

Research Projects in Acoustics and Related Fields of Physics— Recipients of Grants from the Russian Foundation for Basic Research

The list of research projects that received grants from the Russian Foundation for Basic Research as a result of the competitions run in the last few years is presented below. The list includes only the projects concerned with acoustics. Evidently, the choice below cannot be absolutely exact, because some projects that could be of interest to specialists in acoustics were submitted by the authors to other sections of the physics department (e.g., to the sections of plasma physics, condensed state, or theoretical physics) and even to other departments (mathematics, mechanics, and information science; Earth science; etc.). It was especially difficult to select projects from those submitted by authors to departments other than physics. Possibly, if the list were made by other compilers, some of its items would be different. Therefore, the list presented below is organized as follows: it includes projects that were submitted to the physics department and supported in the last three years, i.e., projects that received financial support starting from 2000, 2001, and 2002; it also includes projects concerned with acoustics and submitted to other departments of natural sciences but only those supported in 2002. To obtain more information, one should refer to the *Information Bulletin of the Russian Foundation for Basic Research* No. 10 (Nauchnyi Mir, Moscow, 2002) or to other similar publications of the past few years.

The title of each project is preceded by the name of the principle researcher; the name of the corresponding institute is indicated after the title. Hopefully, the information on the areas of basic research in acoustics and related sciences and the research groups and organizations that received support from the Foundation after being approved by independent experts will be of interest to many acousticians.

PHYSICS, 2000

1. G. M. Shalashov, *Acoustic Studies of Nonlinear Local Elastic Parameters of Real Media*, Radiophysical Research Institute, Nizhni Novgorod.
2. V. I. Turchin, *Emission, Reception, and Processing of Broadband Electromagnetic and Acoustic Signals in Conditions of Propagation through Complex Media*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.
3. A. I. Potapov, *Nonlinear Acoustic Waves in Media with Complex Structure: Theoretical and Experimental*

Studies, Institute of Mechanical Engineering, Nizhni Novgorod Branch.

4. A. M. Reĭman, *Optical–Acoustic Tomography of Biological Tissues through Centimeter Depths*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

5. V. A. Bulanov, *Acoustic Characteristics of Microstructured Liquids and Solutions and Their Measurement at the Transition to Nanostructures in the Presence of Phase Transformations*, Institute of Marine Technology Problems, Far East Division of the Russian Academy of Sciences, Vladivostok.

6. O. V. Abramov, *Effect of the Properties and Motion Features of a Liquid on the Development of an Ultrasonic Cavitation in the Frequency Band within 200–400 kHz in Different Vibration Excitation Conditions*, Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Moscow.

7. V. I. Erofeev, *Nonlinear Acoustic Waves in Solids with Dislocations*, Institute of Mechanical Engineering, Nizhni Novgorod Branch.

8. A. P. Lavrov, *Acoustooptic Spectropolarimeter with a High Temporal Resolution for Studying Pulsar Radio Emission*, St. Petersburg State University of Telecommunications.

9. A. L. Virovlyanskiĭ, *Study of Wave Chaos in Range-Dependent Waveguides*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

10. A. M. Dykhne, *Acoustics of Supercritical Media*, Advanced Laser Technology Department of the Institute of Laser and Information Technology Problems, Troitsk, Moscow oblast.

11. O. P. Galkin, *Sound Fields in Regular and Irregular Waveguides*, Acoustics Institute, Moscow.

12. O. A. Kapustina, *Study of the Mechanism Governing the Formation of Two-Dimensional Domains in Cholesteric Liquid Crystals under the Effect of Ultrasound*, Acoustics Institute, Moscow.

13. L. R. Gavrilov, *Physical Foundations of the Dynamic Focusing of Intense Ultrasound in Inhomogeneous Viscoelastic Media*, Acoustics Institute, Moscow.

14. A. G. Semenov, *Sound Propagation in the Vicinity of Moving Bodies and Moving Inhomogeneities of a Medium*, Acoustics Institute, Moscow.

