



# underground

## LUNCH & LEARN

### THE NORWEGIAN METHOD OF TUNNELING

APRIL 8th, 12-1PM

**ZOOM MEETING:** Join from PC, Mac, Linux, iOS or Android:

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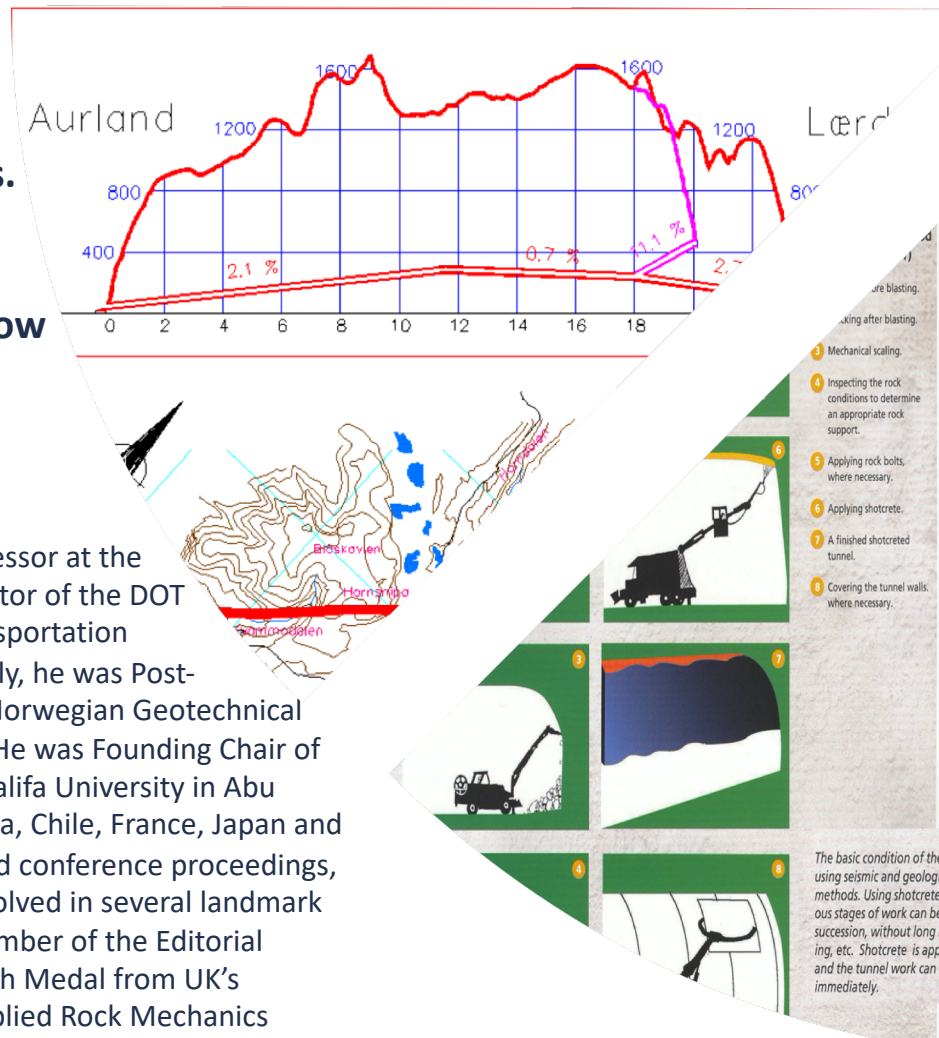
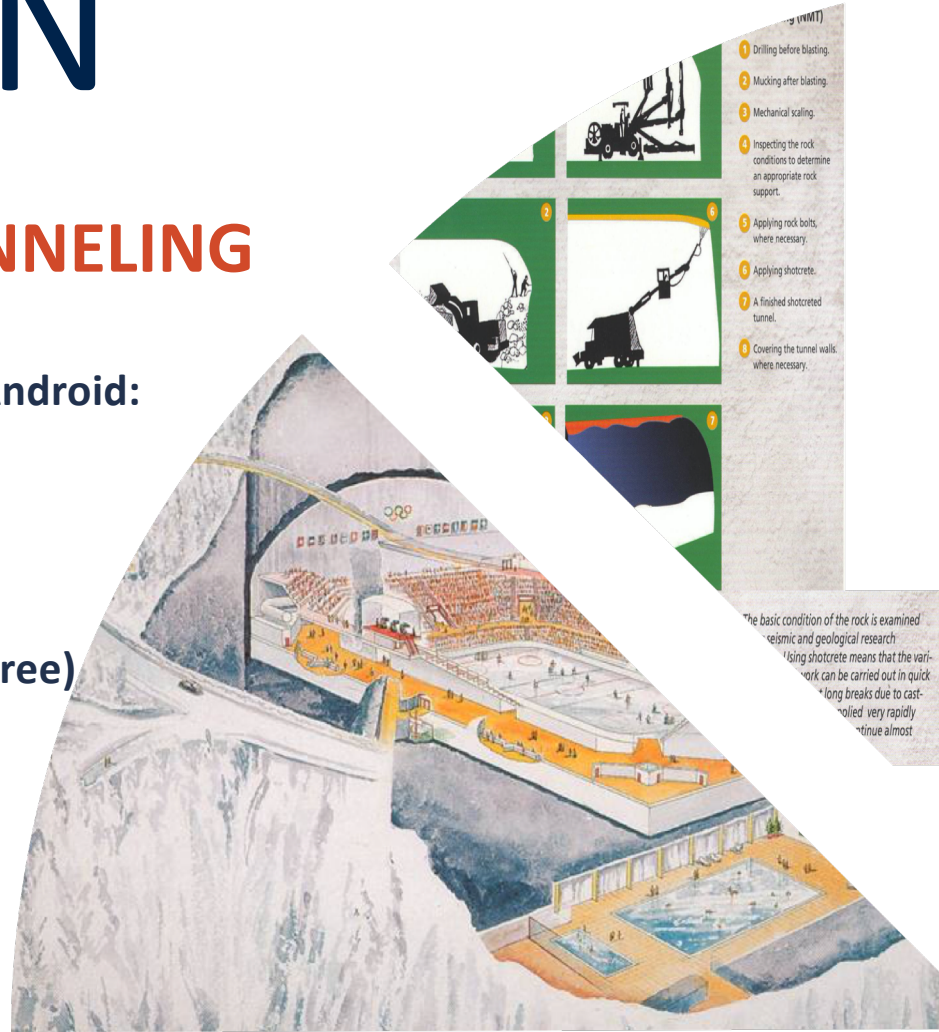
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You'll be introduced to the key concepts and features behind the Norwegian Method of Tunneling (NMT) which includes the use of: (1) "design as you go" procedure, (2) "wet and flexible" construction, and (3) "expect the unexpected" flexible contracting system. A background is provided in the development of NMT and how it evolved in the light of different large Norwegian underground construction projects. The backbone of the NMT is the Q-system of rock mass classification, which is discussed in detail including how Q-logging and mapping of rock masses are performed, and how the Q-system is used in the design of excavations in rocks. Another important component of the NMT is the use of the Distinct Element Method (DEM) to validate tunnel design.



**Dr. Marte Gutierrez** is the James R. Paden Distinguished Professor at the Department of Civil and Environmental Engineering and Director of the DOT Tier 1 University Transportation Center for Underground Transportation Infrastructure (UTC-UTI) at Colorado School of Mines. Formerly, he was Post-Doctoral Fellow, Senior Engineer and Program Leader at the Norwegian Geotechnical Institute, and Associate Professor/Professor at Virginia Tech. He was Founding Chair of the Department of Civil and Environmental Engineering at Khalifa University in Abu Dhabi, UAE. He has also held visiting professorship and researcher positions in China, Chile, France, Japan and South Korea. He has published more than 350 papers in book chapters, journals and conference proceedings, and has given keynote and invited lectures at several conferences. He has been involved in several landmark and groundbreaking Civil Engineering projects while working in Norway. He is a member of the Editorial Board of five International Journals. He is the recipient of the Geotechnical Research Medal from UK's Institute of Civil Engineers, the Peter A. Cundall Honorable Mention Award, the Applied Rock Mechanics Research Award from the American Rock Mechanics Association, and the Kwanghua Visiting Professorship from Tongji University. Dr. Gutierrez's main research interests are in Geomechanics, and Energy and Environmental Sustainability.



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