QUASILOCAL MASS IN GENERAL RELATIVITY

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One of the greatest accomplishments of the theory of general relativity in the past century is the proof of the positive mass/energy theorem for asymptotically flat spacetime. This provides the theoretical foundation for the stability of an isolated gravitating system. However, the concept of mass/energy remains a challenging problem because of the lack of a quasilocal description. Most observable physical models are finitely extended spatial regions and measurement of mass/energy on such a region is essential in many fundamental issues. In this talk, I shall describe a new proposal of quasi-local mass/energy by Shing-Tung Yau and myself.