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# About the Conference

The IStructE Conference on Structural Engineering in Hazard Mitigation is jointly organized by the Institution of Structural Engineers (www. *istructe.org*), Tongji University (*www.tongji.edu.cn*), Tsinghua University (www.tsinghua.edu.cn), and the IStructE China Group. The Conference will be held in Beijing on 28 and 29 October 2013, and in Shanghai on 31 October and 1 November 2013 featuring keynote lectures as well as presentations in parallel themed-based sessions. The IStructE Gold Medal Address 2013 will be held in Shanghai as part of the Conference.

# Organizations

 Organizer The Institution of Structural Engineers Tongji University The IstructE China Group







# Committees

# Conference Advisory Committee

• Connerence Auvisory	Committee
Mr. Yan-Kee Cheng	President, IStructE
Prof. Yi-Yi Chen	Executive Vice Pres
Prof. Jan-Ming Ko	Emeritus Professor,
University	
Prof.Peter Kai-Kwong Lee	Honorary Professor,
	Hong Kong
Prof. Yong-Sheng Li	Former Executive V
	Tongji University
Mr. Nick Russell	Senior Vice Presider
Prof. Da-Sui Wang	Chief Engineer, East
	Design and Researc
Prof. Si Yuan	Vice President, Tsin

### CONFERENCE PROGRAMME

- sident, Tongji University The Hong Kong Polytechnic
- The University of
- Vice President,
- ent, IStructE st China Architectural ch Institute nghua University

# Conference Organizing Committee

## Chairmen:

Prof. Yong-Jiu Shi	Tsinghua University (Beijing)
Prof. Kwok-Fai Chung	The Hong Kong Polytechnic University
Prof. James Jie-Min Ding	Tongji University (Shanghai)

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Dr. Gang Shi	Tsinghua University
Ms. Zoe Ying Zhou	Tongji Architectural Design (Group) Co., Ltd.

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Dr. Xin-Zheng Lu	Tsinghua Uiversity
Dr. Ray Kai-Leung Su	The University of Hong Kong
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Prof. You-Lin Xu	The Hong Kon

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#### Conference Editorial Board

Prof. Kwok-Fai Chung

Chairman & Editor – in – Chief

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• Prof. Yi-Yi CHEN State Key Laboratory of Disaster Reduction in Civil Engineering, Tongji University, Shanghai, China The Concept of 'Buckling Hinges' in H-shaped Steel Members with Non-plastic Elements and Its Usage in Seismic Design

#### Prof. Ahmed ELGHAZOULI

Department of Civil and Environmental Engineering, Imperial College London, U.K.

Structural Robustness of Steel-Composite Structures Under Extreme Loads

#### Prof. Nelson LAM

Department of Infrastructure Engineering, University of Melbourne Displacement Based Seismic Design Principles as applied to Regions of Low and Moderate Seismicity

#### • Dr. Fahim SADEK

Engineering Laboratory, National Institute of Standard and Technology, U.S.A. Structural Design for Disaster Resilience

#### Prof. Andrew WHITTLE

Department of Civil and Environmental Engineering, Massachusetts Institute of Technology, U.S.A. Design and Performance of Coastal Flood Protection Systems

# **Conference Program**• Programme at a Glance

	Date 27 Oct	Day 1	Day 2	Day 3	Day 4	Day 5		
Date		28 Oct	29 Oct	30 Oct	31 Oct	1 Nov		
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday		
		Tsinghua U	Iniversity		Tongji Univ	ersity		
		Beij	ing		Shangh	ai		
		Opening	Session I		Opening	Session		
Morning		Ceremony	Session I		Ceremony	I-A, I-B		
Morning		Keynote	Session II		Cossion II		Keynote	
	Registration	Presentations			Denistustian	Presentations	and I-C	
		Keynote	Keynote	Registration	Keynote	Session		
		Presentations	Presentations		Presentations	II-A,		
Afternoon					Conference	II-B and		
Arternoon	ו	Conference			Reception	II-C		
		Reception			Gold Medal			
					Address			

