Curriculum Vita — Nikolay A. Zabotin

Education:

D. Sc. ("Habilitation") in physics and mathematics from the Russian Academy of Sciences, Moscow, Russia, 1995;
Ph. D. in physics and mathematics from Rostov State University, Rostov-on-Don, Russia, 1983;
M. S. *summa cum laude* in physics from Rostov State University, Rostov-on-Don, Russia, 1978.

Research Experience:

2009 to date: Research Professor, Department of Electrical, Computer and Energy Engineering, University of Colorado Boulder.
2002 to date: Research Scientist III, CIRES, University of Colorado Boulder.
2008 to 2009: Research Associate, Department of Electrical and Computer Engineering, University of Colorado Boulder.
2005 to 2010: Partner and Chief Researcher at Dynasonde Solutions Ltd. (Longmont, CO).
1996-2002: Head of Space Research Division, Institute of Physics of Southern Federal University (formerly Rostov State University, Rostov-on-Don, Russia).
1996-2006: Full Professor, Department of Physics of Rostov State University.
1978-1995: Various research positions at the Rostov State University.

Teaching Experience:

1996-2002: Development and reading of two major courses (*Classical Electrodynamics* and *Hydrodynamics and Plasma Physics*), Rostov State University, Rostov-on-Don, Russia. Supervision of 4 Ph. D. and 6 M. S. theses.
1996-2002: Member of the Ph. D. Committee at Rostov State University.
2009 to date: Member of the Ph. D. Committee, ECEE, University of Colorado Boulder.

Other Professional Activities

Proposal reviewer for the National Science Foundation, Aeronomy Division.
Manuscript reviewer for Radio Science, JASTP, GRL, and other journals.

Membership in Professional Societies:

URSI Commission G (since 2003); American Geophysical Union (since 2002); IEEE (since 2015).

Major Accomplishments:

Comprehensive software suite for the next generation of advanced fully-digital ionospheric sounders (Dynasonde 21). Development of an original method of 3-D plasma density inversion from the Dynasonde data (NeXtYZ, "next wise"). Methods for plasma irregularity diagnostics: based on measuring phase structure function of the radio echoes; using the anomalous attenuation of a vertical sounding signal; from backscattered Z-mode signal intensity data when sounding from a satellite. Theoretical solutions of several fundamental problems in scattering theory: On the optical depth of the ionospheric plasma layer in the HF band; on radio wave anomalous attenuation; on anomalous refraction. Successful experiment confirming predictions of the multiple scattering theory about spatial distribution of a signal reflected from the ionosphere. Application of "acoustic daylight" to measure sound-speed profiles with accuracy suitable for oceanographic applications. Application of the methods of wave interferometry to studies of infragravity waves in deep ocean using data from MOANA experiment. A connection between infragravity waves in the ocean and acoustic gravity waves in the thermosphere has been established theoretically and confirmed experimentally using data from DARTs and Dynasondes. Theoretical justification of the cosmic dust mechanism of sprite initiation and structuring. Original results on statistics of angular variations of relic microwave background in relativistic cosmology.