From the Editor's Desk

In the first issue of 2011, we have concentrated on Algebra and its applications and our guest editor Professor Dilip Patil has put an enormous personal effort to get the articles shaped to mathematical perfection. He has invited authors in specific areas of mathematics and engineering and has produced a nice balance of articles, some dealing with basics and underlying principles of modern day Algebra and the others looking at the application perspectives in engineering sciences. This issue hence should serve as an important handbook for students and readers who are looking for a clear understanding of fundamental aspects from modern Algebra. The forthcoming issues listed on the back cover will give the readers the scope and outlook of our journal to specifically focus on bringing out review articles on key areas in different branches of science and engineering.

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Editorial

Algebra and its Applications

The modern scientific research has become interdisciplinary in nature. Creativity and imagination are essential for research in mathematics. In view of the growing need of applications, several areas of mathematics, like Abstract Algebra, Elementary Number Theory, Combinatorics and Algebraic Geometry have become increasingly important to science and engineering, in particular, to Computer Science, Statistics, Economics and Information Theory. It is therefore essential that there should be emphasis on acquiring knowledge in theoretical aspects, particularly in the fundamental concepts from Algebra, Elementary Number Theory, Galois Theory, Algebraic Curves and their applications. Therefore this special issue has focused on Algebra and its Applications.

Altogether there are seven articles of which the first four are fundamental in nature and the other three are application-oriented. The first four articles are "Group actions and Elementary Number Theory", "Galois theory and Solvable Equations of Prime Degree", "Euler's proof of Fundamental Theorem of Algebra", and "Burnside Algebra of a Finite Group". Just a few words about the first two articles – In the first, the authors describe in an interesting way the fundamental concepts of Algebra and Elementary Number Theory. The readers are introduced to the abstract concepts through applications. Taking into account the wealth of information given, the article is rather short and yet gives proofs; some of these proofs are rather short, and some others are sketchy, but quite innovative. – In the second, on Galois Theory, the authors have made an attempt to do justice to both its great history and the surprising link between Group Theory and the roots of polynomials. I am sure that the readers will enjoy the elegance of ideas therein. It is also important to understand how these ideas have emerged historically and the sources thereof. Further, it is seen that new mathematics is created by such ideas and this leads to greater applications.

On the side of applications there is an article on Algebraic Geometric Codes which uses results from Algebraic Geometry. The last two articles on "Algebraic Approaches to Space-Time Code Construction for Multiple- Antenna Communication", and "Distributed Function Computation over Fields and Rings via Linear Compression of Sources" showcase some applications of Algebra and Elementary Number Theory in the field of communication engineering.

I hope that this collection of articles would be useful to our readers from both mathematics as well as engineering disciplines and that they come together to strengthen the extremely important and the fertile ground between mathematics on one side and science and engineering on the other.

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