

You are cordially invited to the seminar organised by the NTU-JTC Industrial Infrastructure Innovation Centre

## **MAKING DECISIONS WITH DAT - RECENT EXTENSIONS FOR UNDERGROUND CAVERN DEVELOPMENTS**

**By: Prof Herbert H. Einstein, Massachusetts Institute of Technology, USA**

**Date: 1<sup>st</sup> & 2<sup>nd</sup> August 2013      Time: 9.00AM – 12:30 PM**

**Venue: CEE-Seminar Room A, Block N1, Level B1 (N1-B1B-02)**

**School of Civil And Environmental Engineering, Nanyang Technological University ([Map](#))**

### Session 1 – 1<sup>st</sup> Aug 2013

0900 – 0905: Introduction & Welcome Address  
 0905 – 1000: Recent Research in Rock Mechanics & Rock Engineering in MIT  
 1000 – 1015: Interval  
 1015 – 1130: Engineering Geology & Tunneling - A review of Empirical Tunnel Design Methods  
 1130: Lunch

### Session 2 – 2<sup>nd</sup> Aug 2013

0900 – 0930 : NTU Work on the Decision Aids for Tunneling  
 0930 – 1030: Decision Aids for Tunneling (DAT) – Principles and Applications  
 1030 – 1045: Interval  
 1045 – Noon: Decision Aids for Tunneling (DAT) – Recent Extensions  
 Noon: Lunch

Chairperson: Assoc Prof Robert Tiong, School of Civil and Environmental Engineering, Nanyang Technological University

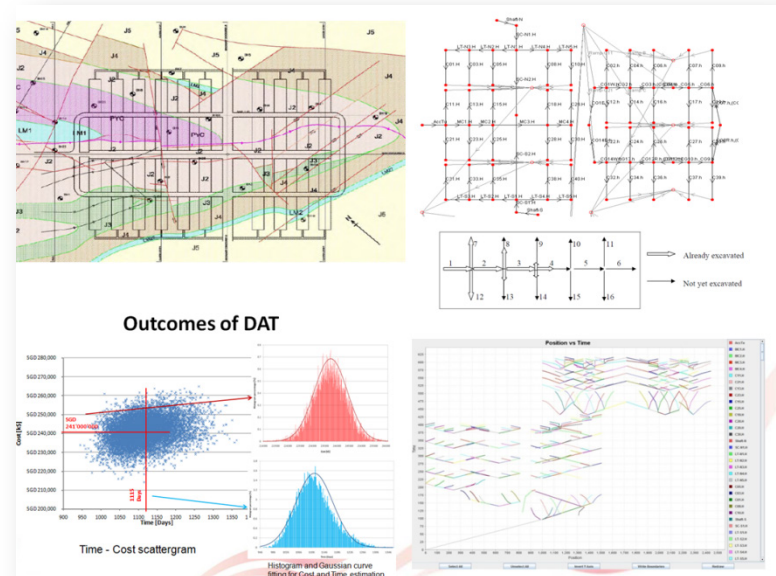
### **ABOUT THE TOPIC:**

#### **Engineering Geology and Tunneling - A Review of Empirical Tunnel Design Methods**

The presentation will review empirical methods for rock tunnel design (Terzaghi, Q, RMR, GSI etc). These methods attempt to relate geologic descriptions to tunnel design. They have limitations, however, which are often not well known. The methods will be briefly described and assessed.

#### **Decision Aids for Tunneling (DAT)**

The DAT were and are being developed in a collaborative effort of MIT and EPFL. The original development was aimed at the Swiss Transalpine Tunnels based on preceding work at MIT (Tunnel Cost Model, Simsuper), but the DAT have been extended and applied in many other cases. The presentation will first briefly discuss the principles of the DAT. It will then illustrate a variety of applications starting with transalpine tunnels in Europe followed by tunnels in Asia and the USA. Usage for assessing new technologies will also be mentioned. This will be followed by a discussion of recent developments of the resource module and, importantly, of an extension to general infrastructure projects. The talk will conclude with two different tunnel-related tools: Major event prediction and the use of Artificial Neural Networks.



### **ABOUT THE SPEAKER:**



#### **Herbert H. Einstein – Professor, Massachusetts Institute of Technology (MIT), USA**

Herbert H. Einstein, Professor Civil and Environmental Engineering at MIT, received his Dipl. Ing. and Sc. D. in Civil Engineering from ETH-Zürich. His teaching and research areas are underground construction, rock mechanics and engineering geology. Professor Einstein has been involved as an advisor, consultant and researcher in issues related to underground construction, rock mechanics, rock engineering and natural disasters, notably landslides and waste repository problems. These activities range from geotechnical and engineering geologic research and design, to risk analysis. He is the co-editor of the journal, Rock Mechanics and Rock Engineering and a member of the editorial boards of Tunneling and Underground Space Technology and Engineering Geology. Professor Einstein is author or co-author of over 200 publications in his area of expertise. He was the recipient of the prestigious Müller lecture award from the International Society for Rock Mechanics and the “Outstanding Contribution to Rock Mechanics” Award from the American Rock Mechanics Association. He has also received several teaching awards at MIT.

**Admission is free. To register for this workshop, please click on the link below. Closing Date: 31<sup>st</sup> July 2013**

**Online Registration: [https://wis.ntu.edu.sg/pls/webexe/REGISTER\\_NTU.REGISTER?EVENT\\_ID=OA13070910563847](https://wis.ntu.edu.sg/pls/webexe/REGISTER_NTU.REGISTER?EVENT_ID=OA13070910563847)**