



JAMES R. HARRIS



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Spring 2014 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
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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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Principal, J.R. Harris & Company, Denver, CO

"The Evolution of Building Design to Resist Earthquakes"

Friday, February 21st, 2014 – 4:30 pm

Location: Sinclair Lab Auditorium, Lehigh University, 7 Asa Drive, Bethlehem, PA

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

Jim Harris is well versed in structural engineering practice and research. His work experience includes consulting practice in Denver since 1968 and continued with the establishment of J.R. Harris & Company in 1984. From 1975-1981 he was a research structural engineer at the National Bureau of Standards in Gaithersburg, MD. He has designed or evaluated thousands of structures ranging from dwellings, to high-rise buildings, industrial facilities, and renovations of historic buildings to name a few. His research has focused on the loading and response of structures, particularly earthquake and snow loadings, with a second focus on improving the formulation and use of engineering standards. He is a member of the National Academy of Engineering and an active member of several committees that produce national standards for structural engineering practice and is a former chair of the committee that produces the standard *ASCE/SEI 7 Minimum Design Loads for Buildings and Other Structures*, and its subcommittee for seismic design. He has also served on ACI Committee 318 which prepares *Building Code Requirements for Structural Concrete* and on the AISC Committees that prepare the *Specification for Structural Steel Buildings* and the *Seismic Provisions for Structural Steel Buildings*. Jim received his BSCE from the University of Colorado, Boulder, in 1968 and his MSCE and PhD from the University of Illinois, Urbana in 1975 and 1980, respectively.

The Evolution of Building Design to Resist Earthquakes: Much of the history of the development of design approaches and building code provisions for seismic resistance in the United States is in direct response to damaging earthquakes. The early work was largely empirical. The fundamentals of an analytical mechanics approach were created in the middle of the 20th century, and over the past half century there has been a considerable amount of theoretical development and laboratory validation. The economic and social impact of large earthquakes is very consequential, and the technical aspects of the problem are challenging. Modern computing power coupled with new analytical techniques and better characterization of the demand from ground shaking are making possible much more realistic approaches to achieving the desired performance in future earthquakes.

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."**