

# 2015 C.N. Yang Visiting Professor: Marlan O. Scully



THE CHINESE UNIVERSITY OF HONG KONG  
Department of Physics  
COLLOQUIUM

## Remote Detection via Quantum Coherence

**Professor Marlan O. SCULLY**

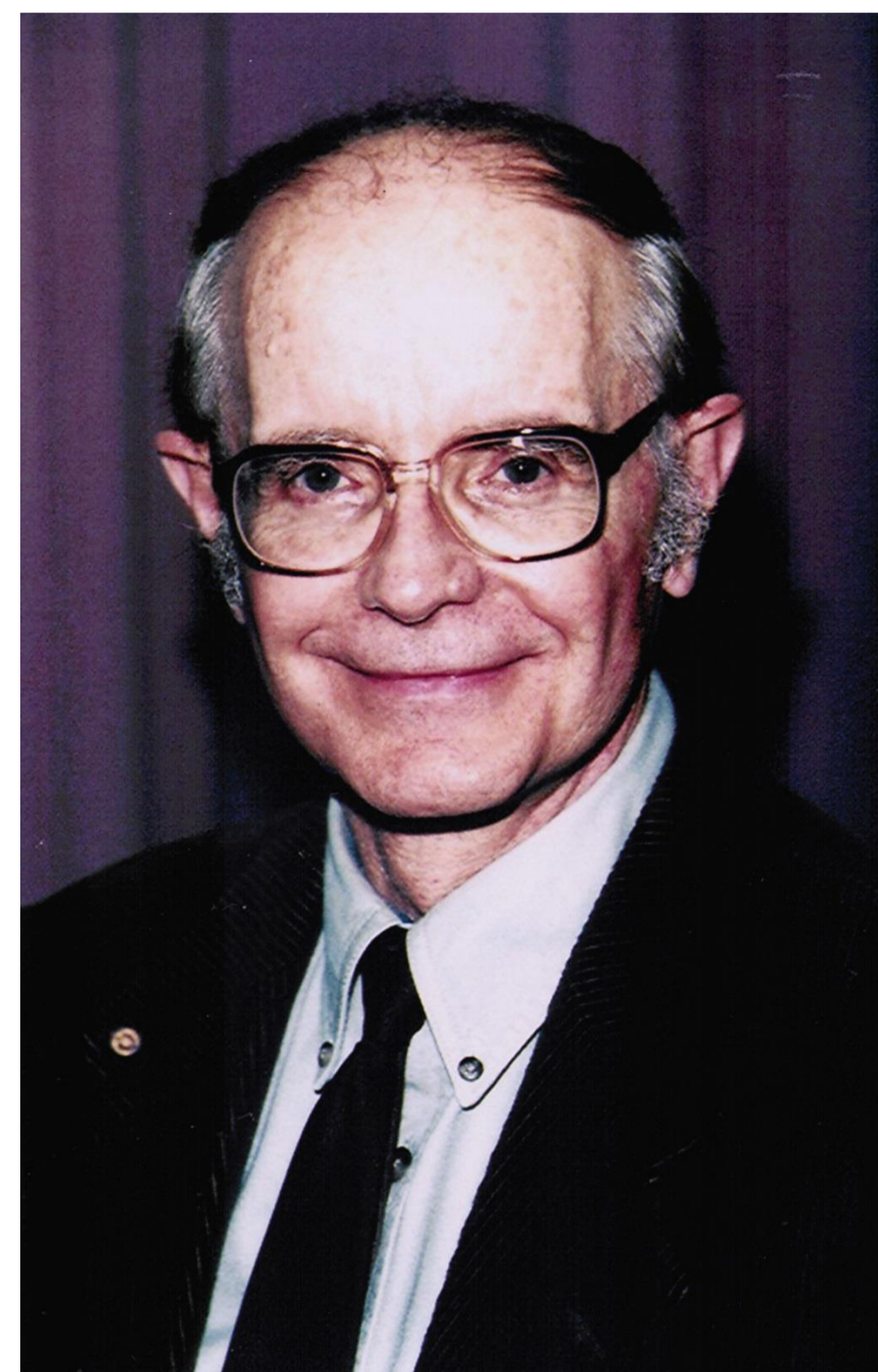
Princeton University, USA  
Texas A&M University, USA  
Baylor University, USA

*Date: April 30, 2015 (Thursday)*

*Time: 4:00 - 5:00 p.m.*

*Place: L2, Science Centre, CUHK*

*(Light refreshments will be served before the talk.)*



### Abstract

There is nothing so practical as a good theory. As a case in point, the compelling need for standoff detection of hazardous gases and vapor indicators of explosives has motivated the development of remotely pumped, scheme(s) which produce radiation in the backward direction [1,2]. Moving from conceptualization to theoretical analysis and experimental verification, we demonstrate that high gain can be achieved in air. Backward air lasing provides possibilities for remote detection [3] as will be discussed.

[1] Dogariu, A, Michael, JB, Scully, MO, Miles, RB, High-Gain Backward Lasing in Air, *Science*, 331(6016), 442-445 (2011).

[2] Svidzinsky, AA, Yuan, LQ, Scully, MO, Transient lasing without inversion, *New Journal of Physics*, vol. 15, art. no. 053044 (2013).

[3] Yuan, L, et al., Coherent Raman Umklappscattering, *Laser Physics Letters*, 8(10), 736-741 (2011).

### Biography

Professor Marlan O. Scully, Burgess Distinguished Professor and Director of Institute for Quantum Science and Engineering in Texas A&M University and professor in Princeton University, is awarded the C. N. Yang Visiting Professorship (2014-2015) of Department of Physics, The Chinese University of Hong Kong. He has done seminal works in quantum optics including the first quantum theory of the laser with Lamb, the first demonstrations of lasing without inversion, the first demonstration of ultraslow light in hot gases, and the use of quantum coherence to detect anthrax in real time. Furthermore Scully's work on quantum coherence and correlation effects has shed new light on the foundations of quantum mechanics, e.g., the quantum eraser. For his distinguished works, Professor Scully has been elected to the National Academy of Sciences, American Academy of Arts and Sciences, Academia Europaea, and Max Planck Society. He has numerous awards including the APS Schawlow prize, OSA Townes Award, IEEE Quantum Electronics Award, Franklin Institute's Elliott Cresson Medal, OSA Lomb Medal, and Humboldt Senior Faculty Prize. More recently he was named Harvard Loeb Lecturer, received an honorary doctorate from University of Ulm, and was awarded the OSA's DPG Hebert Walther Award.

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