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Editorial

Preface: Viktor V. Sobolev and his scientific legacy



The study of radiation processes in celestial objects is a fundamental problem in astrophysics. A powerful tool for the solution of this problem is provided by the theory of radiative transfer. One of the founding fathers of modern radiative transfer theory was the prominent full member of the Russian (formerly Soviet) Academy of Sciences Viktor Viktorovich Sobolev (Fig. 1).

Academician Sobolev was born on 2 September 1915. All his professional life was associated with the Saint Petersburg (formerly Leningrad) State University. From 1948 to 1988 he was the head of the Chair of Astrophysics. He passed away on 7 January 1999 at the age of 83.

For many years Viktor Sobolev was the leader of the renowned Leningrad/St. Petersburg school of theoretical astrophysics founded by Academician Viktor Amal'sonovich Ambartsumian (Fig. 2). He made seminal contributions to many fields of astrophysics. His best-known result is the famous so-called Sobolev approximation describing line formation in moving media such as envelopes of stars [1]. His classical monographs on radiative transfer in stellar and planetary atmospheres [2,3] have been quite influential and are still widely cited. Many Sobolev's results have become standard textbook material. Sobolev's *Course in Theoretical Astrophysics* (first published in 1967 and updated in 1975 and 1985) [4] has for many years been the main graduate textbook on theoretical astrophysics for students in the former USSR, Russia, and other countries.

1. Memorial Sobolev conference

The 100th birthday anniversary of Academician Sobolev was celebrated by the astrophysics community on 2 September 2015. In his honor, the Saint Petersburg State University organized the international conference on "Radiation Mechanisms of Astrophysical Objects: Classics Today" which was held from 21–25 September 2015 (Fig. 3). The conference highlighted recent advances in the research fields to which V. V. Sobolev had contributed so prominently. It included plenary sessions featuring review

talks by internationally recognized experts as well as a memorial session. Original scientific results were presented during parallel sessions on:

- radiative transfer theory
- interstellar matter
- stellar atmospheres, circumstellar matter, and planetary atmospheres
- high-energy astrophysics and cosmology.

The program and the abstracts of conference presentations are available at the conference web site <http://www.astro.spbu.ru/Sobolev100>.

With Elsevier's encouragement, we solicited full-size papers for a topical issue of the *Journal of Quantitative Spectroscopy and Radiative Transfer (JQSRT)* intended to pay



Fig. 1. Academician V. V. Sobolev.

tribute to Academician Sobolev and commemorate his scientific contributions. As always, every invited review and regular paper included in this topical issue has undergone the same rigorous peer-review process as any other manuscript published in the *JQSRT*.



Fig. 2. Academicians V. A. Ambartsumian and V. V. Sobolev.

2. Scientific organizing committee of the Sobolev conference

Yuri Yu. Balega (Special Astrophysical Observatory, Russia)

Anatoly M. Cherepashchuk (Moscow State University, Russia)

Nikolai N. Chugai (Institute of Astronomy, Russia)

Rustam D. Dagkesamanskii (Pushchino Radio Astronomy Observatory, Russia)

Stanislav I. Grachev (Saint Petersburg State University, Russia)

Vladimir P. Grinin, *Co-Chair* (Pulkovo Observatory, Russia)

Alexander F. Kholtygin, *Secretary* (Saint Petersburg State University, Russia)

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Arthur G. Nikoghossian (Byurakan Astrophysical Observatory, Armenia)

Juri Poutanen (Tuorla Observatory, Finland)

Nail A. Sakhbullin (Kazan Federal University, Russia)

Boris M. Shustov (Institute of Astronomy, Russia)



Fig. 3. Participants of the memorial Sobolev conference.

Rashid A. Sunyaev (Space Research Institute, Russia);
 Max Planck Institute for Astrophysics, Germany)
 Lev Titarchuk (Universita Ferrara, Italy)
 Tõnu Viik (Tartu Observatory, Estonia)

and the Russian Foundation for Basic Research. MIM acknowledges financial support from the NASA/Goddard Space Flight Center Community Service Fund managed by David Leisawitz.

3. Local organizing committee of the Sobolev conference

Andrej V. Dementyev (Saint Petersburg State University, Russia)
 Nazar R. Ikhsanov (Saint Petersburg State University, Russia)
 Vladimir B. Il'in, *Co-Chair* (Saint Petersburg State University, Russia)
 Alexander F. Kholtygin, *Co-Chair* (Saint Petersburg State University, Russia)
 Maria V. Kostina, *Secretary* (Saint Petersburg State University, Russia)
 Yulia V. Milanova (Saint Petersburg State University, Russia)
 Ilya S. Potravnov (Pulkovo Observatory, Russia)
 Marina S. Prokopjeva (Saint Petersburg State University, Russia)
 Vladimir M. Serbin (Balta Ltd, Russia)
 Stanislav I. Shirokov (Saint Petersburg State University, Russia)
 Natalia Y. Sotnikova (Saint Petersburg State University, Russia)
 Olga A. Tsiopa (Pulkovo Observatory, Russia)

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Special Issue Editors
 Alexander F. Kholtygin
*Chair of Astronomy, Saint Petersburg State University, 28
 Universiteski Prospect, Saint-Petersburg, 198504, Russia*
E-mail address: afkholtygin@gmail.com

Michael I. Mishchenko
*NASA Goddard Institute for Space Studies, 2880 Broadway,
 New York, NY 10025, USA*
E-mail address: michael.i.mishchenko@nasa.gov

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