



Presentations will be held  
in Whitaker Lab 303 at  
Lehigh University  
*Receptions to precede  
events starting at 4:10 P.M.*

# 2018

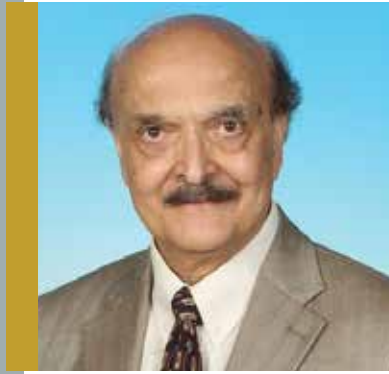
## FAZLUR RAHMAN KHAN DISTINGUISHED LECTURE SERIES

*Honoring a legacy in structural engineering and architecture*

Friday, February 23, 2018  
4:30 P.M.

*Surendra P. Shah*

Walter P. Murphy Professor  
of Civil Engineering (Emeritus)  
Northwestern University  
Evanston, IL



### SUSTAINABILITY IN CONCRETE CONSTRUCTION BASED ON NANOTECHNOLOGY

Supertall buildings such as the one km high Kingdom Tower are constructed with concrete as a structural material. Such tall buildings are made with so-called high performance concrete, which can have strength 5 times that of conventional concrete. The development of high strength concrete is a result of our understanding of particle packing, rheology and microstructure engineering. Concrete is a critical material for infrastructure; the world wide consumption of concrete is about 2 tons for every living human being. However, its continuing use will require improving its sustainability. Nanotechnology is playing an increasing role in making concrete more sustainable. Some examples are given.

Friday, March 23, 2018  
4:30 P.M.

*Robert Sinn*

Principal, Thornton Tomasetti  
Chicago, IL



### FROM BILBAO TO JEDDAH: AN ENGINEER'S JOURNEY

Two projects conceived twenty years apart. One, a three-story museum in the capital city of Spain's Basque country, changed the face of architecture upon opening in 1997 and was labeled "the greatest building of our time" by architect Philip Johnson. The other, an audacious 240-story tower in the Red Sea port of Jeddah, is planned to be the first manmade structure to reach one kilometer in height – an achievement comparable to a Neil Armstrong moment for structural engineers and architects. The engineering logic and structural systems development for these landmark projects are important chapters in the ongoing story of computer-based geometric and structural engineering analysis within the building industry. The presentation will compare the two projects, focusing on the key technical challenges and the analytical tools available to realize these groundbreaking designs.

Friday, April 13, 2018  
4:30 P.M.

*Yozo Fujino*

Distinguished Professor, Institute  
of Advanced Sciences  
Yokohama National University  
Yokohama, Japan



### LESSONS LEARNED FROM 30 YEARS OF EXPERIENCE IN DYNAMICS, MONITORING AND CONTROL OF BRIDGES

Increasingly, bridges exhibit excessive vibration due to longer spans and greater flexibility, as well as excessive loading; hence, various control remedies have been developed and applied. Based on Prof. Fujino's extensive experience, various vibration displayed by existing bridges and their control are surveyed. The importance of measured vibration responses will also be presented through several examples. It is strongly stressed that monitoring in situ performance of bridges under in-service loads is essential for not only better understanding of bridge behavior, but also better lifetime management.

## 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



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

[www.lehigh.edu/frkseries](http://www.lehigh.edu/frkseries)



