

Yuri Raizer

Subjects: **Physics, Fluids & Plasmas**

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physical gas dynamics

low-temperature plasma

shock waves

Basic Information



Name: Yuri Raizer
(Sep 1927–Jun 2021)

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| Birth | Kharkov, Ukraine |
| Location: | |
| Title: | Professor, Doctor of Science (physics and math) |
| Affiliations: | Problems in Mechanics of the Russian Academy of Sciences Moscow Institute of Physics and Technology |
| Honors: | Lenin Prize of the USSR (1966) Medal of the Badge of Honor of the USSR (1975) International Penning Prize in Ionized Gas Physics (USA, Penning Award Excellence, 1993) State Prize of the Russian Federation (1999) American Society of Aeronautics and Astronautics Award (USA, AIAA Plasmadynamics & Lasers Award, 200 “Phystech Star” Moscow Institute of Physics and Technology Badge of Honor (2016) Zel’dovich Gold Medal (Russian Academy of Science, 2020) |

1. Brief Introduction

Yuri Raizer was born in 1927 in Kharkov, Ukraine. He graduated from the Leningrad Polytechnic Institute in 1949, and became Doctor of Sciences (Physics and Mathematics) in 1959, full professor in 1968, and Honored Scientist of the Russian Federation in 2002. He was a chief researcher at the Institute for Problems in Mechanics of the Russian Academy of Sciences, and Honored Professor of the Moscow Institute of Physics and Technology (2012).

He worked at the Institute of Physics and Power Engineering (Obninsk), the Institute of Applied Mathematics, the Institute of Chemical Physics, and the Institute of Physics of the Earth of the USSR Academy of Sciences. Since

1965, Yuri Raizer worked at the Institute of Problems of Mechanics of the Russian Academy of Sciences since the foundation of the Institute and was a head of the Department of Physics of Gas-Dynamic Processes for 34 years.

2. Notable Contributions

Yuri Raizer was a specialist in the field of physical gas dynamics and low-temperature plasma. He made an outstanding contribution to the physics of shock waves, strong explosions, optical breakdown and interaction of laser and microwave radiation with plasma, gas discharges, lightning, and high altitude atmospheric electricity phenomena. On the basis of his ideas and theory, the process of continuous plasma generation in free space by laser radiation (continuous optical discharge) was discovered. This process creates a new type of plasma generators—optical plasmatrons. This new method of organizing the discharge proposed by him was used to create a series of high-power technological CO₂-lasers. He was the author of over 200 scientific papers, and 8 books, translated and published in many countries. His monographs “Physics of Shock Waves and High-Temperature Hydrodynamic Phenomena” co-authored with Yakov Zeldovich, and “Physics of a Gas Discharge” are table-top books of many researchers around the world.



Professor Yuri Raizer and his books.

Raizer's sociability and friendliness immediately won everyone's favor. Yuri Raizer was always full of ideas and energy. He lived without reference to age. As a physicist, Raizer's characteristic was his ability to distinguish the important features of a problem and ignore the minor ones. This Riser phenomenon has kept him at the forefront of science. Along with outstanding scientific activity, Yuri Raizer devoted a lot of time to educating young scientists. For many years he was engaged in the pedagogical process, being a professor at Moscow Institute of Physics and Technology.

In recognition of his contributions to work in the field of physics of shock waves, explosions, gas discharges, and interaction of laser radiation with plasma, Yuri Raizer was awarded numerous national and international prizes:

Lenin Prize (1966); State Prize of the Russian Federation (1999); International Penning Prize in Ionized Gas Physics (USA, Penning Award Excellence, 1993); American Society of Aeronautics and Astronautics Award (USA, AIAA Plasmadynamics & Lasers Award, 2002); Order of the Badge of Honor (1975); Zeldovich's Gold Medal (RAS, 2020); "Phystech Star", and MIPT Badge of Honor (2016).

3. Implications for Sciences, Humanities

Several generations of gas dynamics and plasma physicists studied from the books he wrote. His ideas have inspired and continue to inspire scientists around the world. His scientific contribution to the physics of a gas discharge, the physics of strong shock waves, and plasma physics for many years determined the development of these fields of science.

4. Books published

- *B. Zel'dovich, Yu. P. Raizer. Physics of Shock Waves and High-Temperature Hydrodynamic Phenomena.* Moscow: Nayka, 1963, 1966, 2008.
- *B. Zel'dovich, Yu. P. Raizer. Physics of Shock Waves and High-Temperature Hydrodynamic Phenomena.* New York: Academic Press, 1968; Mineola, New York: Dover Publication, 2002.
- *P. Raizer. Laser-Induced Discharge Phenomena.* Moscow: Nayka, 1974.
- *P. Raizer. Laser-Induced Discharge Phenomena.* New York, London: Consultants Bureau, 1977.
- *Yu. P. Raizer. Basics of modern gas discharge physics.* Moscow: Nayka, Fizmatlit, 1980.
- *P. Raizer. Gas Discharge Physics.* Moscow: Nayka, Fizmatlit, 1987, 1992.
- *P. Raizer. Gas Discharge Physics.* Berlin, New York: Springer, 1991, 1997.
- *P. Raizer. Gas Discharge Physics.* Dolgoprudny: Intellect Press, 2009.
- *P. Raizer, M. N. Shneider, and N. A. Yatsenko. Radio-Frequency Capacitive Discharges.* Dolgoprudny: MIPT Press, 1995.
- *P. Raizer, M. N. Shneider, and N. A. Yatsenko. Radio-Frequency Capacitive Discharges.* Boca Raton, New York: CRC Press, 1995.
- *M. Bazelyan, Yu. P. Raizer. Spark Discharge.* Dolgoprudny: MIPT Press, 1997.
- *M. Bazelyan, Yu. P. Raizer. Spark Discharge.* Boca Raton, New York: CRC Press, 1998.
- *M. Bazelyan, Yu. P. Raizer. Lightning Physics and Lightning Protection.* Bristol, Philadelphia: IOP Publishing, 2000.
- *M. Bazelyan, Yu. P. Raizer. Lightning Physics and Lightning Protection.* Moscow: Fizmatlit, 2001.
- *P. Raizer. Introduction to Gas Dynamics and Shock Wave Theory for Physicists.* Dolgoprudny: Intellect, 2011.

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