



Międzynarodowa Środowiskowa Szkoła Doktorska  
przy Centrum Studiów Polarnych  
w Uniwersytecie Śląskim w Katowicach

ul. Bedzińska 60  
41-200 Sosnowiec  
tel. +48 32 368 93 80  
polarknow@us.edu.pl  
www.mssd.us.edu.pl



**Title of PhD project:** Geomagnetic dynamo generated by nonequilibrium turbulent wave field.

**Providing institute:** Institute of Geophysics, Polish Academy of Sciences

**Requirements:**

1. Master degree in physics, mathematics or engineering.
2. Programming skills.
3. Good knowledge of electrodynamics and fluid mechanics.
4. Good knowledge of English.

**Description of the tasks:**

1. application of the fully three-dimensional code (created and owned by the PI) to solving the hydro-magnetic dynamo problem under the anelastic approximation in the Cartesian geometry, including the effects of shear, gravity and density stratification, with different types of thermal boundary conditions;
2. numerical simulations with high resolution in 3D;
3. numerical analysis of the evolution equations for the cross- and kinetic helicities and numerical modeling of theoretically obtained mean field equations within the scope of incompressible approximation. Summary of the doctoral project:

**Summary:**

The goal of the project is to describe the hydromagnetic dynamo in nonequilibrium turbulence. The simulations, produced by the PhD candidate, will be an important element of the constructed theory, as they will enable verification of the nature of the beating effect of the turbulent wave field in the dynamics of the large scale magnetic field and the influence of these beatings on geomagnetic reversals and excursions.

**Other information:**

The work will be carried out under the supervision of:

dr hab. Krzysztof Mizerski, [kamiz@igf.edu.pl](mailto:kamiz@igf.edu.pl), Institute of Geophysics PAS.



**Międzynarodowa Środowiskowa Szkoła Doktorska**  
przy **Centrum Studiów Polarnych**  
w Uniwersytecie Śląskim w Katowicach

ul. Bedzińska 60  
41-200 Sosnowiec  
tel. +48 32 368 93 80  
polarknow@us.edu.pl  
www.mssd.us.edu.pl



The Secretary of the IEDS Recruitment Committee: +48 32 3689 380, e-mail:

[polarknow@us.edu.pl](mailto:polarknow@us.edu.pl)

Information on the IEDS admissions: <https://www.mssd.us.edu.pl/en/admission-2024-2025/>