette Schavan:



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DATUM Berlin, 2. November 2007

” ... It has also come to my attention that Georgian scientists has been collaborating successfully with the Research Centre Jülich for a number of years in the field of nuclear and hadron physics. I’m delighted to hear of your interest in FAIR and would **welcome the participation of Georgia. ...**”



The END

**Thank you very much for your
attention**