Professor Stephen R Leone Hon DSc

Oration by Dr Vasilos Stavros
Department of Chemistry

Steve Leone holds the John R Thomas Endowed Chair in Physical Chemistry and Professorships of both Chemistry and Physics at the University of California, Berkeley. He is also a faculty principal investigator at the Lawrence Berkeley National Laboratory. All that sounds fairly serious and when one looks up his group web page in Berkeley, aside from the great big picture of his research group with enough members to run its own small conference, one reads that he specialises in, amongst many other areas, ultrafast chemical dynamics on the attosecond timescale – an attosecond is to a second what a second is to the birth of the universe almost three times over!!

Steve was born in New York City and moved to Batavia, Illinois at the age of five. Even at a young age, there were clear signs that Steve was destined to be an experimentalist, playing with Chemistry sets that you would certainly not be able to purchase nowadays!

Steve attended Northwestern University (approximately 1hr 10 mins from Batavia according to Google Maps!), where he majored in Chemistry. At Northwestern, his love of Chemistry sets switched to lasers, which very much moulded his research direction when he moved to UC Berkeley to carry out his PhD studies and to the present day.

Steve is one of the fathers of using lasers to study gas-phase reactions and energy-transfer processes, what we chemists call *photochemistry*. His early work at the University of Boulder, Colorado, on how molecules respond when they are bombarded by laser light, and how this energy is partitioned into the various 'parts' of a molecule, has been key to our understanding of the *fundamental processes* in operation during the making and breaking of chemical bonds. Entire conferences are now dedicated to this field which Steve was instrumental in developing.

Steve then moved to Berkeley where I was fortunate enough to join his group. I certainly found him an inspirational person to work with and can attribute the growth of my own enthusiasm for research, and attention to detail, to his. Regarding the latter, I recall attending a machinist's workshop, which taught us how to use the tools of the trade (mills/lathes and so on). At the end of this workshop, we had to machine a piece of stainless steel into what I can only describe as a metallic rocket. This rocket contained features such as a particular thread and pitch diameter. I was quite proud of my achievements until Steve showed me his masterpiece – he had attended the same workshop when he was a PhD student. His rocket was even anodised! It left me thinking, now there's a man who pays attention to detail and has foresight. My piece has now gathered quite a bit of rust on my shelf whilst Steve's is probably in pristine condition!!

Steve's creativity and insatiable curiosity is complemented by this tremendous foresight. He has recently developed multi-million-dollar attosecond laser facilities which include enough lasers to keep some major laser companies in business as well as great big stainless steel vacuum chambers; combined they require, pretty much, their own building to house. These attosecond capabilities, which in a nutshell are used, in part, as super-fast cameras, can now take movies of the motion of electrons through silicon, which essentially unravels the speed limit in electronic circuitry!

In addition to his leadership in the scientific community, Steve is widely considered second to none when it comes to his generosity to help others progress in their careers. Steve has had countless PhD and postdoctoral students emerge from his group (300 now); Steve has guided each and every one of these scientists, with 70 of them now holding positions in universities across the world (in the UK

alone, there are five of ‘his’ professors). Helping his group members reach their goals is a hallmark of Steve’s character, evidenced through his award of the Nobel Laureate Signature Award for Graduate Education in Chemistry in 1983. Those who have been fortunate to bear the fruits of Steve’s expert tutelage can attest to his commitment in ensuring his group members are supported unconditionally.

Although Steve has already published nearly 600 scientific papers, his energy is such that we are sure his greatest science is still yet to come. His award of a degree with us today is due to his combination of superbly crafted science and unwavering leadership in the scientific community, which has already been recognised by some of the most prestigious awards in chemistry and physics (and would require another five mins to list!).

Mr Vice-Chancellor, in the name of the Senate, I present to you, for the admission to the degree of Doctor of Science, *Honoris Causa*, Professor Steve Leone.