Oration for Professor Charles Fefferman, Hon DSc

To be Delivered on Thursday 19 July 2018, 3pm by Professor Jose Rodrigo

Vice Chancellor

Charles Louis Fefferman – or Charlie as everyone knows him – is, without question, one of the world's foremost mathematicians.

Born in 1949, Charlie was a child prodigy. He entered the University of Maryland at the age of 14, graduating at 17 with degrees in Mathematics and Physics. He then went to Princeton, where he obtained his PhD aged 20, under the supervision of the great Eli Stein. Professor Stein recently described Charlie's work in this period as transforming our view of several subjects in a 'series of achievements unique in the history of modern mathematics'. By 22, those achievements were significant enough to earn Charlie a Professorship at the University of Chicago - the youngest full Professor ever appointed in the United States. He remained at Chicago for two years before returning to Princeton, where he is today, the Herbert Jones Professor of Mathematics.

During his career, Charlie has demonstrated an extraordinary versatility, making fundamental contributions to multiple, distant fields including Harmonic

Analysis, Partial Differential Equations, Several Complex Variables, Conformal Geometry, Quantum Mechanics, Fluid Mechanics, Whitney Theory and the Mathematics of Graphene.

With over 200 research papers and monographs to his name, many of which have dramatically transformed our view of the corresponding subject, it is difficult to choose highlights. But in this room today are two students who have completed their senior theses on Charlie's work on the Ball multiplier theorem – one of the many occasions when Charlie produced an extraordinary and shocking result, in this case by proving that the hoped-for theorem was, in fact, false. Charlie's beautiful geometric construction, which had eluded the best mathematicians for years, does in fact, fit in just seven pages.

Charlie's contributions have already earnt him the highest accolades: the Salem Prize, the inaugural Alan T. Waterman Award (established that year by an act of Congress), the Bergman Prize, and the Wolf Prize. In 1978, he also received the Fields Medal – often referred to as the Nobel Prize for mathematics – and he is one of only two mathematicians to have received this honour under the age of 30.

One of the most fascinating qualities of Charlie is his immense ability to concentrate on an idea, sticking with it relentlessly until it is completely exploited and the problem resolved. In his own words: "It's just so exciting. A

problem sort of chooses you and you can't stop thinking about it. At first you try something, and it doesn't work. You get clobbered. You try something else and get clobbered again! Eventually you get some insights and things begin to come together. Everything starts to move. Everyday things can look different. Eventually you manage to solve it all, and that is a great feeling!"

I was lucky enough to be a student of Charlie's and know first-hand what an inspiring and gifted teacher he is. He has a very rare ability to take incredibly complex problems and theories and break them down into simple examples or ideas, which he is able to present in an elegant and natural way, appearing to the audience as if, they were obviously meant to be that way. Indeed his lecturing skills were apparent very early on: like many a child he took an interest in dinosaurs, and became so knowledgeable that his impromptu "lectures" to his younger brother, on fossil exhibits at the Smithsonian Museum, reputedly drew throngs of followers.

Charlie's contribution to mathematics is undisputed and in itself makes him a truly unique and remarkable academic. What is most inspiring about Charlie, however, is who he is as a human being. The kindest, gentlest, and most humble, family man; always approachable; never dismissive of an idea that you've spent hours working up (even if he is smart enough to see from a mile away that it won't work).

He has an infectious passion for anything creative, whether music, art (he is a talented painter) or literature. What is more, he has the ability to bring that passion to life and has delighted many an audience with an impromptu rendition of some Gilbert and Sullivan or even a passage from the Iliad (which rumour has it, he has memorised).

On a more personal level, he is the sort of person who, with his wife, will drive for hours through New York traffic on the day of a Yankees game to be at the hospital after the birth of your first child. The sort of person who will spend hours pacing up and down with the baby of a friend so that the parents could get some rest, only to end up thanking the baby for “useful conversations” in one of his recent brilliant papers.

Charlie published his first research paper in 1964 when he was just 15 – that year was also notable for the foundation of the Warwick Mathematics Institute. Since the early 2000s, Charlie has visited Warwick many times, delivering lectures and courses, publishing with our academics, postdoctoral fellows, and students. And now looking to the future, Charlie will chair the advisory board for a newly established partnership between Princeton, Warwick and other universities, for the study of nuclear Fusion and the development of stellarators.

Vice - Chancellor, it is an honour and a great personal pleasure for me, on behalf of the Senate, to present to you for admission to the degree of Doctor of Science, honoris causa, Professor Charles Louis Fefferman.