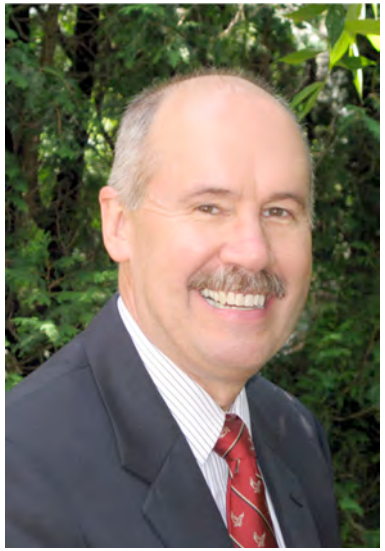

2013-2014 POCC Lecture Series

April 17, 2014, 8:00 PM

Prof. Lawrence T. Scott
Boston College

Strategies for the Directed Synthesis of Single-Index (n,m) *Carbon Nanotubes*

Carolyn Hoff Lynch Lecture Hall
Chemistry Building, University of Pennsylvania

The Philadelphia Organic Chemists' Club

POCClub.org

Lawrence T. Scott holds the Louise & Jim Vanderslice and Family Chair in Chemistry at Boston College. After completing his bachelor's degree in chemistry at Princeton University in 1966 and his Ph.D. degree with R. B. Woodward at Harvard University in 1970, he joined the chemistry faculty at UCLA as an assistant professor. In 1975, he moved to the University of Nevada-Reno, where he was named Foundation Professor in 1985 and served as department chairman from 1988 to 1991, before moving to Boston College in 1993. Dr. Scott has been awarded senior scientist fellowships from NATO, the Japan Society for the Promotion of Science, and the Alexander von Humboldt Foundation. He is an elected Fellow of both the American Chemical Society and the American Association for the Advancement of Science. He has served as chairman of the Gordon Research Conference on Physical Organic Chemistry and sits on the Governing Board of the Organic Reaction Mechanisms Conferences. Both the University of Nevada-Reno and Boston College have honored him with Faculty Distinguished Research Awards. His most recent award is the 2011 ACS George A. Olah Award in Hydrocarbon Chemistry. He currently serves on the editorial advisory board of *The Journal of Organic Chemistry* and as past-chair of the ACS Division of Organic Chemistry.

Abstract: Carbon nanotubes have been widely touted for their potential to fulfill dreams in materials science and in the emerging realm of nanotechnology. Single walled nanotubes (SWNTs) composed of six-membered rings oriented along the shaft in a so called "armchair" arrangement, for example, are expected to find innumerable uses as ultra thin, super strong, light weight, nanowires, with metal-like electrical conducting properties. First discovered by accident in the early 1990s, these carbon-rich materials hold considerable intrinsic scientific interest as well, owing to their unusual curved networks of trigonal carbon atoms. Despite intense scrutiny by scientists and engineers worldwide for over two decades, however, these fascinating tubes of carbon are still being made today by poorly understood, empirical, high temperature methods based on the transition metal-mediated capture of atomic, diatomic, and polyatomic carbon species from the gas phase. Control over which nanotubes will be formed under such conditions is exceedingly difficult, and it seems unlikely that further modifications of these empirical methods will ever give scientists the ability to prepare selectively any nanotubes of predefined structure in pure form. That will be possible only through rational chemical synthesis. Unfortunately, the necessary methodology does not yet exist. This lecture will describe efforts to develop synthetic organic chemical methods that will make possible the rational chemical synthesis of all-carbon SWNTs that have predefined and uniform diameter, chirality, end cap structure, and rim structure.