

## О редакторе тематического блока профессоре Вячеславе Михайловиче Гордиенко



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Вячеслав Михайлович Гордиенко – хорошо известный в нашей стране и за рубежом ведущий специалист в области лазерной физики, нелинейной оптики и фотоники.

В.М. Гордиенко родился в 1944 г., в 1969 г. окончил физический факультет МГУ. В 1970 г. начал трудиться на кафедре волновых процессов на физического факультета МГУ им. М.В. Ломоносова, работал под руководством таких выдающихся ученых в области нелинейной оптики как академик Р.В. Хохлов и профессор С.А. Ахманов. В 1977 г.

защитил кандидатскую диссертацию, а в 1998 г. – докторскую по лазерной физике, тематика которой была посвящена нелинейным взаимодействиям интенсивного пико- и фемтосекундного лазерного излучения с веществом в сильно неравновесном состоянии. В 1999 г. ему было присвоено звание профессора. В настоящее время является заведующим лабора-

Сфера широких научных интересов профессора В.М. Гордиенко связана и с развитием методов и техники дистанционной доплеровской диагностики скорости ветра в атмосфере с использованием CO<sub>2</sub>-лазеров, скорости движения

Более 300 статей опубликовал В.М. Гордиенко в ведущих отечественных и зарубежных журналах. Он член программных комитетов ряда крупных международных и отечественных конференций по лазерной физике, нелинейной оптике, сверхсильным полям в плазме и др. Им

В.М. Гордиенко много лет является экспертом РФФИ, он является заместителем председателя экспертного совета РФФИ по физике, а в 2014 г. выступал в качестве приглашенного редактора тематического выпуска журнала «Вестник РФФИ» «Фотоника и перспективные лазерные и лазерно-информационные технологии».

high-temperature nonequilibrium plasma ignited by ultra-intense (more than  $10^{16}$  W/cm<sup>2</sup>) femtosecond laser radiation on the surface of a solid-state target; new schemes for the use of nano- and microstructured targets for controlling the parameters of laser-induced microplasma were developed; studies were conducted on the thermonuclear reactions initiation in a high-temperature femtosecond laser induced nearsurface plasma; the role of surface electromagnetic waves in the process of second harmonic generation on targets with periodic microrelief of the surface is revealed. The possibility of laser-plasma excitation of low-lying nuclear Ta levels has been demonstrated for the first time.

The scope of Professor V.M. Gordienko broad scientific interests is also connected with the development of methods and techniques for remote Doppler diagnostics of wind velocity in the atmosphere using CO<sub>2</sub>-lasers, the speed of aerosol flows, including the use of schemes based on femtosecond lasers. Under his the direction, the concept of creating and implementing a solid-state femtosecond laser system based on near-IR chromium-forsterite was developed in the interests of fundamental research and promising laser femtotechnologies. Using the intense radiation of a new generation femtosecond laser system on chromium forsterite, the effect of

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increasing the output of hard X-ray radiation during the formation of microchannels in solid-state targets was detected, record data were obtained on the effective conversion of the radiation of a femtosecond laser on chromium forsterite into the visible and medium IR ranges, *etc.*

In the last 7-8 years, Professor V.M. Gordienko research interests have been focused on the problem of "Micro and Nanoobjects in an Extreme State". He conducted pioneering experiments to study nonlinear optical phenomena occurring from the interaction of high-intensity femtosecond laser radiation with supercritical fluids. On the example of carbon dioxide and xenon, the peculiarities of the effect of nanoclusterization of a supercritical medium in the Vidome region on the modification of the nonlinear refractive index were found. Experiments have been carried out to study secondary processes appearing in cluster nanoplasma under the action of femtosecond laser radiation of relativistic intensity (more than  $10^{18}$  W/cm<sup>2</sup>). Using nanoscale krypton clusters created by supersonic expansion of a high-pressure gas into a vacuum, new results on effective broadband generation of X-rays (up to 100 keV) have been obtained. The possibility of accelerating the electron

beam to the MeV level has been demonstrated, and pioneering experiments on the joint generation of terahertz and X-ray radiation in cluster nanoplasma initiated by high-intensity femtosecond laser radiation have been performed. The recently obtained pioneering results aimed at investigating the possibility of neutron generation in the mode of interaction of laser radiation of relativistic intensity with deuterium-containing nanoaggregates arising during gas-dynamic expansion of a supercritical fluid into a vacuum are extremely important. Neutron generation in the DD reaction under the influence of relativistic ( $I \approx 3 \cdot 10^{18}$  W/cm<sup>2</sup>) femtosecond laser pulses on submicron aggregates created from a single-phase supercritical mixture of CO<sub>2</sub>+CD<sub>3</sub>OD initially located in cryogenic free conditions is demonstrated.

More than 300 scientific papers have been published by V.M. Gordienko in leading domestic and foreign journals. He is a member of the Program Committees of a number of major international and domestic conferences on laser physics, nonlinear optics, super-strong fields in plasma, *etc.* He was supervisor of nineteen PhD of physical and mathematical sciences in laser physics, nonlinear optics and photonics. Among his students, there are also representatives of the teaching staff from a number of regional universities. The Laboratory of Nonlinear Optics named after Academician Khokhlov, which he directs, continues the traditions lay down by this world-famous scientist.

V.M. Gordienko has been the RFBR scientific expert for many years, he is Deputy Chairman of the Expert Council on Physics, and in 2014 has acted as a guest editor of the topical issue of the *RFBR Journal* themed as "*Photonics and Advanced Laser and Laser Information Technologies*".