LEHIGH UNIVERSITY | P.C. Rossin College of Engineering and Applied Science

March 25 & April 29 lectures will be held in-person in Whitaker Lab 303 at Lehigh University

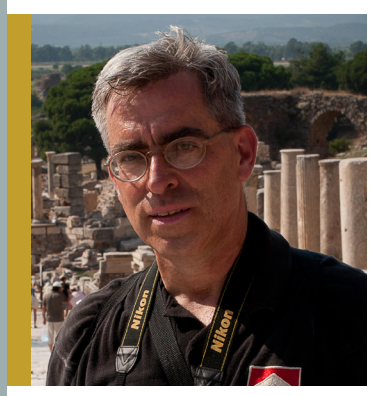
Lectures also held via Zoom Webinar, *To register go to www.lehigh.edu/frkseries*

2022 FAZLUR RAHMAN KHAN DISTINGUISHED LECTURE SERIES

Honoring a legacy in structural engineering and architecture

Friday, February 18, 2022
4:30 P.M. EST
***Lecture via webinar only, must register**

Stephen J Ressler
Professor Emeritus US Military Academy (USMA), West Point, NY;
President Lehigh Valley Section, ASCE, Bethlehem, PA



THE ASHTABULA BRIDGE DISASTER AND THE ADVENT OF CIVIL ENGINEERING PROFESSIONALISM

Constructed in 1865, the 154-foot railroad truss bridge over the Ashtabula River in northeastern Ohio represented a unique and innovative response to the challenge of adapting traditional timber bridge-building techniques to a new and fundamentally different structural material—iron. The Ashtabula Bridge served its purpose with minimal problems for eleven years. But on the evening of December 29th, 1876, during a severe blizzard, the structure collapsed under the weight of a routine service loading—a passenger train pulled by two steam locomotives. Tragedy then turned to unspeakable horror, as coal-fired heating stoves in the passenger coaches set the wreckage on fire. Within minutes, many passengers who had survived the collapse perished in an uncontrollable blaze. The official death toll was 92—but the actual number was probably much higher, because there was no reliable count of passengers on the train. The Ashtabula Bridge disaster was America's worst rail accident up until that time. The event shocked the nation and prompted a rigorous response from the civil engineering professional community.

In this lecture, we will examine the unique design of the Ashtabula Bridge, its troubled construction process, and the likely causes of the collapse. We will also explore the surprising impact of this catastrophe on bridge design practice during a pivotal period when civil engineering was undergoing an important transition from a craft-based occupation to a profession.

Friday, March 25, 2022
4:30 P.M. EST

Adrian D Smith
Partner,
Adrian Smith + Gordon Gill Architecture,
Chicago, IL

SUPERTALL TOWERS + GREEN CITIES

Adrian D. Smith, FAIA is one of the first American architects to design supertall buildings internationally. During his 50+-year career, his work has shown an evolving interest in the use of vernacular and indigenous forms and compositions together with state-of-the-art systems and technologies to integrate new buildings into the regional context. As a leading expert on the advanced technology of supertall towers and their impact on cities, this talk will explore projects that have effectively reduced negative environmental impacts, while simultaneously improving the overall quality of life in the city. His talk will feature major international projects including the Burj Khalifa, Jeddah Tower, and plans for a self-sustaining satellite city in China.

Friday, April 29, 2022
4:30 P.M. EST

Mitsuyoshi Akiyama
Professor and Chair-
Dept of Civil & Environmental Engineering,
Waseda University,
Tokyo, Japan

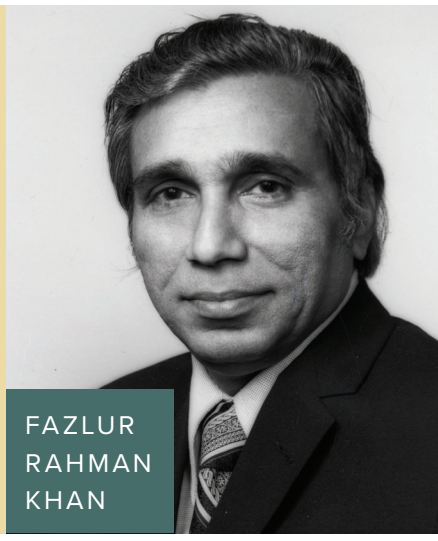
INCREASING THE RESILIENCE OF HIGHWAY BRIDGES UNDER MULTIPLE HAZARDS INCLUDING EARTHQUAKE, TSUNAMI, CORROSION AND CLIMATE CHANGE

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.

ABOUT THE KHAN SERIES

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 Willis (formerly Sears) Tower — the tallest building in the United States since its completion in 1974.

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 inaugural 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.



FAZLUR RAHMAN KHAN

This lecture series is sponsored by:
Civil & Environmental Engineering
College of Engineering & Applied Science
Art, Architecture & Design
College of Arts & Sciences

SEI ASCE STRUCTURAL ENGINEERING INSTITUTE Lehigh Valley Chapter

1 PDH will be awarded to eligible attendees for each lecture.

Lehigh.edu/FRKSeries