



**Innovative Facility for Isotope GENeration with Efficient Ion Accelerator**

# Aristotle University of Thessaloniki

## Profile of the Coordinating Institute

Petridou Chara , AUTH

**Kick-off meeting**

3-4 March 2025

Thessaloniki, Greece



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IFIGENEIA

# Coordinator's profile



- AUTH named after Aristotle (born in Stageira ~50km east) is 100 year old today ! and the largest University in Greece with ~90000 students out of which ~7000 postgraduates and about 4000 doctoral students
  - Large variety of disciplines: 12 faculties and 45 departments
- The faculty of Physics and Mathematics (now faculty of Sciences) was one of the first to be formed (1928)
- The Laboratory of Nuclear and Particle Physics was established in 1970 from Prof. Stefanos Charalampous and since then is actively collaborating with CERN
- The Laboratory of Accelerator Physics and Detector Technologies (established recently, in 2017)

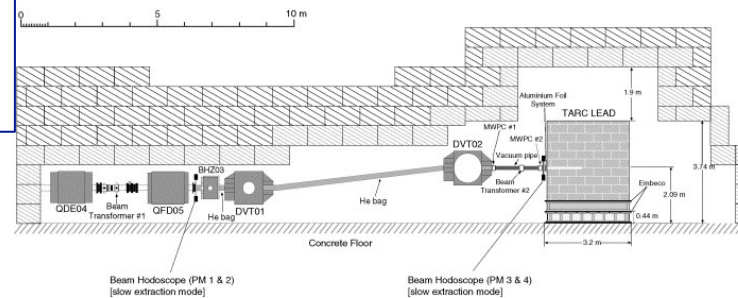


The oldest building on campus, built in 1888 with The university's motto engraved:  
Μουσας Χαρισι Θύε

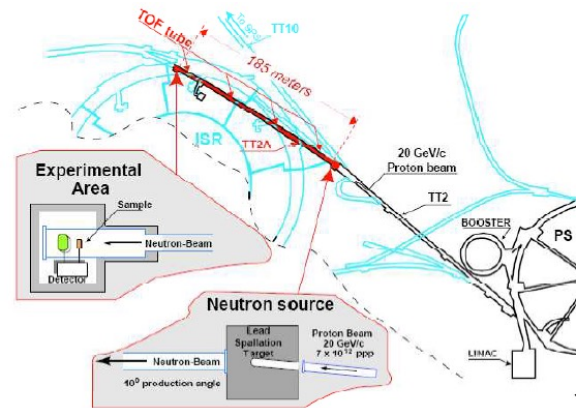
# Main activities & competencies



CPLEAR (1985-1999)  
CP violation in the  
Low Energy Antiproton Ring  
Studied the neutral kaon  
system ( $K^0$ - $\bar{K}^0$ )



TARC (1995-1997)  
(Transmutation by Adiabatic  
Resonance Crossing). Studied  
neutron-driven nuclear  
transmutation of long-lived  
radioactive isotopes to  
reduce nuclear waste



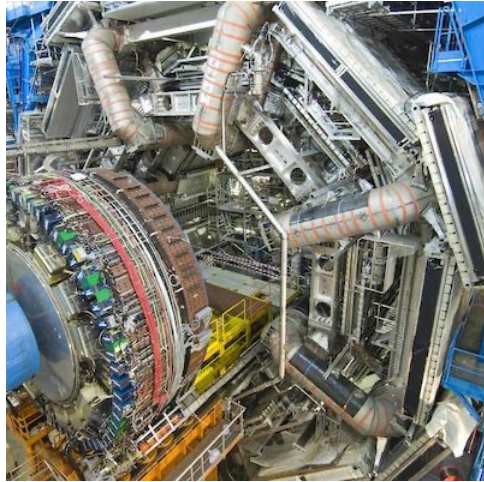
n\_TOF (2001-today)  
(Neutron Time-Of-Flight).  
Studies neutron-induced  
reactions. Essential for  
nuclear astrophysics,  
nuclear technology, and  
medical applications



CAST 2003-2021 (CERN  
Axion Solar Telescope)  
Designed to search for  
axions, a dark matter  
candidate



