Rashid Ashirovich Ganeev

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Presently, Prof. Ganeev works in the position of Chief Researcher at the Laboratory of Materials Science, Laser and Nanotechnology, Institute for Advanced Studies, New Uzbekistan University, Tashkent, Uzbekistan.

Researcher profiles

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Education Background

1972 – 1977, Tashkent Polytechnic Institute, Department of Physical Engineering, Tashkent, USSR. Undergraduate and graduate study. M.Sci. diploma of engineer – physicist.
1984 – 1987, Institute of Electronics, Tashkent, USSR. Postgraduate and Ph.D. study. Ph.D. diploma in Physics and Mathematics (1987).

Scientific employments and academic responsibilities

Institute of Electronics, Tashkent, USSR; Staff Engineer, Research Fellow, Oct. 1976 – Jan. 1993
Scientific Association Akadempribor, Tashkent, USSR, Uzbekistan; Principal Scientist, Jan. 1993 – Mar. 2009
Standards and Industrial Research Institute of Malaysia, Shah Alam, Malaysia; Visiting Researcher, Mar. 1997–Feb. 1998
Centre for Advanced Technology, Indore, India; Visiting Fellow, Senior Visiting Researcher, Visiting Professor, Mar. 1999 – May 1999, Oct. 1999 – Dec. 1999, Jan. 2006 – Mar. 2006, Feb. 2009 – Mar. 2009, Feb. 2010 – Mar. 2010
University of Tokyo, Kashiwa, Japan; Foreign Research Fellow, Visiting Professor, Sep. 2000 – Sep. 2001, Nov. 2002 – May 2005, Feb. 2007 – Dec. 2007, Nov. 2008 – Jan. 2009
International Centre for Theoretical Physics, Trieste, Italy; Senior Associate, Feb. 1994 – Mar. 1994, Sep. 2005 – Oct. 2005, Aug. 2009 – Sep. 2009, May 2010 – June 2010
Institut National de la Recherche Scientifique, Montreal, Canada; Visiting Researcher Sep. 2006 – Dec. 2006, May 2008 – Nov. 2008
Imperial College, London, United Kingdom; Visiting Researcher, Nov. 2010 – Oct. 2012
Institute of Ion, Plasma, and Laser Technologies, Tashkent, Uzbekistan; Principal Scientist, Nov. 2012 – Mar. 2013, Apr. 2014 – Sep. 2014
Westfalische Wilhelms Universitat, Muenster, Germany; Visiting Researcher, Jun. 2010, Sep. 2011, Feb. 2012
Instituto de Química Física Rocasolano, Madrid, Spain; Visiting Researcher, Feb. 2011, Oct. 2011
Saitama Medical University, Moroyama, Japan; Professor, Apr. 2013 - Mar. 2014, Oct. 2014 - Oct. 2015
Voronezh State University, Voronezh, Russia; Professor, Apr.2012 - Aug. 2014, Apr. 2016 – Aug. 2017, Jan. 2019 – Mar. 2019
Changchun Institute of Optics, Fine Mechanics and Physics, Changchun, China; Professor, Aug. 2017 – Dec. 2018
American University of Sharjah, Sharjah, United Arab Emirates, Visiting Researcher, Apr. 2019 – Dec. 2020, Jan. 2024 – Mar. 2024.
Moscow Institute of Physics and Technology, Moscow, Russia; Invited Researcher, Jan. 2021 – Apr. 2021
University of Latvia, Riga, Latvia, ERA Chair holder, head of the Laboratory of Nonlinear Optics, May 2021 – Nov. 2023
Institute of Fundamental and Applied Research, TIIAME National Research University, Tashkent, Uzbekistan, Professor, Dec. 2023 – Jul. 2025
Institute for Advanced Studies, New Uzbekistan University, Tashkent, Uzbekistan, Chief Researcher, Sep. 2025 - present

Grants and nominations

1994, International Science Foundation Grant; 1997, The World Academy of Sciences (TWAS) Associateship Scheme Grant; 2000, COE Grant of the Ministry of Sciences and Technology of Japan; 2004-2007, Visiting

