

New center to explore quantum information theory

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[摘要] | March 9, 2007. What are the ultimate powers of quantum computers, quantum communications and quantum precision measurement systems? MIT's new \$3.5 million W. M. Keck Foundation Center for Extreme Quantum Information Theory (EQIT) has been inaugurated with \$1.63 million in funding from the Keck Foundation, as well as funding from MIT and other sponsors, to discover answers to these fundamental, yet still unsolved, questions.  
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Professor Seth Lloyd of the Department of Mechanical Engineering and Jeffrey H. Shapiro, the Julius A. Stranon Professor of Electrical Engineering and director of the Research Laboratory of Electronics (RLE), will lead the new center.  
The new center enables a major new push by MIT theorists in the international race to determine the ultimate capabilities of quantum information systems. Establishing these theoretical capabilities would be a step towards being able to exploit quantum effects for novel applications, including computers, communication networks and sensors.  
As technological advances drive contemporary systems and devices to ever smaller and faster scales, mastery of quantum mechanical effects is proving crucial to overcoming the current limitations of classical systems and creating the next generation of applications in which macroscopic quantum phenomena play an explicit role.  
MIT President Susan Hockfield said, "The Keck Foundation has a distinguished history of supporting bold research efforts and laying the groundwork at pivotal moments to enable breakthrough scientific progress."  
"MIT is grateful for the foundation's foresight in founding this new center at a time when much federal support is devoted to applications of quantum information science, but less to the fundamental quantum science theory needed to frame and solve some of the most important questions."  
MIT's research team will pursue theoretical problems in three key areas: adiabatic quantum computing, quantum channel capacity and quantum sensing and control.  
The new center, based in the RLE, unites theorists in five academic departments and five major research laboratories and centers in a coordinated project that will be one of the largest theoretical research efforts at MIT. In addition to Lloyd and Shapiro, senior investigators include Professor Edward H. Fuchs, Jeffrey Goldstone, Jacques E. Slotine.  
Said MIT's Vice President for Research Claude R. Canizares, "One of the most exciting things about the Keck Foundation's support for the new center is that it creates a locus of interdepartmental and interdisciplinary common purpose among MIT's researchers in quantum information theory. Our individual, world-leading efforts in quantum information science can now be integrated in a way that will improve the chances of success in the three important research areas of EQIT."  
Lloyd, the program's principal investigator, said, "The Keck-funded center on extreme quantum information theory gives us a huge opportunity to uncover the truth about the universe at its most fundamental scales. EQIT assembles an unmatched team of scientists and engineers to attack some of the toughest problems in the field."

