



SPONSORED BY:
 THE DEPARTMENT OF CIVIL &
 ENVIRONMENTAL ENGINEERING
 and
 THE DEPARTMENT OF ART, ARCHITECTURE &
 DESIGN



2022 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

dan.frangopol@lehigh.edu, www.lehigh.edu/~dmf206

MITSUYOSHI AKIYAMA

Professor and Chair of the Department of Civil & Environmental Engineering,
 Waseda University, Tokyo, Japan

“Increasing the Resilience of Highway Bridges Under Multiple Hazards Including Earthquake, Tsunami, Corrosion and Climate Change”

Friday, April 29, 2022 – 4:30 pm

Location: Whitaker Lab 303, Lehigh University, 5 E. Packer Avenue, Bethlehem, PA

Lecture will also be live streamed, please register for link ([Register here](#))

<http://www.lehigh.edu/frkseries>

Mitsuyoshi Akiyama, before joining Waseda University in 2011 as Professor of Civil Engineering, Dr. Akiyama was Assistant and Associate Professor at Tohoku University. In 2001, he received a doctorate in Civil Engineering from Tohoku University. He is now the Chair of the Department of Civil and Environmental Engineering at Waseda University. He was a Visiting Research Associate at Lehigh University from October 2008 to September 2009 (sponsored by Kajima Foundation), and from August 2018 to September 2019 (sponsored by JSPS) in the research group of Prof. Frangopol. Dr. Akiyama's main research interests are earthquake engineering, life-cycle structural performance, and reliability of civil infrastructure systems. He is the recipient of several awards including the 2001 JCI Award for Engineering Development, the 2007 JSCE Encouragement Award for Outstanding Thesis, the 2008 Commendation for Science and Technology, the 1998, 2008, and 2010 JSCE Yoshida Award, and the 2016 IABMAS Junior Award. He is serving as a Managing Editor for *Structure and Infrastructure Engineering* and an Associate Editor for *ASCE Journal of Bridge Engineering*.

Increasing the Resilience of Highway Bridges Under Multiple Hazards Including Earthquake, Tsunami, Corrosion and Climate Change. After recent large earthquakes, such as the 2011 Great East Japan earthquake and 2016 Kumamoto earthquake, field investigations confirmed that several bridges were severely damaged and collapsed not only due to the earthquake, but also to the subsequent tsunami, landslide or fault displacement. In addition, long-term material deterioration might have an important impact on structural damage to bridges. Therefore, it is important to study multiple hazards and their effects on the reliability, risk and resilience of bridges and bridge networks. Although earthquake is still a dominant hazard to bridges in many earthquake-prone countries, a life-cycle reliability and risk approach has to consider all hazards causing bridge failure during the structure's lifetime including climate change effect. Such an approach is presented in this lecture. In addition, issues on how to ensure the reliability, reduce the risk and enhance the resilience of bridges and bridge networks under multiple hazards are discussed. Finally, the concepts and methods presented are illustrated on both individual bridges and bridge networks.

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.*"

MITSUYOSHI AKIYAMA

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.



1 PDH will be awarded to eligible attendees for each lecture (minimum webinar participation time of 55 minutes is required)

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