Lithuania and CERN: Quick Overview

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on behalf of **Lithuanian community**

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Contents

Personnel

Personnel in High-Energy Physics

Approximate people count (VU so far):

- Faculty
  - Experimental particle physics – 1 (GEM), 1[1] (TEPX)
  - Theoretical particle physics – 2 (theory)
- Non-faculty
  - Engineers – 0; technicians – 0; postdocs – 0
  - PhD students: 1 (finishing)
  - MSc students: 5 (2 in experiment and 3 in theory)
- Forecast
  - Expected average number of PhDs per year:
    In HEP – 0.2
  - Postdocs – 1

[1] Incoming

Personnel in Related Areas

Approximate people count:

- Faculty
  - Computer & Data Science (CDS) – 1 (DBs/OMS/ML) @ VU
  - Material Science (MS) – 3.5 (MTD, rad-hard Si) @ VU
  - Material Science (MS) – 1 (Surface coating) + 1 @ KTU
  - Medicine – 1 (Biomarker analysis) @ KTU/LSMU
- Non-faculty
  - Engineers – 0; technicians – 0; postdocs – 1 (MS)
  - PhD students: 1 in CDS, 4 in MS @ VU
  - PhD students: ? @ KTU
  - MSc students: ?
- Forecast
  - Expected average number of PhDs per year:
    In MS – 1 + KTU
  - Joining CERN topics: 1 faculty

Lithuanians at CERN

Approximate people count:

- Faculty
  - Material Science – 1 (SC) @ LD CERN
  - Chemistry – 1 (?) + 1 @ LD CERN
- Non-faculty
  - Engineers – 10 (CMS IT); postdocs – $\sim$1 (HEP-ex)
  - PhD students: 3 (ATLAS-ex), 1 (LHCb)
- Forecast
  - Expected average number of PhDs per year:
    In HEP – $\sim$1
  - Incoming 1 CERN fellow (HI TH)

SC: superconductivity, HI TH: heavy-ion theory

Projects

Hardware Projects in CMS

Currently engaged in, taken responsibilities:

- GEM: DBs use for construction, conditions, interfacing groups, CMSSW, online
- MTD: scintillating material studies & quality control

Projects in the pipe (post/writing stage)

- Twinning

Could be of interest, but no engagement yet

- TEPX
- Tracker DB
- EuroHPC / computing

Expertise

- Software: CMSSW, ROOT, DBs, online DAQ
- Scintillating & semiconducting material response and properties

Hardware Projects in Applications

Currently engaged in, taken responsibilities:

- Fin-film coating
- Isotopes for clinical use / biomarker analysis
- Radiation damage in semiconductors
- AIDA 2020: cryogenic semiconducting sensors

Projects in the pipe (post/writing stage)

- ?

Could be of interest, but no engagement yet

- Hadron therapy (sensors + LINAC)
- Laser accelerators

Projects in HEP

Currently engaged in, taken responsibilities:

- Standard Model Physics (SMP) Drell–Yan
- Top, Higgs Physics, ttH
- Theory
  - Multi-Higgs doublet models
  - Heavy Majorana neutrinos, grand-unified theories (GUT)
  - Few-nuclei reactions

Projects in the pipe (post/writing stage)

- Twinning, Marie Curie fellowship

Could be of interest, but no engagement yet

- ttX properties (X $\sim$ H), non-SM H, di-Higgs

Expertise

- Electrons, tops, MEM, particle property measurements

MEM: Matrix Element Method

“Official” CERN Matters

Some Highlights

What happened recently?

- Kaunas and Vilnius have just signed for CERN incubator
- Lithuanian delegates participated in CERN council mtgs.
  - (Future) deficit of software and firmware developers
  - Identified: computational (HEP) is not rewarding enough
- CERN (TH) is not used to partial employment
- Lithuania “passed” yearly review
- ECFA invites all CERN members