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OBITUARY

Renan Arcadio Poveda Ricalde
1930–2022

Arcadio Poveda passed away in Mexico City on March 24th, 2022. He was a Professor at the Instituto de Astronomía of the Universidad Nacional Autónoma de México (UNAM). He also held a Chair of Excellence, and was an Emeritus Professor of both UNAM and the Sistema Nacional de Investigadores of Consejo Nacional de Ciencia y Tecnología (Conacyt).

He was born in Mérida, Yucatán on July 15th, 1930. From an early age he showed great interest in science and research. He moved from Mérida to Mexico City to study Physics at the Facultad de Ciencias,

UNAM. At the same time, he attended astronomy lectures delivered by Paris Pishmish at the Observatorio Astronómico Nacional. He continued his studies at the University of California at Berkeley, where he obtained his PhD in 1956. Upon his return to Mexico City he was appointed Associate Researcher at the Instituto de Astronomía of UNAM, where he continued for the rest of his career. Early on, he showed great interest in lecturing and incorporating young students into research projects. He was intensely dedicated and productive, and soon several students were excited by his enthusiasm for astrophysics. In 1962, he directed my BSc thesis on Stromgren Spheres. Since the beginning of the operation of the first computer in Mexico, the IBM 650 at UNAM Computing Center, he encouraged his students to become familiar with this instrument for the development of their future research.

The astrophysical topics he studied were very diverse, I will mention briefly some of his main subjects of interest.

Poveda realized that the masses of elliptical galaxies could be derived from their observable photometric and kinematic properties, specifically from the dispersion of their star velocities with the help of the Virial Theorem. Masses play an important role in correlations of galaxian properties, as unified in the Fundamental Plane. This work formed a foundation for many subsequent studies.

In 1965, from just a handful of observational data related to star formation then available, he proposed a scenario with several predictions that were well ahead of that time. Originally motivated by two puzzling facts then known, the existence of young stars below the main sequence and the so-called Faulkner-Griffiths-Hoyle paradox, Poveda went on to predict the existence of infrared excesses in young stars, to speculate on the ubiquity of planetary systems, and to present a modern view that described several key characteristics of the Herbig-Haro objects. These predictions were later confirmed observationally and constitute an important part of our present knowledge of stellar and planetary formation.

Poveda was also interested in supernova explosions and their remnants. His collaboration with Ludowijk Woltjer led to an empirical relation linking the surface brightness at radio wavelengths with the diameter of supernova remnants: the sigma-D Relation. While the theoretical explanation of this relation is not fully satisfactory, its practical utility in the estimation of distances to supernova remnants made it very appealing in the study of their galactic distribution.

In 1967 Poveda and Christine Allen proposed a new mechanism that drives runaway stars as the result of the gravitational collapse of proto-stellar clusters. Over the years, this mechanism has proved to be viable, and it is now recognized as one of the two most accepted mechanisms that give rise to runaway stars in our Galaxy. In their research they wondered about the formation of double and multiple stars. They concluded that there were three processes involved: multiple condensations, capture, and fission. They and others made much progress on multiple condensations and cluster disintegration. In later work, they pointed out that young double stars can be found at large separations (up to 100,000 AU) while the maximum separations found became smaller the older the systems are. The work on runaway stars triggered interest to catch escaping stars "in flagranti" among the Orion Trapezium members, and their close neighbors. This problem has encouraged some colleagues to obtain data to improve our knowledge on the kinematics of that very young and relatively nearby stellar system. Recent observations of components A, B and E in the Orion Trapezium, favor very recent, and probably ongoing, violent dynamical activity among the Trapezium members which are, in turn, multiple systems themselves. As part of their work on trapezia, they found that they can eject members either early on in their evolution (1000 yr) or much later (a million yr). Depending on their configuration, trapezia can completely disintegrate in times as short as several thousand years, or they can last up to a million years.

Poveda extended his scientific interests to planetary sciences, namely to comets, asteroids, meteorites, and impact craters. In particular, the Chicxulub impact crater caught his attention. Chicxulub is the best preserved of the large multi-ring craters in the terrestrial record and its impact has been related to the global environmental climatic effects and the mass extinction that marks the Cretaceous-Tertiary boundary. In addition to studying the crater, he investigated asteroid and cometary impacts in the inner solar system, impact chronologies, and near-Earth objects, thus bringing a planetary perspective to crater studies.

In addition to his astronomical work, Poveda was active in academic-administrative tasks that led to the development of several research institutions. In 1968 he was appointed Director of the Instituto de Astronomía, UNAM. Around 1973, and full of enthusiasm, he started the construction of the Observatorio Astronómico Nacional in the Sierra de San Pedro Mártir, in Baja California. This site had been identified by Guillermo Haro as suitable for this purpose a few years earlier. Much of Poveda's effort was the development and construction

of this observatory. Three telescopes that are still in operation were installed (84 cm, 1.5 m and 2.1 m in diameter). The observatory was inaugurated in September 1979. From the beginning of this development, the need to establish an operations station, as well as an astronomical research center in the nearby city of Ensenada, was recognized. This center was inaugurated in 1980. A few years later, Poveda became a leading administrator at UNAM. He was appointed as member of the Governing Board of this university, and later as Dean of Science, in addition to participating in various planning committees.

Apart from his activities at UNAM, he promoted the foundation of the Centro de Investigación Científica y Educación Superior de Ensenada, Baja California (CISESE); and also the foundation of the Centro de Investigación en Óptica (CIO) in León Guanajuato, among other projects. He also held various advisory positions in other academic institutions.

He was a member of the Mexican Academy of Sciences, the American Astronomical Society, and the International Astronomical Union.

His work was widely recognized through the many distinctions he received: the Prize for Young Scientist from the Academia Mexicana de Ciencias (1966), the National Prize for Sciences and Arts (1975), the Eligio Ancona Medal from the Government of Yucatan (1977), and honorary doctorates from the Universidad de Yucatán (1977), from the Centro de Investigación en Óptica (2000), and from the University Council of UNAM (2001). He was appointed as member of El Colegio Nacional in 1989. The public planetarium in his native Mérida, Yucatán, bears his name in recognition of his academic merits.

He is survived by his son Renan, his daughter Laila, and several grandchildren.

Manuel Peimbert