

Preface

IV Vinogradov Conference “Hydrology: from learning to worldview” in memory of outstanding Russian hydrologist Yu. B. Vinogradov is held in Saint-Petersburg University (Russia). It has become a regular scientific platform for a free discussion on current problems in hydrology and the search for ways to overcome them, the synthesis of modern approaches in the study of hydrological processes and their application to solve fundamental and practical problems. A special aspect of the Conference is the equal participation of young scientists: any scientific idea or result is considered and discussed from the standpoint of scientific significance and not the authority of the presenting scientist.

Yu.B. Vinogradov (1932-2012) is one of the leading scientists of Russia in the field of hydrology. He is the author of numerous scientific studies, including several fundamental monographs on the mathematical modeling of hydrological processes, and catastrophic hydrological phenomena (flash floods and mudflows). Prof. Vinogradov developed a number of new modeling systems that describe the processes of river runoff formation, the formation and movement of mudflows, breakthroughs of moraine lakes, and erosion and pollution processes on the catchment. The Conference in memory of Prof. Vinogradov is held for the fourth time (following 2013, 2015, 2018).

The 2020 conference program consists of six scientific sessions:

- Mathematical modeling in hydrology: problems, achievements, practical applications
- Hazardous hydrological phenomena: predictability and assessment
- Geocological research and protection of water bodies: what are the limits – imperfection of water legislation or lack of knowledge of processes?
- Hydrological studies of the Arctic, Antarctic and Mars: exotic or fundamental problems? (in honor of the 200th anniversary of the discovery of Antarctica)
- Regional water issues: anthropogenic impact and / or climate change?
- Methodology of science and current tasks of hydrological research

The cross-cutting theme of the Conference is the development of methods of mathematical modeling in hydrology, as one of the most promising areas in the field of Earth sciences. The topic of mathematical modeling is addressed at the school-seminar for young scientists and at one of the most popular sections of the Conference. Issues related to studying the impact of climate change and anthropogenic impact on the hydrological regime of water bodies, development of scientific approaches to water management and providing water resources for the population and economy, development of modern methods for forecasting dangerous hydrological phenomena are considered. Hydrological processes in remote regions, such as the Arctic and Antarctic, as well as modern issues of hydroecological research, the issues of interaction between the natural and social sciences, global forecasting and management of the development of water-intensive sectors of the economy, including the study of water-ecological processes to solve the problems of rationing and forecasting the dynamics of aquatic ecosystems are discussed.

In 2020 the Vinogradov Conference is held under the auspices of the International Association of Hydrological Sciences (IAHS), with the support of the Russian Foundation for Basic Research (project 20-05-20031), sponsorship of Gidrotehproekt Ltd (St. Petersburg, Russia) and NIC Geodynamics (Yuzhno-Sakhalinsk, Russia), as well as the participation of the State Hydrological Institute (St. Petersburg, Russia). The conference is organized by the Hydrograph model Research Group and the Department of Land Hydrology of St. Petersburg State University.

Dr. Olga Makarieva

Chair of Organizing Committee, Editor of the Conference Proceedings

St. Petersburg State University

Melnikov Permafrost Institute

Hydrograph model Research Group