Shing-Tung Yau – LMS Honorary Member citation

Short citation:

The London Mathematical Society has elected Professor Shing-Tung Yau, Director of the Yau Mathematical Sciences Centre at Tsinghua University, and William Caspar Graustein Professor Emeritus at Harvard University, to Honorary Membership of the Society. Professor Yau is a seminal figure in modern global analysis, the applications of analytic methods to differential and algebraic geometry.

Long citation:

The London Mathematical Society has elected Professor Shing-Tung Yau, Director of the Yau Mathematical Sciences Centre at Tsinghua University, and William Caspar Graustein Professor Emeritus at Harvard University, to Honorary Membership of the Society.

Professor Shing-Tung Yau is a seminal figure in modern global analysis, the applications of analytic methods to differential and algebraic geometry. He received his Ph.D. at UC Berkeley in 1971 under the direction of Shing-Shen Chern, then held faculty positions at numerous distinguished institutions including Stanford and the Institute for Advanced Study, in addition to his posts at Harvard and Tsinghua. He is best known for his resolution of the Calabi conjecture on the existence of Kaehler metrics with prescribed Ricci curvatures on compact complex manifolds, which was achieved through a delicate study of complex Monge Ampere equations, non-linear partial differential equations whose study was revolutionised by this research. This, together with his proof of the positive energy theorem in general relativity, was cited in his award of the Fields Medal by the International Mathematical Union in 1982.

In the subsequent decades, in addition to continuing his ground-breaking work in geometry such as the Donaldson–Uhlenbeck–Yau theorem, Professor Yau has been among the most prolific and impactful contributors to activity at the interface of geometry and physics, especially string theory and quantum field theory. In 1996, together with Strominger and Zaslow, he wrote a paper formulating mirror symmetry as a duality between Calabi–Yau fibrations that has been enormously influential in both mathematics and physics, including ramifications in the Langlands programme. In over 600 publications, Professor Yau has continued to transform the landscape of geometry, topology, analysis and physics, even while reaching out to applied areas like mathematical biology, numerical analysis and data science.

Within China, Professor Yau has been instrumental in raising awareness of mathematics among the general public and policy makers, leading to the creation of numerous centres of research that stimulate the growth of the next generation and the international exchange of ideas. It is difficult to name any other mathematician who has been as influential to the international community in our times as Shing-Tung Yau. It is a great privilege for the London Mathematical Society to have him as an Honorary Member.