

# CAMK Annual Meeting 2026

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ASTROCENT

# Introduction

- New doctoral student at Astrocent, CAMK-PAN
- Supervisor: Prof. Marcin Kuźniak, Co-supervisor: Dr. Andre Filipe Ventura Cortez
- Research focus: Experimental dark matter searches like DarkSide-20k and NEMESIS

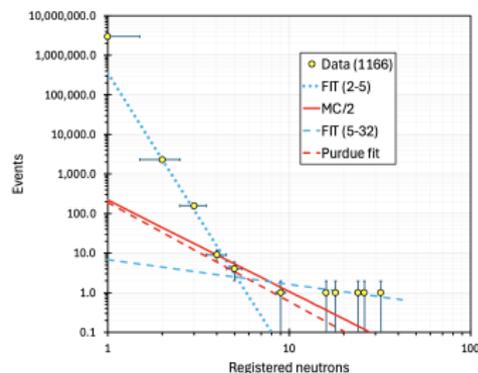
# NEMESIS

## NEMESIS

i.e. NEutron MEasurementsS In Subterranean locations



NEMESIS detector inside one of the measuring station.



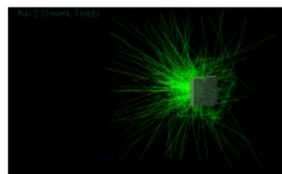
Observation and fits for neutron multiplicity

(W.H. Trzaska et al., 2024)

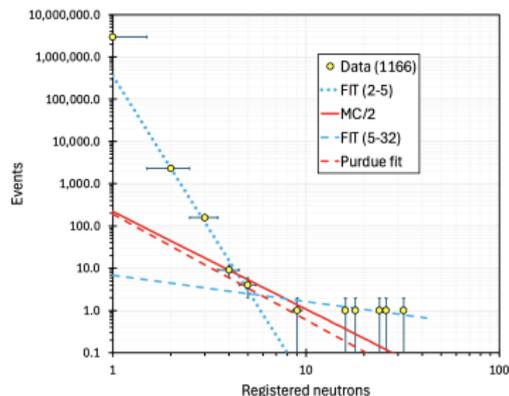
- Underground facility at Pyhäsalmi mine, Finland
- $^3\text{He}$  neutron detectors + Pb target
- Cosmic muon-induced neutron production study in high-Z targets

# Power Law Deviation Anomaly and Simulation

- Investigating power law deviation in NEMESIS data
- Working on GEANT4 simulations
- Submitted Preludium proposal for experimental setup

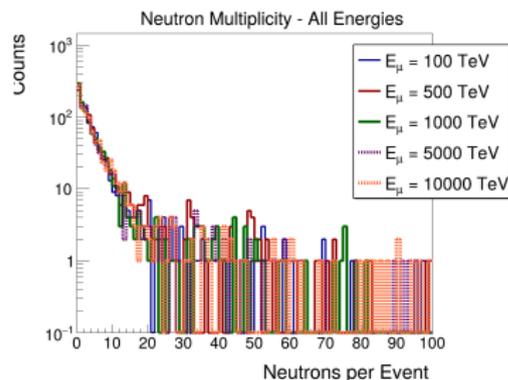


Simulation sample



Observed data and fits

(DOI:10.22323/1.441.0083)



Simulation of 1000 events at differing energies

- For higher events, planning to run the optimized simulation on cluster.

# Research Activities

## Recent Works:

- Involved in cryogenic testing vPDU for DarkSide-20k at CEZAMAT
- GEANT4 simulations for NEMESIS anomaly
- Participated in DRD1 collaboration meeting in Oct 2025

## Future Prospects:

- Gaseous Detector or TPC related R&D
- Preludium proposal resubmission (June 2026)
- Data analysis of a follow up NEMESIS run at SURF (South Dakota)
- Muography collaboration (Muotech)

Thank you