

## **Al Seiff: Thoughts About and Lessons from a Great Engineer**

Michael E. Tauber  
ELORET Corp.

By every measure of success, Al Seiff was considered an outstanding atmospheric scientist during the last several decades of his life, before his unfortunate passing in late 2000. However prior to his specializing in atmospheric science, Al was also an outstanding, innovative engineer, a fine technical manager and a mentor of young engineers many of whom rose to high positions. I will begin by discussing one aspect of his earlier engineering work briefly. In 1963, Al published a seminal report (NASA TN D-1770) that described how measurements on-board a vehicle could be made at hypervelocity speeds and, in combination with knowledge of its high-speed aerodynamics, be used to determine atmospheric properties. In 1971, his concept was confirmed in a successful flight test at Earth (Planetary Atmospheric Entry Test, PAET) and applied to nine US entry vehicles. The result was a vast increase in our knowledge of the atmospheres of Mars, Venus, Jupiter and Titan. Second, I will relate briefly my interaction with Al, since he hired me in 1962. I was fortunate to work with and for him on problems of atmospheric entry during my first decade at NASA Ames Research Center and learned much from him. In the mid-1960s, Al asked me to investigate the possibility that a probe could survive atmospheric entry at Jupiter at speeds approaching 60 km/sec. To my initial surprise, the entry problem was solvable and led to the development of the Galileo probe eventually. In relation to this work, I will cover some aspects of the extremely severe entry heating environment and its effect on the heat shield performance of the Galileo probe. Lastly, some suggestions will be offered for speeding the preliminary design and analysis of heat protection systems, based on lessons learned from several successful entry probes and landers.