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79_PRL Ka Amrut Vyakhyaan

Wednesday, 19 April 2023

@ 04:00 PM (IST)



“Shocking waves - Healing touch!”

Prof. Gopalan Jagadeesh

Professor, Department of Aerospace Engineering
Indian Institute of Science,
Bangalore



<https://youtube.com/live/A9ESb4fi3Fk?feature=share>



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Title: “Shocking waves - Healing touch! ”

Speaker: Prof. Gopalan Jagadeesh

Professor, Department of Aerospace Engineering

Indian Institute of Science, Bangalore

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Abstract

“The phenomenon of “Shock Waves” has been historically associated with aerospace engineering and in particular with supersonic flight. Shock waves appear in nature, when different elements in a fluid approach one another with a velocity higher than the local speed of sound. These waves are also generated if massive energy dissipation takes place within ultra-short time in events like explosions. A number of methodologies/facilities to generate shock waves of requisite strength have been designed and indigenously built in the Laboratory for Hypersonic and Shockwave Research (LHSR) in Indian Institute of Science (IISc), Bangalore. Over the years, these facilities have facilitated very interesting interdisciplinary research programmes in IISc with participation of several faculty members from physics, chemistry, biology and materials engineering. Some of the novel techniques that will be discussed in this talk includes retractable aero-spikes, smart coatings, forward facing jets and concentrated energy deposition for reducing the aerodynamic drag around vehicles flying at hypersonic speeds. Concurrently, utilizing the remarkable ability of shock waves to instantaneously enhance the pressure and temperature in the propagating medium, several innovative shock wave assisted techniques have been developed in LHSR. These include non-intrusive needleless vaccine delivery, cell transformation, Wound healing, bio-film destruction, sandal oil extraction, polyphenol enrichment in tea, metal texture modification, and preservative impregnation in bamboo. A broad overview of the recent Trans-disciplinary shock wave research and technology development activities at LHSR will be presented in this Colloquium.”

The Speaker

Professor Gopalan Jagadeesh is a Senior Professor in the Department of Aerospace Engineering, IISc Bangalore. He is the Founder Chairman of Centre of Excellence in Hypersonics, in IISc. He is also the Founder Director of Super-Wave Technology Pvt. Ltd – an Initiative with equity participation from IISc to commercialize his discoveries related to industrial applications of shock waves. He was also an honorary professor in the School of Engineering, University of Glasgow, UK .

His research areas include Hypersonic Aerothermodynamics and shock wave propagation in complex fluids. He has extensively published and holds several patents on various innovations related to Shock Waves. He is currently the President of International Shock Wave Institute, Japan and Society for Shock Wave Research (India).

He is a Fellow of Royal Aeronautical Society, (UK), National Academy of Engineering (India), Indian Academy of Sciences and an Associate Fellow of American Institute for Aeronautics and Astronautics. He actively works with voluntary organizations for popularizing science among high school/college students especially in rural India.

