From Editor's Desk

S.B. Krupanidhi, Exec. Editor

Smart materials and structures may be considered as systems, those adapt to the surrounding environment in some possible way, and they even result in an unrealized functionality and performance. Smart materials are known to change their mechanical properties or provide some mechanical function in response to an external stimulus. A smart structure often involves smart material actuators and/or sensors to collectively adapt to its surroundings. Significant demands are persistent in today's technological developments for improved human life conditions, smart controls and health monitoring.

A major research initiative was launched in India in the last more than 5 years to develop innovative smart structures, systems and their combination. This also resulted in a major upsurge in research community, which demanded advanced synergy in the form of society formation (ISSS), organizing international conferences (bi-annual) and a publication platform as well to bring the researchers further closer. We are very pleased to announce that a new journal (Journal of ISSS), hence, is formulated and being launched to cater these needs.

Journal of ISSS (JISSS) is designed in a multi-disciplinary nature to explore generation and functionalization of different forms of sensing and actuation. The journal is primarily in the area of smart materials and structures, and aims at publishing the most significant results across the globe. The results could be as distinct as the development of new materials and active composite systems, to complex structural systems, which generate new capabilities by incorporating enabling new smart material transducers. These systems may span from the nano-scale to macroscopic systems. The scope of the journal spreads across plethora of areas dealing with smart and intelligent systems, which include, Materials science, Sensing and actuation, Optics and electromagnetics, Controls, Information processing, SHM and IVHM.

The journal editorial committee has brought together several Associate Editors who are experts in corresponding areas. The editorial committee is also committed to ensure quick and fair reviews in all sub-disciplines of smart materials, systems and structures. It is also aimed to internationalize the journal publication status and publish on-line as well for an easy and fast access by the readers.

I take this opportunity to invite the researchers to contribute actively to the journal and make it a global success.

Professor Krupanidhi holds a Ph.D., in Solid State Physics (1981) and obtained 3 years of post-doctoral experience at Queen's University, Kingston, Canada (1984). He served as a principal staff scientist at Motorola, Alnbuquerque , USA (1984-88), and later he served as a Professor of Engineering Science & Mechanics, Penn State University, USA (1988-1995). He is currently, a Professor at Materials Research Centre Indian Institute of Science, Bangalore, India since 1995. He is awarded with Tatachem Chair Professorship, Rustum Choksi medal and J.C. Bose Fellow. He is a Fellow of Indian Academy of Sciences, Fellow of Indian National Science Academy, and Fellow of Indian National Academy of Engineering.

Professor Krupanidhi's research on multi-component ferroelectric oxides has focused on the oriented and epitaxial growth by pulsed laser ablation and magnetron sputtering. He was the first to couple the ECR plasma to physical vapor growth for low temperature epitaxy in complex oxides. Professor Krupanidhi was one of the first to integrate ferroelectric thin films on semiconductors to demonstrate ferroelectric field effect transistors. Currently he is focusing on the development of engineered ferroelectric nano structures for accomplishing high capacitance density for ultra high density memories. Most recently these results are further confirmed by polarization mapping via piezo force microscopy by his group.

Professor Krupanidhi's work in the area of relaxor ferroelectrics has received major attention. His group was the first to design and formulate the multilayered relaxors which has shown higher orders of strain via electrostriction. Most recently, his group discovered an unconventional phase transformation in the asymmetrically multilayered relaxors through interfacial strain coupling. The mechanical stain acts as a mediator among the electric and magnetic domains and their micro structural interactions among the domains. This aspect has been exploited in the artificially structured superlattices of the multiferroic pervoskites. The interfacial strain induced charge coupling was successfully demonstrate in terms of artificial magnetoelectric effect for the first time.

In the area of III-V compound semiconductors, Professor Krupanidhi developed space quality solar cells (funded by ISRO) involving MOCVD growth of epitaxial GaAs on Ge substrates. Most recently Professor Krupanidhi's research has been extended to the design and development of quantum well and quantum dot structures of epitaxial GaAS by MBE, specifically for longer wavelength Quantum Well structured Infrared Photodetectors (QWIPs). In addition, his group pioneered droplet epitaxy of quantum dots of GaAs using MBE process. These quantum dots are successfully employed in the band gap engineering and tuning of the IR detector wavelength. Most recently, his group developed epitaxial III-nitride quantum structures for high bright LEDs.