# • Programme Overview Day 4(31 Oct 2013,Thursday)

Time	Programme	Venue
08:00-09:00	Registration	Lecture Hall of TJA
09:00-09:45	Opening Ceremony	Lecture Hall of TJA
09:45-10:30	Keynote Presentation 1	Lecture Hall of TJA
	Prof. Yi-Yi CHEN, State Key Laboratory of Disaster	
	Reduction in Civil Engineering, Tongji University,	
	Shanghai, China.	
	The Concept of 'Buckling Hinges' in H-shaped Steel	
	Members with Non-plastic Elements and Its Usage in	
	Seismic Design	
10:30-11:00	Coffee Break	
11:00-11:45	Keynote Presentation 2	Lecture Hall of TJA
	Prof. Ahmed ELGHAZOULI, Department of Civil and	
	Environmental Engineering, Imperial College London, UK.	
	Structural Robustness of Steel-Composite Structures	
	Under Extreme Loads	
11:45-13:30	Lunch Break	
13:30-14:15	Keynote Presentation 3	Lecture Hall of TJA
	Prof. Nelson LAM, Department of Infrastructure	
	Engineering, University of Melbourne, Australia.	
	Displacement Based Seismic Design Principles as	
	applied to Regions of Low and Moderate Seismicity	
14:15-15:00	Keynote Presentation 4	Lecture Hall of TJA
	Dr. Fahim SADEK, Engineering Laboratory, National	
	Institute of Standard and Technology, USA.	
	Structural Design for Disaster Resilience	
15:00-15:45	Keynote Presentation 5	Lecture Hall of TJA
	Prof. Andrew WHITTLE, Department of Civil and	
	Environmental Engineering, Massachusetts Institute of	
	Technology, USA.	
	Design and Performance of Coastal Flood Protection	
	Systems	
15:45-16:30	Conference Reception	Lobby of TJAD
16:30-17:30	Gold Medal Address	Lecture Hall of TJA

# Day 5(1 Nov 2013, Friday)

Venue	C201, Tongji Sino- France Center	C301, Tongji Sino- France Center	C401, Tongji Sino- France Center
Session Recent Developments of Seismic Engineering		Session I -B Modern Structural Engineering Against Fire and Blasts	Session I -C Structural Health Monitoring and Vibration Control of Engineering Structures
09:00-09:10	Opening Remarks Chair: Prof. Xi-Lin LV	Opening Remarks Chair: Prof. Guo-Qiang LI	Opening Remarks Chair: Dr. Paul Heung- Fai LAM Co-Chair: Dr. Tao YIN,
09:10-09:40	Presentation 1 Prof. Stephen MAHIN Using Performance- Based Design to Improve the Life Cycle Costs of Structures	Presentation 1 Dr. Suwen CHEN Investigation Of Blast Resistance Of Point- supported Laminated Glass Curtain Wall	Presentation 1 Prof. You-Lin XU SHMS-based Prognosis Tool and Rating System of Long-Span Suspension Bridges
09:40-10:00	Presentation 2 Prof. Kazuhiko KASAI Seismic Upgrade Projects For A Steel Tall Building Based On Its Responses Recorded During 2011 East Japan Earthquake	Presentation 2 Prof. Yong DU Fire-resistance Design Strate gies for Large- volume Space with Steel Spatial Structures Exposed to Localized Fires	Presentation 2 Dr. Paul Heung-Fai LAM Structural Model Updating of a Steel Truss System of a Building Structure Based on Ambient Vibration Data
10:00-10:30	Coffee Break		
10:30-10:50	Presentation 3 Dr. Jie LI Advances in Modeling of Engineering Seismic Ground Motion and Its Applications	Presentation 3 Dr. Pei-Jun WANG Experimental and Numerical Studies on Restrained Steel Columns with Non-Uniform Temperature Distribution Across Sections in a Fire	Presentation 3 Dr. Hai-Jun ZHOU Vibration frequency and damping of two parallel cables with a cross-tie and dampers
10:50-11:10	Presentation 4 Prof. Huan-Jun JIANG and Prof. Xi-Lin LV Introduction to Updated Code for Seismic Design of Buildings in Shanghai	Presentation 4 Dr. Jian Jiang Development of Structural Fire Engineering in Research and Practice	Presentation 4 Dr. Ching Tai NG Quantitative identification of damages in beams using longitudinal guided wave: an experimental study
11:10-11:30	Presentation 5 Prof. Ching-Shyang CHEN Relevant Issues of Energy Dissipation Technology Application on High-rise Buildings in China	Presentation 5 Chun-lin LIUSecurity and Protective Design for Water Facility	Presentation 5 Dr. F. L. ZHANG Ambient Vibration Tests And Operational Modal Analysis Of Field Structures

