



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade, ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF AEROSPACE ENGINEERING

Title:	Shock Waves Applications
Coordinator:	Ms. U. Kavya, Assistant Professor Ms. M. Bhuvaneshwari, Assistant Professor
No. of Participants:	107
Event Type:	Webinar
Name of Resource person & Details:	Dr Ashish Vashishtha Assistant Lecturer Department of Aerospace Mechanical and Electronics Engineering Institute of Technology, Carlow, Ireland Email: ashish.vashishtha@itcarlow.ie Phone: 059 9175000
No. of Days Conducted and Dates:	One day –14 th June 2021.
Summary of the Event:	The speaker has explained the basics of Shock waves applications. He has presented the work done by him and his team at various levels in the Shock waves applications.
Outcome from the Event:	The participants have got the understanding on Shock waves applications. The research areas in the Shock waves applications are also explored.
Feedback taken from Participants:	The Coordinator has taken the feedback from the participants and attached below.
Action plan:	Planning to schedule more webinars to enhance the knowledge of the students and other participants.



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Brochure:



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L.B. REDDY NAGAR, MYLAVARAM, KRISHNA Dist. AP, India, 521230

DEPARTMENT OF AEROSPACE ENGINEERING

SPEAKER

Dr. Ashish Vashishtha

Department of Aerospace, Mechanical and Electronics Engineering Institute of Technology, Carlow, Ireland.



Webinar on

SHOCK WAVES APPLICATIONS

On
14th June, 2021
At 4 PM IST

CONVENER
Dr. P. Lovaraju
Head and Professor

CO-ORDINATOR
U. Kavya (Asst. Professor)
M. Bhuvaneshwari (Asst. Professor)

STUDENT CO-ORDINATOR
D. Sony, 4th B.Tech

Registration Form Link:

<https://tinyurl.com/yz6kr6rk>

E- Certificate will be provided to all
The participants

For further details mail us at

hodaero@lbrce.ac.in



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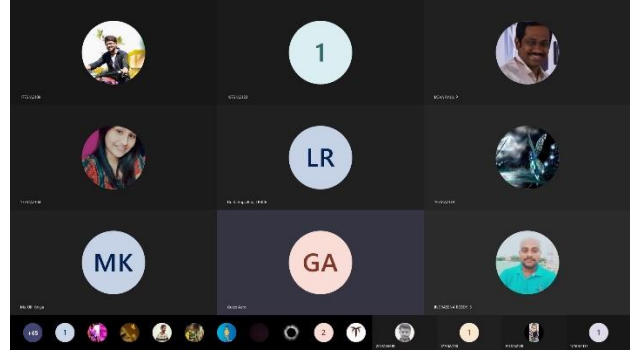
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Photo Gallery:



Background:

UG & Masters (2003-2006) Aerospace Engineering, Indian Institute of Technology, Kanpur, INDIA	Industrial Experience (2008-2013), Senior Engineer, Renault Nissan Technology and Business Center, INDIA Dr. Frederic Ravet	PHD (2013-2016), Aerospace Engg., The University of Tokyo, JAPAN Advanced Engg., Indian Institute of Science, Bangalore, INDIA	Position 1 (2017-2018), Aerospace Engg., Indian Institute of Science, Bangalore, INDIA	Position 2 (2019-2019), Mechanical Engineering, NT Carlow, IRELAND	Assistant Lecturer (2019 onwards), AAE, Engineering, IT Carlow, IRELAND
8 Tech.M.Tech (5 years) (Last 4 years Canada) Mentor: Prof. E. Rathakrishnan Had Teaching and Research Experience in the areas of: <ul style="list-style-type: none"> Low Speed (Subsonic) Aerodynamics Subsonic-Supersonic Open Jets 	Automotive Industry Department of Production and CNC Mentor: Dr. Frederic Ravet Developed Test Rig for: <ul style="list-style-type: none"> Design and Functional Analysis for IC Engine Components Numerical Spray & Combustion 	Funded by MEXT Scholarship, Govt. of JAPAN Mentor: Prof. Kojiro Suzuki Had Research Experience: <ul style="list-style-type: none"> Hypersonic Aerothermodynamics Numerical Simulation and Code Development for Hypersonic Flow 	Funded by DST, Govt. of INDIA Mentor: Prof. G. Jagadeesh & Prof. Smita Dasgupta Had Research Experience: <ul style="list-style-type: none"> Hypersonic Aerothermodynamics Numerical Simulation for detonation combustion 	Funded by SFI and Systems Canada Mentor: Dr. Rory Managhan & Dr. Gilles Bourque Had Research & Teaching Experience: <ul style="list-style-type: none"> Hypersonic Aerothermodynamics Gas Turbine Emission Modelling Guided Masters Students for Wind Tunnel Design for Academic Purpose 	Assistant Lecturer (2019 onwards), AAE, Engineering, IT Carlow, IRELAND Main directions of research: <ul style="list-style-type: none"> Green Fuel Conversion Systems Detonation Combustion Systems Cost-Scopy Manufacturing Hypersonic System Modelling
Other Short Experiences: <ul style="list-style-type: none"> Summer Internship at University of New Hampshire, May 2005 - July 2006, US (USA) Guest Faculty, MNIT Allahabad, INDIA (2 Weeks), Courses on Engineering Mechanics & Numerical Heat Dynamics Research Student, Suzuki Lab, The University of Tokyo (April - Dec. 2013) Visiting Researcher, Suzuki Lab, The University of Tokyo (Oct., 2016 - Feb. 2017) 					
Dr. Ashish Vashishtha (PhD., U-Tokyo)		IT Carlow (engCORE)		June 14, 2021	

Waves in $M_{\infty} > 1$ Flows:

Any change in flow properties happen by waves:
Mach waves: weak pressure waves present in $M_{\infty} > 1$ flow.
Compression Waves: (All the images from Rathakrishnan E., Applied Gas Dynamics)

Expansion Waves: Expansion fan, Prandtl Meyer / Isentropic Expansion

Continuous Compression: Expansion rays

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Waves in $M_{\infty} > 1$ Flows:

Shockwave: A non-linear wave characterized by sudden jump in Pressure, Temperature and Density across it.

Normal Shock

$p_1 < p_2$
 $V_1 > V_2$
 $T_1 < T_2$
 $\rho_1 < \rho_2$
 $M_2 < 1.0$

Normal Shock at $M = 1.5$

Oblique Shock at $M = 1.76$

$p_1 < p_2$
 $V_1 > V_2$
 $T_1 < T_2$
 $\rho_1 < \rho_2$
 $M_2 > 1.0$

Detached Bow-Shock

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Generation of Shockwaves:

Natural Sources:

Thunderclap **Volcanic Eruption** **Meteorite Air-blast**
Cosmic Explosions **Solar Winds**

SHOCK WAVE

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Feedback for Webinar on "Shock Waves Applications"

