

A Tribute to Dr. S. Balakrishna, the first Head of Flight Mechanics & Control Division



Dr. S. Balakrishna worked for the National Aeronautical Laboratory, Bengaluru from 1960 to 1991. He served as a scientist and later became head of the erstwhile Systems Engineering division. Dr. S. Balakrishna obtained his Ph.D. in Aero/Controls from IISc, Bangalore (1971-75).

During his stint at NAL, Dr. S. Balakrishna spearheaded the setting up of the NAL-ISRO Acoustic Test Facility along with his colleagues Dr. Nagabhushana and Dr. Ranjan Moodithaya. The 1980s were exciting times in the Systems Engineering Division as Dr. S. Balakrishna and his colleagues embarked on a series of new and challenging initiatives in the mechanics of flight involving modelling, simulation, optimisation and control and in novel dynamic wind tunnel simulation techniques. He built experimental simulators with and without motion and conducted high-class research in the areas of human operator modelling. He built a dynamic wind tunnel to prove feedback control concepts. He also immensely contributed to other projects of NAL: pressure regulating valve, brake pad test rig, filament winding machine, and non-destructive testing facility, for all these, he provided control solutions.

Dr. S. Balakrishna became the first Head of the Flight Mechanics & Control division in 1990. He created an era of control activities in the country and has left behind a formidable division that is doing world-class research and development in the areas of control laws, flight simulation, and parameter estimation. He was a genius in engineering solutions and was a high-class scientist with a humanitarian approach. He was himself a very hard-working scientist, sincere, and a very free and frank human being. He was always focused on his tasks and wanted quick engineering solutions to the problems. He trained dozens of scientists and technical personnel in the allied areas like parameter estimation from flight test data, and flight simulation. He had nurtured and trained people who eventually became the heads of divisions and directors of the lab.

Dr. S. Balakrishna was a member of the team that pioneered the concept of automatic flight control replacing manual flight controls in India. He provided critical inputs on missile flight control aspects to the DRDL towards IGMDP during the 1980s. Dr. S. Balakrishna strongly supported the option of digital flight control for LCA. He was highly knowledgeable of the sensors and actuators associated with digital flight control systems.

Dr. S. Balakrishna took voluntary retirement and joined NASA as a Research Engineer in Cryogenic Wind Tunnel Research in 1991 and worked until his demise. He contributed to numerous wind tunnels and other projects of NASA. In 2015, Dr. S. Balakrishna received the **NASA Exceptional Engineering Achievement Medal** for his exceptional engineering contributions to aeronautical exploration goals (**High Reynolds Number Transonic Semi-span Test**). He published many scientific and engineering papers and was awarded professional Fellowships like NRC.

Dr. Balakrishna was brought up in the Vaidika tradition and studied the scriptures at a young age. He liked to research old documents and scripts in different Indian languages to bring to light vast scientific knowledge of the Vedic period to currently acceptable terms. He has worked on proposing the astronomical identity of the 27 stars (in Jyotishya) as visible explicit stars in the sky and provided their modern astronomical names. Dr. S. Balakrishna researched the Bhishmaparva - Mahabharata statement that two eclipses occurred within 13 days during the battle at Kurukshetra and concluded that such eclipse pairs have occurred. He published several scientific articles in Kannada as well.

Dr. S. Balakrishna has left behind his wife, a daughter and a son. CSIR-NAL salutes Dr. S. Balakrishna for his rich contributions to CSIR-NAL and he will be always remembered for his engineering genius.

-Dr.J.R.Raol & Dr.P.Lathasree



Dr. S. Balakrishna (right) can be seen along with Dr. S. Srinath Kumar studying computer-generated results of control law analysis/design with F Henschel of DLR in November 1986.



Dr. S. Balakrishna's participation in Growing Ties with IAF can be seen in an animated discussion with Air Marshal B W Chauhan (IAF), Dr. A C Raghuram and Dr. K N Raju in 70's



Visitors to the Systems Engineering Division in 1979 . Dr. S. Balakrishna (left) and Dr. C S Rangan are also seen



Moments with Dr. K. N. Raju during the farewell of Dr. Balakrishna



Moments with Dr. Srinath Kumar during the farewell of Dr. Balakrishna