

Registration form

This is a registration form for Host Institutions wanting to establish a Dioscuri Centre of Scientific Excellence within Dioscuri 4 call.

Registration form for Polish research institution

1. Research institution data (name and address):

Wrocław University of Environmental and Life Sciences - UPWr

ul. C.K. Norwida 25

50-375 Wrocław

Poland

Website: <https://upwr.edu.pl/en/>

2. Type of research institution¹:

1) higher education institution

3. Head of the institution:

prof. dr hab inż. Jarosław Bosy

Rector

4. Contact information of designated person(s) for applicants and the NCN: first and last name, position, e-mail address, phone number, correspondence address:

Witold Rohm, Associate Professor

witold.rohm@upwr.edu.pl, +48 697806126,

Institute of Geodesy and Geoinformatics.

ul. Grunwaldzka 53, 50-357 Wrocław

5. Research discipline in which the strong international position of the institution ensures establishing a Dioscuri Centre (select one from the 25 listed disciplines):

Natural Sciences and Technology:

Earth sciences

1 As specified in "Addressees of the call"

6. Description of important research achievements from the selected discipline from the last 5 years including a list of the most important publications, patents, other (up to one page in A4 format):

The UPWr is one of the best specialized research Universities it was ranked 12 among all Polish Universities in the Excellence Initiative – Research University, competition in 2019. One of the key disciplines dynamically developing is Earth Sciences within the Institute Geodesy and Geoinformatics (IGG). In recent years IGG host a large number of excellent projects related to Earth Sciences: such as European Plate Observing System (EPOS-PL and EPOS-PL+) developing observation and processing infrastructure for high-class geodynamic research such as: gravimeters, radiometers, GNSS stations, InSAR processing for CubeSats, GNSS processing facility for induced seismicity and deformations. These large-scale infrastructure investments are matched with successful project applications by one of the best researchers in the field:

Prof. Krzysztof Sośnica is leading a research team actively involved in precise orbit determination, global geodetic parameters retrieval, relativistic effects, his team is also hosting an associated processing centre of the International Laser Ranging Service (ILRS).

Prof. Witold Rohm is leading GNSS remote sensing and AI research group that has established a reputation as a GNSS ground-based and space-based remote sensing and weather forecasting research hub. Group is hosting EUMETNET EIG GNSS water vapour programme (E-GVAP) processing centers for Poland, Lithuania and Australia.

Dr Maya Ilieva is leading research activities related to SAR, GNSS and LiDAR monitoring of mining activities in both deformation and induced seismicity aspects. She is a project coordinator in Twinning Action (Coordinate and Support Action CSA – Twinning) collaborating with top universities in Europe: TU Delft, La Sapienza and TU Vienna.

The Dioscuri Centre should complement and extend research capabilities of IGG in one of the following areas: **space debris tracking, space-based reflectometry and polarimetry, hyperspectral, spectral and microwave remote sensing, application of artificial intelligence to EO, climate change and global geodynamics.**

The excellence in science and large-scale collaboration is also visible in the quality and number of highly cited papers published by the IGG team every year (25-30 JCR papers p.a.):

Bury, G., Sośnica, K., Zajdel, R., & Strugarek, D. (2020). Toward the 1-cm Galileo orbits: challenges in modeling of perturbing forces. *Journal of Geodesy*, 94(2), 1-19.;

Hadas, T., Kazmierski, K., & Sośnica, K. (2019). Performance of Galileo-only dual-frequency absolute positioning using the fully serviceable Galileo constellation. *GPS Solutions*, 23(4), 1-12.

Rohm, W., Guzikowski, J., Wilgan, K., & Kryza, M. (2019). 4DVAR assimilation of GNSS zenith path delays and precipitable water into a numerical weather prediction model WRF. *Atmospheric Measurement Techniques*, 12(1), 345-361.

7. List of no more than 3 important research projects from the selected discipline awarded in national and international calls to the institution in the last 5 years (title, name of PI, source of funding, amount of funding):

Title: **“EPOS – European Plate Observing System (EPOS-PL)/ EPOS – European Plate Observing System (EPOS-PL+)”**

Partner in a consortium: GIG(leader), UPWr, IGF PAN, CBK PAN, ING PAN, PGG, Cyfronet AGH

PI UPWr: dr hab. inż. Witold Rohm / dr hab. inż. Jan Kapłon

Number: EU POIR.04.02.00-00-C005/19

Funding: 52 844 599,09 zł

Time: 1.01.2020 - 31.12.2023

URL: <https://epos-pl-plus.eu>

Title: **“Integrated terrestrial reference frames based on SLR measurements to geodetic, active LEO, and GNSS satellites”**

