

This annual Cornell University Geotechnical Engineering Colloquium was created through a generous bequest by the late Dr. Robert L. Schiffman, Cornell Civil Engineering Class of 1944 and Professor Emeritus at the University of Colorado at Boulder. Professor Schiffman believed that all interested CE students should have the opportunity to meet and to hear lectures delivered by distinguished geotechnical engineers and geoscientists. Through his bequest, generations of Cornellians will have this opportunity. Schiffman Lectures to date are:

1. *"Conduction Phenomena: From Theory to Geotechnical Practice"*  
13 Apr 1995 Prof. James K. Mitchell, Virginia Tech
2. *"Case History of Scott Dam: Geotechnical Practice for Public Safety"*  
8 Apr 1996 Prof. Richard E. Goodman, Univ. of California at Berkeley
3. *"Alternative Design Strategies for Piled Raft Foundations"*  
21 Oct 1996 Prof. Harry G. Poulos, Univ. of Sydney & Coffey Partners
4. *"Leaning Tower of Pisa – Current Situation"*  
1 Oct 1998 Prof. Michele B. Jamiolkowski, Technical Univ. of Torino
5. *"Soil Mechanics and U.S. National Defense – A Mutually Beneficial Relationship"*  
11 Nov 1999 Dr. William F. Marcuson III, US Army Waterways Exp Station
6. *"Uncertainty in Geotechnical Engineering: How Reliable is My Geotechnical Engineer?"*  
31 Jan 2002 Dr. John T. Christian, Consulting Engineer
7. *"The World Trade Center - From Genesis to Armageddon"*  
24 Oct 2002 Mr. George J. Tamaro, Mueser Rutledge Consulting Engrs.
8. *"Geosynthetic-Reinforced Retaining Structure -The Future 'Standard Retaining Wall?'"*  
28 Oct 2003 Prof. Robert D. Holtz, Univ. of Washington
9. *"Anatomy of a Court Trial on Tank Settlements"*  
7 April 2005 Prof. Charles C. Ladd, III, Massachusetts Inst. of Tech.
10. *"Long Term Performance of Contaminant Barrier Systems"*  
6 April 2006 Prof. R. Kerry Rowe, Queen's Univ.
11. *"Stability Assessment of Ten Large Landfill Failures"*  
17 April 2007 Prof. Robert M. Koerner, Drexel Univ.
12. *"Design of Foundations for the World's Tallest Buildings"*  
10 November 2009 Mr. Clyde Baker, Jr., STS Consultants
13. *"Re-Examination of Liquefaction Field Case Histories"*  
01 April, 2010. Prof. Emeritus Izzat M. Idriss, Univ. Cal Davis.
14. *"Current Approaches to Performance Monitoring and Future Trends"*  
07 April, 2011. Dr. W. Allen Marr, Geocomp Corporation
15. *"An Investigation into Why the Earthquake Liquefaction Charts Work So Well"*  
05 April, 2012. Prof. Ricardo Dobry, Rensselaer Polytechnic Institute
16. *"Performance-based Design in Geotechnical Engineering"*  
13 Sept 2012. Prof. Malcolm Bolton, University of Cambridge
17. *"Smart Geotechnical Infrastructure and Construction"*  
13 April 2017 Prof. Kenichi Soga, University of California at Berkeley
18. *"Earthquake Engineering for Nuclear Facilities"*  
26 Oct 2018 Prof. Masanori Hamada, Waseda University
19. *"Global Directions on Reducing Risks of Natural Disasters in the Built Environment"*  
11 Oct. 2018 Dr. Lucile M. Jones, Caltech, Pasadena, CA
20. *"Lessons from Critical London Infrastructure Projects for Deep Circular Shaft Construction"*  
8 Oct 2019 Professor Lord Robert Mair, Cambridge University

