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Indian-born scientist wins prestigious Dirac Medal

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BENGALURU: The International Centre for Theoretical Physics (ICTP), late on Wednesday announced the 2018 winners of the Dirac Medal, pegged to be one of the highest honours for Physics, named after renowned physicist Paul Adrien Maurice Dirac. Among the three winners is Subir Sachdev, a Herchel Smith Professor of Physics at Harvard University specializing in condensed matter, who is of Indian origin with all of his schooling done in Bengaluru.

His ICTP citation reads: “Sachdev has made pioneering contributions to many areas of theoretical condensed matter physics. Of particular importance were the development of the theory of quantum critical phenomena in insulators, superconductors and metals...” ICTP also emphasises on his theory of spin-liquid states of quantum antiferromagnets and the theory of fractionalized phases of matter.

Sachdev, who was elected to the US National Academy of Sciences in 2014, and received the Lars Onsager Prize from the American Physical Society earlier this year, did his schooling at St Joseph’s Boys High School in Bengaluru and completed his 11th and 12th grade from Kendriya Vidyalaya (KV), ASC here.

He then went to IIT-Delhi before moving to the Massachusetts Institute of Technology (MIT) in 1982, from where he went to Harvard University (June 1984) where he completed his PhD in November 1985. A decade later, he got his MA (honorary) from Yale University.

ICTP has awarded its 2018 Dirac Medal and Prize to three distinguished physicists—Subir Sachdev of Harvard University, Dam

Thanh Son of the University of Chicago, and Xiao-Gang Wen of the Massachusetts Institute of Technology—for their independent contributions toward understanding novel phases in strongly interacting many-body systems, introducing original cross-disciplinary techniques.

All three winners study how quantum mechanics affects large groups of particles, known as many-body systems. Researchers now understand how the laws of quantum mechanics affect the behavior of very small groups of particles, but everyday objects are made up of a huge amount of particles, nearly 1,023.

"All of the particles are interacting with each other in various ways. These interactions make quantum entanglement important to consider, and so applying quantum mechanics to these systems becomes very complicated. The complex patterns of quantum entanglement are key to understanding the macroscopic properties of a material, especially when many-body systems exhibit surprising emergent behaviour," the ICTP said.

Among other things, Sachdev's research describes the connection between physical properties of modern quantum materials and the nature of quantum entanglement in the many-particle wavefunction.