PI: prof. dr hab. inż. Krzysztof Sośnica (UPWr)

Number: NCN OPUS UMO-2019/35/B/ST10/00515

Funding: 1 295 040 zł

Time: 18.06.2020 - 17.06.2024

Title: **“GATHERS - Integration of Geodetic and imaging Techniques for monitoring and modelling the Earth's surface deformations and Seismic risk”**

Leader in a consortium: UPWr(leader), TU Delft, TU Wiena, La Sapienza

PI: dr Maya Ilieva (UPWr)

Number: H2020 857612

Time: 1.12.2019 - 30.11.2022

Funding: 407 675 EUR

URL: <http://gathers.eu>

8. Description of the available laboratory and office space for the Dioscuri Centre (*up to one page in A4 format*):

The following spaces will be made available for the Dioscuri Centre:

- **GISLab** - A Laboratory oriented towards processing Geographic Information System (GIS) data and development of the spatial information infrastructure. GISLab contains 24 computer stands with licences for processing GIS and GNSS observations
- **Laboratory for Remote Sensing, Laser Scanning and 3D Modelling** - A Laboratory with laser scanners, precise digital cameras, 3D cameras, software for data processing, inertial measurement units, lidars, and drones supporting airborne laser scanning and airborne photogrammetry equipped with 10 computer stands
- **Laboratory for Geodetic and Surveying Technologies** - a Laboratory with precise surveying instruments: tachymeters, levels, autonomous total stations, and calibration stations
- **Laboratory of Geodetic Monitoring** for structural monitoring of buildings
- **Gravimetric Observatory** equipped with tidal and mobile gravimeters connected to a rubidium atomic clock
- **Real Estate Cadastre Laboratory** - equipped with 30 computer stands with licence for the cadastre and real estate appraisal software
- **Satellite Observatory** - a network of multi-GNSS receivers equipped with microwave radiometers and meteorological sensors for GNSS data collecting and processing, as well as for the GNSS meteorology
- Three offices equipped with computers and beamers for 10 new employees (5 + 4 + 1) at the Institute of Geodesy and Geoinformatics. A possibility to adopt the existing offices for the project needs
- 3 libraries: The Main University Library, The Faculty Library with a reading room, and the Library of the Institute of Geodesy and Geoinformatics with specialized literature and equipped with social facilities (coffee machine, dish washer, fridge, and microwave oven; canteen and cafeteria are available in the university building next door)
- A Seminar Room for project meetings, brainstorming, and discussions

9. List of the available research equipment for the Dioscuri Centre:

- Access to 446 CPU cluster, GNSS data processing software: Bernese GNSS 5.2, GAMIT/GLOBK, GypsyX, GNSS-WARP for Precise Point Positioning (PPP) in real-time and post-processing modes (in-house), TOMO2 GNSS tomography software (in-house), ROWNP radio occultation (in-house), Ray-tracing satellite to ground and satellite to satellite (in-house), WRFDA with in-house extensions; SAR/InSAR/PInSAR data processing software: SNAP toolboxes, StaMPS, SARscape; Matlab, ArcGIS
- Access to the WCSS (Wroclaw Centre for Networking and Supercomputing) cluster (distributed computing infrastructure)
- network of 9 regular multi-GNSS stations and 20 low-cost multi-GNSS stations installed in the south and south-west Poland tracking GPS, Galileo, GLONASS, BeiDou, and QZSS satellites

- 2 microwave radiometers (Wroclaw and Borowa Gora)
- 2 gravimeters: tidal gPhone-X and mobile Autograv CG-6
- access to ILLRS, IGS, EPN, MGEX data collected by global network of GNSS and SLR stations with processing centers at IGG UPWr
- fiber optical link connection to the cesium fountain and hydrogen masers in the Borowiec Observatory (to be realized in 2021)

10. List of the additional benefits (other than listed in call text) that the Institution declares to provide for the Dioscuri Centre (i.e.: additional funds, personal benefits, other) (*up to one page in A4 format*):

The HR Excellence in Research distinction, awarded to UPWr in 2017, offers a friendly environment for scientific work, and the recruitment rules applied in it are fully transparent. The Dioscuri Centre - created at UPWr favorable, international working environment - will be a lighthouse of scientific excellence in Poland. The initiative is fully supported by UPWr authorities who declares to ensure:

1) additional funding:

