The curious capacities of quantum channels

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The best asymptotic rate of a communication channel to process information (such as transmitting data or creating correlation) is called the capacity of the channel for the task involved.   We will examine Shannon's original results on the capacity of classical channel to transmit classical data, followed by the analogous problems on the capacities of a quantum channel to communicate quantum or private classical data. We first summarize well known surprising results in the quantum setting (superadditivity, superactivation, privacy without coherence), followed by sharing a few recent developments in the subject.