# Main activities & competencies

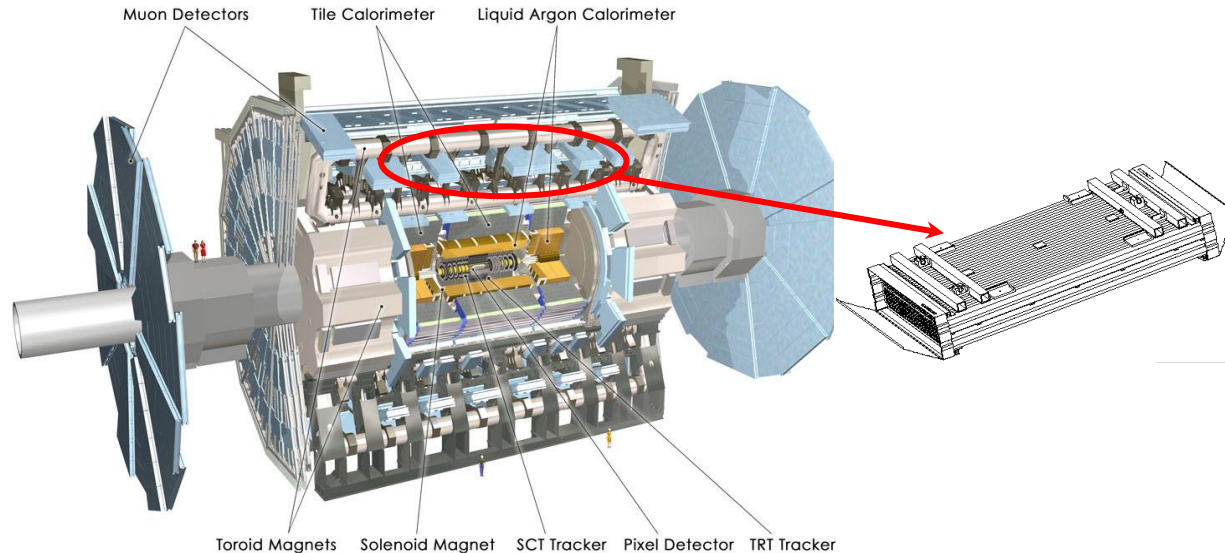


ATLAS (1994-today)

A Toroidal LHC ApparatuS

The largest and most complex detector. Designed to study high-energy particle collisions.

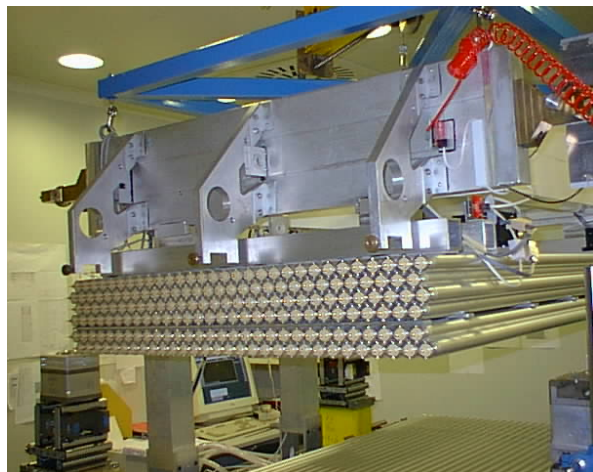
Discovered the Higgs boson. Searches for new physics, dark matter, and extra dimensions



A Collaboration between three universities:  
National Kapodistrian University of Athens  
National Technical University of Athens  
**Aristotle University of Thessaloniki**



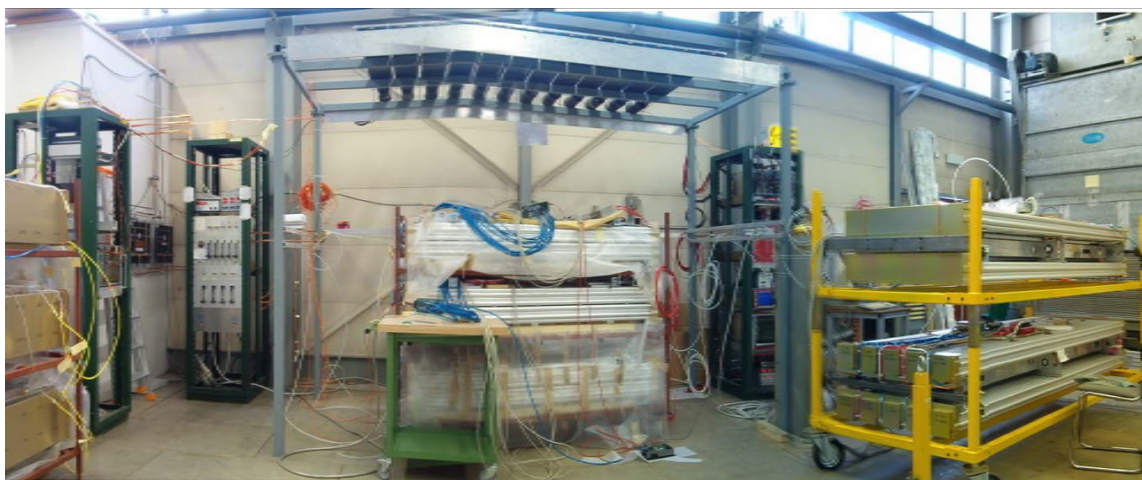
# Main activities & competencies



1998-2008

AUTh constructed 112 Muon chambers (BIS).

