

Aims and Scope

The University of Mondragon in collaboration with the Applied Mechanics Group of the Institute of Physics and the Technical Committee on Vibration and Sound of the American Society of Mechanical Engineers is hosting a meeting on the mechanics of systems employing slender structural elements. This conference forms a continuation of a successful meeting series on the Mechanics of Slender Structures staged by the University of Northampton in 2004 and 2006 ([website: http://www.eng.nene.ac.uk/~conf2006/Symposium.htm](http://www.eng.nene.ac.uk/~conf2006/Symposium.htm)) and the University of Maryland Baltimore County in 2008 ([website: http://www.eng.nene.ac.uk/~moss2008/index.html](http://www.eng.nene.ac.uk/~moss2008/index.html)).

Applications of slender structures include terrestrial, marine and space systems. Moving elastic elements such as ropes, cables, belts and tethers are pivotal components of many engineering systems. Their lengths often vary when the system is in operation. The applications include vertical transportation installations and, more recently, space tether propulsion systems. Traction drive elevator installations employ ropes and belts of variable length as a means of suspension, and also for the compensation of tensile forces over the traction sheave. In cranes and mine hoists, cables and ropes are subject to length variation in order to carry payloads. Tethers experiencing extension and retraction are important components of offshore and marine installations, as well as being proposed for a variety of different space vehicle propulsion systems based on different applications of momentum exchange and electrodynamic interactions with planetary magnetic fields. Furthermore, cables and slender rods are used extensively in civil engineering; in cable-supported bridges, guyed masts and long-span roofs of buildings and stadia. Also, suspended cables are applied as electricity transmission lines. Chains are used in various power transmission systems that include such mechanical systems as chain drives and chain saws. Moving conveyor belts are essential components in various material handling installations.

The behaviour of these elements plays a significant role in the performance of the host structure and a holistic approach is needed in the analysis and design of the entire

system. The symposium will bring together experts from various fields: structural mechanics, thermo-mechanics, dynamics, electrodynamics, vibration and control, structural health monitoring, artificial intelligence, and materials science to discuss the current state of research as well as rising trends and direction for future research in the area of mechanics of slender structures. The meeting is aimed at improving the understanding of structural and thermo-mechanical properties and behaviour of slender structures. More specifically, the methods for the suppression of adverse dynamic responses of such systems will be addressed. The scope covers analytical, numerical, and experimental research into the mechanics of ropes, cables, tethers, chains, yarns and fibres as well as their interactions with the host structure in various engineering applications.

Topics

Technical papers addressing the following and related subjects are invited for submission:

- Acoustic emission in damage detection
- Active and passive damping strategies
- Composite materials
- Contact and friction models
- Dynamic stability
- Electro-mechanical and magneto-mechanical interactions
- Flow-induced vibrations and fluid-structure interactions
- Inspection, monitoring and sensor techniques
- Intelligent materials and structures
- MEMS technology
- Non-linear dynamic interactions
- Non-stationary dynamic phenomena
- Stochastic dynamics
- Stress and fatigue
- Structural integrity and damage assessment
- Testing methods
- Thermo-mechanical behaviour
- Residual strength and endurance prediction
- Vibro-acoustics
- Vibration and control

Abstracts and Papers

Abstracts of up to 300 words are invited in electronic format and should be submitted as an MS Word file via e-mail to the symposium office before 18 December 2009. The abstract should state the authors' names, affiliations and e-mail address, the title of the paper, the objectives, methodology employed, the main results, and the conclusions of the research. Notification of acceptance of the abstracts will follow by 22 January 2010. If the abstract is accepted, authors will be asked to submit their paper no later than 26 March 2010. Copies of the abstracts will be available in booklet format and the papers will be included in the CD-ROM of the conference proceedings.

Keynote Speakers

Keynote addresses will be given by renowned international experts:

Olivier **Bauchau**, Georgia Institute of Technology, U.S.A.
Matthew **Cartmell**, University of Glasgow, U.K.
Ignacio **Herrera**, University of Extremadura, Spain
Nick **Jones**, Johns Hopkins University, U.S.A.
Bryan E. **Laubscher**, The International Space Elevator Consortium, U.S.A.
Andrei **Metrikine**, Delft University of Technology, The Netherlands

Guest Speaker

Rafael **Macía**, Otis-Spain

Key Dates

Deadline for submission of abstracts:	08 Jan 2010
Authors notified of acceptance of abstracts:	29 Jan 2010
Submission of final papers:	09 Apr 2010
Conference dates:	21-23 Jul 2010

Venue and Accommodation

The symposium will be held at the Miramar Palace, Donostia - San Sebastian, Spain. Accommodation will be available at local hotels.

The airports closest to Donostia – San Sebastian are Biarritz B.A.B. Airport (France) and Bilbao Loiu Airport (Spain).

Registration and Fees

The deadline for registration is 2nd July 2010. Registration form and details will be available soon from the symposium website:

<http://www.mondragon.edu/MoSS2010/>

Organising Committee

Xabier **Arrasate**, University of Mondragon, Spain (Host)
Matthew **Cartmell**, University of Glasgow, UK
Ignacio **Herrera**, University of Extremadura, Spain
Stefan **Kaczmarczyk**, University of Northampton, U.K.
Lawrie **Virgin**, Duke University, U.S.A.
Weidong **Zhu**, University of Maryland BC, U.S.A.

Symposium Office

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Greg **Chirikjian**, Johns Hopkins University, U.S.A.
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Dewey **Hodge**, Georgia Institute of Technology, U.S.A.
Erdem **Imrak**, Technical University of Istanbul, Turkey
Radoslaw **Iwankiewicz**, Technical University of Hamburg, Germany
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Brian **Mace**, The Institute of Sound and Vibration Research, U.K.
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Stewart **Mcwilliam**, University of Nottingham, U.K.
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Noel **Perkins**, University of Michigan, U.S.A.
Gexue **Ren**, Tsinghua University, China
Randy **Roberts**, Otis, U.S.A.
Rory **Smith**, ThyssenKrupp Elevator Corporation, U.S.A.
Yoshiaki **Terumichi**, Sophia University, Japan
Robin **Tucker**, Lancaster University, U.K.
Gert **van der Heijden**, University College London, U.K.
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Changming **Zhu**, Shanghai Jiao Tong University, China

Symposium on Mechanics of Slender Structures MoSS 2010

21 - 23 July 2010

Hosted by



In collaboration with

IOP | Institute of Physics
Applied Mechanics Group



Technical Committee
on Vibration and Sound



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Conference website:

<http://www.mondragon.edu/MoSS2010/>