

**International Scientific Conference
dedicated to 50th anniversary of IO RAS SPb Branch
and 80th birthday of its founder S.S. Zilitinkevich**



**NATURE, THEORY AND MODELLING
OF THE
ATMOSPHERE – HYDROSPHERE – LAND-SURFACE SYSTEM**

PROGRAMME

12–14 April 2016



FINNISH METEOROLOGICAL INSTITUTE



ACADEMY OF FINLAND



UNIVERSITY OF HELSINKI

Co-funded by the
Erasmus+ Programme
of the European Union



Pan-Eurasian Experiment

PEEX



norden

NordForsk

Saint-Petersburg

Conference organisers

- Saint-Petersburg Scientific Centre of the Russian Academy of Sciences
- P.P. Shirshov Institute of Oceanology of the Russian Academy of Sciences
- Russian Foundation for Basic Research
- Saint-Petersburg Branch of the P.P. Shirshov Institute of Oceanology of the Russian Academy of Sciences
- Joint Research Council for Geosciences (Russia)
- Research Council on Fundamental and Applied Hydrophysics (Russia)
- Finnish Meteorological Institute
- University of Helsinki
- International (EU-Russia-China) Programme “Pan-Eurasian Experiment” (PEEX)
- Nordforsk Nordic Center of Excellence CRAICC (26060) “Cryosphere-atmosphere interactions in a changing Arctic climate”
- Joint *Academy of Finland – Russian Foundation for Basic Research* project clusters ABBA (280700) “Atmosphere-hydrosphere interaction in the Baltic Basin and Arctic seas” and CarLAC (281196) “Carbon Cycle in Lake-Atmosphere Continuum: Observations and modelling”
- EU Commission Erasmus+ project 561975 ECOIMPACT «Adaptive learning environment for competence in economic and societal impacts of local weather, air quality and climate»

Conference main topics

- Atmosphere – hydrosphere – land-surface interaction
- Processes in planetary boundary layers of the Earth’s atmosphere and hydrosphere
- Reconstructions and projections of climate and environment change
- Observations of atmosphere – hydrosphere – land-surface interaction
- Applied aspects of studying the atmosphere – hydrosphere – land-surface system
- Modernisation of environmental education in response to modern demands from climate and environment change

Venue: Saint Petersburg Scientific Center (Russian Academy of Sciences)
5 Universitetskaya Nab., St. Petersburg, Russia

Official conference languages: Russian, English

TUESDAY, 12 APRIL

10:00–11:00 REGISTRATION OF PARTICIPANTS

GREAT HALL

**IO RAS SPB BRANCH IN THE CONTEXT OF THE WORLD OCEAN SCIENCE
(Chairperson A.A. Rodionov)**

- 11:00-11:05** Welcome address from Saint-Petersburg Administration and Saint-Petersburg Scientific Centre of the RAS
- 11:05-11:35** **A.A. Rodionov, O.V. Kopelevich (Russia)** Saint-Petersburg Branch of the P.P. Shirshov Institute of Oceanology of the RAS: 50 years of history and development
- 11:35-12:00** **S. Zilitinkevich (Finland / Russia)** Cognitive chaos: turbulence and boundary layers in the atmosphere and hydrosphere
- 12:00-12:25** **M. Kulmala (Finland)** Climate relevant feedback loops and interactions
- 12:25-12:50** **G.G. Matishov (Russia)** Large Northern and Southern marine ecosystems in conditions of ongoing climate change
- 12:50-13:15** **A.V. Belotserkovsky (Russia), S.N. Stepanenko (Ukraine)** Modernisation of environmental education in response to *grand challenges*

13:15–13:40 – COFEE BREAK; CONFERENCE PHOTO

**ATMOSPHERE – HYDROSPHERE – LAND-SURFACE INTERACTION / Pan-Eurasian Experiment (PEEX), Nordic Center of Excellence CRAICC
(Chairperson T. Petaja)**

- 13:40-14:00** **R. Bornstein (USA)** Urban impacts on summer convective thunderstorms: results from field studies and modeling several mega cities
- 14:00-14:20** **G.S. Golitsyn, O.G. Chkhetiani (Russia)** Horizontal diffusion of admixture at the sea surface in the presence of wind waves
- 14:20-14:40** **A.Z. Shvidenko (Austria)** System approach to assessing the influence of Russian terrestrial ecosystems on global bio-geo-chemical cycles
- 14:40-15:00** **A.A. Baklanov (WMO)** Seamless coupled meteorology-chemistry modeling in the Earth System

15:00 – 16:30 CONGRATULATION SPEECHES

16:30 – 17:00 CONCERT OF MARIINSKY THEATRE ARTISTS

17:00–19:00 RECEPTION

WEDNESDAY, 13 APRIL

GREAT HALL

10:00-10:30 **G. Djolov (South Africa / Bulgaria)** Works of the founder of IO RAS SPb Branch S.S. Zilitinkevich

