Abilene Christian University

- Department of Engineering and Physics
  - 115 engineering and physics majors
  - Recently started engineering program so the number of students is growing
- New facilities due to ENGR program and recent fundraising
  - 2400 sq ft assembly hall with 5 ton crane
  - Machine shops
  - 450 sq ft class 1000 clean room
  - 200 sq ft class 100 clean room
  - SEM
  - more coming

Undergraduate Research Experience

- Strong DOE medium energy nuclear group
  - Continuous funding since 1981
  - Two APS Undergraduate Research Mentor awards
  - Current projects - NIFFTE, SpinQuest (E1039), STAR
- Lots of detector construction and maintenance experience
  - PHENIX muon arm wire chambers, COMPASS wire chambers, SeaQuest hodoscopes, STAR forward upgrade calorimeter, etc.
- Typically employ 5-10 undergrad students each summer

DUNE areas of Interest

- Detector construction and maintenance
  - Was asked to join a UT-Arlington led far detector construction team
  - Near Detector HPgTPC – we expressed interest in helping UC-Boulder with central TPC segments and/or UT-Arlington with light collection system
- Taking shifts
  - Allows our students to interact with other scientists and experts
- Data analysis or simulation

Funding and Resources

- This is a new research area for ACU so no current external funding
- Internal funding possible for 1-2 students while working on getting a grant

- With funding 3-5 students each summer would be reasonable but more could be possible for specific projects or with external mentors
- Possible other faculty could join in future after SpinQuest ends

Augustana University

- A primarily undergraduate university
  - Sioux Falls, South Dakota
  - Physics has about 50 undergraduate students
  - All three tenured/tenure track members have external funding
    - Associate Professor Drew Alton wishes to join DUNE
  - About 95% of undergraduate physics majors perform research before graduation

Associate Professor Drew Alton

- Previous collaborations
  - NuTeV (Fermilab)
  - D-Zero (Fermilab)
  - CUBED (SURF)
  - DarkSide (LNGS)
- Previous Experience
  - Wrong Sign Muon events in neutrino experiments
  - Drift chamber construction, commissioning, and operations
  - Two phase Argon TPC operation
- Short term plans on DUNE
  - Focus on Proto-DUNE data analysis
  - Start with hot/dead channels
- Longer term interests
  - On-site construction and commissioning
- Physics
  - Supernova neutrino detection
  - SM neutrino interactions.

Application for the DUNE experiment

Universidad EIA

Envigado, Colombia

Professor: Amalia Betancur-Rodríguez

The university

- Located in Envigado, next to Medellín, Colombia.
- With over 1800 students.
- Programs in Physics and Engineering
- PhD. Program in Engineering.
- With a new building dedicated to laboratories under construction.

The group

- Dr. Juan Guillermo Suárez:

More than 20 years' experience in HEP experiment, including work in E158 at SLAC and CMS at CERN. Was a member of the muon trigger group and generator group at CMS.

- Dr. Guillermo Palacio:

HEP phenomenology with experience in building extensions of the SM model that address the neutrino mass and dark matter problems. Additionally, work in constraining models using neutrino physics, direct and indirect detection as well as collider phenomenology.

- Dr. Amalia Betancur:

Research oriented towards model building and statistical analysis for DM and neutrino masses. Using also HEP packages for constraining the models.

- We will also work alongside electronic engineers for the experimental contribution at DUNE.

Our Contributions:

Experiment:

We are working with other Colombian and South American institutes to design and later test the warm interface board for the photon detector system of the far detector in single phase.

Phenomenology:

Build models of sub GeV dark matter that may be studied in the near detector.

Funding Resources:

University internal research resources.

We are coordinating with other Colombian DUNE members to access funding from the government's science agency (COLCIENCIAS).


THANK YOU

On Participation Institute of Quantum Physics and Engineering Technologies (IQPET) of the Georgian Technical University (GTU) in the DUNE experiment

Zviad Tsamalaidze
On behalf of the GTU-DUNE team

Georgia

Tbilisi

The Georgian Technical University (GTU)

GTU is THE LARGEST UNIVERSITY IN TRANSCAUCASIA

- Established -- January 16, 1922
- Location -- Tbilisi, Georgia
- Campus -- 9
- Website -- www.gtu.ge

Georgian Technical University (GTU)

- 8 faculties
- 34 departments
- 64 educational scientific centers
- 14 scientific-research institutes
- Academic Personnel–1086
    1. Full Professors-357
    2. Associate Professors–526
    3. Assistant Professors–203
    4. Invited Professors–190
- Undergraduates 20000
- Postgraduates 3000

IQPET,GTU group in DUNE

IB representative : Tsamalaidze Zviad

Tsamalaidze Zviad – Chief researcher, physicist.
Experience: ARES (JINR), PIBETA (PSI, Swiss), CMS (CERN), E391a, ILC and COMET (KEK, J-PARC, Japan)

