III Baltic International School of Young Scientists "Magnetosphere-Ionosphere-Atmosphere Connections" (MIAC)

Immanuel Kant Baltic Federal University

Language of study: **English**
Mode of study: **full-time**
Duration: **1 week**
Availability of free education: **no**
Price: **12600 + 180 € (participation fee)**

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The school is devoted to the analysis of the reaction of the "atmosphere-ionosphere" system both to the anthropogenic processes taking place in it and to the internal processes and solar-terrestrial relations.

The main themes of the school:

1) general theory of atmospheric-ionosphere relations;

2) solar-terrestrial relations and space weather;

3) climate of the lower, middle and upper atmosphere;

4) global electric circuit;

5) magnetosphere-ionosphere current systems;

6) influence of the upper atmosphere in the Arctic region on positioning and tracking of aircraft and ships;

7) disruption of global satellite positioning systems during solar flares and magnetic storms;

8) plasma turbulence and heterogeneity in the ionosphere;

9) wave-particle interaction in the magnetosphere.

The development of modern technology puts forward strict requirements to improve positioning accuracy and reliability of navigation support. The latter is dictated by the need to improve the safety and efficiency of ground, sea and air-based objects, as well as the need to solve special tasks (aerial photography, search and rescue of vehicles in distress, solving transport problems and border situations, synchronization of long electrical networks, etc.). The key problem is the study of the interfering factors of radio waves propagation leading in the conditions of geomagnetic disturbances to signal failure and disruption of GLONASS satellite positioning system accuracy. The strongest scintillations affecting the accuracy of GLONASS/GPS positioning systems are recorded in the polar cap and are usually associated with polar patching, where ionization can be several times greater than the background. According to some estimates, positioning errors at mid latitudes reach about 10 metres. The school will also discuss the fundamental issues of plasma heterogeneity and turbulence formation, wave-particle interaction and sources of global electrical circuit variability. The materials presented as part of the lectures will help young scientists in the future to solve the problem of creating predictive models of the upper atmosphere and the plasma-sphere ionosphere system, which can be used to solve applied problems of radio waves CV propagation in the Earth's ionosphere and to correct navigation positioning systems during disturbances in the magnetosphere and neutral atmosphere.

Financial support for the event will make it possible to increase the total number of Russian Federation scientists involved in monitoring the Earth's middle and upper atmosphere and will help young scientists to become more

familiar with the work and achievements of leading specialists working in the field.

Specializations within this programme