

Sir Michael ATIYAH

Citation

According to his peers, Sir Michael Atiyah received the equivalent of two Nobel Prizes. The prizes he won are considered the Nobel equivalent because there is no Nobel Prize for Mathematics. If Alfred Nobel were alive today, he might see it differently, because as Sir Michael so charmingly and convincingly made clear, mathematics is the language of science, some say the mother of science.

Sir Michael's theoretical contributions have resulted in the solution of many outstanding and difficult problems in mathematics. Of the two Nobel-equivalent prizes in mathematics won by Sir Michael, the first was the Fields Medal in 1966, for his seminal work with others on the K Theory and the Atiyah-Singer Index Theorem for which he also jointly won the Abel Prize in 2004 with his long-time collaborator Isadore Singer in recognition of "their discovery and proof of the Index Theorem, bringing together topology, geometry and analysis and their outstanding role in building new bridges between mathematics and theoretical physics". Several major areas in theoretical physics, such as the theories of superspace and supergravity, as well as the string theory of fundamental particles profited from the ideas advanced by Sir Michael. He earned the ultimate honor of having the 'Atiyah-Singer Index Theorem' named after him and his collaborator. At the same time Sir Michael has done much to bring the work of theoretical physics to the attention of his mathematical peers.

Sir Michael is mathematically prolific, having produced a large body of influential works, including a book on K Theory, six volumes of his *Collected Works* published by Oxford University Press, and *Introduction to Commutative Algebra*, a widely used advanced textbook. He has the knack of seeing interconnections between disciplines and sub-disciplines within mathematics, saying "What drives my interest in mathematics is the interconnections between different parts of mathematics." His students have been inspired to do likewise. A man of peace, he can see clearly the interconnections between mathematics and the military science. In his farewell presidential address to the Royal Society in 1995, he said that the ivory tower is no longer a sanctuary for scientists, pointing out that mathematical thinking and technology has changed the character of warfare, including the atomic bomb, stealth technology, and miniaturization. Mathematics has led to a complete reorganization of knowledge, including its role on the revolutionary impact of the computer.

Success came early to Sir Michael. After obtaining his doctorate from Cambridge University and teaching there and Oxford, he was made a Fellow of the Royal Society at the young age of 32. Sir Michael has practically garnered every prize and honor in mathematics worth garnering, from becoming the first Director of the Isaac Newton Institute for Mathematical Sciences to being installed as President of the Royal Society in 1990. He casts a giant shadow in the academic

world, occupying the Savilian Chair of Geometry at Oxford, becoming the Master of Trinity College at Cambridge and being appointed Professor of Mathematics at the Institute for Advanced Study in Princeton. The numerous awards he has won throughout his career include the De Morgan Medal, the Feltrinelli Prize, and the King Faisal International Prize for Science, and the Copley Medal of the Royal Society, the Benjamin Franklin Medal, the Nehru Medal and the Grand Officier of the French Légion d'honneur. In 1974-76 he became President of the London Mathematical Society. In 1983, he was knighted by the Queen. And in 1992 he was made a member of the Order of Merit.

In the mathematical galaxy, Sir Michael is one of its brightest stars. He belongs to that fine tradition among great mathematicians who can deliver 'a high density of truth' with compact statements that are both elegant and precise. As John Neumann once said, "If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is." Sir Michael cuts through the complexity of life, seeing connections where others see none. His prodigious intellect is capable of decoding complexity with great simplicity.

HKUST is therefore hugely blessed to have Sir Michael serving on the International Advisory Board of our Institute for Advanced Study since its foundation, and of which he was a visiting member from 2007 to 2010. His popular public lectures here left us enthralled and enlightened.

There is no mathematician alive today more honored in more countries than Sir Michael, having been elected a foreign member of many national academies across the globe, from

Australia to America, and from India to Ireland. Countless universities in countless countries have conferred honorary degrees on him, from Chicago to Cambridge, and from Wales to Waterloo. The honors are many but they all agree on one thing: that in Sir Michael, we have a great mathematician and a great human being who has an eye for the interflow of ideas and a heart for peace.

Mr Council Chairman, on behalf of the Council of the Hong Kong University of Science and Technology, I have the high honor of presenting to you Sir Michael Atiyah, Honorary Professor at the University of Edinburgh, for the award of Doctor of Science *honoris causa*.