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Joint event on

WORLD CONGRESS ON SMART MATERIALS AND STRUCTURES
&
3rd International Conference on
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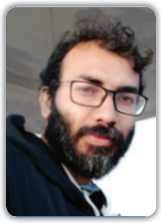

Arun D I

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Smart materials: Evolution of intelligence

Stone Age, Bronze Age, Iron Age, and Silicon Age are the names given to the timeline of human civilization history which highlight the materials in use during each period. The mere naming process suggests that each of these periods evolved technologically and culturally to the next era, primarily through advancements in the field of materials science. The demand for lighter, stronger, and more reliable materials has resulted in the study of a new prospect called multifunctional materials. A specific subgroup of such materials with the capability to sense, process, and respond to external stimuli evolved as smart materials. Camouflage of a chameleon, shyness of the leaves of touch-me not plant, ink shooting of a squid are few of the popularized smartness exhibited by nature, which we humans have copied as ready made solutions during the various stages of our developments. More the challenges, more we looked for stable solutions from natural smart systems. The basic units of such smart systems are termed as smart materials that by function or properties respond intelligently. Shape memory systems or materials find a significant place among the synonyms used for smart materials in this modern era. Alloys, ceramics, gels, polymers and their combinations enrich the domain of shape memory materials, applications of which ranges from cardiovascular stents to deploy-able robotic arms for deep space missions. Today, technology's Cutting edge lustre portrays new manufacturing freedom of shape memory materials inducing multiple dimensions defining 4D printing and 5D materials. The lecture titled "Smart materials: Evolution of Intelligence" will take a journey through the natural smart systems, their influence, various shape memory materials and their mechanisms, applications that links us back to the nature.

Biography

Arun D I is a Scientist at Vikram Sarabhai Space Centre, ISRO and is responsible for design and realisation of composite overwrapped propellant tanks for electric propulsion spacecrafts for ISRO missions. His area of research focuses on smart materials and structures as replacement for the pyro-systems currently in use for deployment in spacecrafts and other space based applications. He has published a book titled SHAPE MEMORY MATERIALS with CRC press, Taylor & Francis group which addresses the basic principles, synthesis / fabrication and applications of smart materials, specifically shape memory materials. In addition to the book, he has generated many research articles about shape memory materials (both theoretical and experimental) which are published with popular refereed journals. His bachelor degree is in Civil Engineering, Masters in Project management and PhD is in the field of Aerospace Engineering.

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