

## Symposium on the Mechanics of Slender Structures

The Symposium on the Mechanics of Slender Structures (MoSS 2006; website <http://www.eng.nene.ac.uk/~conf2006/Symposium.htm> ) was held at the University of Northampton (U.K.) from 28<sup>th</sup> to 29<sup>th</sup> September 2006. The event formed a part of the Inaugural Lift Engineering School 2006-07 held annually by the Lift Technology Section in the Division of Engineering. The symposium was organized in collaboration with the Stress and Vibration Group of the Institute of Physics and was co-sponsored by Invest Northamptonshire, the Lift and Escalator Industry Association, ThyssenKrupp Research Innovation and Design (TRIaD) Product Planning Group, the British Gear Association and the Institution of Mechanical Engineers.

The meeting was attended by over fifty delegates representing the elevator and other industries as well as academic institutions from Austria, Denmark, Finland, Germany, Iran, Japan, Switzerland, The Netherlands, Turkey, U.K. and USA.. A diverse range of topics featured in the seminar presentations covering the theory and applications of slender structures in terrestrial, marine and space systems, including vertical transportation installations and space tether propulsion systems.

Six keynote lectures were given by international experts. They included:

- *Dynamics of Cables: Overhead Lines, Belt Drives and Electrodynamical Tethers* by Professor Peter Hagedorn of Technical University of Darmstadt (Germany);
- *Localisation and Plying in Rod-Like Structures* by Dr Gert van der Heijden of University College London (U.K.);
- *On the Weakly Nonlinear Dynamics of Axially Moving Belt Systems* by Professor Wim Van Horssen of Delft University of Technology (The Netherlands);
- *How to Achieve Good Elevator Ride Quality* Rory Smith of ThyssenKrupp Elevator Corporation (U.S.A.);
- *Dynamic Stability of Translating media with Variable Length and /or Speed* by Professor Weidong Zhu of University of Maryland Baltimore County (U.S.A.);
- *Structural Health Monitoring Based on One-Time Measurements* by Dr Helmut Wenzel of Vienna Consulting Engineers (Austria)

Following keynote presentations the technical sessions featured seventeen regular papers addressing the following subjects:

- Damping strategies and models
- Composite materials
- 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
- New technologies
- Non-linear dynamic interactions
- Non-stationary dynamic phenomena
- Stress and fatigue
- Structural integrity and damage assessment
- Testing methods
- Thermo-mechanical behaviour
- Residual strength and endurance prediction
- Vibration and control

The meeting brought together experts from various fields: vertical transportation, civil engineering, 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 symposium included a workshop on elevator traffic design and analysis conducted by Rory Smith of ThyssenKrupp Elevator Corporation. The latest developments in the area of elevator technology were presented during the meeting including Teuvo Vântänen's (KONE, Finland) invited lecture on the MaxiSpace™ counterweight-less elevator and its working principles and technical characteristics. The proceedings were concluded by a presentation by Derek Smith of Otis Ltd. (U.K.) and discussion forum on the use of lifts during evacuation of buildings in the event of fire, earthquake, explosion and other emergency situations. It was proposed that a group comprising academic and industrial experts be established to conduct an in-depth investigation into the problem of evacuation of high-rise building structures including research into the issue of the monitoring of the condition and the dynamic response / vibration of the building structure to detect early signs of emergency events.