

IN MEMORIAM

V. A. AMBARTSUMIAN

(18 September 1908 – 12 August 1996)

Viktor Amasaspovich Ambartsumian was born on September 18, 1908 in Tbilisi, the capital of Georgia. He graduated in 1928 at Leningrad University, continued his studies as a post-graduate at Pulkovo Observatory (near Leningrad) in the years 1928-1931, and next was associated with the University of Leningrad (now St. Petersburg), from 1934 as a professor. In subsequent years he devoted much of his time to the foundation and construction of Byurakan Observatory in Armenia of which he became the Director, and from 1947 he also was Professor of Astrophysics at the State University at Yerevan, the capital of Armenia. The observational programme of Byurakan Observatory has been strongly inspired by Ambartsumian's imaginative thinking.

Ambartsumian's scientific achievements are manifold. His earliest work, in theoretical astrophysics and in collaboration with N. A. Kosirev, dealt mainly with solar physics: the solar atmosphere, sunspots and the theory of radiative equilibrium. He subsequently broadened his interest taking up problems of Wolf-Rayet stars and planetary nebulae, generalizing Zanstra's work on the determination of the radiation field of the nebula and the temperature of the central star. A related result was his estimate, also made in collaboration with Kosirev, that the mass loss of an ordinary nova outburst is a minor fraction only of the stellar mass, which implies that it is a surface phenomenon only, not involving the whole star. A very impressive extension of his work in theoretical astrophysics is his demonstration of an invariant property of the law of diffuse reflection by a semi-infinite plane-parallel atmosphere. This preceded work in the same field by S. Chandrasekhar who expressed himself as follows on some of these topics in a 'Festschrift-paper' at the occasion of Ambartsumian's 80th birthday:

The formulation of the principles of invariance in the theory of radiative transfer: a theoretical innovation that is of the greatest significance. Many papers were contributed to a symposium on this topic at Byurakan in the fall of 1982; and in my contribution to that symposium I narrated the influence of Academician Ambartsumian's ideas on my own related work.

Ambartsumian's marvelously elegant formulation of the fluctuations in brightness in the Milky Way: 'in the limit of infinite optical depth, the probability distribution of the fluctuations in the brightness of the Milky Way is invariant to the location of the observer'.

Ambartsumian's interest then broadened to include stellar evolution, the problem of star formation, and the origin and evolution of stellar systems. In early work on the statistics of double stars he had argued that these cannot have existed for more than ten billion years, a time scale much shorter than was generally accepted at that time. In his work of the 1940s and later on star formation and the origin and evolution of

small stellar systems, Ambartsumian's unorthodox approach drew much attention.

In the years 1941–43, he postulated that certain groups containing stars with similar properties, drifting among the general stellar population, are dynamically unstable systems and must be of much more recent origin than the stellar population in general. He called them stellar associations and distinguished two categories: the O-Associations characterized by membership of the massive O- and B-type stars, and the T-Associations containing the, less massive, T-Tauri stars. He pointed out the frequent occurrence of so-called Trapezium-type systems in the O-Associations: compact groups of very massive stars whose lifetime cannot exceed a few million years at most and that must have a common origin. This work has greatly contributed to the now generally accepted view that star formation has been a continuous – and still ongoing – process up to the present. As to the formation process itself, Ambartsumian went even as far as postulating that stellar associations originate from superdense primordial matter, a postulate he later extended to the formation of galaxies in general.

Ambartsumian earned world-wide recognition for his pioneering work. He was a Vice-President of the International Astronomical Union from 1948 to 1955 and its President from 1961 to 1964 and he also served as President of the International Council of Scientific Unions. He received many honours, both from inside the USSR and internationally. Among the first were the Order of Lenin and the Stalin Prize, both awarded soon after the end of World War II. In 1950 he became a Deputy to the Supreme Soviet and in 1961 a member of the Presidium of the Academy of Sciences of the USSR. In 1960 he was awarded the gold medal of the Royal Astronomical Society, and in the same year he received the Bruce medal of the Astronomical Society of the Pacific. He was a foreign member of many Academies of Science.

Ambartsumian's term as a Vice-President of the IAU coincided with the years of the cold war between western powers and the Soviet Union. In those years, the IAU went through a critical stage in its existence as a consequence of the IAU Executive Committee's decision to postpone the General Assembly that had been planned for 1951 in Leningrad. During the subsequent years, although vigorously contesting the EC's decision, Ambartsumian did not fail to continue his support to the Union as the world-wide organization embracing astronomers from all countries. His election as President of the IAU in 1961 reflected both the appreciation for his efforts in this respect and his outstanding scientific achievements.

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