15. V. S. Teslenko, *Mechanisms of Glow in a Liquid Medium in the Cavitation Conditions and the Role of the Bubble Collapse Dynamics in the Activation of Physical-Chemical Processes*, Hydrodynamics Institute, Siberian Division of the Russian Academy of Sciences, Novosibirsk.

16. V. K. Kedrinskii, *Experimental and Theoretical Modeling of the Process of Sound Generation by Bubble Systems with Phase Transitions and Chemical Reactions*, Hydrodynamics Institute, Siberian Division of the Russian Academy of Sciences, Novosibirsk.

PHYSICS, 2001

1. S. A. Makhortykh, *Inverse Problem of the Acoustic Tomography of Ground and the Problem of Environmental Predictions near the Sources of Intense Sound and Vibration*, Institute of Mathematical Problems in Biology, Russian Academy of Sciences, Pushchino, Moscow oblast.

2. V. I. Al'shits, *A Series of Works on the Theory of Elastic Waves in Anisotropic and Inhomogeneous Media*, Institute of Crystallography, Russian Academy of Sciences, Moscow.

3. B. D. Zaitsev, *Theoretical and Experimental Studies of Surface Acoustic Waves in Piezoelectric Structures with Conducting Layers*, Saratov Branch of the Institute of Radio Engineering and Electronics, Russian Academy of Sciences.

4. V. A. Burov, *Investigation of Theoretical and Experimental Methods of Solving Inverse Scattering Problems in Acoustics and Their Application to Medical Diagnostics and Ocean Tomography*, Faculty of Physics, Moscow State University.

5. A. V. Golenishchev-Kutuzov, *Propagation, Generation, and Transformation of Acoustic Waves in Transition Metal Oxides Containing Periodic Structures*, Kazan State Power University.

6. Yu. N. Cherkashin, *Study of Acoustic Gravity Waves in Ionosphere at the Maximal Applicable Frequency with the Use of a Multichannel Automated Receiving System*, Institute of Terrestrial Magnetism and Radio Wave Propagation, Russian Academy of Sciences, Troitsk, Moscow oblast.

7. V. G. Andreev, *Optical-Acoustic Tomography of Light Absorbing Inhomogeneities in Scattering Media*, Faculty of Physics, Moscow State University.

8. V. L. Preobrazhenskii, *Self-Focusing of Finite-Amplitude Sound Beams in the Parametric Wave Conjugation*, Wave Research Center of the General Physics Institute, Russian Academy of Sciences, Moscow.

9. N. V. Studenichnik, *Studies of the Sound Field Structures in Layered and Inhomogeneous Underwater Waveguides in the Audio and Infrasonic Frequency Bands*, Acoustics Institute, Moscow.

10. Yu. N. Makov, *A Complex Study of the Ultrasonic and Acoustomechanical Effects on the Functional Activity of the Heart and Its Tissues: Physical Princi-*

ples and Medical-Biological Applications, Faculty of Physics, Moscow State University.

11. N. A. Mityakov, *Study of Convective, Turbulent, and Wave Processes in Troposphere and Stratosphere by a Unique System of Decameter Radioacoustic Sounding*, Radiophysical Research Institute, Nizhni Novgorod.

12. I. N. Didenkulov, *Study and Development of Methods of Nonlinear Acoustic Imaging*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

13. N. I. Pushkina, *Study of the Main Laws of Nonlinear Acoustic Wave Propagation in Multiphase Media*, Computational Research Center of Moscow State University.

14. A. V. Osetrov, *Theory of the Acoustic Tomography of Two-Dimensional Inhomogeneities*, St. Petersburg State University of Electrical Engineering.

15. V. A. Vdovin, *Study of the Interaction of Intense Microwave Pulses with Solids by Thermal Acoustic Diagnostics*, Institute of Radio Engineering, Russian Academy of Sciences, Moscow.

