



# Experimental Nuclear and Particle Physics Center Activities at CERN

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# About the Center

## Some highlights:

- Established as a criterion for CERN associated membership.
- Chair started in 2019 April.
- Currently, all staff is project-based.



# Main Activities 2021–2022 (1/2)

## CMS research:

- Engaged in
  - $t\bar{t}H$  analysis (A. Rinkevicius, N. Chychkalo)
  - CMS online tools (D. Simelevicius, V. Rapsevicius)
  - DiHiggs analysis (A. Carvalho, N. Chychkalo)
- CMS “extended internships” (Cat A personnel)

## Overall research:

- Projects with CERN, industry, and Lithuanian Research Council.



## Main Activities 2021–2022 (2/2)

### Studies and students:

- Reworking (and teaching) HEP courses.
- Student (undergraduate and graduate) supervision.

### Knowledge transfer:

- Co-starting DeepTech Entrepreneurship program with VU Business School, CERN Lithuanian BIC, CERN KT.

### Baltics:

- Keeping ties with Baltics via CERN Baltic Group.
- Co-organization of 1st CERN Baltic Conference (2021), organized 2nd (2022)

### Outreach:

- A couple of masterclass events with KTU, LSMU, ...
- Various solo events



# A Closer Look



## Financial resources:

Bruto income (2019–2021): 790 k€ (380 ITC CERN, 280 Ministry, 130 LRC);  
2022: 62+ k€; 2023 onwards: 200+ k€

- Projects: 6 orders, 1 LRC. Applied: 3 EU Horizon, 1 EU SF.

## Human resources:

- Management: Chair and admin. specialist
- Scientific personnel (4<sup>1</sup> FTE): 2 Sen. Sc., 1 Sc., 1 junior Sc.
- Students (PhD): 1; (BSc/MSc): 2
- Outside: 1 postdoc\* (CERN), 2 PhD stud. (Cornell U.), 1 intern

Actively engaged FF ITPA/TFAI staff:

- 4 Sen. Sc., 1 postdoc
- 2 PhD students

In the past (2019–2021):

- deputy, 5 CERN interns, 2 junior Sc., 3 internat. students (2 U. of Cambridge)

<sup>1</sup>Including chair

# Activities at the Center (2019–2022)

Activities with partners (esp. VU FF TFAI, VU MIF).

- R&D: HEP, Computer and Data Science
  - 150+ CMS pubs. (esp. top and Higgs), 5 confs.
- CERN supporting activities: DBs, monitoring, DAQ SW, shifts
- Renewed BSc and MSc (6 new courses)
- Coestablished DeepTech Entrepreneurship program
- Outreach and events: ~27 events for school pupils and teachers
- CERN Baltic Group (CBG) activities; HEPCOST/COMETA consortium
  - CBG summer schools and conferences
- Dedicated stipends: 11 students

# Envisioned Activities

- Pixel detector lab (2023–2027)
  - Ministry allocated 1.5M, but were difficulties
  - Together with Makerspace/Hackerspace Entrepreneurship (DeepTech)
- Accelerator technologies (2023++)
  - Exotic accelerators (laser based).
  - Early steps towards particle therapy.
- Tier-2 cluster (?) and smart systems lab (2027+)
- Baltic region hadron therapy center (2027++)