- High precision construction in a dedicated Clean Room at AUTh
- Testing, integration, installation and commissioning at CERN

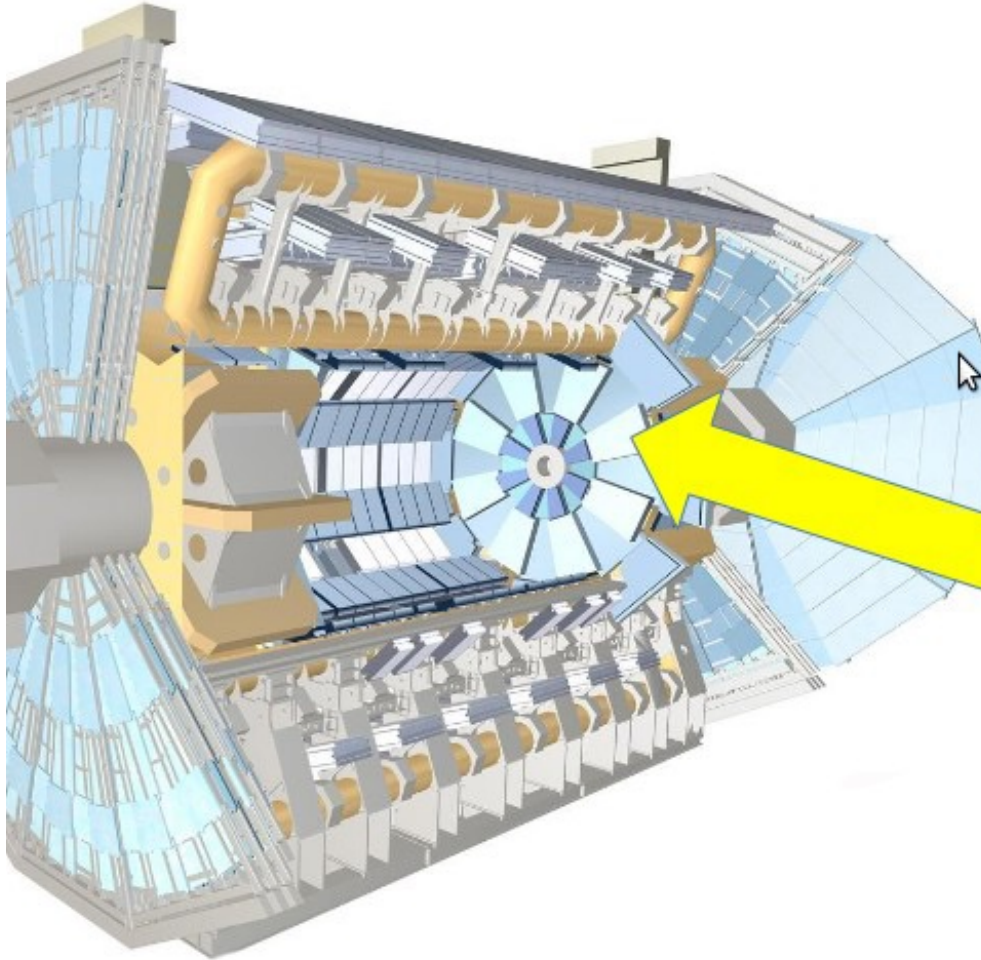


Major Contributions:

- Higgs discovery
- Standard Model precision measurements
- Searches for New Physics
- Software
- Data Analysis



# Main activities & competencies



2016-2020

AUTH constructed the Large Micromegas Detectors in a dedicated Laboratory, equipped with Clean Room facilities for the New Small Wheel of the ATLAS Upgrade



