

**Second United States – Japan Workshop on**  
**“Structural Dynamics and Monitoring of Bridges and**  
**Flexible Structures against Wind Hazards”**

November 12-14, 2011

Venue:  
Northeastern University, 360 Huntington Avenue, Boston MA  
Stearns Research Building, Room 431



*Organized and Partially Sponsored by*  
Department of Civil and Environmental Engineering  
Northeastern University



## Second US-Japan Workshop on

### “Structural Dynamics and Monitoring of Bridges and Flexible Structures against Wind Hazards”



Northeastern University - November 12-14, 2011

#### Themes of the Workshop

This workshop is a platform for sharing information on the latest developments on structural dynamics and monitoring of bridges and slender structures with an emphasis to wind hazards.

Topics will include, but will be not limited to: structural dynamics, random vibrations, numerical methods, experimental methods (wind tunnel and full scale), monitoring and structural identification, aerodynamic and aeroelastic phenomena, stochastic simulations. The main focus of the workshop will be on flexible bridges. Nevertheless, presentations related to other slender structures affected by wind hazards, such as buildings, and other emerging applications will be welcome.

Invited speakers from Japan and United States are kindly requested to prepare a 20-minute PPT presentation. Each presentation will be followed by a brief discussion (5 minutes). The objective of these presentations is to promote discussion among researchers and to possibly identify common topics for future academic interaction.

#### List of Participants

##### *From Japan*

- Professor Hitoshi Yamada, Yokohama National University (*Delegation Chairman*)
- Dr. Koichiro Fumoto, Japan Bridge Engineering Center
- Professor Hiroshi Katsuchi, Yokohama National University

##### *From USA*

- Dr. Emil Simiu, National Institute of Standards and Technology, Washington DC (*Delegation Chairman*)
- Professor Nicholas P. Jones, Johns Hopkins University, Baltimore, MD (via teleconference)
- Professor Partha P. Sarkar, Iowa State University, Ames, Iowa
- Dr. DongHun Yeo, National Institute of Standards and Technology, Washington DC
- Professor Delong Zuo, Texas Tech University, Lubbock, Texas

##### *Local Committee and Participants from NEU*

- Professor Luca Caracoglia, local organizer (Tel: +1.617.373.5186, lucac@coe.neu.edu)
- Professor Dionisio Bernal (structural health monitoring, damage identification)
- Professor Jerome F. Hajjar, CEE Chairman (steel/composite structures, structural dynamics)
- Professor Andrew T. Myers (steel structures, multi-scale testing, risk modeling), *11/12 only*
- Professor Ming L. Wang (bridge engineering, full-scale monitoring, sensing technology)



## Workshop Agenda

### November 12 (Saturday)

- 10:00 am Meeting in the Lobby of the Colonnade Hotel (<http://www.colonnadehotel.com/>)  
10:30-12:00 Tour of wind engineering laboratory areas (054 Richards Hall and 050 Snell Engineering Building, - Northeastern Campus) with poster session.  
Lunch on your own

### November 13 (Sunday)

Free day - visit to Boston

### November 14 (Monday)

- 9:30-9:55 *Opening* - Session Chair: Professor Katsuchi  
Introduction: Professor Yamada and Dr. Simiu  
Welcome remarks: Professor Hajjar, Chair, Department of Civil and Environmental Engineering, Northeastern University
- 9:55-10:05 Short Break – Breakfast refreshments
- 10:05-11:20 **Session 1: Fundamental Aerodynamics and Experimental Methods** - Session Chair: Professor Sarkar
- "Full-Scale Measurement of Wind Pressure Acting on a Circular Cylinder"*  
Delong Zuo (Assistant Professor), Department of Civil and Environmental Engineering, Texas Tech University
- "Dry galloping characteristics of indented stay cables in turbulent flow"*  
Hiroshi Katsuchi (Professor), Yokohama National University
- "Simplified Wind Flow and Aerodynamic Response of Residential Homes"*  
Emil Simiu (NIST Fellow), National Institute for Standards and Technology
- 11:20-11:30 Break
- 11:30-12:20 **Session 2: Structural Health Monitoring** - Session Chair: Professor Yamada
- "Health Monitoring of Cable-Stayed Bridges- Field Implementations"*  
Ming. L. Wang (Professor), Department of Civil and Environmental Engineering, Northeastern University
- "Bridge Inspection of National Road in Japan"*  
Koichiro Fumoto (Research Engineer - Leader), Japan Bridge Engineering Center
- 12:20-1:40 Lunch – Faculty Club, Northeastern University



1:40-2:30pm **Session 3: Structural Modeling and Identification** - Session Chair: Professor Zuo

*“Factor Analysis in Damage Detection”*

Dionisio Bernal (Professor), Yang Liu (Visiting Scholar) and Salma Mozaffari Kojidi (Graduate Research Assistant), Department of Civil and Environmental Engineering, Northeastern University

*“Identification of Time-Domain Aeroelastic Load Parameters and Response Prediction of Long-span Bridges in Transient Wind”*

Partha P. Sarkar (Professor) and Bochao Cao (Graduate Research Assistant), Department of Aerospace Engineering, Iowa State University

2:30-2:40pm Break

2:40-3:30pm **Session 4: Performance and Design of Slender Structures** - Session Chair: Dr. Fumoto

*“Dynamic Response of Long-Span Bridges Influenced by Wind Loading Uncertainty: A Recently-Developed Simulation Framework”*

Luca Caracoglia (Associate Professor), Department of Civil and Environmental Engineering, Northeastern University

*“Database-Assisted Design of High-Rise Structures for Wind”*

DongHun Yeo (Research Engineer), National Institute for Standards and Technology, Washington DC

3:30-3:40pm Break

3:40-4:30pm **Panel Discussion** - Session Chairs: Professor Yamada and Dr. Simiu

4:30-4:45pm **Final Remarks and Closing**

6:30pm Dinner



**Poster Session** (on display 11/12 and 11/14)

*“Stability Driven Seismic Risk for Slender Monopole Wind Turbine Towers”*

Professor Andrew T. Myers, Northeastern University <sup>(a)</sup>

*“Statistical Buffeting Simulations of Long-Span Bridge Response under Wind Hazards -Fragility Curves and Surfaces-“*

Dong-Woo Seo (Graduate Research Assistant) and Luca Caracoglia, Northeastern University

*“Protecting Tall Buildings against Wind-Borne Debris Missiles: A Probabilistic Perspective”*

Farid Moghim (Graduate Research Assistant) and Luca Caracoglia, Northeastern University

*“Predicting the Nonlinear Dynamics of Cable Networks: A Stochastic Gradient Algorithm Approach”*

Gian Felice Giaccu (Post-doctoral Fellow), University of Cagliari, Italy; Luca Caracoglia and Bernardo Barbiellini-Amidei, Northeastern University

*“Design of a Drag-Force Setup for Small-Scale Wind Tunnel Tests”*

Frank Xia (Undergraduate Research Assistant, REU), Farid Moghim and Luca Caracoglia, Northeastern University

*“Performance-Based Modeling of Slender Structures Affected by High Winds: Aerodynamics of Long Span Bridges and Tall Buildings”*

Luca Caracoglia, Northeastern University

*“Beyond Horizontal-Axis Wind Turbines: An Innovative Wind-Based Energy Harvesting System”*

Luca Caracoglia, Northeastern University

Note (a): Professor Myers will be available for discussion on 11/12 only.

