

*The 5<sup>th</sup> Symposium on  
Mechanics of Slender Structures*

# **MoSS 2015**

21 - 22 September 2015

Organized by

Department of Engineering and Technology



In collaboration with

**IOP** | Institute of Physics  
Applied Mechanics Group

Supported by



Endorsed by

[The ASME Technical Committee on Vibration and Sound \(TCVS\)](#)

Website: <http://www.moss2015.org.uk/>

## **Aims and Scope**

The Department of Engineering and Technology, University of Northampton, in collaboration with the Applied Mechanics Group of the Institute of Physics 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 first held in Northampton, U.K., in 2006 (website <http://www.eng.nene.ac.uk/~conf2006/Symposium.htm> ), followed by the event hosted in Baltimore, USA., in 2008 (website <http://www.eng.nene.ac.uk/~moss2008/index.html> ), in San Sebastian, Spain (website: <http://www.mondragon.edu/MoSS2010/>) and in Harbin, China, in 2013 (<http://cndr.hit.edu.cn/MoSS2012>)

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.

Tall buildings and towers represent another important class of slender structures. In the modern high-rise built environment tall buildings have increased height and slenderness as well as reduced weight. Such structures are designed to withstand a broad range of external loads such as strong wind and seismic excitation. However, they are prone to structural vibrations and complex resonance

phenomena that cause damage, affect their occupants and modular installations such as vertical transportation/ lift systems. The performance of these installations plays a significant role in the building operation and a holistic approach is needed in the analysis and design of the entire structural 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 **the end of March 2015**. 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 **the end of April 2015**. If the abstract is accepted, authors will be asked to submit an extended abstract (maximum six pages A4) by **the end of May 2015**. Authors will be notified of acceptance by **the end of June 2015**.

The authors will be invited to submit full papers for publication in the **Open Access peer-reviewed *Journal of Physics: Conference Series (JPCS)*** which is part of ***IOP Conference Series***. All papers published in IOP Conference Series are abstracted in Conference Proceedings Citation Index – Science (CPCI-S, Thomson Reuters, Web of Science) and are fully citable. Upon publication the papers will be free to download in perpetuity.

The Authors who will present their work on research subjects balancing the theoretical advances and practical new technologies and techniques in the area of transportation systems in built environment and associated areas will have an opportunity to submit their papers for publication in an open-access peer-reviewed journal ***Transportation Systems in Buildings (TSIB)*** which is edited and managed jointly by the University of Northampton and the Chartered Institution of Building Services Engineers (CIBSE) Lifts Group.

## Keynote Speakers

Keynote addresses will be given by renowned international experts. Please refer to the conference website (<http://www.moss2015.org.uk/>) for further details.

## Key Dates

<b>Deadline for submission of abstracts</b>	<b>27 April 2015</b>
<b>Authors notified of acceptance of abstracts</b>	<b>The end of April 2015</b>
<b>Submission of extended abstract</b>	<b>The end of May 2015</b>
<b>Authors notified of acceptance of extended abstracts</b>	<b>The end of June 2015</b>
<b>Conference dates</b>	<b>21-22 of September 2015</b>

## Venue and Accommodation

The event will be held at [Highgate House Conference Centre & Hotel](http://www.liftsymposium.org/), Creaton, Northampton. The delegates attending the MoSS symposium will have an opportunity to attend the 5<sup>th</sup> Symposium on Lift and Escalator Technologies planned for 23 – 25 September 2015 (<http://www.liftsymposium.org/>).

## Registration and Fees

The registration fees are as follows:

<b>Full</b>	<b>**£275.00</b>
<b>Supporting Organization</b>	<b>£205.00</b>
<b>Student</b>	<b>£170.00</b>
<b>Student (excluding dinner and social event)</b>	<b>£130.00</b>

\*\* The deadline for registration is 4th September 2015. Registrations received before 30 June 2015 will be entitled to an Early Booking Discount of £30.00. The fees include admission to sessions, coffee breaks, lunches, the symposium dinner on 21<sup>st</sup> September, a copy of the book of abstracts and the CD-ROM of the symposium proceedings. A social event before the dinner on 21<sup>st</sup> September is planned and participation in this event is included into the registration fee.

## The 5<sup>th</sup> Symposium on Lift and Escalator Technologies

(<http://www.liftsymposium.org/>) will be held at Highgate House directly after the MoSS 2015 event (from 23 to 24 September 2015). Full delegates attending both events will receive a discount of £30.00 on their registration fees for the events.

## The International Organizing Committee

Professor José Manoel Balthazar, Aeronautics Technological Institute (ITA), Brazil

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