11:30-11:50	Presentation 6 Zhiguang ZHOU University, Shanghai, China Effects Of Soil-structure Interaction On Seismic Response Of Isolated Nuclear Power Plant	Conclusions by Session Chairman	Presentation 6 Dr. Tao YIN Structural Damage Detection With Incomplete Modal Data Based On The Bayesian Probabilistic Approach	
11:50-12:00	Conclusions by Session Chairman		Conclusions by Session Chairman	
12:10-13:30	Lunch Break			
Afternoon Session	Session II -A Modern Bridge Engineering in Hazard Mitigation	Session II -B Modern Structural Engineering in Super- highrise Buildings	Session II-C Modern Structural Engineering Design using Eurocodes	
13:30-13:40	Opening Remarks Chair: Prof. Airong CHEN	Opening Remarks Chair: Prof. Jie-Min Ding	Opening Remarks Chair: Prof. Kwok-Fai Chung	
13:40-14:10	Presentation 1 Prof. Mitsuyoshi AKIYAMA Life-cycle Reliability of Concrete Structures under Extreme Events and Hazards Associated with Continuous Deterioration	Presentation 1 Prof. Jie-Min DING Performance-based Seismic Design Principles and Evaluation of Shanghai Tower	Presentation 1 Dr. Sing-Ping CHIEW Impact of Structural Eurocodes on Steel and Composite Structures in Singapore	
Prof. F. Necati CATBASProf. JianUse of Family ofPractice inModels to IncorporateDesign of HUncertainty: A CaseBuildings a		Presentation 2 Prof. Jian-Long ZHOU Practice in Structural Design of High-rise Buildings and Discussions on Critical Issues	Presentation 2 Prof. Ahmed ELGHAZOULI Seismic Design of Building Structures to Eurocode 8	
14:30-15:00	Coffee Break			
15:00-15:20	Presentation 3 Prof. Fathy SAAD Sustainable Prestressed Concrete Innovative System: Applications of CFRP Strips in Precast Concrete Structures	Presentation 3 Prof. Jian GONG Key Technologies in the Construction of Super High-rise Buildings	Presentation 3 Prof. Nelson LAM Earthquake Loading Model in the Proposed National Annex To Eurocode 8 for Peninsula Malaysia	
15:20-15:40 Presentation 4 Prof. Xin RUAN Risk Management Strategy for Long Span Bridge during Operation Stage		Presentation 4 Prof. Qi-Lin ZHANG Numerical Analysis and Monitoring Research for Construction Progress of Shanghai Tower	Presentation 4 Prof. Dennis LAM Demountable Shear Connectors for Sustainable and Robust Composite Structures	
15:40-16:00	Presentation 5 Prof. Ru-Jin MA Structural Performance of Simple-supported Bridge under Blast Loading	Presentation 5 Prof. Xin ZHAO Long-period Earthquake Action and Seismic Responses of High-rise Building Structures	Presentation 5 Prof. Kwok-Fai CHUNG Harmonized Structural Design and Material Specifications in Structural Eurocodes	

# CONFERENCE PROGRAMME

16:00-16:20	Chairman	<b>Presentation 6</b> Lianjin BAOStructural Design of Shenfu Circle	Conclusions by Session Chairman
16:20-16:30		Conclusions by Session Chairman	

### Parallel Session

#### Session I - A

Recent Developments of Seismic Engineering Design 1 Nov 2013, 9:00 - 12:00 (C201) Chair: Prof. Xi-Lin LV, Research Institute of Structural Engineering and Disaster Reduction, Tongji University, China

1. Prof. Stephen MAHIN, University of California, Berkeley, California USA. Using Performance-Based Design to Improve the Life Cycle Costs of Structures 2. Prof. Kazuhiko KASAI, Structural Engineering Research Center, Tokyo Institute of Technology, Japan.

