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UPWr Base of Knowledge - link	https://bazawiedzy.upwr.edu.pl/info_seam?id=UPWrbd14633e36ae4108a4aefde1c1e25350&affil=&lang=pl
Researchgate:	https://www.researchgate.net/profile/Krzysztof-Sosnica
Personal website / Working group website:	http://www.igig.up.wroc.pl/igig/
Projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	<p>Theme: Integrated terrestrial reference frames based on SLR measurements to geodetic, active LEO, and GNSS satellites PI: prof. dr hab. inż. Krzysztof Sośnica Number (MSHE code): National Science Center, UMO-2019/35/B/ST10/00515 Duration: 18.06.2020 - 17.06.2024</p> <p>Theme: Determination of Global Geodetic Parameters using the Galileo Satellite System PI: prof. dr hab. inż. Krzysztof Sośnica Number (MSHE code): National Science Center, UMO-2018/29/B/ST10/00382 Duration: 2.01.2019 - 1.01.2022</p> <p>Theme: General Relativistic Effects in the orbits of Galileo Satellites Project manager: dr hab. inż. Krzysztof Sośnica, prof. uczelni PI: European Space Agency, ESA Contract No. 4000130481/20/ES/CM Duration: 1.04.2020 - 1.03.2021</p> <p>Theme: Innovative Methods of the Troposphere Delay Modeling for Satellite Laser Ranging Observations PI: prof. dr hab. inż. Krzysztof Sośnica Number (MSHE code): National Science Center, UMO-2015/17/B/ST10/03108 Duration: 15.02.2016 - 14.02.2020</p>
Research topic and funding	
1) PhD topic:	Simulations of the satellite orbit and global geodetic parameters for future geodetic satellites
2) Research discipline in Doctoral School	Civil Engineering and Transport
3) Short description of the research problem to be solved in the PhD:	<p>Description and understanding of the dynamic Earth system, which changes in time and space, are one of the main goals of the International Association of Geodesy. This goal is being pursued by improving the main three pillars of geodesy: rotation, geometry, and gravity of the Earth, which provide a conceptual and observational basis for high-quality geodetic reference frames, global geodetic parameters, such as Earth rotation parameters, low-degree gravity field coefficients, coordinates of the Earth center of mass, station coordinates, and the realization of the International Terrestrial Reference Frames (ITRF). Four basic observation techniques and services used for deriving global geodetic parameters and ITRF include: Satellite Laser Ranging (SLR) and Lunar Laser Ranging (LLR), Very Long Baseline Interferometry (VLBI), Global Navigation Satellite Systems (GNSS), Doppler Orbitography and Radiopositioning Integrated by Satellite (DORIS).</p> <p>The goal of this project is to improve the quality of global geodetic parameters, such as: pole coordinates and length-of-day, Earth's oblateness term and degree-2 to 4 coefficients, geocenter coordinates, SLR station coordinates, and the ITRF realization, by using microwave orbits of LEOs, GNSS and SLR measurements to different satellite types, such as passive geodetic, active LEOs, and navigational GNSS satellites.</p> <p>Main tasks:</p> <p>Processing of laser observations to the LARES-2 satellite (Laser Relativity Satellite 2, planned launch date: 1st half of 2021),</p> <p>Integration of laser observations to the LAGEOS-1/2, LARES-1/2 satellites along with the implementation of global reference systems, determination of the parameters of the Earth rotation, geopotential and station coordinates,</p> <p>Modeling the impact of non-gravitational forces on the LARES-2 satellite and other geodetic satellites,</p> <p>Simulations of orbit parameters for future geodetic satellites, with particular emphasis on improving the quality of the parameters of the Earth's gravitational field potential, geocenter coordinates, gravity constant, range biases, correlations between determined parameters.</p>
4) Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques):	<p>Completed master's studies in the field of engineering and technical sciences or exact and natural sciences, e.g. geodesy, computer science, physics, mathematics, astronomy, space and satellite engineering or a related discipline,</p> <p>Proficiency in programming in a selected language (e.g. C ++, Perl, Fortran, Python), Experience in advanced data analysis or numerical modeling (confirmed by scientific articles or thesis),</p> <p>Scientific achievements, including publications or speeches at scientific conferences, will be an additional advantage,</p> <p>Fluency in English (spoken and written),</p> <p>Ability to work independently in a defined time regime, to present complex results in international forms in a concise and accessible way.</p>
5) Details of the project to support PhD research	
a) Project title:	Integrated terrestrial reference frames based on SLR measurements to geodetic, active LEO, and GNSS satellites
b) Agreement number:	UMO-2019/35/B/ST10/00515
c) Number of months in the project to support PhD (in months; starting from 1st of October 2021):	36
6) Project website:	