16. V. V. Mityugov, *Study of the Physical Characteristics of Spatial and Temporal Acoustic Holography in Underwater Channels*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

17. V. V. Chernov, *Study of the Acoustic and Physical Properties of Ice at the Phase Transition*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

18. P. L. Soustov, *Study of the Laboratory and Atmospheric Turbulence by Means of Remote Acoustic Diagnostics*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

19. Yu. V. Ilisavskii, *Acoustic and Acoustoelectronic Phenomena in Rare Earth Manganite Films*, Physical-Technical Institute, St. Petersburg.

20. A. D. Mansfel'd, *Theoretical and Experimental Study of Acoustic Infrared Imaging of the Internal Temperature of Biological Objects by Focused Antennas*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

21. N. V. Pronchatov-Rubtsov, *Study of the Nonlinear Dynamics of Gas Bubbles and the Resonance Interaction of Intense Acoustic Waves*, Nizhni Novgorod State University.

22. A. V. Klyuchnik, *Phonon Laser, Generation of Coherent Phonons, and Near-Field Acoustic Microscopy*, Institute of Laser Technology and Materials Science of the General Physics Institute, Russian Academy of Sciences, Moscow.

PHYSICS, 2002

1. A. L. Sobisevich, *Nonlinear Resonant Structures: Quality Factor, Spectral Characteristics, and Acoustic Diagnostics*, Joint Institute of Earth Physics, Russian Academy of Sciences, Moscow.

2. A. I. Korobov, *Experimental Studies of the Characteristic Features of Acoustic Wave Propagation in Metals in the Region of Elastoplastic Deformations*, Faculty of Physics, Moscow State University.

3. V. Yu. Zaitsev, *Study of the Structure-Induced Acoustic Nonlinearity of Solids*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

4. I. Yu. Solodov and B. A. Korshak, *Parametric Instability, Chaotization, and "Memory" in the Nonlinear Interaction of Acoustic Waves with Defects in Solids*, Faculty of Physics, Moscow State University.

5. I. B. Esipov, *Nonlinear Acoustic Processes in a Non-Newtonian Fluid*, Acoustics Institute, Moscow.

6. V. G. Petnikov, *Sound Wave Propagation in a Randomly Inhomogeneous Channel and Acoustic Monitoring by Low-Intensity Signals*, Wave Research Center of the General Physics Institute, Russian Academy of Sciences, Moscow.

7. L. M. Lyamshev, *Fractals and Wavelets in Acoustics*, Institute of Radio Engineering and Electronics, Russian Academy of Sciences, Moscow.

8. F. V. Bunkin, *Ultrasonic Fields in Inhomogeneous and Nonlinear Media at a Parametric Wave Conjugation*, Wave Research Center of the General Physics Institute, Russian Academy of Sciences, Moscow.

9. O. A. Sapozhnikov, *Dynamics of Cavitation Fields and the Mechanisms of Cavitation Damage Due to the Propagation of Intense Ultrasound and Weak Shock Waves*, Faculty of Physics, Moscow State University.

10. V. A. Zverev, *Study of the Physical Limitations and Limiting Abilities of the Acoustic Methods Used for the Observation of Underwater Inhomogeneities*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

11. V. I. Talanov, *Sounding of Inhomogeneities of the Earth Medium and Remote Seismic Monitoring by Means of Coherent Acoustics*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

12. S. A. Rybak, *Theoretical and Experimental Study of Wave Processes in Inhomogeneous and Multiphase Media*, Acoustics Institute, Moscow.

13. V. B. Bychkov, *Acoustic Diagnostics of Radiation Effects in Physics of High-Energy Particles*, Institute of Theoretical and Experimental Physics, Moscow.

14. N. I. Polzikova, *Acoustoelectronic and Acoustomagnetic Parametric Interactions in Multilayer Resonant Acoustic Structures*, Institute of Radio Engineering and Electronics, Russian Academy of Sciences, Moscow.

15. O. M. Gradov, *New Nonlinear Methods for the Acoustic Analysis of the Physical-Mechanical Properties and Structural Changes of Parameters of a Material with a Fully Developed Defect Structure*, Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Moscow.