Seismic Upgrade Projects For A Steel Tall Building Based On Its Responses Recorded During 2011 East Japan Earthquake

3. Dr. Jie LI, State Key Laboratory of Disaster Reduction in Civil Engineering, Tongji University, China.

Advances in Modeling of Engineering Seismic Ground Motion and Its Applications

4. Prof. Huan-Jun JIANG and Prof. Xi-Lin LV, Research Institute of Structural Engineering and Disaster Reduction, Tongji University, China. Introduction to Updated Code for Seismic Design of Buildings in Shanghai 5. Prof. Ching-Shyang CHEN, Shanghai Xue Hui Anti-Earthquake Technology Consulting Co., Ltd., China.

Relevant Issues of Energy Dissipation Technology Application on High-rise Buildings in China

6. Zhiguang ZHOU, Research Institute of Structural Engineering and Disaster Reduction, Tongji University, Shanghai, China Effects Of Soil-structure Interaction On Seismic Response Of Isolated Nuclear Power Plant

#### Session I -B

Modern Structural Engineering Against Fire and Blasts 1 Nov 2013, 9:00 - 12:00 (C301) Chair: Prof. Guo-Qiang LI, Tongji University, China

1.Dr. Suwen CHEN, Tongji University, China. Investigation Of Blast Resistance Of Point-supported Laminated Glass Curtain Wall

2.Prof. Yong DU, Nanjing University of Technology, China.

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Fire-resistance Design Strategies for Large-volume Space with Steel Spatial Structures Exposed to Localized Fires

3.Dr. Pei-Jun WANG, Shandong University, China.

Experimental and Numerical Studies on Restrained Steel Columns with Non-Uniform Temperature Distribution Across Sections in a Fire

4.Dr. Jian Jiang, College of Civil Engineering, Tongji University, Shanghai, China

Development of Structural Fire Engineering in Research and Practice

5. Chun-lin LIU, School of Civil Engineering, Tongji University, China

Security and Protective Design for Water Facility

#### Session I -C

Structural Health Monitoring and Vibration Control of Engineering Structures

1 Nov 2013, 9:00 - 12:00 (C401)

Chair: Dr. Paul Heung-Fai LAM, City University of Hong Kong, Hong Kong SAR, China.

Co-Chair: Dr. Tao YIN, Wuhan University, China.

1. Prof. You-Lin XU, Hong Kong Polytechnic University, Hong Kong SAR, China. SHMS-based Prognosis Tool and Rating System of Long-Span Suspension Bridges 2. Dr. Paul Heung-Fai LAM, City University of Hong Kong, HKSAR, China.

Structural Model Updating of a Steel Truss System of a Building Structure Based on Ambient Vibration Data

3. Dr. Hai-Jun ZHOU, Shenzhen University, China.

Vibration frequency and damping of two parallel cables with a cross-tie and dampers

4. Dr. Ching Tai NG, School of Civil, Environmental & Mining Engineering, The University of Adelaide, Australia. Quantitative identification of damages in beams using longitudinal guided wave: an experimental study

5. Dr. F. L. ZHANG, City University of Hong Kong, HKSAR, China

Ambient Vibration Tests And Operational Modal Analysis Of Field Structures

6. Dr. Tao YIN, Wuhan University, China

Structural Damage Detection With Incomplete Modal Data Based On The Bayesian Probabilistic Approach

# Session II -A Modern Bridge Engineering in Hazard Mitigation

### 1 Nov 2013, 13:30 - 16:30 (C201) Chair: Prof. Airong CHEN, Tongji University, China.

1. Prof. Mitsuyoshi AKIYAMA, Waseda University, Japan. Life-cycle Reliability of Concrete Structures under Extreme Events and Hazards Associated with Continuous Deterioration 2. Prof. F. Necati CATBAS, University of Central Florida, USA. Use of Family of Models to Incorporate Uncertainty: A Case Study with a Long Span Bridge

3. Prof. Fathy SAAD, Ain Shams University, Cairo, Egypt. Sustainable Prestressed Concrete Innovative System: Applications of CFRP Strips in Precast Concrete Structures 4. Prof. Xin RUAN, Tongji University, China. Risk Management Strategy for Long Span Bridge during Operation Stage 5. Prof. Ru-Jin MA, Tongji University, China. Structural Performance of Simple-supported Bridge under Blast Loading

#### Session II - B

Modern Structural Engineering in Super-highrise Buildings 1 Nov 2013, 13:30 - 16:30 (C301) Chair: Prof. Jie-Min Ding, Tongji Architectural Design (Group) Co., Ltd., China.

