

## Aleksey Shestov

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Born: 16 June 1985, Ryazan, Russia  
Degree: Ph.D. in Marine Civil Engineering, 2013  
Present Position: Post Doc, A Centre for Research-based Innovation Sustainable Arctic Marine and Coastal Technology (SAMCoT); Department of Arctic Technology, The University Centre in Svalbard (UNIS)  
Civil Status: married, 3 year old son



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### Education

- 2008-2013 Ph.D. in Marine Civil Engineering, Department of Civil and Transport Engineering, Norwegian University of Science and Technology (NTNU); Department of Arctic Technology, The University Centre in Svalbard (UNIS)  
Thesis: *The Role of the Thermodynamic Consolidation of Ice Ridge Keels in the Seabed Gouging Process*  
Supervisors: Dr. Aleksey Marchenko, Dr. Knut Høyland, Dr. Sveinung Løset
- 2006-2008 Master in Applied Mathematics and Physics, Department of Aerophysics and Space Research, Moscow Institute of Physics and Technology (MIPT)  
Thesis: *Physical and mechanical properties of fast ice depending on under ice currents properties*  
Supervisor: Dr. Aleksey Marchenko
- 2002-2006 Bachelor in Applied Mathematics and Physics, Department of Aerophysics and Space Research Moscow Institute of Physics and Technology (MIPT)  
Thesis: *The problems of the models of forest fire development being used in the systems of satellite monitoring*  
Supervisor: Dr. Aleksey Romanov

## Research Experience

2013-present Post Doc, SAMCoT Centre, UNIS

- thermodynamic modelling of drifting ice ridge predicting spatial and temporal variations of ice ridge mass, macro-porosity and temperature on the way of its drift to Bear Island from Edgoya region
- collecting and analyzing data on ice and wave action on floating harbor in Longyearbyen, Svalbard
- collecting and analyzing data on hydrodynamics of ice-covered fiords in Svalbard

2008-2013 Ph.D. candidate, NTNU, UNIS

- An additional consolidation mechanism of ice ridge keels compared to typical atmospheric cooling is proposed and investigated. A model of ice ridge keel consolidation in water with varying freezing point is developed. The analytical solutions, experiments and numerical simulations that describe the process are developed.
- Two expeditions to the Fram Strait in 2010 and 2011 were performed. The morphology structure of old ice ridges and their physical properties were investigated. The summer transformation process of ice ridges and their keels in particular were of especial interest.

2006-2008 Master Diploma Project, MIPT, UNIS

- Measuring parameters of water currents beneath the ice in a very shallow area of the Van Mijen Fjord on Spitsbergen during the spring of 2008 and calculating the turbulent drag force, the drag coefficients and the turbulent heat fluxes toward the ice bottom.
- Thermodynamic model of level ice growth

2006-2013 Researcher, State Oceanographic Institute (SOI), Moscow, Russia

- Developing mathematical model of seabed gouging by keels of ice ridges and implementing it to GIS
- Taking part in expeditions to Yamal region, Kara Sea to perform sonar surveys of seabed in Baydaratskaya Bay, collect meteorological data, hydrological data and samples for environmental surveys in Baydaratskaya Bay and Kharasavey.

2005-2006 Bachelor Diploma Project, MIPT

- Investigation of existing models of forest fire development.
- Surveying the possibility of creation of a forest fire edge propagation prediction block within the monitoring system of critical facilities.

**Field Work Experience**

2006, 2008 Arctic Survival and Safety Course, UNIS. Knowledge of potential risk scenarios and skills in planning and accomplishing fieldwork and private trips under arctic conditions

*Equipping and Carrying the following Expeditions:*

2013 Annual R/V Lance expedition to the Barents Sea. Properties of drifting ice. UNIS  
 2012 Oden Arctic Technology Research Cruise. Field work on the drifting ice in the Greenland Sea by research icebreaker Oden. SAMCoT, NTNU, Statoil, UNIS  
 2010-2011 Regular annual R/V Lance expeditions to Fram Strait, the Greenland Sea. Morphology and physical properties of old sea ice ridges. Norwegian Polar Institute (NPI), UNIS  
 2009 Yamal Peninsula shore line of Baydaratskaya Bay, the Kara Sea. Meteorology, coastal erosion, hydrology. SOI  
 2008 Kharasavey, Yamal Peninsula. Hydrology, Meteorology, Ecology. SOI  
 2008-2011 Annual R/V Lance expedition to the Barents Sea. Properties of drifting ice. UNIS  
 2008-2014 Regular expeditions in Svalbard fjords to study properties of sea currents, waves and land fast ice. UNIS, SAMCoT, SMIDA projects  
 2007 Ural shore of Baydaratskaya Bay, Kara Sea. Hydrology, Meteorology. SOI  
 2007 R/V Ivan Petrov expedition to Baydaratskaya Bay, the Kara Sea. Hydro sonar surveying of the seabed, oceanographic measurements. SOI

