

## Resume of Rashid A. Ganeev

Prof. Rashid A. Ganeev was born in Tashkent (Uzbekistan) on 18 January 1955. Currently, he is a citizen of Russian Federation. Prof. Ganeev works in Voronezh State University, Russian Federation. He is married, has two children.



### 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.

### Scientific employments and academic responsibilities

*Institute of Electronics*, Tashkent, USSR

Staff Engineer, Research Fellow Oct. 1976 – Jan. 1993

*Scientific Association Akadempribor*, Tashkent, USSR, Uzbekistan

Research Fellow, 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 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

Visitor, 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

*Westfälische Wilhelms Universität*, Muenster, Germany

Invited Researcher Jun. 2010, Sep. 2011, Feb. 2012

*Instituto de Química Física Rocasolano*, Madrid, Spain

Invited 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, Principal Scientist Apr. 2012 - Aug. 2014, Apr. 2016 – present

### **Awards, grants, and distinctions**

- 1994, awarded by the International Science Foundation Grant;
- 1997, awarded by The World Academy of Sciences (TWAS) Associateship Scheme Grant;
- 2000, awarded by the COE Grant of the Ministry of Sciences and Technology of Japan;
- 2002, awarded by the Galileo Galilei Award and Medal of the International Commission for Optics;
- 2004, nominated a Visiting Professor of the Tokyo University, Japan;
- 2004, awarded by the International Center of Theoretical Physics Senior Associateship Grant;
- 2006, awarded by Fond Quebecois sur la Recherche de la Nature et Technologies;
- 2006, awarded by the Japan Society for the Promotion of Science Grant;
- 2007, nominated a Visiting Professor of the Tokyo University, Japan;
- 2008, elected a Fellow of TWAS;
- 2009, awarded by the TWAS-UNESCO Associateship Grant;
- 2010, awarded by TWAS Research Grant;
- 2010, awarded by Marie Curie International Incoming Fellowships Grant;
- 2011, awarded by Khwarizmi International Award;
- 2011, awarded by Volkswagen Grant;
- 2012, nominated a Professor of Voronezh State University, Russia;
- 2013, nominated a Professor of Saitama Medical University, Japan;
- 2013, awarded by TWAS Research Grant;
- 2015, awarded by the Japan Society for the Promotion of Science Grant;
- 2017, nominated a Professor of Changchun Institute of Optics, Fine Mechanics and Physics, China;
- 2018, awarded by Chinese Academy of Sciences President's International Fellowship Initiative.

### **Main topics of scientific interests**

- Nonlinear optics (high-order harmonic generation of laser radiation, investigation of the nonlinear optical properties of various media);
- Investigation and construction of coherent extreme ultraviolet radiation sources;
- Laser – surface interactions.

### **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 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 surfaces without fragmentation from a surface 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 ( $C_{60}$ , 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, United Kingdom, Malaysia, Italy, China, Spain, etc. where he carried out his studies.

Among the funds awarded to Prof. Ganeev are The World Academy of Sciences Associateship Scheme Grant, the COE Grant of the Ministry of Sciences and Technology of Japan, Visiting Professorship grant of the Institute for Solid State Physics, Japan, the ICTP Senior Associateship Grant, Fond Quebecois sur la Recherche de la Nature et Technologies, a few Japan Society for the Promotion of Science Grants, the TWAS-UNESCO Associateship Grant, a few TWAS Research Grants, Marie Curie International Incoming Fellowships Grant, Volkswagen Grant, Chinese Academy of Sciences PIFI grant, etc. Prof. Ganeev has been a supervisor of numerous high education students. He supervised 5 Ph.D. students. He also served as a senior adviser to formal supervisors of the Ph.D. students in Japan, Canada, India, Germany, China, and United Kingdom. He has supervised a whole set of plasma harmonic studies, alongside the host researcher, in various laboratories worldwide.

He has published eight 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 350 publications in peer-reviewed journals. His *h*-index is 37. In 2002, the International Commission for Optics awarded him the ICO Galileo Galilei Award and Medal for the contribution in the nonlinear optics. In 2011, he was awarded by Khwarizmi International Award. In 2008, The World Academy of Sciences elected him a Fellow of TWAS.