

PERSONALIA

PACS number: **01.60. + q**

Evgeny Mikhailovich Dianov (on his 80th birthday)

DOI: 10.3367/UFNe.0186.201601i.0111

January 31, 2016 is the 80th birthday of Evgeny Mikhailovich Dianov, the outstanding scientist in the field of fiber optics, laser physics, and optical materials science, Doctor of Sciences in Physics and Mathematics, Professor, and founder of the Fiber Optics Research Center of the Russian Academy of Sciences (RAS) (FORC RAS).

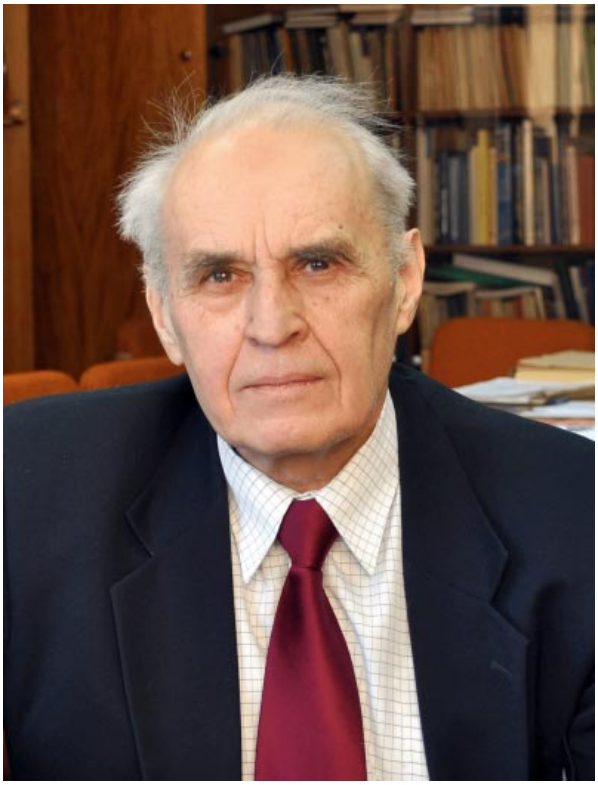
E M Dianov was born in the village of Krasnoe, Tula region, into a family of teachers. In 1960, on graduating from the Faculty of Physics of Lomonosov Moscow State University, he began working in the Laboratory of Oscillations of the Lebedev Physical Institute of the USSR Academy of Sciences. After defending his Candidate of Sciences thesis in 1966, he continued scientific research under the direct guidance of the Nobel laureate in Physics 1962, Academician A M Prokhorov, who noticed the talent and diligence of the young scientist, his lively interest in quantum electronics rapidly developing at that time.

The first significant work by E M Dianov was the creation and translation in a commercial commodity of athermic neodymium laser glass ensuring high directivity of lasing. For this work he, together with research workers at the S I Vavilov State Optical Institute (SOI) and Lytkarino Optical Glass Factory, was awarded the USSR State Prize 1974.

In those years, fiber optics was arising as a branch of quantum electronics. In 1972, on the initiative of A M Prokhorov, Evgeny Mikhailovich headed work on the creation of technology for obtaining low-loss silica optical fibers (together with the Institute of Chemistry of the USSR AS) and on the studies of the physical properties of such fibers. Since then, E M Dianov has entirely devoted his talent and energy to fiber optics. The first Russian world-level optical fibers were obtained already in 1975. Somewhat later, radiation-resistant, high-strength, metallized, active, and other types of fibers were produced which, in their properties, often surpassed the world level. E M Dianov's work, much of which was done in collaboration with the G G Devyatykh Institute of Chemistry of High-Purity Substances of RAS (ICHPS RAS), won recognition throughout the world.

Evgeny Mikhailovich and colleagues thoroughly studied nonlinear laser radiation propagation in fibers and carried out a detailed theoretical and experimental investigation of the generation and propagation of solitons in fibers. He also discovered the effect of stimulated Raman self-scattering of solitons, for the first time described theoretically their distant interaction, and revealed that this interaction is due to electrostriction. The generation of a high-frequency soliton train in optical fibers was experimentally accomplished for the first time in the world under the guidance of E M Dianov.