PROCESSES IN PLANETARY BOUNDARY LAYERS OF THE EARTH'S ATMOSPHERE AND HYDROSPHERE / Finnish-Russian project clusters ABBA and CARLAC (Chairperson A. Karppinen)

10:30-10:45 **Yu.I. Troitskaya (Russia)** Bag-breakup control of sea spray in hurricanes

10:45-11:00 **V. Kudryavtsev, P. Golubkin (Russia), B. Chapron (France / Russia)** Wind-wave generation and coupling for moving extreme events: a simplified analytical model

11:00-11:15 **E.A. Mareev (Russia)** Electromagnetic weather and the global electrical circuit

11:15-11:30 **S.V. Anisimov, S.V. Galichenko, K.V. Afinogenov (Russia)** The electric condition of atmospheric boundary layer: results of ground-based observations and numerical modeling

11:30-11:45 **I. Esau (Norway)** Stably stratified planetary boundary layers in the Earth's climate system

11:45-12:00 **I.A. Repina (Russia)** Interaction of atmosphere with inhomogeneous surface covered by sea ice

12:00–13:00 – LUNCH

13:00-13:30 **R.I. Nigmatulin (Russia)** Wave dynamics in bubbly liquids

SESSION CONTINUES

13:30-13:45 **T. Vesala (Finland)** Lesson from long-term flux observations over lakes

13:45-14:00 **T. Elperin, N. Kleeorin, I. Rogachevskii (Israel)** Self-organization mechanisms in transport of aerosols by stratified atmospheric turbulence

14:00-14:15 **A.A. Grachev, T. Uttal, P.O.G. Persson, E.A. Konopleva-Akish, S.M. Crepinsek, C.J. Cox, C.W. Fairall, G. Lesins (USA), A.P. Makshtas, I.A. Repina (Russia)** Annual cycle and latitudinal variation of the surface fluxes at Arctic terrestrial sites

RECONSTRUCTIONS AND PROJECTIONS OF CLIMATE AND ENVIRONMENT CHANGE (Chairperson V.V. Zhmur)

- 14:15-14:30** **J. Haapala (Finland)** Sea ice dynamics and recent changes of Arctic sea ice
- 14:30-14:45** **G.M. Shved, S.I. Ermolenko, A.E. Kukushkina (Russia)** Generation of Earth's free oscillations by atmospheric motions
- 14:45-15:00** **A. Izquierdo Gonzalez (Spain)** The Strait of Gibraltar: a paradigm of Oceanography and a challenge for modelling

15:00–15:15 – COFFEE BREAK

- 15:15-15:30** **R.E. Vankevich, V.A. Ryabchenko, E.V. Sofina (Russia)**
Oceanographic operational systems in the Baltic Sea: state-of-the-art and prospects
- 15:30-15:45** **O.D. Shishkina (Russia)** Mechanism of transformation of internal waves at the “shallow” and “deep” shelf
- 15:45-16:00** **N.E. Voltsinger, A.A. Androsov (Russia)** Non-hydrostatic dynamics of channels in the World Ocean
- 16:00-16:15** **B.A. Kagan, E.V. Sofina (Russia)** Tide-induced changes of a regional marine system climate: two methods of taking them into account as applied to the Barents Sea in summer
- 16:15-16:30** **N.A. Dianskiy, V.V. Fomin, E.V. Borisov (Russia)** Modeling of circulation in the Western Arctic Seas and estimating water exchange through the Kara Strait
- 16:30-16:45** **V.A. Ryabchenko, V.A. Gorchakov, A.Yu. Dvornikov, S.S. Pugalova (Russia)** Estimates of the ice cover influence on the primary production of phytoplankton in the Barents Sea (based on 3D modeling)
- 16:45-17:00** **A.S. Safray, I.V. Tkachenko, S.M. Gordeeva (Russia)** On evolution of a solitary internal wave in a channel: numerical experiments

SMALL HALL

- 14:15-17:00** **ECOIMPACT Project Meeting (Chairperson S.S. Zilitinkevich)**
- 19:00** **DINNER** at restaurant *Le Boat* (by invitation cards)

THURSDAY, 14 APRIL

GREAT HALL

**OBSERVATIONS OF ATMOSPHERE-HYDROSPHERE-LAND SURFACE
INTERACTION / Finnish-Russian project clusters ABBA and CARLAC
(Chairperson V.N. Kudryavtsev)**

