



**David Scott**



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## **Spring 2011 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: DAN M. FRANGOPOL**

Fazlur Rahman Khan Endowed Chair of Structural Engineering and Architecture  
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### **David Scott**

Arup, Americas Building Practice Leader; Past Chairman, CTBUH, New York, NY

#### **"Extreme Engineering"**

**Friday, February 18<sup>th</sup>, 2011 – 4:10 pm**

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. For more information on Fazlur R. Khan please visit:

<http://www.fazlurrkhan.com>

**David Scott – Arup, Americas Building Practice Leader; Past Chairman, CTBUH, New York, NY:** David Scott is an award winning structural engineer who has worked on some of the world's most prominent engineering projects. He is a Principal at Arup, based in the New York office, and is the Building Practice Leader for Arup in the Americas, where Arup has 800 engineers in 10 offices located across the United States. David is a designer and is internationally recognized for his leading role in the design of long span lightweight structures and tall buildings. He leads a large multidisciplinary team of creative engineers to deliver efficient, innovative and beautiful projects around the world. His extensive portfolio includes the Songdo Convention Center and towers, Second Avenue Subway, Hong Kong International Airport, Cheung Kong Center, the Hongkong Bank Headquarters. He is currently working on a 2,000ft tower in Seoul, a 1500ft tower in m tower in Qatar and substantial towers in China and New York. In 2001, David was one of the team leaders working with the contractors in the search, recovery and clean-up of the World Trade Center site after 9-11, as part of the SEAoNY-led effort. Following 9/11 he was extensively involved in the industry review of building design and standards: presenting papers and working with GSA on new standards. He has also written papers on fire performance of structures, progressive collapse, seismic design, wind testing, long span structures and tall buildings. David was appointed Chairman of the Council on Tall Buildings and Urban Habitat in 2006. During his 3 ½-years of tenure the Council trebled in size. In recent years he has developed an extensive interest in complex geometry structures and has a reputation for finding simplicity in complex forms. He uses a variety of parametric design and modeling techniques to arrive at innovative and buildable solutions to complex shapes. In 2008, David and his team developed and patented a new structural system for twisting residential towers that is more efficient than conventional square box buildings.

#### **Extreme Engineering:**

Modern computer design and fabrication technology gives architects and engineers the ability to design and build more complex and unusual structures than ever before imagined. This is good and perhaps bad. Many of the tools are easy to use, so that inexperience and lack of understanding can lead to buildings that are horrendously expensive and almost impossible to build. Similarly inexperienced engineers can apply standard codes and design philosophy to super-tall towers and the most complex of structures and assume that their buildings will have a comparable robustness and comparable risk to normal design; when codes are clearly not written with these unusual forms in mind. Yet when used effectively modern tools enable architects and engineers to design efficiency and simplicity into some of the most complex forms and create buildings that are unusual yet easy to build and only marginal more expensive than their square box alternates. Performance based design, whether it is for seismic, wind, fire or other extreme events also allows designers to design unusual buildings with confidence about their performance. David Scott PE will show how these recent advances in design and construction tools are changing the industry. He will show how an innovative and informed approach to design can lead to efficiency and simplicity. These examples include a range of towers and long span structures, that are both simple and complex, but all containing an elegant efficiency and construction led design that drives his work.



**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.

**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.**" For more information on Fazlur Rahman Khan please visit: <http://www.fazlurrkhan.com>

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