

**Georgian Technical University**  
**Institute of Quantum Physics and Engineering Technologies**

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***"Joint Research Activity with International Partners"***

The Institute of Quantum Physics and Engineering Technology of the Georgian Technical University is competitive in terms of volume, quality and international cooperation and plays a significant role in the development of nuclear and elementary physics both at national and international level.

Due to the fact that the Institute is a member of international collaborations, it has close cooperation with leading world centers such as CERN (Switzerland), KEK, J-PARC (Japan), JINR (Russia).

A short list of the Institute's activity

**CMS Experiment at CERN-LHC, Switzerland.**

The Institute works effectively in different directions of the CMS experiment and our experts are working on the key tasks. These directions are:

1. Optimization and analysis of the core software CMSSW platform of CMS experiment.
2. Revision of the Monte Carlo geometry of CMS experiment
3. RPC detectors of the muon system of CMS experiment
4. Hadron calorimeter (HCAL) of the CMS experiment
5. Participation in the CMS central DQM-offline, RPC and HCAL shifts

**COMET Experiment (KEK, J-PRC, Japan).**

In the Comet experiment our group performs (will perform in the future) the following tasks:

1. Straw Tube research, design and improvement for the Track system of the COMET experiment. Production of the Straw Tracker prototype, measurements at 105 MeV beam, straw detector construction, cosmic test, calibration and installation
2. R&D of electromagnetic calorimeter, preparation of prototype, measuring flow, calorimeter construction, cosmic test, calibration and installation.
3. R&D of Cosmic Ray Veto (CRV) system, construction, cosmic test and installation.

## JINR (Dubna)

Cooperation with the Joint Institute for Nuclear Research (JINR), is carried out in the following directions:

1. R & D program implementation, for the creation of the newest type of homogeneous and inhomogeneous calorimeters.
2. Realization of the R & D program for the construction of the newest type of track straw detector.
3. Creation of computer farm for the COMET experiment.

## PUBLICATIONS

The staff members of the Institute are co-authors of scientific articles published in the internationally-reviewed journals on the international scale with the impact factor and in the Proceedings of the International Scientific Conferences.

During the 2015-2017 years, the Institute's employees are co-authors of about 400 works, mostly from international journals of higher rankings, Phys. Rev, Phys.Rev.Lett., Phys.Lett., Nucl.Phys., Nucl. Instrum.Meth., JINST, PTEP, Nature Phys., Euro.Phys.J., JHEP, Phys.Part.Nucl., Phys.Atom.Nucl., Yad.Fiz., Phys.Part.Nucl., Fiz. Elem, Chast.Atom.Yadra., Theor.Math.Phys., J.Math.Phys., J.Math.Sci., Class.Quant.Grav., Few Body Syst., Adv.High Energy Phys., Science, Nucl.Part.Phys.Proc., EPJ Web Conf., Int.J.Mod.Phys. Conf.Ser., AIP Conf.Proc., JPS Conf.Proc., Zap.Nauch.Semin., Ann.U.Craiova Phys.

### **International Conferences and Meetings in which the scientists of the Institute participated.**

The group carried out a 14 workshops with CMS top management at CERN, where the issues and achievements of the Institute activity with CMS collaboration were discussed.

Members of the Institute regularly participate in the CMS week meetings.

The Group regularly participates and reports on COMET Collaborative meetings.

Report at important international conference dedicated to the problems of ILC (International Linear Collider).

In 2017, the Institute participated in a Science Festival organized by the Ministry of Education and Science, where we made reports.

In 2017, the COMET Collaborative Workshop was held at the Institute, where the report was given by the members of the Institute.