Uspekhi Fizicheskikh Nauk **186** (1) 111 – 112 (2016)
DOI: 10.3367/UFNr.0186.201601i.0111
Translated by M V Tsaplina



Evgeny Mikhailovich Dianov

These studies laid the physical basis for the use of solitons in long-haul optical communications lines and led to the creation of ultrashort-pulse fiber lasers.

High-efficiency fiber Raman amplifiers for optical communications lines and fiber Raman lasers capable of generating radiation in the wide spectral region of 1.1–2.2 μm were developed under his scientific guidance.

E M Dianov and colleagues worked out different modifications of micro-structured and photon-crystal optical fibers with unique dispersion properties, as well as low-loss hollow-core optical fibers. These innovations are needed as a medium for laser radiation transmission, the generation of broad-band coherent radiation ('supercontinuum'), application in sensors, and the delivery of radiation in medicine and scientific research.

A brilliant recent achievement by E M Dianov is bismuth-doped fibers, which are a new type of active optical fibers. In 2005, E M Dianov and colleagues were the first in the world to observe lasing in this new laser medium. His further studies showed that 'bismuth' fibers allow an effective generation and amplification of optical signals in the wide spectral range of 1.15–1.8 μm, including wavelengths at which traditional active fibers are inapplicable. The 'bismuth' fibers designed by E M Dianov and colleagues open up the prospect of exploiting a much wider spectral range in optical communications, which will result in a speed-up of information transfer.

One of Evgeny Mikhailovich's achievements is working out and investigating chalcogenide and polycrystalline optical fibers of silver halogenides for the mid-IR range. The scientific and practical results in this area obtained in collaboration with research workers at ICHPS RAS and SOI won the 1998 State Prize of the Russian Federation.

E M Dianov's scientific school, which has been in operation for four decades, deserves to be thought of as one of the leading schools in the world. Among Evgeny Mikhailovich's disciples are two Corresponding Members of RAS, nine Doctors of Science, and more than seventy Candidates of Sciences. 'Graduates' of E M Dianov's school work at scientific and industrial organizations in Russia and all over the world.

The Web of Science database contains over 900 publications by E M Dianov, which are frequently cited: his Hirsch index reaches 44.

At the present time, Evgeny Mikhailovich devotes much time and gives consideration to the organization of industrial production of optical fibers and optical fiber sensors in Russia. Commercial-scale production of fibers for optical communications was initiated with his direct participation in the town of Saransk (Mordovia) for the first time in Russia. At the Autonomous Institution 'Tekhnopark-Mordovia', work is conducted under the scientific guidance of E M Dianov on the organization of production of special fibers for fiber lasers, sensors, and other applications of current importance.

In 1987, E M Dianov was elected a Corresponding Member of the USSR AS, and in 1994 a Full Member of RAS. From 2002 to 2013, he was a member of the Presidium of RAS and for many years was member of the Bureau of the Division of Chemistry and Materials Sciences of RAS, a fellow on RAS Commissions on Nanotechnologies and on Innovation Activities, and Deputy Director of the General Physics Institute of RAS. From the foundation of FORC RAS in 1994 to 2015, E M Dianov was its Director, and since 2015 he has been the research supervisor of FORC RAS.

Evgeny Mikhailovich is a member of the State Duma Council on Innovations. He is the chair of the All-Russian Conference on Fiber Optics and member of editorial boards of many Russian and foreign scientific journals. He is continually invited to program committees of Russian and foreign conferences and often gives invited talks. E M Dianov is a member of international scientific societies: Optical Society of America (OSA fellow), Institute of Engineers in Electrical Technology and Electronics (IEEE), Materials Research Society (MRS), and American Ceramics Society (ACerS).

Evgeny Mikhailovich was awarded the Order "For the Merit to the Fatherland" of the IVth degree, the Order of the Badge of Honor, the Order of Friendship, medals of the USSR, the S I Vavilov Gold Medal of RAS. He won the A S Popov Prize of the USSR AS, and the Prize of the USSR AS–GDR AS.

Staff members of FORC RAS, colleagues, and friends of Evgeny Mikhailovich Dianov heartily wish him on this jubilee good health, happiness, and new advances in scientific and innovation activities.

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