

OLLSCOIL na hÉIREANN
NATIONAL UNIVERSITY OF IRELAND

TEXT OF THE INTRODUCTORY ADDRESS DELIVERED BY:

DR. MICHAEL B. MURPHY, President, University College Cork on
2 December 2013 in the Royal College of Physicians of Ireland, on the
occasion of the conferring of the Degree of Science, *honoris causa*, on
PROFESSOR SÉAMUS DAVIS

A Sheansailéir, a mhuintir na hOllscoile agus
a dhaoine uaisle,

Séamus Davis is one of the world's most
accomplished physicists. When he chose to
leave Berkeley for Cornell ten years ago, the
Los Angeles Times, on July 14, 2003, carried
a major article lamenting the demise of
Physics in the jewel of the University of
California system, and the potential scale of
consequent economic loss to the state.

He was born in Skibbereen, in 1961 to a
family of renowned footballers. His father and
two uncles played for O'Donovan Rossa while three first cousins were Cork
County Senior players. His uncle Seamus, for whom he is named, was a
locally celebrated, poet, musician and seanachai.

At St. Fachtnas De La Salle School in Skibbereen, his teacher Liam
O'Donovan, a footballing friend of Séamus' father, nurtured in him a passion
for mathematics and physics. Seamus also admits indebtedness to Patricia
Boland who tutored him in public speaking and debating, skills he has since



employed in delivering over 500 invited lectures at the world's greatest universities.

In 1978 he was admitted to UCC to study Physics under the tutelage of Prof. Frank Fahy. Fahy was without peer, in that era, in nurturing creativity and fostering excellence and ambition in small classes of hand-picked students. Among Seamus's contemporaries in the laboratories were Richard Milner, today Head of the Laboratory for Nuclear Science at MIT, Margaret Murnane, Professor of Physics at the University of Colorado, Member of the US National Academy of Sciences and current Chair of President Obama's National Medal of Science Committee, and Frank's own son Stephen, today a Professor of Physics at UCC following a distinguished career at the University of Michigan.

After graduation from Cork in 1983, Seamus went to Berkeley to read for a PhD. Berkeley had been one of the most important physics departments of the 20th century. EO Lawrence invented the particle accelerator there and J.R. Oppenheimer led the development of the first atomic bomb from Berkeley. More elementary particles and new elements were discovered at Berkeley than anywhere else in the world; the imprint of the Big Bang on the cosmic microwave background radiation and the accelerating expansion of the universe were also discovered at Berkeley.

So where does Seamus fit in the cosmos? Best to use his own words – I quote. “Everything around us, everything each of us has ever experienced, and virtually everything underpinning our technological society and economy is governed by quantum mechanics. Yet this most fundamental physical theory of nature often feels as if it is a set of somewhat eerie and counterintuitive ideas of no direct relevance to our lives. Why is this? One

reason is that we cannot perceive the strangeness (and astonishing beauty) of the quantum mechanical phenomena around us by using our own senses.”

So, a theme of Séamus’ work has been to reject the idea that the quantum world is forever hidden from human senses and to develop new ways of perceiving its amazing effects. One of Seamus’ major discoveries at Berkeley in the late 1990’s was the ‘Superfluid Josephson Effect’. Richard Feynman and Brian Josephson had predicted in the 1960’s, that the macroscopic quantum dynamics of a superfluid could be revealed as a pure musical tone that should be generated spontaneously by pressurizing the quantum fluid. Seamus developed the complex instrumentation necessary and eventually discovered this quantum sound - the first time that a quantum mechanical phenomenon was experienced by one of the human senses.

Séamus then became fascinated by the challenge of visualizing quantum mechanics. In the early 2000’s, he invented the ‘spectroscopic imaging scanning tunneling microscope’ an instrument that allows the quantum ‘matter waves’ of electrons to be visualized (and even converted into movies), revealing many amazing and exotic quantum effects. Today he is leading the world in applying his science to discover compounds that will exhibit superconductivity at room temperature, allowing the passage of electricity without loss of energy – a holy grail of science for economic and social benefit.

Seamus’ work is utterly “ground-breaking”. He has authored over 30 papers in Science and Nature, the two foremost scientific journals in the world. His many honours include Loeb Lecturer in Physics at Harvard, Einstein Lecturer at the Weizmann Institute in Israel, Ehrenfest Lecturer at Leiden University and the Von Borries Lecture at Tübingen. In 2005 he was awarded the Fritz London Memorial Prize, the greatest honour in Low Temperature Physics. Of the 48 awardees since 1957, 20 have been Nobel Laureates. In 2009 he

received the Kamerlingh Onnes Prize named for the Nobel Laureate who discovered superconductivity.

A winner of the National Science Foundation Young Investigator award in his early days, he has become a Fellow of the Institute of Physics and of the American Physical Society. In 2010, he was one of the youngest physicists ever elected to the US National Academy of Sciences.

Seamus remained at Berkeley for almost 20 years, becoming a full Professor and Faculty Physicist at the Lawrence Berkeley National Laboratory. But he also found time to marry - Kathy Selby, herself a physicist at UC San Francisco, and they had two sons. In 2003 Seamus and Kathy swapped the West for the East Coast to be closer to Europe (their home) and to give the kids the chance for a rural upbringing that they themselves had enjoyed. Moving to New York, both were awarded professorships at Cornell University at Ithaca, he as Professor of Physics and a Senior Physicist at Brookhaven National Laboratory. Today, he holds a Distinguished Research Professorship at St. Andrews University, Scotland, on a part-time basis.

Kathy's real vocation is the fiddle. Trained in classical violin, she had never considered traditional fiddle music until one day, she visited Séamus Davis senior on his farm in Lisheen near Skibbereen. Knowing that she was a musician, he played some traditional Irish tunes for her on his flute. From that day she became a fanatical traditional musician, dedicated to learning, preserving and playing the fiddle music of Ireland, Scotland and New England. Nowadays she has a full performance schedule throughout the academic year in New England, and another one throughout West Cork during the summers.

Seamus' extended family still live in West Cork where Kathy and Séamus now spend every summer with their boys Michael and Owen. I am delighted

to welcome Séamus' sister Denise Collis along with her husband Mark, his brothers Michael and Joe along with their spouses Joan and Maeve, to today's ceremony. To quote Seamus, "All have been amazingly patient , over the years, with a mad scientist for a brother! "

Mad, or otherwise, Seamus Davis is one of the most accomplished Irish university graduates of the 20th century and I have the honour of presenting him to you Chancellor for the conferment of the University's highest accolade – a Doctorate in Science.

PRAEHONORABILIS CANCELLARIE, TOTAQUE UNIVERSITAS:

Presento vobis hunc meum filium, quem scio tam moribus quam doctrina, habilem et idoneum esse qui admittatur, *honoris causa*, ad gradum Doctoratus in Scientia, idque tibi fide mea testor ac spondeo, totique Academiae.