Professor of the Tokyo University, Japan; 2004, International Center of Theoretical Physics (Italy) Senior Associateship Grant; 2006, Fond Quebecois sur la Recherche de la Nature et Technologies; 2006, Japan Society for the Promotion of Science Grant; 2009, TWAS-UNESCO Associateship Grant; 2010, TWAS Research Grant; 2010, Marie Curie International Incoming Fellowships Grant; 2011, Volkswagen Grant; 2012, Professor of Voronezh State University, Russia; 2013, Professor of Saitama Medical University, Japan; 2013, TWAS Research Grant; 2015, Japan Society for the Promotion of Science Grant; 2016, Russian Ministry of Science and Education grant; 2017, Professor of Changchun Institute of Optics, Fine Mechanics and Physics, China; 2017, Russian Fund of Basic Research grant; 2017, Center of Advanced Studies program of Ludwig-Maximilians-Universität München, Germany; 2018, Chinese Academy of Sciences President's International Fellowship Initiative grant; 2018, High-End Foreign Expert Program Grant (China); 2019, grant of American University of Sharjah (UAE); 2020, European Research Area, ERA Chair at the University of Latvia; 2022, Chinese Academy of Sciences President's International Fellowship Initiative grant; 2024, grant of American University of Sharjah (UAE); 2025, grant of Russian Science Foundation.

Main topics of scientific interests

Nonlinear optics; Investigation and construction of coherent extreme ultraviolet radiation sources; Laser – plasma and laser – surface interactions; High-order harmonics generation; Nanofabrication and characterization of small-sized species; Spectroscopic and morphological analysis of materials.

A brief account of scientific activity

Prof. Ganeev has initiated the systematic studies of the nonlinear optical properties of various media. The nonlinear optical parameters (nonlinear refractive indices, nonlinear susceptibilities, multi-photon and saturated absorption coefficients, etc.) of colloidal metal solutions, metal-doped organic polymers, low-excited plasmas, semiconductor chalcogenide films and solutions, dye vapors and solutions, metal-doped glasses and polymers, nonlinear crystals, liquids, fullerenes, fullerene-doped organic films, etc., have been analyzed. The optical limiting in fullerene-doped solutions, colloidal metals, and semiconductors was achieved. The studies of the low-order harmonic generation of picosecond laser radiation in colloidal metals, metal-doped organics and glasses, fullerenes, dye vapors, and solutions were carried out, and their nonlinear susceptibilities were analyzed in the frames of the influence of self-action processes on the harmonic generation. The low-order harmonic generation in dye vapors caused by the difference frequency generation was achieved. The nanorippling formation in different materials was studied.

Prof. Ganeev has established his methods to perform the high-order harmonic generation in laser ablation plumes from various solid targets through the collaboration with a number of leading laboratories. This has allowed him to study, in well-controlled samples, high-order harmonic generation of laser radiation from a variety of atoms and ions of, for instance, a broad range of metals and organics. Through this work he has been able to demonstrate strong resonant enhancement at particular harmonic orders due to the effects of resonance on phase matching. More recently he has shown that nanoparticles and fullerenes can, under the correct illumination conditions, be lifted from a surface without fragmentation and form a gaseous plume of high density and purity. For instance, he has shown this for 10 nm clusters of Ag, Pt, and Au and found evidence of enhanced harmonic generation. He has also performed the first-ever harmonic generation experiments using the carbon-contained clusters (C60, carbon nanoparticles, graphene, carbon fibers, and carbon nanotubes), which allowed achieving the efficient conversion efficiency of laser radiation in the extreme ultraviolet range. He has developed new methods of quasi-phase-matching in multi-jet plasmas, allowing the enhancement of the groups of harmonics in the extreme ultraviolet range and the definition of the electron density in plasmas. Among his other achievements are the development of various methods of harmonic stabilization using the rotating targets during laser ablation using high pulse repetition rate lasers, characterization of plasma parameters, laser ablation-induced high-order harmonic generation spectroscopy, analysis of DNA components and various complex organic materials through the ablation and nonlinear optical study of plasma plumes, application of mid-infrared pulses for the amendment of plasma harmonics, application of extended laser-produced plasmas for efficient harmonic generation, quasi-phase matching in plasma plumes, etc.

Prof. Ganeev has established the network on plasma harmonic studies with numerous scientists in Japan, India, Canada, Bosnia and Herzegovina, Russia, Germany, the United Kingdom, Malaysia, Italy, China, Spain, the UAE, Latvia, etc. In those countries, he established the laboratories studying various aspects of laser-plasma and laser-surface interactions.

He has published 10 monographs based on his studies of the low- and high-order nonlinear optical properties of various materials. Prof. Ganeev is the first co-author of most of his 500+ publications in peer-reviewed journals. His *h*-index is 63 (Google Scholar).