

AstroCeNT

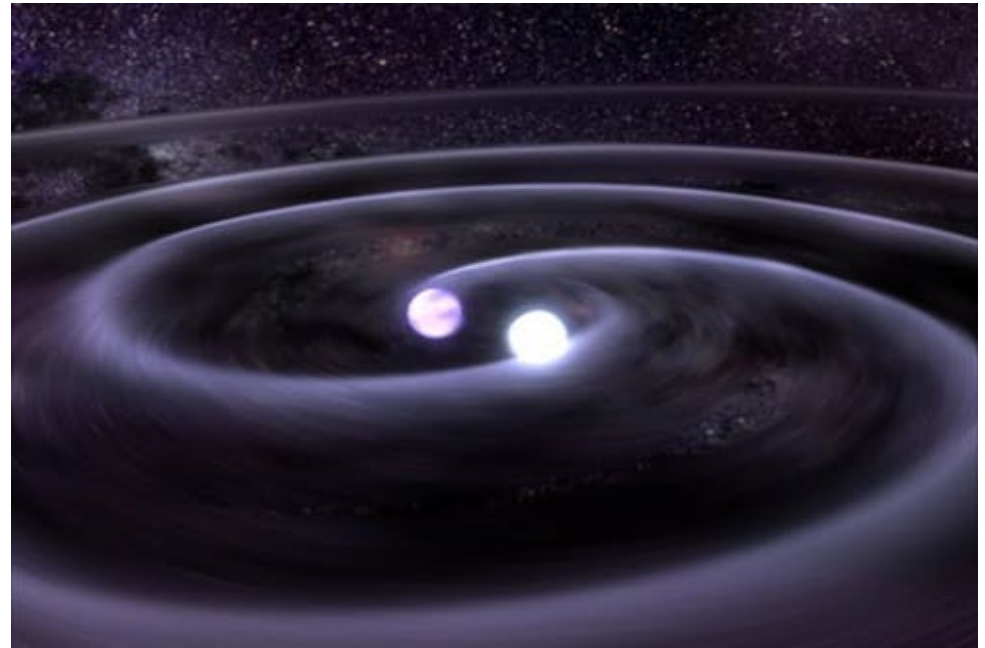
Particle Astrophysics Center for Science and Technology
@CAMK PAN

Leszek Roszkowski

Explore the hidden Universe

Two Universes

Astronomer's Universe



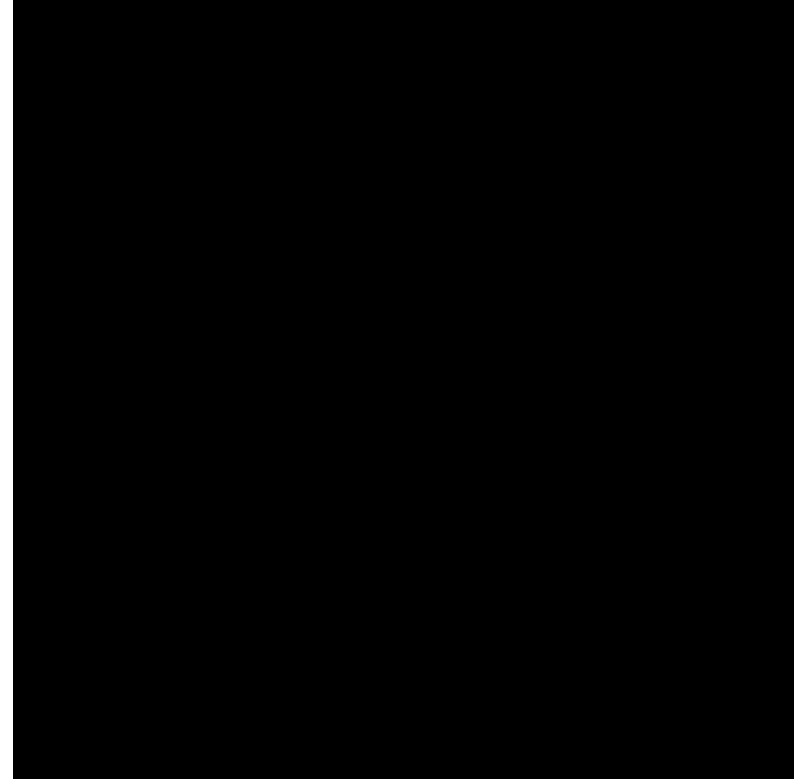
GW discovery, Nobel Prize 2017

Two Universes

Astronomer's Universe



Particle physicist's Universe



AstroCeNT

- Formally: new administrative unit (Zakład 3) of CAMK

❖ International Research Agenda

❖ Funding: 38 MPLN for 5 years (1 July '18 –30 June '23)

source: FNP
(EU structural funds)

❖ Leszek Roszkowski, main applicant, Astrocent head

❖ Tomasz Bulik, co-applicant

Main objectives:

- Studies of the invisible Universe (**gravitational waves, dark matter,...**)
- Ultra-sensitive instruments to detect extremely faint signals
 - Seismic sensors, modules of silicon photomultipliers (SiPMs), ...
- Big data collection and processing
- Applications to hi-tech industry and medicine (e.g., PET)
- ...

