JOB OFFER

Position in the project:	**Student** at the International Research Agenda AstroCeNT: Particle Astrophysics Science and Technology Centre
Scientific disciplines:	Dark matter, gravitational wave studies; experiment; seismic sensors, infra sound sensors; data acquisition and analysis; computer science: quantum computation, machine learning, signal processing; high vacuum technology; instrumentation technology;
Job type (employment contract/ stipend):	scholarship
Number of job offers:	6
Remuneration/stipend amount/ month *("X0 000 PLN of full remuneration cost, i.e. expected net salary at X 000 PLN"):*	1,500.00 – 2,500.00 PLN net/month
Position starts on:	1.12.2020 (or later)
Maximum period of contract/stipend agreement:	12 months The start and duration of the scholarship: • the preferred starting date is 1st November 2020, • the preferred duration of the scholarship is 3 months, • other options may be considered depending on the project and an applicant.
Institution:	AstroCeN*T* Department of the Nicolaus Copernicus Astronomical Center of the Polish Academy of Sciences
Project leaders:	Leszek Roszkowski (leader), Tomasz Bulik (co-leader)
Project title:	**AstroCeNT*:* Particle Astrophysics Science and Technology Centre** *(The project is carried out within the International Research Agendas Programme of the Foundation for Polish Science)*
Project description:	**Proposed research tasks:** 1. Simulation of propagation of light in a liquid argon-based detector. 2. Measurements and/or analysis characterizing optical properties of fluorescent materials for dark matter or neutrino detectors. 3. Implementing Monte Carlo simulation routines modelling background events in a dark matter detector. 4. Development of a data acquisition system for a set of 100 elecret microphones. 5. Development of an active seismometer based on a single

geophone.

6. Development of vibration monitoring and balancing systems.
7. Development of a system for measuring the frequency response of a geophone.
8. Development of software for viewing seismic data.
9. Development of a file system for seismic sensors.
10. Development of a indoor navigation system using radio beacons.
11. Development of algorithms for object recognition in seismic signal.
12. Development of machine learning algorithms for early detection of gravitational waves.
13. Testing applications of quantum machine learning algorithms.

About AstroCeNT:
On the physics side, research at AstroCeNT is primarily focused on studies of gravitational waves and dark matter, as well as on related topics of astronomy, particle cosmology and particle physics. On the technological side, our prime objective is to specialise in R&D on ultra-sensitive instruments for low background and low count rate particle astrophysics experiments, primarily, but not exclusively, in:

- dark matter searches, in particular modules of silicon photomultipliers, as part of DarkSide and Global Argon Dark Matter collaborations, and
- gravitational waves, especially seismic sensors, as part of Advanced Virgo/Ligo and the Einstein Telescope collaborations.

The centre is comprised of six international research groups of physicists and engineers:

- SiPM Systems for Astroparticle Physics and Medical Physics (leader: Dr Marcin Kuźniak)
- Seismic Sensors (Prof. Tomasz Bulik)
- Electronics and Data Acquisition and Processing (Dr Mariusz Suchenek)
- Ultrapure SiPMs and Associated Readout Electronics (Dr Masayuki Wada)
- Scientific Computing & Information Technology Group (Prof. Piotr Gawron)
- Particle Astrophysics (Prof. Leszek Roszkowski)

AstroCeNT has developed close collaborative links with several institutions in Europe and outside, in particular with our strategic partner APC (Astroparticles and Cosmology Laboratory) in Paris and the McDonald Institute in Canada.

AstroCeNT is conveniently located in the city centre, with easy access to rail stations and airports. It occupies a suite of spacious and modern labs and offices on top floor of a modern building, https://www.cziitt.pw.edu.pl/ of Warsaw University of Technology. The site is also well connected with Physics Department of the University of Warsaw and the main site of the Nicolaus Copernicus Astronomical Centre.
AstroCeNT strongly values the diversity of candidates and is very committed

	to the equality of opportunity.
Key responsibilities include:	• Writing technical reports or papers; • Active co-operation with different research teams at AstroCeNT. • Performing research in dark matter, gravitational wave detection or machine learning under supervision of a more senior scientist.
Profile of candidates/requirements:	• Enrolment as a **1st and 2nd grade student in physics, electronics, mathematics or computer science** at a higher education institution; • Willingness to work in the areas of gravitational waves or dark matter detection, preferably: the existing research experience in one of the above areas; • Good English language skills; • Willingness to perform scientific research under supervision.
Required documents:	• Curriculum Vitae including the candidate's education and employment record and his/her involvement in scientific activities, • Cover letter (in English) including a short description of the candidate's scientific interests and justification of his/her intention to do internship at AstroCeNT • Scan of signed GDPR statement: available at the bottom of the website: https://www.camk.edu.pl/en/about/ochrona-danych-osobowych/ ("Project Astrocent documents").
We offer:	• Opportunity to make an impact in a hot area of research; • Close collaboration with other AstroCeNT researchers; • Stimulating, international research environment in a new centre of excellence; • Offices located at the centre of Warsaw.
Please submit the following documents to:	All the documents should be sent by email to: **internships@astrocent.pl**
Application deadline:	**22nd November 2020**
For more details about the position please visit (website/webpage address):	https://astrocent.camk.edu.pl/job-offer/ More information can be obtained from: Dr. Marcin Kuźniak (mkuzniak@camk.edu.pl) Prof. Tomasz Bulik (bulik@camk.edu.pl), Dr. Mariusz Suchenek (msuchenek@camk.edu.pl) Dr. Masayuki Wada (masayuki@camk.edu.pl) Prof. Piotr Gawron (gawron@camk.edu.pl) Prof. Leszek Roszkowski (roszkowski@camk.edu.pl)
Euraxess job/stipend offer (in case of PhD and postdoc positions):	https://euraxess.ec.europa.eu/jobs/559812

European Funds Smart Growth
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