- Bagaturia Iuri – chief researcher, physicist.
  Experience: PIBETA (PSI Swiss), HERA-B (DESY, Germany), LHCb , CMS (CERN), COMET (J-PARC)
- Chokheli David – senior researcher, physicist.
  Experience: CDF and Mu2e (Fermilab)
- Khvedelidze Arsen – chief researcher, theoretical physicist.
  Experience : CMS (CERN), COMET (KEK, J-PARC)
- Lomidze Irakli – PhD student, physicist.
  Experience: CMS (CERN), COMET (KEK, J-PARC)
- Tsverava Nika - PhD student, physicist.
  Experience: COMET (KEK, J-PARC)
- Adamov George - young researcher, engineer-programmer.
  Experience: CMS (CERN), COMET (KEK, J-PARC, Japan)

The areas of expertise in our group

Design, construction, assembling, optical quality test, general characterization using rad. Sources, calibration, aging, data tacking & analysis

- Scintillation detectors with organic & inorganic scintillators. Electromagnetic and Hadron calorimetries
- Gaseous detectors
  - MWPC, Drift chambers, Straw trackers, RPC detectors

1. PMT (characterization, optimization for single photon counting or wide dynamic range)
2. SiPM (characterization, radiation hardness studies)
3. APD (characterization)
4. Adaptive Gain Integrating Pixel Detector (characterization, calibration)

1) Software Development (web-development, system programming)
2) DevOps (cluster administration, cloud infrastructure development)
3) Electronics (hardware architecture, embedded systems development, firmware programming)
4) Set of development tool for library listing for the CMSSW framework used in the CMS experiment
5) Web tool for the HCAL update progress accounting
6) Parallelization of the reconstruction algorithms using CUDA technologies for the CMS experiment

Our interest in the DUNE

We plan our activity mainly in the DUNE_ND detector

We will take part in the creation of Straw Tube Tracker and Electromagnetic Calorimeter.
Participation in detector R&D, construction, assembling and beam tests of prototypes including activity in Fermilab and CERN.

Also we are planing:

- Participation in beam tests
- Assembling of detector modules
- Final assembling, calibration and installation of detectors

Simulation and analyzes of physics performance

The new IQPET-GTU building

- We got a new space for research purposes, which will give us the opportunity to successfully participate in the DUNE experiment
- 1000 m^2 are is dedicated to ~~build new infrastructure~~
- Laboratories and smart workshop for a fast prototyping

GTU workshop

In the GTU we have facilities and machine shops for even complicated mechanical work. Also all necessary tools for a fast prototyping and R&D, including power supplies, VME DAQ system and huge spectra of NIM electronics.

The GTU has good and close contacts with the industry, which can easily be used for the manufacture of mechanical parts for the DUNE.

Thank you for attention!

Membership Proposal for University of California-Riverside

Yanou Cui

DUNE collaboration meeting May 22 2019

University of California-Riverside (UCR)

- One of the ten general campuses of UC systems, 55 miles (89 km) east of downtown Los Angeles
- Counted among the Top 35 public universities in the US, UCR is America's fastest rising ranked university.
  – U.S. News 2019 rankings

University of California-Riverside (UCR)

- 2018 fall enrollment: 20,581 undergraduate students, 3341 graduate students
- Offers: 101 BS' degrees, 55 MS' degrees, 42 Ph.D's degrees
- On the faculty: 2 Nobel Laureates (1 in physics), and 10 members of the National Academies of Science and Medicine

Department of Physics and Astronomy at UCR:

45 faculty engaged in research programs in Condensed Matter Physics, Nanoscale Materials and Electronic Device Physics, Biophysics, High Energy Physics, Relativistic Heavy Ion Physics, Astrophysics and Space Physics, and Extragalactic Astronomy and Cosmology.

Our Contribution to DUNE

Dr. Yanou Cui (faculty, assistant professor)

- High energy theorist specialized in beyond the Standard Model particle physics, interface between particle physics and cosmology;
- One of the original proposers for the idea of Boosted Dark Matter that has now gained substantial interest/recognition by SuperK, DUNE collaborations.

  *(JCAP 1410 (2014) 062, **YC** w/Agashe, Necib, Thaler;*
  *JCAP 1502 (2015) , **YC** w/Berger, Zhao)*
- Most senior theorist on the current BDM working group for DUNE, already contributed to DUNE TDR
- We will continue to contribute: analyze benchmark models, provide theory-motivated advice, help optimize opportunities for searching for BDM and other DM-related new physics at DUNE

Resources

- YC's current research group: 1 postdoc, 2 graduate students
- The UCR physics department has (*preliminary*) near-future hiring-plan for multiple experimentalists faculty members in cosmology/early-universe physics, DUNE is one of the highlighted relevant experiments
- Funding: YC is currently funded by a DOE HET grant, theoretical studies related to BDM@DUNE is one of the projects that is being funded; actively seeking for additional funding resources to support DUNE related studies

Thank you!