Big Science

**Innovative
technologies**

FNP: Foundation for Polish Science,
APC: Astroparticule et Cosmologie Laboratory,

Main partners: APC (Paris), Princeton, GSSI, McDonald Institute

Locally: Warsaw University of Technology, NCBJ,

- Located at WUT premises





FIND OUT MORE ABOUT ASTROCENT

PARTICLE ASTROPHYSICS SCIENCE AND TECHNOLOGY CENTRE
INTERNATIONAL RESEARCH AGENDA

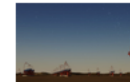
MORE

Events



Conference "Particle Astrophysics in Poland"

20/05/2019



The Annual meeting of the Polish CTA Collaboration to be held at Astrocent

22/05/2019

Read more

News



13 MAY 2019 ASTROCENT | NOBEL PRIZE | EVENT

Nobel Prize winner Art McDonald to visit Astrocent

A 2015 Nobel Prize in Physics, Prof. Art McDonald will visit Astrocent. Our distinguished guest will take part in the conference "Particle Astrophysics in Poland" (20-21 May 2019) that Astrocent is one of the main organizers.

Read more



13 MAY 2019 ASTROCENT | EUROPEAN GRAVITATIONAL ORGANIZATION

Director of European Gravitational Organization Professor Stavros Katsanevas will visit Astrocent in late May 2019

Professor Stavros Katsanevas, the director of the European Gravitational Organization (EGO), based in Pisa, Italy, is coming to visit Astrocent.

Read more



13 MAY 2019 ASTROCENT | SNOLAB

SNOLAB Director Dr. Nigel Smith to visit Astrocent in May 2019

The director of SNOLAB, Dr. Nigel Smith is going to visit Astrocent in late May. He will come to discuss prospects for collaboration with Astrocent. He will also take part in special session devoted to Astrocent at the conference "Particle Astrophysics in Poland" (20-21 May 2019)...

Read more

Read more news from AstroCent

Calendar

May 2019						
M	T	W	T	F	S	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Our teams

Team I

**SiPM Systems for Astroparticle
Physics and Medical Physics
(leader: Marcin Kuźniak - TBC)**

Team IV

**Ultrapure SiPMs and
Associated Readout Electronics
(leader: M. Wada – TBC)**

Team II

**Seismic sensors
for gravitational waves
(leader: T. Bulik)**

Team V

**Scientific Computing and
Information Technology
(leader: N. Benekos -- TBC)**

Team III

**Electronics and Data
Acquisition and Processing
(leader: M. Suchenek, TBC)**

Team VI

**Particle astrophysics
(leader: L. Roszkowski)**

Typical team structure:

- leader
- 2-3 postdocs
- 2-3 PhD students

Plus:

- technicians
- senior postdocs
- visitors, collaborators

Altogether, Astrocent is expected to employ 30-40 researchers.

L. Roszkowski, 21.5.2015

Research directions

Astrocent will aim to contribute to:

- **frontline physics**
- **innovative technologies:**
 - Silicon Photo Multiplier (SiPM) based systems;
 - seismic sensors;
 - data acquisition and large data set processing;
 - ...

Develop innovative solutions for and prototypes of:

- Seismic sensors;
- Silicon photomultiplier (SiPM) systems;
for particle astrophysics experiments and for potential
commercial or medical applications

**Exploring
uncharted
waters**

Main planned projects:

- Cryogenic SiPM modules for low-bgnd experiments (e.g. **DarkSide**, **Global Argon**, ...)
- 3+1D seismic sensors (**Advanced Virgo**, **Einstein Telescope**)
- SiPM modules for PETs

Strategic big projects



Global Argon Dark Matter Collaboration

- 68 institutes
- 350 researchers
- Strong assistance from CERN
- 13 nations:

Brazil, Canada, China, France, Greece, Italy, Mexico, Poland, Romania, Spain, Switzerland, UK, USA

Sequence of experiments:

- DEAP: 3 tonnes
- DarkSide 20K: 20 tonnes
- 300 tonnes to reach the “Neutrino Floor”

Towards global argon collaboration:

DarkSide, DEAP, miniCLEAN, ArDM > 350 researchers



Letter of support from Gran Sasso, SNOLAB, CanFranc Laboratory Directors

Global Argon Dark Matter Collaboration

Today: AstroCeNT
to officially
declare intention
to join GADMC

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ASTROCENT

Letter of support from Gran
Sasso, SNOLAB, CanFranc
Laboratory Directors

APC – strategic international partner**Other potential key partners include:**

- Princeton University
- Gran Sasso Science Institute
- Warsaw University of Technology
- National Centre for Nuclear Research
- McDonald Institute
- ...

Co-operation with APC:

- Formal agreement signed between CAMK PAN and CNRS/IN2P3
- Astrocent-APC Executive Committee

- Joint PhD programs, “Co-tutor” (“cotutelle”): APC, GSSI, McDonald Institute?;
- shared postdocs;
- Visitors program (APC, McDonald Institute, ...)
- Student and researcher training program: WUT, NCBJ, ...
- Joint workshops;
- Outreach: education and dissemination programme;
- Astrocent-APC and international collaboration;
- Joint R&D

International Scientific Committee of AstroCeNT

1. Prof. Stavros Katsanevas, European Gravitational Observatory, director -- **CHAIR**
2. Prof. Marek Banaszekiewicz, Space Research Center PAS
3. Prof. Barbara Erazmus, CNRS Nantes
4. Prof. Cristiano Galbiati, Princeton University and GSSI, DarkSide leader
5. Prof. Antoine Kouchner, APC, director
6. Prof. Sotiris Loucatos, APC, deputy director
7. Dr Harald Lueck, University of Hannover
8. Prof. Michał Ostrowski, Jagiellonian University, Cracow
9. Prof. Tomasz Starecki, Warsaw University of Technology
10. Mr Marek Winkowski, MSc Eng, Wroclaw Technology Park, vice-president







Thank you