1. Prof. Jie-Min DING, Tongji Architectural Design (Group) Co., Ltd., China. Performance-based Seismic Design Principles and Evaluation of Shanghai Tower 2. Prof. Jian-Long ZHOU, East China Architectural Design & Research Institute, China.

Practice in Structural Design of High-rise Buildings and Discussions on Critical Issues

3. Prof. Jian GONG, Shanghai Construction Group Co. Ltd., China. Key Technologies in the Construction of Super High-rise Buildings 4. Prof. Qi-Lin ZHANG, Tongji University, China. Numerical Analysis and Monitoring Research for Construction Progress of Shanghai Tower

5. Prof. Xin ZHAO, Tongji Architectural Design (Group) Co., Ltd., China. Long-period Earthquake Action and Seismic Responses of High-rise Building **Structures** 

6. Lianjin BAO, East China Architectural Design & Research Institute, Shanghai, China

Structural Design of Shenfu Circle

# Session II - C

Modern Structural Engineering Design using Eurocodes 1 Nov 2013, 13:30 - 16:30 (C401) Chair: Prof. Kwok-Fai Chung, The HongKong Polytechnic University, HongKong SAR, China.

1. Dr. Sing-Ping CHIEW, Nanyang Technological University, Singapore.

Impact of Structural Eurocodes on Steel and Composite Structures in Singapore

2. Prof. Ahmed ELGHAZOULI, Imperial College London, UK.

Seismic Design of Building Structures to Eurocode 8

3. Prof. Nelson LAM, The University of Melbourne, Australia.

Earthquake Loading Model in the Proposed National Annex To Eurocode 8 for Peninsular Malaysia

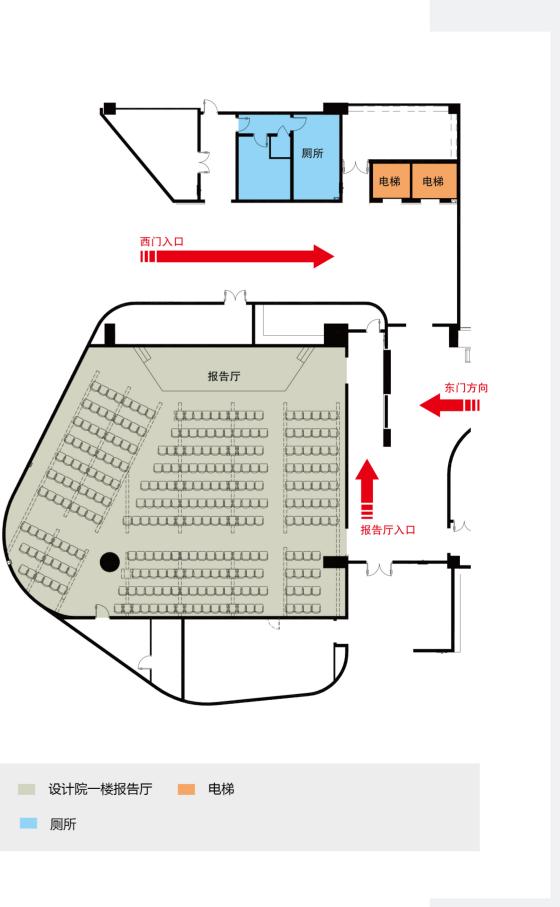
4. Prof. Dennis LAM, Bradford University, UK.

