



საქართველოს  
თავისუფლებისათვის

საქართველოს ტექნიკური  
უნივერსიტეტი

LEGAL ENTITY  
OF PUBLIC LAW

GEORGIAN TECHNICAL  
UNIVERSITY



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Georgian Technical University (GTU), Institute of Quantum  
Physics and Engineering Technologies (IQPET), Kostava Str. 77,  
Tbilisi, Georgia, Zipcode: 0175, <http://gtu.ge/Eng/>

May 10 2019

To the DUNE:

Institutional Board Chair

Robert Wilson, Professor of Physics at Colorado State University.

Collaboration Co-spokespersons

Mark Thomson, Professor of Physics at University of Cambridge.

Edward Blucher, Professor of Physics at University of Chicago.

Dear Sirs,

This is a petition letter to present an application of the Institute of Quantum Physics and Engineering Technologies of Georgian Technical University to participate in DUNE experiment. By the letter, we state our intent to join DUNE collaboration framework in a common and coordinated manner. We consider the DUNE project as an outstanding experiment in a world-wide neutrino research program and hope to provide relevant contribution to it bringing in our skill from past experiences of collaboration within an international particle physics experiments. Based on the experience of scientific staff of the Institute of Quantum Physics and Engineering Technologies of Georgian Technical University, the initial involvement of GTU team, should be definitely connected with the ongoing research and development activities for creation of the near detector system of DUNE experiment. In the following text we provide some details on our expectations concerning possible participation of the Institute of Quantum Physics and Engineering Technologies of Georgian Technical University in DUNE collaboration and a short description of our previous activities in the particle physics field.

Yours Sincerely,

Prof. Archil Prangishvili  
Rector

Prof. Arsen Khvedelidze  
Director of the  
Institute of Quantum Physics  
and Engineering Technologies

Prof. Zviad Tsamalaidze  
Deputy Director of the  
Institute of Quantum Physics  
and Engineering Technologies

**Previous research background:** The team of physicist, engineer and technicians from the Institute of Quantum Physics and Engineering Technologies of Georgian Technical University has about 25 years of working experience in the area of nuclear and elementary particle physics.

During this period, this team was involved in the projects performed at several leading scientific centers. Among them,

**CERN** (Switzerland) -- CMS (HCAL and RPC subdetectors), NA62 (rare decay);

**Fermilab** (USA) -- CDF and Mu2e;

**KEK, J-PARC** (Japan) -- E391a (rare decay), COMET (rare process);

**PSI** (Switzerland) -- PIBETA (rare decay)

**The areas of expertise:** Physicists and engineer-programmer

- Electromagnetic and Hadron calorimeters, gaseous detectors (MWPC, Drift chamber, Straw-tube tracker, RPC).
- Software development, DevOps (cluster administration, cloud infrastructure development)
- Electronics (hardware architecture, embedded systems development, firmware programming)

**We suggest the following members of the Institute of Quantum Physics and Engineering Technologies of Georgian Technical University to participate in DUNE experiment:**

**Institutional Board (IB) representative** – Zviad Tsamalaidze

- Iuri Bagaturia (Chief scientist)
- David Chokheli (Senior scientist)
- Arsen Khvedelidze (Chief scientist)
- Zviad Tsamalaidze (Chief scientist)
- Irakli Lomidze (PhD student)
- Nika Tsverava (PhD student)
- George Adamov (Engineer-programmer)
- 1 young engineer
- 2 undergrad students

**Scientific and technical interests:** We propose to contribute to DUNE joining Georgian efforts in activities involving the DUNE\_ND detectors and subsystems prototyping, tests, integration, commissioning and operation. Also it's possible to participate in activity in ND design group. In particular, our main activities will be in R&D, preparation of prototype, testing, and analysis for Straw-Tube Tracker (STT) and Electromagnetic Calorimeter (EC). In the future, we are willing to participate in the integration of the STT and EC in DUNE. We are also planning to contribute in the development of physics analysis.

**Resources:** Initially we expect to contribute around 2.0 FTE. This contribution should naturally increase as students and postdocs are getting involved with our studies and R&D activities and should participate in creation of STT and EC detectors. Perspective for postdoc fellowships dedicated to DUNE are also a possibility. We are willing to apply for funds for DUNE experiment and send students and researchers to Fermilab to do on site operation and data taking shifts in case to availability of funds.

**Potential funding sources:** There are two main potential agencies (Georgian and International), available for funding the diverse activities necessary for research: Shota Rustaveli National Science Foundation of Georgia (SRNSFG) and International Science and Technology Center (ISTC). Also, we can try to get together with colleagues from USA, Civilian Research and Development Foundation (CRDF).