2007

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2018



Fazlur Rahman Khan

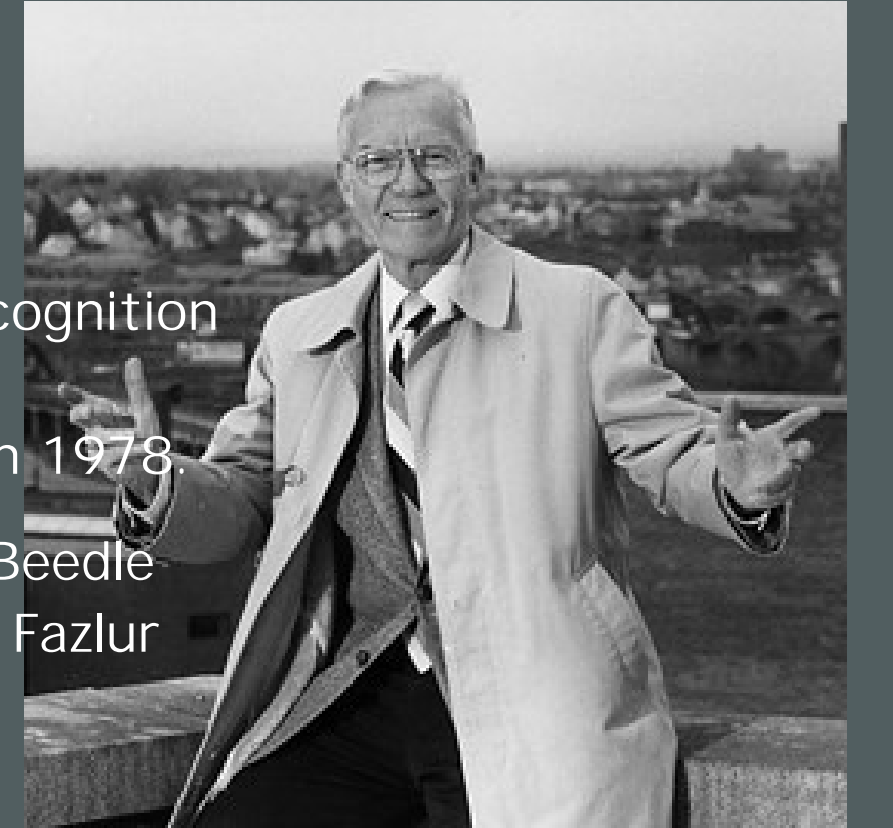
1929-1982

Fazlur Rahman Khan ushered in a renaissance in skyscraper construction during the second half of the 20th century. Khan was a pragmatic visionary: the series of progressive ideas that he brought forth for efficient high-rise construction in the 1960s and 1970s were validated in his own work of his professional and research achievements, he was appointed to a University Distinguished Professorship in 1978. Following the premature death of Fazlur Khan in 1982, Beedle organized the establishment at Lehigh University of the Fazlur Rahman Khan Endowed Chair.

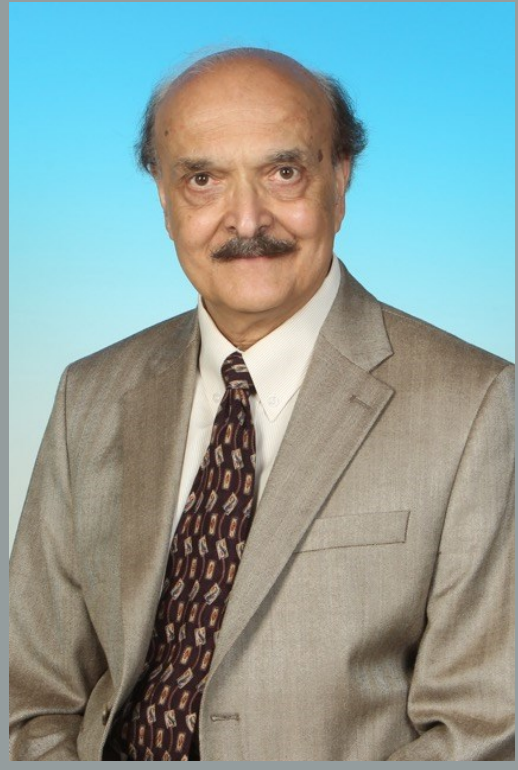
technical man must not be lost in his own technology. He must be able to appreciate life; and life is

Lynn S. Beedle

1917-2003



## 2018 SPEAKERS



Surendra P. Shah

Walter P. Murphy Professor of Civil Engineering (Emeritus)  
Northwestern University Evanston, IL

Sustainability in Concrete Construction Based on Nanotechnology

February 23, 2018



Robert Sinn

Principal  
Thornton Tomasetti  
Chicago, IL

From Bilbao to Jeddah: An

March 23, 2018



Yoizo Fujino

Distinguished Professor  
Institute of Advanced Sciences  
Yokohama National University  
Yokohama, Japan

Lessons Learned from 30 Years of Experience in Dynamics, Monitoring and Control of Bridges

April 13, 2018

### SPEAKERS - 2017



### SPEAKERS - 2016

### SPEAKERS - 2015

### SPEAKERS - 2014

### SPEAKERS - 2013

### SPEAKERS - 2012

### SPEAKERS - 2011



### SPEAKERS - 2010

### SPEAKERS - 2009



### SPEAKERS - 2008

### SPEAKERS - 2007