

**OLSCOIL NA hÉIREANN, GAILLIMH
NATIONAL UNIVERSITY OF IRELAND, GALWAY**

Text of the Introductory Address delivered by **PROFESSOR COLIN BROWN**, National University of Ireland, Galway on the 9th June, 2017 on the occasion of the Conferring of the Degree of Doctor of Science *honoris causa*, on **KRIS JOHNSON**.

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

In 1968, a young girl from Denver spent a long summer holiday with her cousin, Áine O'Donoghue and family in Tralee. She was really excited because her mother, whose parents had emigrated from Roscrea to the States, had inculcated in her daughter a love of Ireland and Irish culture. When she arrived, she attended the local primary school with her O'Donoghue cousins, and impressed her teachers and classmates with her ability and passion for mathematics and science, and she was remembered long afterwards as the 11-year old girl who left the school with a design to retrofit its heating system to improve its efficiency. At the end of an idyllic holiday, she had also fallen in love with Ireland

This young girl, Kristina Johnson, returned to high school in the States. She was encouraged by her grandfather, who had worked with the famous engineer George Westinghouse, and her father, who had worked for Westinghouse Corporation, to develop her scientific skills - when she wasn't competing in Tae Kwon Do and playing lacrosse on the boys' lacrosse team. She was introduced to the world of optics and, at a school science fair she made double-exposure holograms of growing fungus in the laboratory, measured the separation of the interference from the two exposures and determined the rate of growth and direction. '*It was like magic*' and it propelled her to

Stanford University where she progressed rapidly to a PhD in electrical engineering - and founded the women's club lacrosse team, played on the field hockey team, and had trials for the US Team.

The Irish family connections were part of her decision to continue post-doctoral research at TCD. After that her career took off. At the University of Colorado and Duke University, her work formed the basis for 3D films, TV projection systems, digital mammograms, screening of smears for cervical cancer, and near-to-eye display technology. She published 150 articles and 120 patents. She became the first woman to be presented the annual Dennis Gabor Award – and remember those growing fungus holograms - '*in recognition of outstanding accomplishments which further the development of holography and applications in the science of measurement*'. She co-founded ColorLink, an SME which developed optoelectronic 3D imaging and color systems for 3D effects in movies such as Avatar and Gravity. She was awarded the John Fritz Medal, the highest engineering award for '*outstanding scientific or industrial achievements*'.

She became Dean of Engineering at Duke, Professor at Colorado, and Vice-President for Academic Affairs at John Hopkins. And these positions led to board membership at AES, a global sustainable energy company, Boston Scientific and Cisco Systems whom we know in Galway, and SFI. It was inevitable that she would sit on the Board of the Ryan Institute in NUI Galway. And as its former Director, I can vouch for the great experience and warmth she brought to the role.

She was Provost at John Hopkins when Barak Obama was elected President. As she put it, '*I sat up late to watch him and his family accept the results of the election, and knew immediately if I had the chance to work for this new President, I just had to*'. She was

offered several positions but was passionate about – remember that school heating system – Under-Secretary of Energy. She managed the \$10.5 billion ‘Energy and Environment’ portfolio, and \$37 billion of investments in ‘Energy and Environment’ as part of the American Recovery and Reinvestment Act of 2009.

When the Deep Horizon oil spill happened, the technique she had used in that science fair project on fungus growth provided the means to measure the rate at which oil was spewing into the Gulf of Mexico. It allowed the President to announce after several days that > 25,000 barrels a day were leaking and gave the political impetus to stop the leak. In her own words '*It was a scary time*'. Not surprisingly, after her spell as Under-Secretary, and in her father and grandfather’s engineering footsteps, she became co-founder and CEO of Cube Hydro, a company dedicated to modernising hydroelectric facilities at unpowered dams, and demonstrating renewable hydropower to reduce reliance on harmful carbon-based energy.

Kristina is a strong proponent of women in leadership in science and engineering and is proud of '*all her students who have gone on to do amazing things*'. She is passionate about education in Science, Technology, Engineering and Mathematics (STEM) and STEAM (STEM with Art), and creating jobs via small businesses so it’s no surprise that she has a '*Women Engineers Lifetime Achievement Award*', and a '*Woman of Vision Award for Leadership*'. And in September when she starts as Chancellor of the US’s largest higher-education system, the State University of New York, her commitment to these values will be of enormous help to the university’s mission of education and training for the 21st century.

A few weeks ago, I asked Kris ‘*What is your proudest achievement?*’ She replied, not unreasonably, ‘*carrying out the American Recovery and Reinvestment Act that resulted in doubling the size of our renewable energy and bringing cleaner hydropower onto the grid. It is a critical time to use less, waste less, and reuse more to create a sustainable future.*’ She had preceded that by saying ‘*being able to take care of my mother at the end of her life*’.

Dr Kristina Johnson, we have been very fortunate that your early links with Ireland through your mother Kathleen Johnson so inspired you that you maintain close connections with the country on many levels – with family and friends, academia, science, enterprise and industry - and happily with NUI Galway. We are pleased to confer upon you the Degree of Doctor of Science *honoris causa*.

PRAEHONORABILIS CANCELLARIE, TOTAQUE UNIVERSITAS:

Praesento vobis, hanc meam filiam, quem scio, tam moribus quam doctrina, habilem et idoneum esse, quae admittatur, honoris causa, ad gradum Doctoratus in Scientiae, idque tibi fide mea testor ac spondeo, totique Academiae.