- Apart from 25k EUR/year funding (obligatory in the proposal), UPWr will offer 20k EUR/year additionally for DC as a future Leading Research Group. This additional funds are in line with UPWr Excellence Initiative strategy which assumes systemic mechanism for financing excellence research (Leading Research Groups) and doctoral school
- Family allowance (for DC leader whose family stays in Poland for at least 3 months): 300 EUR gross per month
- Special needs allowance: 200 EUR per month (if eligible)

2) professional assistance from English-speaking administrative staff, among others:

- provide administrative support in recognition of national and international research programmes and grant schemes (International Research Office)
- support in all matters relating to knowledge transfer and Intellectual Property Right (Centre of Innovation and Knowledge Transfer)
- assistance in relocation, visa procedures, mobility grants/travels in Poland and abroad (International Relations Office)

3) research networking and support:

- provide integration in academic community by attending scientific seminars held in English, introducing to doctoral school and participating in networking events in Wroclaw academic community
- provide support in recruitment procedure of DC research team
- support the DC research team in obtaining the required consents, opinions, authorisations or permits if the research carried out within the fellowship requires formal certification with ethical standards

4) social benefits:

- provide (in cooperation with Wroclaw Academic Centre) a flat for DC leader and his/her family,
- assistance (in cooperation with Wroclaw Academic Centre) in securing a place in nursery, kindergarten, school for kids,
- providing a range of employment offers for DC leader's spouse (in cooperation with Wroclaw Academic Centre),
- others: Multisport programme; language courses on preferable conditions at UPWr Language Centre; loans from UPWr social allowance available on preferable financial conditions.

11. Other information about the internationalisation of the research institution, international researchers employed at the institution, the availability of English language seminars etc. (*up to one page in A4 format*):

Within the last years as stated in the UPWr Excellence Initiative strategy (<https://upwr.edu.pl/en/research/research-university>), following actions strongly linked to internationalisation were implemented:

- increasing scientific excellence through international cooperation - outcomes: since 2018 UPWr triples funds obtained within international programmes/initiatives; intensive doctoral and staff mobility within a wide range of national and international programmes such

as NAWA, DAAD, Erasmus+, Fullbright (avg. per year doctoral students mobilities 40 (incoming), 70 (outgoing), staff mobilities - 50 (incoming); 500 (outgoing);

- new approach to UPWr doctoral training - outcomes: 70% of the doctorates are run within dedicated, externally funded projects; 42% are fully implemented in English with foreign co-supervision and the mandatory one year international research internship; currently, 21% of PhD candidates are from abroad

- increasing the competences of administration staff - outcomes: establishment of new organizational units dedicated to international grant applications (International Research Office) and project implementation (Centre for Project Implementation and Finance). The staff is fluent in English.

Internationalisation strategy developed at the IGG level has been already in place for 20 years. It is based on investment in the best, proactive young researchers and students. IGG management team were always motivating best performing students, to start engaging in international Masters and PhDs (e.g. Dr. Małgorzata Jarząbek-Rychard, graduated from MSc in Geomatics Engineering - GeoEngine University of Stuttgart, prof. Krzysztof Sośnica - PhD in Physics from University of Bern, Switzerland). Moreover, all international and UPWr-based PhDs are encouraged to complete post-doc in the internationally renowned institution (e.g. prof. Witold Rohm SPACE Research Centre in Melbourne, Australia). UPWr guarantees a full time employment after completion of post-doc position. In the last 5 years this strategy is also completed with a strong notion towards partial or full employment of international researchers (e.g. Dr. Maya Ilieva, Dr Luca Demarchi).

Following employees who obtained PhD degree abroad: Dr Maya Ilieva (University Pierre and Marrie Curie, Paris, France); Prof. Krzysztof Sośnica (University of Bern, Switzerland); Prof. Andrzej Borkowski (TU Dresden, Germany); Dr Paweł Bogusławski (University of South Wales, UK); Dr Luca Demarchi (Vrije Universiteit Brussel, Belgium); Dr Katarzyna Siła-Nowicka (University of St. Andrews) - affiliated researcher; Dr Vanessa da Silva Brum Bastos (University of St. Andrews) - visiting researcher.

In the last 5 years, all PhD Thesis defended by IGG PhDs' are based on a cumulative collection of 4-8 JCR papers, most of the time reviewers are external internationally renowned researchers from top European universities and research institutions. PhD defenses are held in English. PhD students are jointly supervised by IGG professors and an international researcher to improve.

80% of staff is essentially using English as a second language, and therefore all seminars are conducted in English. The Institute website has two versions Polish and English, moreover, the Leading Research Group SpaceOs has only English website and twitter (#SpaceOs4). Internal communication using Slack is done English only.