Professor Shigefumi Mori – July 2017 biography

Professor Shigefume MORI was the 1990 Fields Medallist for his ground-breaking work on algebraic 3-folds (3-dimensional complex algebraic varieties). In the same year he was also awarded the Japanese cultural medal. He was director of the prestigious Kyoto University Research Institute for Mathematical Science and is currently president of the International Mathematical Union.

He was a visiting professor at: Harvard University 1977–1980, the Institute for Advanced Study in 1981–82, Columbia University 1985–87 and the University of Utah for periods during 1987–89 and again during 1991–92. He has been a professor at Kyoto University since 1990.

From the late 1970s Mori produced several ground-breaking innovations in algebraic geometry. These include a revolutionary new technique to prove the existence of rational curves on an algebraic manifold using deformation theory and reduction to characteristic p. The technique is called "bending-and-breaking"; it was first used to prove major conjectures in complex projective geometry and in compact Kähler geometry that characterise complex n-dimensional projective space by curvature conditions. Mori then extended this and other techniques, developing the cone of effective curves of a projective manifold as a surprising and powerful new invariant. The results surrounding his Theorem on the Cone and their Extremal Rays radically changed our outlook on higher dimensional projective manifold and included the first serious steps in the higher dimensional Minimal Model Program (now known as Mori theory or the Mori program).

His work and discoveries have become a cornerstone of research in higher dimensional geometry and theoretical physics.