



We present the last issue of the year 2013 which is guest edited by Professor S. Gopalakrishnan, Department of Aerospace Engineering. High performance advanced composites have become a major component of aircraft manufacture in recent years and the review articles in this issue concentrate on the design aspects, performance evaluation and durability tests conducted on such materials. Prof. Gopalakrishnan's effort in collating 11 reviews on this topic and the meticulous editing done by him is appreciated and gratefully acknowledged by the editorial board.

It is time now to look at the year 2014, it is "very very special" as we enter our Centenary year. It is planned to earmark the mid year issue for this special occasion and efforts are underway to commemorate and cherish what has elapsed in 100 years in the form of invited reviews. The year 2014 is also declared as the International Year of Crystallography and our first issue of the year 2014 entitled "From Kohi-noor to IYCr 2014" is getting ready to register the remarkable achievements of this branch of Science with specialist review articles.

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High Performance Advanced Composites

Composites are the materials of future. These are lightweight high strength materials that are gradually replacing traditional structural materials such as Aluminum and Steel across engineering disciplines. Corrosion is a non issue in composites. In the field of aerospace engineering, its use has increased significantly in recent times. In the new generation advanced giant aircrafts made from Boeing (787 aircrafts) and Airbus (A-380 aircrafts), more than 50% of the structural materials are made from Composites. India has also made significant strides in the development of composites technology. The indigenously made Tejas fighter aircraft (Light Combat Aircraft) and Dhruv Helicopters (Advanced Light Helicopters) contain more than 60% composites.

The behavior of composites under applied loads is many orders complex compared to metallic structures. Anisotropic construction and complex failure mechanisms makes the design, modeling and analysis of composites very challenging. The number of design parameters in composites is many and as a result, it offers designers many design options. Due to this, the design philosophy has undergone sea change and with more emphasis on damage tolerant design as apposed to safe life design. Such design philosophy mandates periodic inspection, which requires development of robust Non Destructive Evaluation and Structural Health Monitoring Methodologies. In addition, composites have poor impact resistance and the design has to consider impact behavior in its design philosophy. Manufacturing of composite components is yet another challenging area where much advances has taken place. Some of these issues are addressed in this special issue on “*High Performance Advanced Composites*”. This issue contains 11 articles written by well known researchers from both India and abroad and I take this opportunity to express my heart felt thanks to all the contributors for their time and effort in bring out this volume. I would also like to thank the Editorial Board of The Journal of Indian Institute of Science for providing me with an opportunity to edit this volume.



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