

Preface

Nonlinearity plays an important role in almost all fields of science and technology. Examples of areas where concepts like chaos, fractals, etc developed through nonlinear studies have had an impact are.

- Biology and image reconstruction
- Chemical physics and material science
- Control systems and meteorology
- Ecology and plasma physics
- Economics and statistical mechanics
- Fluid mechanics

Given the varied nature of applications where nonlinearity is important, researchers in a broad range of fields have contributed to recent developments in the field. Consequently, interdisciplinary interaction has been largely responsible for the growth of the field and for its recent extraordinary pace of progress.

Two special issues of the *Journal of the Indian Institute of Science* on nonlinear dynamics are envisaged that reflect on the above interdisciplinary nature of the field. We have contributions from researchers working in several different areas of nonlinear dynamics. Nevertheless, this collection is far from being an exhaustive one and many important areas have been left out. The aim of these special issues is limited to providing a sampling of the problems being studied.

In the first issue, five articles have appeared. In this issue, Kavitha and Narayana Dutt review the application of nonlinear dynamics to analyse EEG data. The paper discusses various models that have been developed for EEG signals using chaotic analysis. Tamizhmani and Kanagavel review certain integrability properties of the differential-difference Kadomtsev-Petviashvili equation. Porsezian reviews the concept of optical solitons in nonlinear fiber optics. This has important implications in the field of communications.

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