The Legacy of S Chandrasekhar
Remembering a Giant of Our Times

Kameshwar C Wali

There is a secret society whose activities transcend all limits in space and time, and Chandrasekhar is one of its members. It is the ideal community of geniuses who weave and compose the fabric of our culture.

Res Jost

The twentieth century has witnessed many outstanding scientists who have revolutionized our understanding of Nature. Chandra is certainly one of the foremost among them. With his prolific contributions to wide ranging fields in physics, astrophysics and applied mathematics, he became and continues to be a legendary figure. He has undoubtedly left behind a rich legacy of scientific accomplishments. While there have been scientists whose discoveries have had greater impact and names that have become more illustrious, Chandra stands alone in a broader perspective of a life devoted to science. It is from this broader perspective that I want to reflect upon Chandra’s life in this article. What makes him so special when it comes to his style of research, is his attitude to and single-minded pursuit of science. I will not speak about Chandra’s science that extends over such a wide and varied landscape that is almost impossible to describe in a short article like this one. I refer the reader to the six volumes (and one more to come) of Selected Papers, published by the University of Chicago.

Any account about Chandra brings to mind the celebrated discovery of the Chandrasekhar Limit, the limit on the mass of a star that could become a white dwarf. In 1930, Chandra was only nineteen years old when he made this discovery on his maiden voyage to England to pursue his graduate studies in Cambridge.
In those days white dwarf stage was considered to be the only terminal stage for stars in the course of their evolution. Chandra’s discovery raised fundamental questions: What is the fate of more massive stars whose masses were greater than the limiting mass (~1.44 solar mass)? Are there other terminal stages? “Great progress in the analysis of stellar structure,” Chandra wrote, “is not possible before we can answer the following fundamental question: Given an enclosure containing electrons and atomic nuclei (total charge zero), what happens if we go on compressing the material indefinitely?” After years of hard work and establishing his preliminary finding of 1930 on a rigorous basis, when Chandra presented his results at the January 1935 meeting of the Royal Astronomical Society, he encountered a totally unexpected confrontation with his senior and mentor, Sir Arthur Stanley Eddington. Eddington made it look like Chandra had gotten it all wrong. A conceptual error! The manner in which Eddington cavalierly dismissed the whole idea of a limiting mass amounted to public humiliation. Eddington’s prestige and authority prevailed and it took over two decades before Chandrasekhar limit entered the standard lexicon of astronomy and astrophysics. It pioneered the way to the discovery of other terminal stages, namely, neutron stars and black holes.

I have described in some detail the irony, the drama and its aftermath of this historical event in my biography of Chandra (Chandra: A Biography of S Chandrasekhar, University of Chicago Press, Chicago 1991). What is remarkable is how Chandra handled the situation. Instead of confronting, Chandra withdrew himself from further work related to white dwarf studies. He wrapped up his findings in a monograph, his first book titled, An Introduction to the Study of Stellar Structure (1939), and went on to work in another area. “After all I was in my middle twenties at that time,” Chandra reflected in my conversations with him. “I foresaw for myself some thirty to forty years of scientific work, and I simply did not think it was productive to constantly harp on something which was done. It was much better for me to change the field of interest and go into