

## Preface

The International Conference on Engineering Vibration (ICOeV 2015) has been held in Ljubljana, Slovenia, 7-10 September 2015. The conference was an action of the International Federation for the Promotion of Mechanism and Machine Science (IFToMM). It has been held under auspices of the University of Ljubljana, Faculty of Mechanical Engineering. The aim was to bring together a broad spectrum of scientists and researchers, who are focusing on Engineering Vibrations in a very broad sense. The Ljubljana conference has attracted 200 participants from 31 countries including senior scientists, as well as master and PhD students. During four days of the conference 17 specialized mini-symposia and 8 sessions on various general topics took place.

The top-quality papers have established the ICOeV as a high-level forum where engineers, researchers, university teachers, students and other professionals have had an opportunity to present recent developments and discuss the scientific, technical and experimental results and ideas in various areas of rational, experimental and applied Dynamics.

Take a note, that dynamics as a scientific discipline draws inspiration from a large variety of engineering areas, such as Mechanical and Civil Engineering, Aero and Space Technology, Wind and Earthquake Engineering and Transport and Building Machinery. Moreover, the basic research in Dynamics nowadays includes many fields of theoretical physics and various interdisciplinary subject areas.

Two mini-symposia oriented to problems of Non-linear Dynamics have been organized:

- (i) MS01 - Non-linear Dynamics and Dynamic Stability, organized by Jiří Náprstek (Czech Republic),
- (ii) MS07 - Nonlinear Dynamic Interactions and Phenomena: Emergent Methods and their Applications in Engineering and Science, organized by Jose-Manoel Balthazar and Paulo Batista Goncalves (Brazil)

The scope of both mini-symposia was broad. Papers of discrete and continuous, smooth and non-smooth, deterministic and random systems subjected to external excitation or exhibiting self-exciting vibrations have been discussed. Authors showed employment of analytical, semi-analytical, or numerical approaches. Papers on recent and ongoing research as well as papers of multi-disciplinary nature were presented, including the emerging areas of micro and bio-mechanics.

At mini-symposia MS01 and MS07 23 papers have been orally presented. Organizers of MS01 and MS07 invited authors of all presented papers after the conference to submit modified and extended versions to the special issue of the journal Applied Mechanics and Materials. Every manuscript has been strongly assessed by two or three reviewers of different countries than the authors. After reviewing and modification process 11 papers have been approved for publication in the AMM special issue.

We are firmly convinced that this volume represents a well-balanced overview of theoretical, numerical and experimental work on fundamental and applied studies performed in Non-linear Dynamics and related branches during recent years.

Looking through the volume, highly promising trends are noticeable. Clearly many challenging topics are being investigated using extremely sophisticated combinations of analytic and numeric procedures. Many qualitatively new phenomena have been identified theoretically and verified experimentally. Non-conventional methods based on various aspects of topology are being

developed and applied directly in relevant exploration. Research in Dynamics is adopting more and more discrete models inspired by principles of digital technology itself. Uncertainty modeling is making good progress, offering various new approaches in the realm of Dynamics and Vibration Control. The formulation of problems of Stochastic Dynamics reflects better natural conditions and provides realistic results which have broad applications.

Concluding the introductory remarks, our warmest gratitude should be expressed primarily to Organizing Committee of the ICOeV 2015 Conference, in particular to Miha Boltežar and Janko Slavič for an enormous effort they paid. Their far-sighted management and exceptional enthusiasm were essential for the success of the Conference, which went smoothly and left fond memories at all participants regarding both scientific and as well as social aspects.

It is our great privilege to show recognition to all the authors for their invaluable contributions and their willingness to share their knowledge with other readers. Their contribution has become the backbone of the scientific success of the Conference and ensures the high quality of this special volume. At the same time, we cannot complete the preface to this special volume without expressing our sincerest thanks to a number of individuals among our younger colleagues whose selfless help made possible to prepare this publication.

**Guest editors:**

**Jose-Manoel Balthazar    Paulo Batista Gonçalves    Jiří Náprstek**

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