16. A. N. Serebryanyĭ, *Acoustic Effects Induced by Internal Solitons in the Sea*, Acoustics Institute, Moscow.

17. A. A. Anosov, *Physical Foundations of Reconstructing the Spatial Distributions of the Temperature and the Absorption Coefficient from the Measured Characteristics of Thermal Acoustic Radiation*, ELDIS Research Center of Electronic Diagnostic Systems, Moscow.

18. S. N. Gurbatov, *Theoretical and Experimental Study of the Evolution of Strongly Nonlinear Wave Fields and Structures and Its Dynamical and Statistical Description*, Nizhni Novgorod State University.

19. V. D. Kiselev, *Experimental Studies of the Mechanisms of Energy Transformation from Laser Radiation to Sound at an Optical Breakdown in Liquid*, Pacific Oceanological Institute, Far East Division of the Russian Academy of Sciences, Vladivostok.

20. V. A. Khokhlova, *Effects of Nonlinear Focusing and Heat on Liquids and Biological Tissues in Super-High-Intensity Acoustic Fields*, Faculty of Physics, Moscow State University.

MATHEMATICS, INFORMATION SCIENCE, AND MECHANICS, 2002

1. V. E. Antsiperov, *Synthesis of Neuron-Like Information Systems for the Tasks of Speech Signal Discrimination on the Basis of a Sequential Selective Identification*, Institute of Radio Engineering and Electronics, Russian Academy of Sciences, Moscow.

2. A. A. Arsen'ev, *Resonant Scattering in Quantum and Acoustic Waveguides*, Faculty of Physics, Moscow State University.

3. V. M. Babich, *Study of the Mathematical Aspects of the Current Problems of the Theory of Wave Phenomena (Direct and Inverse Problems)*, St. Petersburg Branch of the Mathematical Institute.

4. Z. M. Benenson, *Theory and Experimental Study of the New Method of Processing Ultrasonic Signals of Linear Phased Arrays to Provide a Quick Survey of a Three-Dimensional Space with a Superhigh Resolution*, Scientific Council on the Complex Problem of Cybernetics, Russian Academy of Sciences, Moscow.

5. S. A. Gaponov, *Theoretical and Experimental Study of the Acoustic Susceptibility of a Supersonic Boundary Layer on a Rough Surface*, Institute of Theoretical and Applied Mechanics, Siberian Division of the Russian Academy of Sciences, Novosibirsk.

6. A. G. Gorshkov, *Development of Numerical-Analytical Methods for Solving the Problems of Aerohydroelasticity and Aeroacoustics*, Moscow Aviation Institute.

7. I. É. Ivanov, *Numerical Study of Nonstationary Processes in a Hartmann Gas-Dynamic Jet Resonator*, Moscow Aviation Institute.

8. Yu. S. Kolesov, *Method of Quasi-Normal Forms and the Attractors of Nonlinear Wave Equations in Plane Regions*, Yaroslavl State University.

9. V. F. Kop'ev, *Mechanism of Aerodynamic Sound Generation and Its Application for Contactless Diagnostics of Turbulence*, Central Aerohydrodynamics Institute, Moscow.

10. A. G. Kulikovskii, *Study of Large-Scale Phenomena Associated with Wave Propagation in Continuous Media*, Mathematical Institute, Russian Academy of Sciences, Moscow.

11. A. V. Faminskiĭ, *Study of the Solutions to the Boundary-Value Problems for Quasi-Linear Equations Describing the Propagation of Waves and the Motion of Solids in a Fluid*, Russian University of People's Friendship, Moscow.

12. V. Ya. Chuchupal, *Study and Development of the Methods of Adaptation of the Speech Discrimination System to an External Medium*, Computational Center of the Russian Academy of Sciences, Moscow.

CHEMISTRY, 2002

1. A. I. Aleksandrov, *Solid-Phase Mechanochemical Synthesis of Cluster Polymers under the Effect of Elastic Wave Pulses*, Institute of Synthetic Polymer Materials, Russian Academy of Sciences, Moscow.

