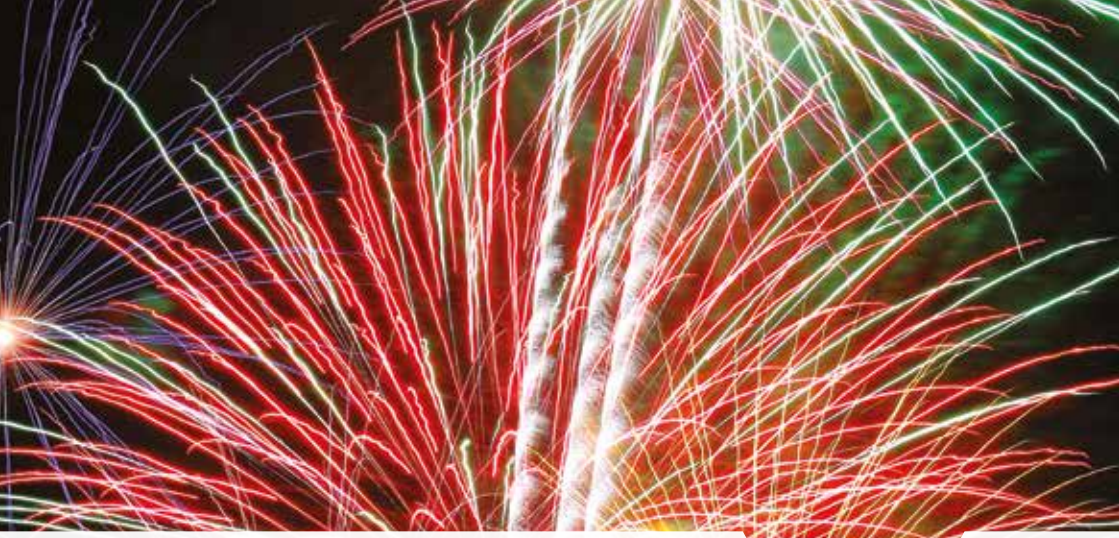

WARWICK
THE UNIVERSITY OF WARWICK

Professor Shigefumi Mori Hon DSc

Oration by Professor Miles Reid
Department of Mathematics

Professor Shigefumi Mori Hon DSc

It is my very great honour to introduce you to Professor Mori Shigefumi, my old friend and one of the world's most distinguished mathematicians.

Mori's ground-breaking research in higher dimensional algebraic geometry from the late 1970s introduced several spectacular innovations that changed the face of the subject, and have been central to developments in geometry and in theoretical physics ever since. Mori was awarded the Fields Medal at the Kyoto ICM in 1990. Since then, alongside his continuing research, he has served as Director of the prestigious Research Institute for Mathematical Sciences at Kyoto University, and is currently President of the International Mathematical Union.

Describing advanced mathematical ideas for the layperson is something of a thankless task, but let me give it a try. Euclid described "straight" space, having parallel lines and with the three angles in a triangle adding to a predictable 180 degrees.

It was recognised from early in the 19th century that other cases are possible and useful: different models of space can be positively curved like the surface of a football or orange peel, and the angles of a spherical triangle always add to more than 180 degrees. Or space can be negatively curved like a Pringles chip or the surface of a saddle, leading to hyperbolic non-Euclidean geometry. The three angles of a hyperbolic triangle always add to less than 180 degrees. Or the curvature of space may vary from point to point, like a curved dumbbell.

Taking these pictures to higher dimensions requires whole rafts of technical foundations in complex algebraic geometry that I will spare you. Suffice it to say that a number of brilliant innovations due to Mori provided some of the key modern tools. One of Mori's first great papers introduced a revolutionary technique called "bending-and-breaking", combining ingenious arguments in algebraic geometry with the number theory technique of reducing to characteristic p to prove the existence of rational curves on a positively curved algebraic manifold. The remarkable aspect of this is that it proves a result concerning curvature in geometry, but passes via methods from number theory. This, and other ideas of Mori were astonishing when they first appeared, and have since become part of the fabric of modern algebraic geometry, with wide influence in other branches of math and science.

I'm happy to say that I have had friendly relations with Mori since my first visit to Japan more than 40 years ago. During the late 1980s and early 1990s, Mori was a frequent visitor to Professor János Kollár at University of Utah, where their combined authority formed the famous Salt Lake City Tabernacle of higher dimensional algebraic geometry. I was lucky enough to visit Utah for one term during this period, when Mori's family and mine lived in two partitions of a vast mansion house built for US army officers. My wife Nayo reminds me that they had a couple of quite justified complaints about noise coming through the partition. While my mathematical debts to Mori-Sensei are enormous, I also have to thank him and his wife Reiko-San for rescuing my daughter when she threw herself off a slide climbing frame in our back garden.

Mori comes from a distinguished pedigree. Japan joined the mainstream of western mathematics already in the 19th century, and produced world class research mathematicians at least since the early 20th century. Mori is the third Japanese Fields medallist in algebraic geometry. He studied in Kyoto University from the early 1970s with Professor Nagata Masayoshi, and then spent three years at Harvard during the late 1970s. For much of the 1980s he was at a number of US universities, before returning to a Chair at Kyoto. The same year as his Fields Medal he was awarded the Japanese cultural medal.

Since serving his stint as director of RIMS, he has been appointed to a leading position in the new Kyoto University Institute for Advanced Studies. Mori has been a major influence on algebraic geometry worldwide, but especially the UK and Warwick in particular; he spent a few weeks with us in the 1990s. He is the first East Asian to serve as President of the International Mathematical Union, and his presidency includes the 2018 Rio de Janeiro International Congress of Mathematicians.

Chancellor, in the name of the Senate, I present to you for admission to the degree of Doctor of Science, *honoris causa*, Professor Mori Shigefumi.