

Valery Troitskaya (1917–2010)

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Valery Troitskaya passed away in Melbourne, Victoria, Australia, on 22 January 2010 at age 92. She was a well-known Russian scientist, respected and loved all over the world. She understood early that much could be learned about space plasmas by characterizing their natural oscillations, and she devoted her scientific career to exploiting that perception. Her devotion to friends and colleagues was legendary, and there are many who owe their success in their scientific careers to her effective support. Her life experiences were unique and an inspiration to all who knew her.

Valery was born in Petrograd (today known as St. Petersburg) on 15 November 1917, during Soviet suppression. Even when young, her gifts were exceptional. She excelled in music (piano) and sports and became fluent in French and German in addition to her native Russian. Later she learned English. Her mastery of many languages gave her easy access to world communications. She was always well read in the popular literature of many countries as well as in their scientific literature.

In 1937, at a time of intense political persecution referred to as the Great Purge, her father was arrested by the Soviet secret police (KGB). Twenty-year-old Valery managed to send a telegram to the dreaded Lavrenty Beria, chief of the Soviet secret police who was directing the ruthless extermination of large numbers of “enemies of the people.” Remarkably, her pleas on her father’s behalf were successful in obtaining his release in 3 years. In 2000 she provided an account of her negotiations (“Telegram to Beria”) in the Russian literary magazine *Neva*.

In 1940, at age 23, Valery graduated from Leningrad State University with a master’s degree in geophysics and spent the succeeding four war years in Kazan, the capital of Tatarstan, teaching German to Soviet officers. She returned to Leningrad and married Alexander Waisenberg, a well-known nuclear physicist. Twins, Katia and Peter, were born to the young couple in 1946, and the following year the family moved to Moscow.

Starting in 1950, Valery became a graduate student at the Institute of Physics of the Earth, in Moscow. In 1953, she obtained her Ph.D., specializing in the study of geomagnetic micropulsations (magnetic pulsations in current parlance)—naturally occurring ultralow-frequency (ULF) sinusoidal variations of the geomagnetic field with periods of about 1 second to 10 minutes as recorded on special magnetograms. She remained at the Institute of Physics of the Earth until 1989, serving as chairman of the electromagnetics department for the last 27 years.

Recognizing the importance of understanding the spatial and temporal properties of ULF waves, Valery advocated the installation of magnetic observatories in Russia and in other countries. She established

magnetic observatories all over Russia, with a particularly notable one at the research community in the village of Borok, halfway between Leningrad and Moscow. She developed joint research programs with Germany, Finland, England, United States, Japan, Hungary, India, Cuba, Czechoslovakia, and Australia. With France she developed a program studying activity at geomagnetic conjugate points in the Southern and Northern hemispheres. To gain international support for her area of research and to facilitate communication between Soviet scientists and their colleagues elsewhere, she was active in many international scientific organizations including International Association of Geomagnetism and Aeronomy (IAGA) and Committee on Space Research (COSPAR). Through these activities and her scientific connections, she developed many close friendships and maintained many of these friendships through correspondence until her death.

In the early days of the space age, after extensively studying magnetograms from all over the world, Valery developed a system of names for different types of magnetic pulsations, identifying them as either continuous (Pc) or irregular (Pi). She introduced colorful language (such as “pearls”) to characterize the appearance of some of these waves on magnetic records. Among Valery’s notable publications is a paper (J. A. Jacobs et al., Classification of geomagnetic micropulsations, *J. Geophys. Res.*, 69(1), 180, 1964) that formally established this nomenclature for types of ULF waves and influenced permanently the way magnetic pulsations are analyzed. In another key paper, Valery proposed that power in waves with periods of several tens of seconds observed on the surface of Earth could be used to infer the magnitude of the interplanetary magnetic field in the solar wind upstream of Earth’s magnetosphere (V. A. Troitskaya et al., Connection of PC2-4 pulsations with interplanetary magnetic field, *Dokl. Akad. Nauk SSSR*, 197, 1312, 1971). This bold insight was confirmed by later work.

Author of more than 300 scientific articles, Valery received many awards at home and abroad. She was a foreign member of the Finnish Academy of Science and Letters and the German Academy of Sciences Leopoldina. The Royal Astronomical Society of London conferred on her the prestigious award of associate. She was elected honorary member of the International Union of Geodesy and Geophysics and served as member of its bureau. She was the first woman to be elected president of the International Association of Geomagnetism and Aeronomy. After moving to Australia in 1989, she became an honorary professor in the department of physics at La Trobe University. She was on the steering committee of the International Geosphere-Biosphere Programme from its start until September 1990.



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Valery’s significance to magnetospheric scientists was underscored in 1996 when a special session was held at AGU Spring Meeting to honor her in anticipation of her eightieth birthday. Organized by Margaret Kivelson (University of California, Los Angeles and University of Michigan, Ann Arbor) and David Southwood (Directorate of Science and Robotic Exploration, European Space Agency), the symposium entitled “ULF Waves: A Tribute to Valeria Troitskaya” (see article by Kivelson and Southwood in *Eos*, 77(43), 417, 1996) brought together colleagues from many countries who paid tribute to their beloved and much appreciated Madame Troitskaya and described how her work on magnetic pulsations had provided the basis for major advances in understanding the magnetosphere and its dynamics.

Valery’s first husband, Alexander Waisenberg, died in 1985. In 1989 she married the well-known scientist Keith Cole. Keith also had been president of IAGA and was a professor at La Trobe University in Melbourne, Australia. Keith and Valery traveled and worked together in many parts of the world, including extensive stays at NASA Goddard Space Flight Center. Eventually they settled in Melbourne.

Valery set the bar for success very high. She is buried in Washington, D. C., in Rock Creek Cemetery. Messages of condolence may be directed to Keith Cole (Kew Gardens Aged Care Facility, 22-24 Gellibrand Street, Kew, VIC 3101, Australia, or by e-mail in care of his son David (david.cole@aon.com.au)) and to Valery’s daughter, Katia Nazarova (katianh@gmail.com).

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