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Asymmetric Planetary Nebulae as a Context for the Physics of Accretion, Outflows, and Binary Interactions

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Accretion and outflows from astrophysical disks have long been studied both for the unifying or distinguishing physics in different contexts, and used in constructing phenomenological scenarios to explain observations of specific systems. I will first highlight some recent unifying lessons and fundamental grand challenges for accretion disk theory, and in particular regarding the role of magnetic fields and large scale transport. I will then describe how asymmetries seen in the end states of stellar evolution more likely involve accretion and binaries than previously thought. In the context of low mass stars, I will discuss some dramatic constraints on the outflow power and associated accretion rates required of these systems. This dovetails into progress in our ongoing efforts to understand broader questions of the orbital and accretion evolution of a giant star interacting with low mass companions or planets, the accretion rates incurred, and their ultimate fate in a common envelope.