2. A. G. Istratov, *Theoretical and Experimental Study of the Parameters of Pressure Waves Generated by Self-Accelerated Turbulent Gas Flames*, Institute of Chemical Physics, Russian Academy of Sciences, Moscow.

BIOLOGY AND MEDICAL SCIENCE, 2002

1. L. M. Kotelenko, *Reflection of the Speed of Sound in the Auditory Cortex*, Institute of Physiology, Russian Academy of Sciences, St. Petersburg.

2. D. N. Lapshin, *Frequency Tuning of the Auditory System of Moths (Lepidoptera, Noctuidae)*, Institute of Information Transfer Problems, Russian Academy of Sciences, Moscow.

3. A. Ya. Supin, *Effect of Noise on the Spectral Resolution of Hearing*, Institute of Ecology and Evolution Problems, Russian Academy of Sciences, Moscow.

EARTH SCIENCE, 2002

1. V. V. Bakhanov, *Theoretical and Experimental Study of the Transformation of Nonlinear Surface Waves to a Field of Three-Dimensional Inhomogeneous Streaming*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

2. A. N. Gavrillov, *Acoustic Monitoring of Large-Scale Variations in the Water Temperature and Salinity in the Arctic Ocean*, Oceanology Institute, Russian Academy of Sciences, Moscow.

3. S. A. Ermakov, *Experimental and Theoretical Study of the Nonlinear Dynamics of Small-Scale Wind*

Waves in Slicks in Application to the Development of the Principles of Remote Diagnostics of Organic Films on the Sea Surface, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

4. B. F. Kur'yanov, *Theoretical and Experimental Studies of Digital Acoustic Methods for Controlling Oceanographical Instruments and Communicating with Them in Shallow and Deep Seas*, Oceanology Institute, Russian Academy of Sciences, Moscow.

5. A. G. Luchinin, *Statistical Problems of the Theory of Image Transfer through a Wavy Surface*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

6. A. V. Nikolaev, *Changes in the Fine Structure of Seismic Emission as an Indicator of Slow Deformations of the Earth Crust and the Processes Preceding Earthquakes*, Institute of Earth Physics, Russian Academy of Sciences, Moscow.

7. E. N. Pelinovskiĭ, *Killer Waves: Physical Mechanisms and Modeling*, Institute of Applied Physics, Russian Academy of Sciences, Nizhni Novgorod.

8. V. F. Pisarenko, *New Parametrization Scheme for the Seismic Regime and the Problem of Evaluating Seismic Danger*, International Institute of the Theory of Earthquake Prediction and Mathematical Geophysics, Russian Academy of Sciences, Moscow.

9. M. V. Rodkin, *Modeling of the Seismic Process in the Framework of the Fluidometamorphogenic Model of Earthquake Genesis*, Geophysics Center of the Russian Academy of Sciences, Moscow.

10. A. A. Rozhnoi, *Study of the Characteristic Features of Super-Long-Wave Signal Propagation with a View to Predicting Intense Earthquakes*, Institute of Earth Physics, Russian Academy of Sciences, Moscow.

11. V. B. Smirnov, *Physical Parameters of the Seismic Regime*, Faculty of Physics, Moscow State University.

12. B. K. Tkachenko, *Dynamics of Wave Processes and the Formation of Hydraulic Jumps in the Coastal Zone*, Moscow Institute of Physics and Technology.

13. V. N. Troyan, *Study of Wave Processes in Complex-Structured Media by Solving Direct and Inverse Geophysical Problems*, Physics Research Institute of St. Petersburg State University.

14. P. A. Chernous, *Theoretical and Experimental Modeling of the Effect of Seismicity on the Mechanical Stability of Snow on a Slope*, Apatity Branch of the Murmansk State Technical University, Apatity.

15. R. F. Shvachko, *Computer Simulation of the Sound Propagation in the Ocean with a Fine-Structure Stratification in Terms of the Wave Approach*, Acoustics Institute, Moscow.

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