

## SAMVAAD: An International Lecture Series of SCTIMST

14 December 2023

Title of talk:

**The Magical World of Shock Waves**



**Prof KPJ Reddy**

**Prof Emeritus, Dept of Aerospace Engineering, IISc, Bengaluru**

After the initiation of life on earth by the biggest natural shock wave called the Big Bang, nature is abound with natural shock waves destroying and recreating many life forms and civilizations. Hence human beings are always fascinated by the shock waves and are making continuous efforts to understand them and create them in controlled conditions to harness their energy for the betterment of life on earth. Now it is well understood that the Shock waves are generated when an object travels at speeds greater than the speed of sound in the medium as in the case of a supersonic aircraft or by the sudden release of energy as in the case of an explosion such as nuclear explosion. It is well documented that one such shock wave produced by the impact of a meteorite (dia. ~10 km) resulted in the extinction of Dinosaurs on earth in the prehistoric times.

Shock waves of required strength and size can be produced in the laboratory using a device called shock tube. Reddy tube is the simplest form of the shock tube invented by the author. It has been declared as one of the top ten inventions of IISc. In this talk Prof Reddy presented the details of this simple hand operated device and its applications in all fields of Science, Medicine, Engineering and Agriculture. Specifically, its application in Artificial insemination of dairy animals, Study of traumatic brain injuries, Treatment of erectile dysfunction and Diabetic wounds were elaborated.

*(Dr Roy Joseph, Dean SCTIMST, gave an introduction to the International Lecture Series of SCTIMST, Dr Jayanand Sudhir, Additional Prof, Dept of Neuro-surgery, SCTIMST introduced the esteemed speaker and Dr Mala R, Prof, AMCHSS, SCTIMST delivered vote of thanks)*

### Short Biography of Prof KPJ Reddy

Prof KPJ Reddy received Masters' Degree from Mysore University in 1975 and PhD degree from Birla Institute of Technology, Ranchi, Mesra in 1981 and joined the department of Aerospace Engineering, Indian Institute of Science (IISc), Bangalore. He has held many positions including the post of Senior Professor, Dr Satish Dhawan ISRO Chair Professor and HAL Chair Professor before retiring in 2018. Prof Reddy has worked in many areas of research, majorly in Hypersonics, Shock Waves, Chemical Kinetics, Lasers, Photonics, Bio-photonics and Nonlinear Optics. He has published more than 300 technical papers in international journals and conferences and has about 30 Patents in these areas of research. Prof Reddy has established very strong research group in IISc consisting of more than 50 people in the area of hypersonics and related fields and has built many unique experimental facilities for high speed testing. Two of his recent inventions are named after him as **Reddy Tube** and **Reddy Tunnel**, which have become part of the UG courses in India and abroad. He has guided about 27 PhD and 6 MSc (Engg) graduates and Majority of them are working as faculty members in various IITs and IISc.

Prof Reddy has organized many prestigious international conferences and workshops and served as the member of **International Advisory Boards** for many such International Conferences. He was the Editor-in-Chief of **International Journal of Hypersonics** and a Member of the **Editorial Boards for the Shock Waves journal, Journal of Indian Institute of Science and Journal of Engineering Physics and Thermophysics**. Prof Reddy is the founder President of **Society for Shock Wave Research, India** and the elected President of **International Shock Wave Institute**, at Nagoya, Japan. He received **Honour Diploma** from Minsk International Forum on Heat and Mass Transfer, Minsk, Belarus and **IISc Alumni Award for Excellence in Engineering Research in 2010**. He was an **Adjunct Professor** of the Defence Institute of Advanced Technology, Pune. Recently he received **Lifetime Achievement Award** from Bangalore Management Association (BMA). Prof Reddy has many inventions to his credit, and is the **Chairman, Machstar Group of companies** consisting of many start-up companies eg Super-Wave Technologies Pvt Ltd, Srushti Engineering Innovations Pvt Ltd, Wavefrac Tech Pvt Ltd and Shock Fluidesign Tech Pvt Ltd.

**Prof Reddy is the Founder of the "Science City" of India** coming up near **Challakere, Chitradurga District** in about 11000 acres of land and **Dr H Narasimhaiah International Science Centre** near **Gauribidanur, Chikkaballapur District** in about 206 acres of land.