- 10:00-10:20** **H. Lappalainen (Finland)** Pan-Eurasian Experiment (PEEX) –
Towards system understanding of the Arctic-boreal regions
- 10:20-10:35** **B. Chapron (France / Russia)** Atmosphere – ocean system extremes
using sensor synergy and modelling
- 10:35-10:50** **S.A. Schuka, D. Rak, V.A. Soloviev, A.Yu. Dvornikov, A.
Stashkevich (Russia)** Dynamics of inter-basin water exchange in the
Baltic Sea after the major inflow of December 2014
- 10:50-11:05** **V.S. Platonov (Russia)** Mesoscale modeling of extreme wind speeds
over the Barents Sea
- 11:05-11:20** **N.A. Zaytseva, Yu.A. Kurbatova, I.M. Kurganova (Russia)**
Towards studying meso- and micro-scale interactions between climate
and terrestrial ecosystems in the framework of Pan-Eurasian
Experiment (PEEX)
- 11:20-11:35** **G.L. Stenchikov (USA / Saudi Arabia)** Impact of strong volcanic
eruptions on ocean and climate
- 11:35-11:50** **V. Miles, I. Esau (Norway)** Arctic urban heat islands under
convective and stably stratified atmospheric conditions
- 11:50-12:05** **A.L. Umnov (Russia)** Distributed systems for environmental
monitoring within the concept of the Internet of Things

12:05–13:00 – LUNCH

**APPLIED ASPECTS OF STUDYING THE ATMOSPHERE – HYDROSPHERE –
LAND-SURFACE SYSTEM / Pan-Eurasian Experiment (PEEX)
(Chairperson S.K. Gulev)**

- 13:00-13:15** **D.A. Romanenkov, A.V. Zimin, A.A. Rodionov, O.A.
Atadzhanova, I.E. Kozlov (Russia)** Variability of fronts and features
of mesoscale dynamics in the White Sea
- 13:15-13:30** **E.V. Borisov (Russia)** Comparison and analysis of sea-level
observations and model data in the Kara Sea
- 13:30-13:45** **M.Yu. Belevich (Russia)** Relationship between the continuity and
density diffusion equations

- 13:45-14:00** **V.I. Bogdanov, T.I. Malova (Russia)** The problems of the modern concept of isostasy and large-scale effects of fractured Earth's crust of continents and oceans
- 14:00-14:15** **A.Ya. Golmshtok (Russia)** Multi-channel seismic profiling, gas hydrates and modeling of mud volcanoes formation in Lake Baikal
- 14:15-14:30** **K. Yu. Bulgakov (Russia)** The surface effects of the atmosphere - ocean - waves coupled model
- 14:30-14:45** **A.S. Guzeev (Russia)** Physical modeling of air flow patterns generated by engineering structures near the Earth's surface

SMALL HALL

- 13:00-15:00** **ECOIMPACT Project Meeting (Chairperson S.N. Stepanenko)**

15:00–15:15 – COFEE BREAK

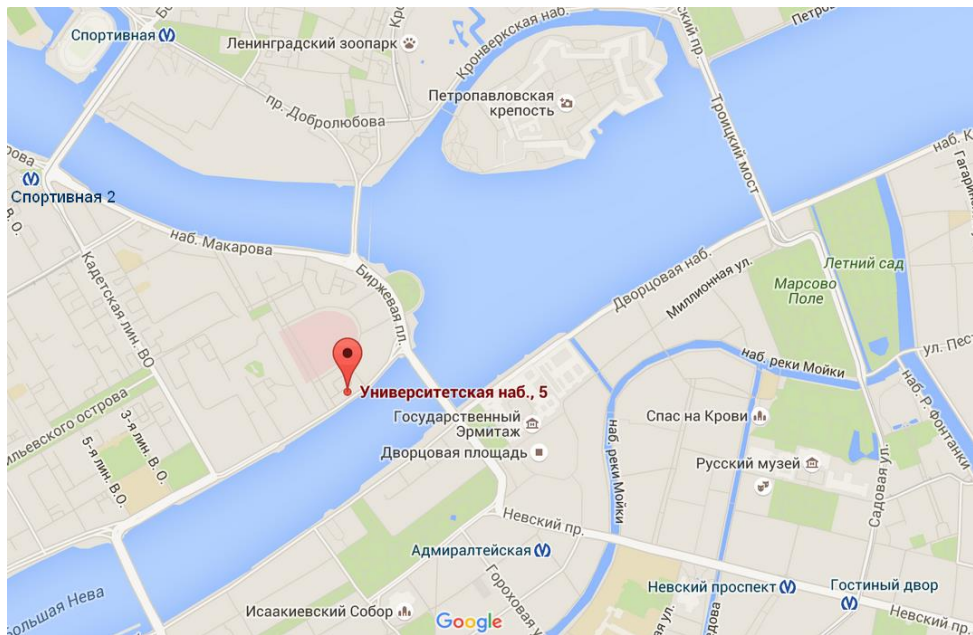
SMALL HALL

- 15:15–16:15** **DISCUSSION OF THE CONFERENCE RESULTS**

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Public transportation to the conference venue (5 Universitetskaya Nab., St. Petersburg)

- from metro "Sportivnaya-2" – bus 24, 47
- from metro "Admiralteiskaya", "Gostinyiy Dvor" and "Nevskiy Prospect" – bus 24, 7, trolley 1, 10, 11