



Material Advantage IIT Tirupati Chapter

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Department of Mechanical Engineering, IIT Tirupati

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Titled

**ENHANCING OUR UNDERSTANDING OF
THE QUASI-STATIC, CYCLIC FATIGUE AND FRACTURE BEHAVIOUR
OF METAL MATRIX COMPOSITES**

By

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Akron, Ohio 44325, USA

Date & Time: January 05th, 2023, 2:00-3:00 PM

Venue:



TC-1 Classroom, IIT Tirupati India

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ABSTRACT

In this technical presentation, a few of the salient attributes and intricacies specific to the domain of metal-matrix composites or metal-based composites as an economically affordable and potentially viable replacement or alternative to metals for selection and use in both performance-critical and non-performance-critical applications will be presented and briefly emphasized/discussed. The intricacies specific to microstructural influences on quasi-static, cyclic fatigue and final fracture behaviour of an aluminium alloy-based metal-matrix composite will be presented and briefly discussed. Test specimens of the chosen aluminium alloy metal-matrix composite were deformed both in uniaxial tension and cyclic fatigue. The cyclic fatigue tests were conducted under both stress-control (high-cycle fatigue) and strain control (low-cycle fatigue). The conjoint influence of intrinsic microstructural effects, and intrinsic microscopic mechanisms in governing deformation and fracture behaviour of the engineered composite will be rationalized considering competing and mutually interactive influences of nature of loading, intrinsic microstructural effects, deformation characteristics of composite micro constituents and macroscopic aspects of fracture.

ABOUT THE SPEAKER

Dr. T. S. Srivatsan (Dr. Sri) received his Bachelor of Engineering degree in Mechanical Engineering from **Bangalore University** in July 1980. He obtained his Master of Science degree in Aerospace Engineering in 1981 from **Georgia Institute of Technology** (Atlanta, USA) and the Doctor of Philosophy degree in Mechanical Engineering also from **Georgia Institute of Technology** in 1984. After short stints at the **Georgia Institute of Technology** in the role of Instructor, the **Centre for Computational Sciences** as Research Associate and **Materials Modification Inc.** (Virginia) as Manager of Research & Development, he joined the University of Akron in 1987 and progressively rose in rank to become Professor in 1997. He has given over 275 technical presentations at conferences and symposia while concurrently authoring over 750+ publications in archival journals (national and international) conference proceedings and bound volumes, technical reviews of books and technical reports. He has authored and/or edited 68 books and 5 monographs in the areas spanning Materials Science & Engineering, Manufacturing Processes, Fatigue & Fracture Behaviour of Materials, Machining of Composite Materials and Mechanics of Solids. An Outstanding Young Alumnus of his Alma Mater Georgia Institute of Technology, **Dr. Srivatsan** is also a **FELLOW** of three American Societies; the **American Society for Materials**, the **American Society of Mechanical Engineers** and the **American Association for the Advancement of Sciences**. He has the honour of being chosen for inclusion in **Who's Who in America**, **Who's Who in Teachers in American Education**, and **Who's Who in the World** (2018-2022).

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