

NEW FUNDAMENTAL ASPECTS IN NONLINEAR SCIENCES

The aim of this special session is to present recent advances of theoretical, computational, and practical aspects for modeling nonlinear phenomena, as well as exploring the new solution techniques developed for dealing with nonlinear equations, in order to reveal new fundamental aspects in science and engineering.

Nonlinear sciences play an important role in applied mathematics, physics and also in engineering. The behavior of many important phenomena is governed by nonlinear equations. Solving such equations often provides researchers and scientists with deeper understanding of the theories and processes under study, often not rendered through observation. Numerical and analytical solution techniques and methods have enjoyed great success in dealing with nonlinear equations. In particular, approximate analytical methods have developed drastically in recent years, attracting the attention of scientists and engineers to explore new possibilities in the field.

We invite authors to submit original research articles as well as commentary and review articles that will stimulate the continuing efforts in nonlinear sciences and related theories. The special session will provide a forum for researchers and scientists to communicate their recent developments, and to present their novel results on nonlinear sciences and related problems. The topics to be considered for this issue would include (but are not limited to):

- Stability theory of solitary waves
- Homotopy method
- Symmetries and separation of variables
- Hirota bilinear method
- Painlevé test and analysis
- Hamilton-Jacobi approach

- Bäcklund transformations
- Variation of parameters method
- Continuous and discrete integrable equations
- Interactions and collisions of solitary waves
- Numerical approaches to nonlinear waves
- Wave phenomena in science and engineering