JIN-GUANG TENG

In step with the abounding vitality of the time, structural engineer **Fazlur Rahman Khan** (1929-1982) ushered in a renaissance in skyscraper construction during the second half of the 20th century. Fazlur Khan was a pragmatic visionary: the series of progressive ideas that he brought forth for efficient high-rise construction in the 1960s and '70s were validated in his own work, notably his efficient designs for Chicago's 100-story John Hancock Center and 110-story Sears Tower -- the tallest building in the United States since its completion in 1974.

Fazlur Rahman Khan

Lehigh endowed a chair in structural engineering and architecture and has established this lecture series in Khan's honor. It is organized by **Professor Dan M. Frangopol**, the university's first holder of the Fazlur Rahman Khan Endowed Chair of Structural Engineering and Architecture, and sponsored by the Departments of Civil & Environmental Engineering, and Art, Architecture & Design.

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ATLSS

Spring 2016 Khan Distinguished Lecture Series

The Fazlur Rahman Khan Distinguished Lecture Series honors Dr. Fazlur Rahman Khan's legacy of excellence in structural engineering and architecture

Initiated and Organized by **PROFESSOR DAN M. FRANGOPOL**
The Fazlur Rahman Khan Endowed Chair of Structural Engineering and Architecture
Department of Civil and Environmental Engineering, ATLSS Engineering Research Center,
Lehigh University
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JIN-GUANG TENG

Chair Professor of Structural Engineering, The Hong Kong Polytechnic University, Hong Kong, China

"Structural Use of FRP Composites in Construction: Past Achievements and Future Opportunities"

Friday, April 22, 2016 – 4:30 pm

Location *(New for 2016!)*: Whitaker Lab 303, Lehigh University, 5 E. Packer Avenue, Bethlehem, PA

http://www.lehigh.edu/frkseries

Dr. Jin-Guang Teng has conducted research over the past three decades on a wide range of topics within the broad field of structural engineering, including the structural use of fiber-reinforced polymer (FRP) composites in construction and steel & thin-walled structures. He has authored/co-authored over 180 SCI journal papers, leading to over 6,000 citations according to the Web of Science Core Collection. His work has impacted significantly on relevant design guidelines/codes in Australia, China, Europe and the United States.

Dr. Teng's research contributions have been recognised by many awards/prizes, including the State Natural Science Award of China, Distinguished Young Scholar Award from the Natural Science Foundation of China, the IIFC Medal from the International Institute for FRP in Construction (IIFC), and the State-of-the-Art of Civil Engineering Award from the American Society of Civil Engineers. He serves as one of the two Editors-in-Chief of the international journal "*Advances in Structural Engineering*" and a member of the editorial boards of 7 other SCI journals. He has been a member of the Scientific/Academic/Technical/Advisory/Steering Committees of over 130 conferences/symposia, and has delivered keynote/invited presentations at over 70 conferences/symposia. He was elected a Fellow of the Hong Kong Academy of Engineering Sciences in 2013 and a Corresponding Fellow of the Royal Society of Edinburgh in 2015.

Structural Use of FRP Composites in Construction: Past Achievements and Future Opportunities. Fiber-reinforced polymer (FRP) composites are formed by embedding continuous fibers (e.g. carbon, glass and aramid fibers) in a polymeric resin matrix. The advantages of FRP composites include their excellent corrosion resistance, high strength-to-weight ratio and tailorability of material properties. They also have some significant weaknesses, including a relatively poor fire resistance and relatively high costs. Over the past two decades, FRP composites have gained increasingly wide acceptance as a new class of construction materials, initially in the strengthening of existing structures and more recently in the construction of high-performance new structures.

This presentation will provide a review of the major achievements in the structural use of FRP composites in construction over the past two decades, covering both research and practical implementations. A strong emphasis will be placed on the optimal use of FRP composites to enhance the performance of structures, which often means that FRP composites need to be used in combination with traditional materials such as steel and concrete. In the area of strengthening, externally bonded FRP reinforcement is now a mainstream technology. In the area of new construction, many innovative structural forms enabled by FRP composites are being explored. The presentation will also examine future opportunities and challenges in the area.

FAZLUR RAHMAN KHAN (1929 - 1982) One of the foremost structural engineers of the 20th century, Fazlur Khan epitomized both structural engineering achievement and creative collaborative effort between architect and engineer. Only when architectural design is grounded in structural realities, he believed — thus celebrating architecture's nature as a constructive art, rooted in the earth — can "the resulting aesthetics … have a transcendental value and quality." His ideas for these sky-scraping towers offered more than economic construction and iconic architectural images; they gave people the opportunity to work and live "in the sky." Hancock Center residents thrive on the wide expanse of sky and lake before them, the stunning quiet in the heart of the city, and the intimacy with nature at such heights: the rising sun, the moon and stars, the migrating flocks of birds. Fazlur Khan was always clear about the purpose of architecture. His characteristic statement to an editor in 1971, having just been selected Construction's Man of the Year by *Engineering News-Record*, is commemorated in a plaque in Onterie Center (446 E. Ontario, Chicago): **"The technical man must not be lost in his own technology. He must be able to appreciate life; and life is art, drama, music, and most importantly, people."**

SEI ASCE STRUCTURAL ENGINEERING INSTITUTE Lehigh Valley Chapter

1 PDH will be awarded to eligible attendees for each lecture

Please contact the Khan Chair office at 610-758-6123 or Email: infrk@lehigh.edu with any questions.