Demountable Shear Connectors for Sustainable and Robust Composite Structures

5. Prof. Kwok-Fai CHUNG, The Hong Kong Polytechnic University, HKSAR, China.

Harmonized Structural Design and Material Specifications in Structural Eurocodes

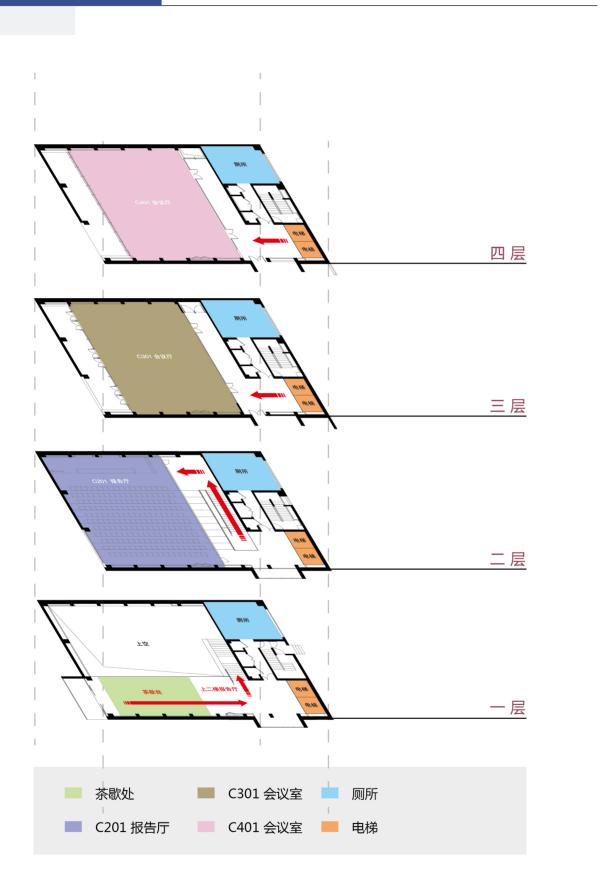
## Floor Plans





#### **CONFERENCE PROGRAMME**

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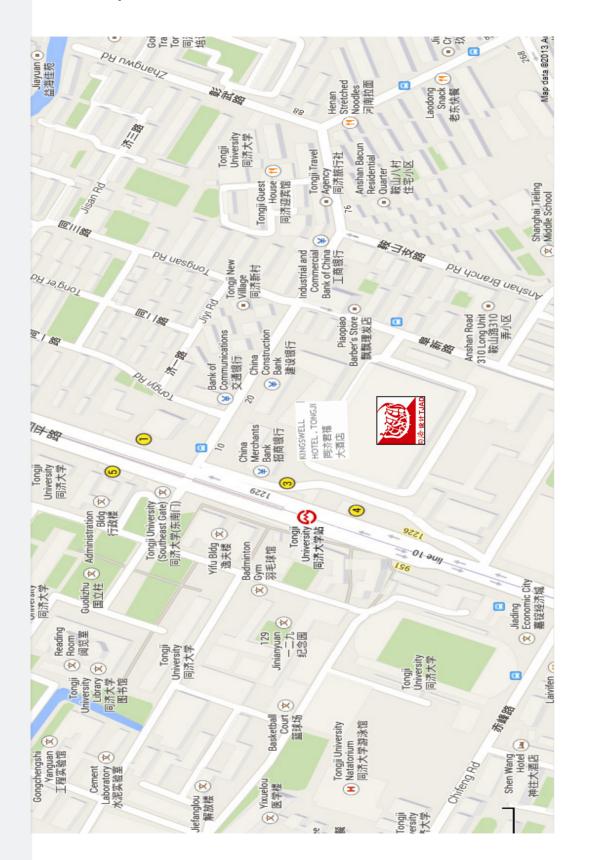


# **General Information**

 Date 31 October - 1 November, 2013 Venue 31 October, 2013 No.1230 Siping Road, Shanghai, China Tongji Architectural Design (Group) Co., Ltd., Shanghai Lecture Hall of TJAD: Opening Ceremony, Keynote presentations, Gold Medal Address Lobby of TJAD: **Conference Reception** 1 November, 2013 No.1239 Siping Road, Shanghai, China Room C201,C301,C401, Tongji Sino-France Center Parallel sessions • Language

English is the official language and is the only language to be used for presentations and publications. There will be no translation into other languages.