## **21<sup>st</sup> Robert L. Schiffman '44 Geotechnical Colloquium**

**4:30 pm Tuesday, 5 November 2019  
366 Hollister Hall**



**Robert L. Schiffman  
27 October 1923 – 10 August 1997**

**International Pioneer and Authority on the  
Theory of Consolidation of Soft Soils and on  
Computer Applications in Geotechnical Engineering**

## Seismic piezocone testing – the versatile means for geotechnical site exploration in 2020 and beyond



**Professor Paul W. Mayne,  
PhD, PE**  
**BSCE'74, MEC'77, PhD'91**

**Georgia Institute of  
Technology**

Towards geotechnical site characterization, seismic piezocone penetration testing (SCPTu) offers up to five separate measurements with depths from a single sounding: cone tip resistance ( $q_t$ ), sleeve friction ( $f_s$ ), porewater pressure ( $u_2$ ), time rate dissipation ( $t_{50}$ ), and shear wave velocity ( $V_s$ ). While normal soundings to 30 m depths are routine, special advancements have now achieved depths of up to 200 m. The SCPTu has proven to be an expedient and economical means for obtaining stratification of the ground and the determination of a variety of soil engineering parameters for analysis and design, including: soil behavior type, unit weight, stress state, strength, stiffness, and permeability, as well as nonlinear stress-strain-strength curves for clays and sands. Calibration and documentation of selected geoparameters from CPTu measurements are presented with statistical datasets from laboratory benchmark tests, specifically effective stress friction angle and preconsolidation stress in sands, silts, and clays. In addition, direct CPT methodologies have been developed for application to shallow footings, piling foundations, and seismic liquefaction concerns. Case studies are presented to show the utilization of SCPTu in geotechnics.

## Professor Paul W. Mayne

### *Professional History:*

Dr. Paul Mayne is an international expert on in-situ testing, geotechnical site characterization, and the evaluation of soil & rock properties. His research interests include the use, conduct, and interpretation of the piezocone, seismic cone, and flat dilatometer test, especially concerning applications towards evaluating soil parameters, foundation systems, and ground modification programs.

Currently Paul is a professor of Civil & Environmental Engineering at the Georgia Institute of Technology. He was author of the 2007 NCHRP Synthesis 368 on *Cone Penetration Testing* and co-author on the new 2019 AASHTO Manual on Subsurface Investigations: [www.trb.org](http://www.trb.org), as well as co-author of the EPRI Soil Properties Manual (1990) and FHWA Manual on Geotechnical Investigations (2002). Paul has given invited lectures internationally including: SOA-1: Geomaterial Behavior & Testing at the 17<sup>th</sup> ICSMGE (Egypt, 2009), Keynote at CPT'10 (California), ASCE SOA Lecture on in-situ testing (Oakland, 2012), 12<sup>th</sup> Jennings Lecture in South Africa (2013), 16<sup>th</sup> Sowers Lecture (2013), Hoover Lecture (Iowa State 2014), Keynote Lecture at CPT'14 (Las Vegas), the Hal Hunt Lecture at the 39<sup>th</sup> DFI Conference (Atlanta 2014), Keynote for ISC-5 Brisbane (2016), 14<sup>th</sup> Nonveiller Lecture in Zagreb (2016), 34<sup>th</sup> Manuel Roche Lecture in Lisbon (2017), 26<sup>th</sup> Spencer Buchanan Lecture at Texas A&M (2018), and the 2018-2019 ASCE Cross-USA Lecture for the Geo-Institute.

Dr. Mayne is an active member of ASCE, TRB, DFI, ADSC, CGS, USUCGER, and ISSMGE. He served as the chair of the international committee on in-situ testing (TC 102) from 2000-2013 and ISSMGE Vice President for North America from 2014 to 2017. Paul is the author or co-author on some 330 publications and has participated in some 120 continuing education courses across the globe. Dr. Mayne has also consulted on recent projects in Australia, Virginia, Washington, South Carolina, Ontario, Puerto Rico, Alabama, Georgia, North Carolina, and Alaska. He is married with one daughter and plays bass guitar.