



# Vilnius University Experimental Nuclear and Particle Physics Center

Aurelijus Rinkevicius

Vilnius University

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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 2022–2023 (1/2)

### Drafting documents and projects:

- Lithuanian CERN Action Plan 2022–2027 (approved 2022 Oct.)
- Consortium “Center Group” Plan (submitted June 2023)
- 5-year report to CERN Task Force
- Prepared a Pixel Lab proposal with CMS Tracker (about to join Tracker formally).
- Co-prepared a COST Action: Comprehensive Multiboson Experiment-Theory Action (COMETA approved for funding in Spring 2023)

### CMS engagement:

- $t\bar{t}H$  analysis (A. Rinkevicius, N. Chychkalo)
- DiHiggs analysis (A. Carvalho, N. Chychkalo) — paused
- CMS Tracker DAQ (N. Chychkalo)
- CMS online tools (D. Simelevicius)
- CMS “extended internships” (Cat A personnel)

### Overall research:

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



## Main Activities 2022–2023 (2/2)

### Studies and students:

- Teaching (and reworking) 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 CERN Baltic Conferences, CERN Baltic Schools

### Outreach:

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



# A Closer Look



## Financial resources (2022–2023):

Bruto income: 310 k€ (78 ITC CERN, 62–230\* Ministry)

- Projects: 1 order, 1 COST\*.
- *Reserved* 1.5 M€ for the Pixel Lab.

## Human resources:

- Management: Chair and admin. specialist
- Scientific personnel (3<sup>1</sup> FTE): 1 Sen. Sc., 1 Sc., 1 junior Sc.
- Students (PhD): 1; (BSc/MSc): 1
- Outside: 2 PhD stud. (Cornell U.), 2 interns
- *Projected*: 1 admin, 1 postdoc, 1 electrical engineer

## In the past (2019–2022):

- deputy, 1 postdoc, 5 CERN interns, 2 junior Sc., 3 internat. students (2 U. of Cambridge), 2 students

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<sup>1</sup>Including chair

# Activities at the Center (2019–2023)

## 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: ~40 events for school pupils and teachers
- CERN Baltic Group (CBG) activities; COMETA consortium
  - CBG summer schools and conferences
- Dedicated stipends: 11 students

# Envisioned Activities

- Pixel detector lab (2023–2027)
  - Together with Makerspace/Hackerspace Entrepreneurship (DeepTech)
- Accelerator technologies (2025–2027)
  - Early steps towards particle therapy.
- Tier-2 cluster and smart systems lab (2027+)
- Baltic region particle therapy center (2027++)