**Technical Skills**

## Instrumentation:

ADV, SBE, ADCP, Thermistor Strings, CR1000 Campbell Data logger, uniaxial compression machine, ice drilling equipment, cold labs

**Research Interests**

Physics and mechanics of ice      Thermodynamic consolidation of ice ridge keels  
 Ice and wave loads on floating structures  
    Morphology and physical properties of ice ridges  
 Seabed gouging by ice formations      Hydrodynamics of ice-covered waters

**Administrative Experience**

2014-present Work Package Deputy Leader, WP1, SAMCoT  
 2011-present Treasurer and Chairman (from 2014), Longyearbyen Diving Club

**Languages**                      English, Russian

## Selected Publications

- Shestov, A.S. and A.V. Marchenko 2014. Thermodynamic consolidation of ice ridge keels in water with varying freezing point. *Submitted to Cold Regions Science and Technology*.
- Shestov, A.S. and A.V. Marchenko 2014. Thermodynamic consolidation of ice ridge keels in water with varying freezing point. Laboratory experiment and computer simulation. *Submitted to Cold Regions Science and Technology*.
- Shestov, A.S. and Marchenko, A.V., 2014. Properties of Ice Ridge Keels and Sea Currents in their Vicinity in the Barents Sea, *Proceedings of 22st IAHR International Symposium on ICE 2014 (IAHR-ICE 2014)*, Singapore.
- Shestov, A. and Marchenko, A., 2013. Thermodynamic Consolidation of Ice Rubble in Water at Varying Freezing Point. Experiment. In: A. Polojärvi and J. Tuhkuri (Editors), *The 22nd International Conference on Port and Ocean Engineering under Arctic Conditions*, Espoo, Finland.
- Ogorodov, S.A., Shestov, A.S., Arkhipov, V.V., Baranskaya, A.V., Vergun, A.P., Kokin, O.V., Marchenko, A.V. and Tsvetsinsky, A.S., 2013. Modern Ice-Scouring relief at the shelf of western part of the Yamal Peninsula: Field Investigations and Modelling. *Vestnik NSU. Series: mathematics, mechanics, computer science*, 13(3): 78-90.
- Shestov, A.S., K.V. Hoyland and O.-C. Ekeberg 2012. Morphology and Physical Properties of Old Sea Ice in the Fram Strait 2006-2011. In Li and Lu, eds. *Proceedings of 21st IAHR International Symposium on Ice "Ice Research for a Sustainable Environment"*, Dalian, China, Dalian University of Technology Press, 493-504.
- Shestov, A.S. 2011. Morphology and Physical Properties of Old Sea Ice in the Fram Strait. *Proceedings of 21th International Conference on Port and Ocean under Arctic Conditions (POAC)* Montreal, Canada.
- Shestov, A.S., Marchenko, A.V., and Ogorodov, S.A., 2011. Mathematical simulation of ice-induced effects on the bed of Baydaratskaya bay in the Kara Sea. *Transactions of the Krylov Shipbuilding Research Institute (KSRI)*, 63(347), 5, pp. 105–118, ISSN 0869-8422.
- Morozov, E.G., Muzylev, S.V., Shestov, A.S. and Marchenko, A.V., 2011. Short-Period Internal Waves under an Ice Cover in Van Mijen Fjord, Svalbard. *Advances in Meteorology*, Volume 2011, Article ID 573269, p6, doi:10.1155/2011/573269.
- Marchenko, A.V., Langen, I. and Shestov, A., 2009. Hydrological Characteristics of a Narrow and Shallow Part of Van Mijen Fjord on Spitsbergen. *Proceedings of the Nineteenth International Offshore and Polar Engineering Conference (ISOPE)*. Osaka, Japan, ISBN 978-1-880653-53-1 (Set); ISSN 1098-618.
- Shestov, A.S. and Marchenko, A.V., 2009. Thermodynamic Evolution of Ice Ridges under Weather Conditions in Baydaratskaya Bay. *Proceedings of the 20th International Conference on Port and Ocean Engineering (POAC)*. Luleå, Sweden, paper # 79, p11.