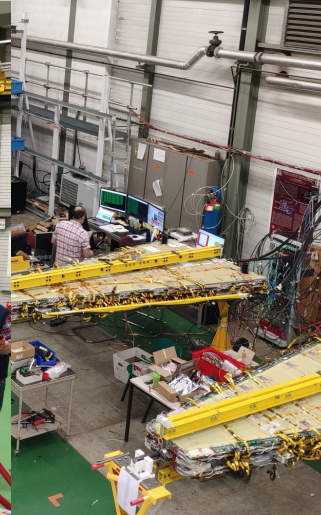
# Main activities & competencies



Construction of the  
Micromegas  
detectors at AUTH



Tests and  
Installation at  
CERN





# Main activities & competencies



2018-today  
Applications of the  
Micromegas Detectors in  
Muon Tomography.  
Exploit Cosmic Muons to  
investigate cultural heritage.  
First application to the tomb  
of Apollonia

A standalone detector system was  
operated in the field:

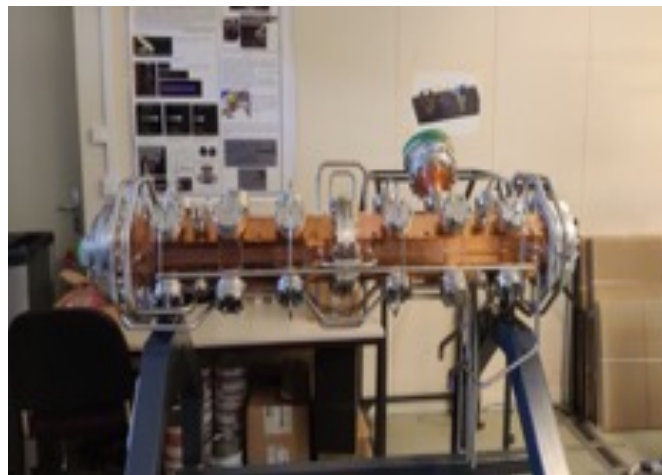
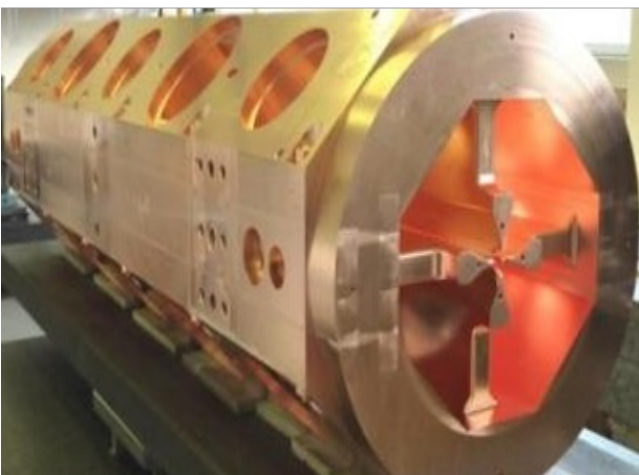
- Power: Solar panels & battery array
- Full system powered ON
- Telescope set @ 20 degs
- Temperature sensors, gas system etc





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# Main activities & competencies



2019-today

AUTH is collaborating with the CERN Accelerator department

- Educating Doctoral, Postgraduates and Technical students of AUTH at CERN
- Collaborating with CERN for the construction in Greece accelerator for Societal purposes
- Developing applications for non-invasive methods to study objects of cultural heritage, using ion beams

- Project Coordinator (WP 1) with leadership on the tasks:
  - T1.1 Project coordination & financial management
  - T1.3 Scientific, innovation & technical management
- In Education, Dissemination, Inclusion & Diversity (WP 2) Leadership in
  - T2.4 on Inclusion strategies and activities
- Lead on LINAC design for Radioisotope production (WP 3) and leadership on the tasks:
  - T3.1 Linac design and beam dynamics
  - T3.3 Optimization of the targets & handling different isotope production
  - T3.6 Development of Computational tools
- In the Mentorship (WP 6) Leadership on T6.1 Accelerator School



- 6 Faculty from the Nuclear and Particle Physics Laboratory
  - Argyropoulos Spyros, Associate Professor
  - Kordas Konstantinos, Professor
  - Lampoudis Christos, Assistant Professor
  - Petridou Chara, Em. Professor
  - Sampsonidis Dimos, Professor
  - Tzamaras Spyros, Em. Professor
- 1 Faculty from the Hellenic Open University
  - Leisos Antonios
- 3 Phd's currently doing their PhD on accelerator technologies at CERN
- Graduate students (MSc diploma thesis on accelerator)
- 4th year Undergraduate students (diploma thesis-ptyxiaki on accelerators)

# The site where Aristotle University was built

SALONICCO - Cimitero Israelita  
SALONIQUE - Cimetière Israélite  
SALONICA - A Jewish Cemetery



A 19th century postcard