

MEMORIAL RESOLUTION
KRISHNAMURTI KARAMCHETI
(1923 - 1993)

Krishnamurti Karamcheti, Professor Emeritus of Aeronautics and Astronautics, suffered a fatal heart attack on December 31, 1993. His death brought to an end the remarkable and fruitful career of this world-class scholar and teacher.

Born in India on February 8, 1923, his early studies in science and engineering led to a Bachelor of Science degree in 1944 at Benares Hindu University. That accomplishment was followed by a Madras Government Merit Scholarship Award for graduate work at the Indian Institute of Science in Bangalore, from which he received a Diploma in Aeronautics in 1946. Before leaving India, Dr. Karamcheti served for four years on the faculty of the Indian Institute of Science, and also taught for a year at Birla Engineering College. While at I.I.S., he was in charge of the design and development of new supersonic wind tunnels.

After coming to the United States in 1951, Dr. Karamcheti, supported by Smith-Mundt and Fulbright Fellowships, enrolled at Caltech to continue his graduate studies in aeronautics with a minor in physics. He received the M.S. in Aeronautics in 1952 and the Ph.D., also in Aeronautics, in 1956. His doctoral research dealt with the acoustic radiation from cutouts in aerodynamic surfaces immersed in high-speed flows.

Karamcheti's first post-doctoral position was that of Research Associate and Adjunct Professor at the University of Southern California School of Engineering, 1955-1958. During that period he was in charge of the design and setup of a two-phase wind tunnel for research in rarefied gas dynamics.

In 1958 Dr. Karamcheti accepted Stanford's invitation to join its aeronautics faculty as Assistant Professor. Promotions to Associate Professor and Professor took place in 1961 and 1966, respectively. During that period he played a central role in the resurrection of a strong teaching and research program in aerodynamics and related fluid mechanics in the Department of Aeronautics and Astronautics. Along with course development work, his initial efforts at Stanford centered, jointly with Professor Vincenti, on the design, assembly, calibration of, and subsequent experiments with a spark-heated hypervelocity intermittent ("Hot-Shot" type) wind tunnel for the study of high-enthalpy gas flow problems. For a while, the Hot Shot facility was widely accepted as the way to do such research. However, problems with flow definition and the reliability of measurements led to the abandonment of the Hot Shot at Stanford and other laboratories around the world.

Partly for this reason Dr. Karamcheti redirected his research interests toward problems of rarefied gas flows (utilizing kinetic theory), and also to aerodynamic sound generation. Another reason for his attention to aeroacoustics stemmed from a strong interest in aerodynamic noise on the part of the NASA-Ames Research Center, an organization with which Stanford's Aero/Astro Department was developing relatively close and mutually beneficial ties. Dr. Karamcheti was particularly skilled in ripening such relationships which led to his becoming a Founding Director of the NASA-Stanford Joint Institute for Aeronautics and Acoustics in 1973.

During its heyday in the late seventies and much of the eighties, the Joint Institute played a central role in the aerodynamics/fluid mechanics program of the Department. Several colleagues joined Dr. Karamcheti in implementing and supervising research under the Institute's auspices. Karamcheti himself supervised approximately fifty doctoral research students during the course of his career. Of these, nine or more are now university faculty in the U.S. and abroad. Several others hold responsible managerial positions in technical industry or research laboratories.

Professor Karamcheti was the author or co-author of over 100 research publications. Some of the principal topics include design of, and measurements in, two-phase and hot shot tunnels, noise generation mechanisms, secondary fluid injection into supersonic flows, kinetic theory of gas-solid interactions, edgetone flow fields, sound propagation in ducts, fluctuation phenomena in aerodynamic flow fields, behavior of jets in cross streams, studies of jet turbulence, studies of multiple jets, flow visualization techniques and vortex interactions.

Apart from the Joint Institute, Dr. Karamcheti's talent as an instigator of educational and scholarly projects was evidenced by his worldwide experience in inspiring and advising on new technical projects and programs. As a result of his serving as Visiting Professor at the National Cheng Kung University, Taiwan, Yarmouk University, Jordan, and the Korea Advanced Institute of Science and Technology, the teaching and research programs in each of these institutions began a significant advancement. At Stanford, he interested several colleagues in various parts of the University to cooperate in a new interdepartmental program in acoustics and noise, a subject which tends to fall into "interdepartmental cracks" in many universities. However in 1986, before that promising program was fully implemented, his ingrained desire to start even more basic new projects took him to Tallahassee, Florida, where he developed an active program as Chair of the Department of Mechanical Engineering and later Dean of Engineering at the College of Engineering, which jointly represented Florida State University and Florida A&M University. During this period he played a crucial role in the merging of the engineering schools of the two universities.

Dr. Karamcheti's experience in Florida was evidently a successful and rewarding one. He was instrumental in establishing his Department's preeminence in both teaching and research; in this connection he was able to attract some outstanding faculty. During his tenure as dean from 1987 to 1992, enrollment rose from 800 to over 2,000 students, and Masters and Doctoral programs were established. In August of 1992, he stepped down from his position as dean to return to teaching on a full-time basis as a Professor of Mechanical Engineering. By this time he was on Emeritus status but remained quite active in both research and teaching.

His additional contributions to the advancement of aerodynamics and fluid mechanics include: membership in the NASA Advisory Subcommittee on Fluid Mechanics, and the American Institute of Aeronautics and Astronautics Technical Committee for Aeroacoustics. He was a consultant to several industrial and research organizations including SRI International and United Technologies Center. Dr. Karamcheti also served as an advisor on jet noise research for the United States Department of Transportation. He also contributed as an organizer and general chairman of major international symposia on rarefied gas dynamics, research on transportation noise, and on photon correlation techniques in fluid mechanics. Among his special distinctions are Fellowship in the American Institute of Aeronautics and Astronautics, Honorary Fellowship in the Aeronautical Society of India, AGARD consultant and lecturer, and Visiting Fellowship at the Joint Institute for Laboratory Astrophysics at the University of Colorado. In addition to his service as editor of two Proceedings publications, he has written two excellent textbooks, namely *Principles of Ideal-Fluid Aerodynamics*, 1966, and *Vector Analysis and Cartesian Tensors with Selected Application*, 1967.

Krish was a delightful individual from a personal standpoint. He was especially happy when socializing with colleagues, students, and other friends. His parties were known to be lively affairs, and most of us always tried our best to attend. He enjoyed the comforts of life, but was always available to befriend and assist others in any way he could. His passing is especially mourned by his three daughters and one son. They are: Indira Karamcheti of Middletown, Connecticut, Girija Karamcheti of Claremont, California, Lore Karamcheti of Los Altos, California, and Michael Karamcheti of Colorado Springs, Colorado. He is also survived by five grandchildren.

Daniel Bershader, Chair
Brian Cantwell
Milton Van Dyke
Walter Vincenti