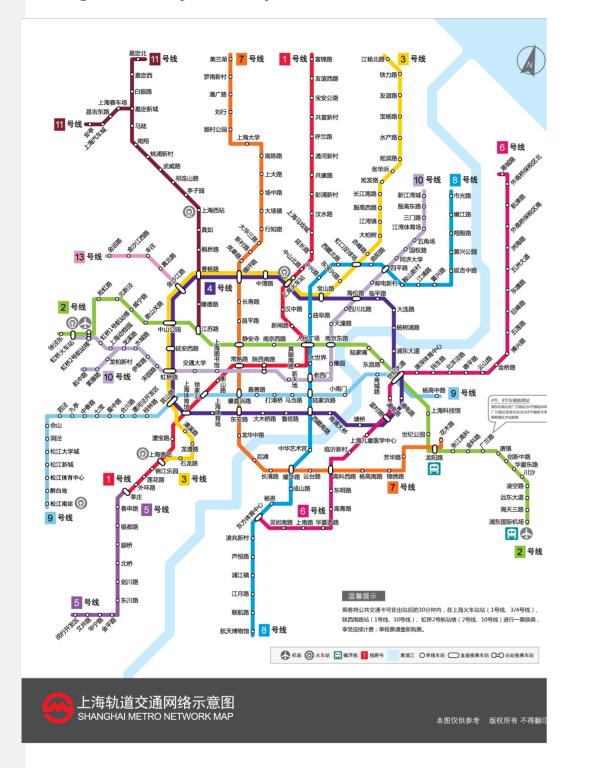






#### CONFERENCE PROGRAMME

# Shanghai MTR System Map



# About IStructE

The Institution of Structural Engineers (www.istructe.org) is the world's largest membership organisation dedicated to the art and science of structural engineering. The Institution has over 27,000 members working in 105 countries around the world. The Institution is an internationally recognised source of expertise and information concerning all issues that involve structural engineering and public safety within the built environment.

The Institution has three core values to support the roles of the structural engineers around the world:

• **Professional standards** striving for continued technical excellence; advancing safety and innovation across the built environment.

• Celebrating excellence and promoting greater understanding of the structural engineering profession by sharing the achievements and milestones of the industry with the public.

• **Sustainability** supporting structural engineers as they protect, influence and advance environmental development responsibly.

The IStructE China Group was formally established in 2002. To better represent IStructE members and their interests in the major cities of China, three subgroups were developed, and they are currently based in Beijing, Shanghai and Shenzhen.

### IStructE Gold Medal Address 2013



The Gold Medal is the Institution's most prestigious award and is given to an individual for exceptional and outstanding contributions to the advancement of structural engineering. The Award was first created and presented in 1922 to Professor Henry Adams who was President of the Institution from 1914 to 1916.

The 2013 Gold Medal will be awarded to Institution

Fellow, Dr. Man-Chung Tang for his outstanding contribution to the structural design of major long span bridges in many parts of the world exemplifying aesthetics, creativity and sustainability.

Dr. Man-Chung Tang is Chairman of the Board of T.Y. Lin International, a consulting engineering firm with headquarters in San Francisco, U.S.A. A world authority on cable-stayed bridges, Dr. Tang has previously served as Chairman of the ASCE committee on cable-suspended bridges which published the definitive gudeline on the design of cable-stayed bridges, used today by engineers all over the world.

Dr. Tang's work on over 100 bridges encompasses all aspects of design and construction : from conceptualization of structural form to final execution and supervision. His bridges can be found in many parts of the world leading to the statement: "the sun never sets on Dr. Tang's bridges".

Dr Tang will present his address entitled: *Innovation* 

#### Synopsis

Innovation is the engine that drives civilization. Without innovation, there would have been no civilization at all and we human would be still living in caves. When innovation stops, civilization also stops. But, what is innovation, how to innovate, and who can innovate? The answer is: "5xl + 3xW + 3xC"!

#### Details of Gold Medal Address:

Date: 31 October 2013, Thursday Time: 3:45 p.m. Refreshment. 4:30 p.m. Seated

Venue: Tongji Architectural Design (Group) Co., Ltd. (TJAD), 1230 Siping Road, Shanghai, China Price: Free to all IStructE members. Included as part of Conference Programme Contact: sehm2013@tjad.cn For further details, refer to: http://www.istructe.org/events-awards/conference-and-lectures/goldmedal-address