



AFTAB A. MUFTI

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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Fall 2020 (Virtual) Khan Distinguished Lecture

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,
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Emeritus Professor, University of Manitoba, Winnipeg, Manitoba, Canada

"Intelligent Sensing for Innovative Structures: Development of the New Discipline of Civionics"

Thursday, October 22, 2020 – 4:30 pm

Via Zoom (Register [here](#))
<http://www.lehigh.edu/frkseries>

Dr. Aftab A. Mufti is an Emeritus Professor of Civil Engineering at the University of Manitoba, Winnipeg, Manitoba, Canada. He is also the former Scientific Director and President of the Innovative Structures with Intelligent Sensing Canada Research Network, a Network of Centres of Excellence. His research interests include FRPs, FOSs, FEM, bridge engineering, Structural Health Monitoring (SHM). At the University of Manitoba, he introduced new research area of Civionics Engineering to monitor deteriorating infrastructure. He has authored or co-authored 5 books, plus provided chapters for 2 others, edited 9 books, and written more than 350 technical publications. Dr. Mufti is the recipient of 24 awards. He is the holder of several patents on the steel-free bridge deck concept, of which he is the principal developer. He has been involved in the writing of bridge design codes since 1992 and was the Chair of the Technical Sub-Committee on the Fibre Reinforced Structures of the Canadian Highway Bridge Design Code. He is a fellow of 9 societies. On November 2013 he was elected as a Fellow of the Royal Society of Canada (FRSC), highest scientific academy in Canada and on July 1, 2010 he was appointed as a Member of the Order of Canada, highest civilian honour bestowed on Canadian citizens. Dr. Mufti considered Dr. Fazlur R. Khan as one of our most distinguished structural engineers, which is reflected in a paper by Aftab A. Mufti and Baidar Bakht, "[Fazlur Khan \(1929-1982\): reflections on his life and works](#)" published in the Canadian Journal of Civil Engineering in 2001.

Intelligent Sensing for Innovative Structures: Development of the New Discipline of Civionics. Civil infrastructures are essential for modern and advanced societies. These structures are foundation of a vibrant economy and improve the quality of people's lives. Therefore, civil engineers strive to design, construct, and maintain structures meeting the highest standards of engineering to enhance safety, durability, and functionality of such infrastructure. However, civil engineers are conservative and have been slow in adopting Structural Health Monitoring (SHM) to inspect and evaluate the infrastructures. The built infrastructures are subject to service and environmental loads. These loads reduce reliability and life cycle performance regardless of their construction quality. Structural damage due to heavy loads, fatigue, temperature, humidity, corrosion, and scour are commonly encountered especially in countries with extreme cold climate like Canada and the USA. The traditional approaches of service life assessment which mostly rely on visual inspection and human judgment are less effective in assessing the health of ageing structures. It is of utmost importance to develop inspection methods to assess the service and end of life of a structure. Through the development of the new discipline of Civionics, which integrates *Civil Engineering with Electronics*, Canada has monitored corrosion free innovative structures for last thirty years. This lecture presents some of the innovations that have been implemented in various infrastructure projects across Canada under the federal program called the Networks of Centres of Excellence (NCE) for Intelligent Sensing of Innovative Structures (ISIS).

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.*"



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.