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**The Swim Pressure of Active Matter** JOHN BRADY, SHO TAKA-TORI, WEN YAN, California Institute of Technology — Through their self-motion, active matter systems generate a unique “swim pressure” that is entirely athermal in origin. This new source for the active stress exists at all scales in both living and nonliving active systems, and also applies to larger organisms where inertia is important. Here we explain the origin of the swim stress and develop a simple thermodynamic model to study the self-assembly and phase separation in active soft matter. Our new swim stress perspective may help analyze and exploit a wide class of active soft matter, from swimming bacteria and catalytic nanobots, schools of fish and birds, and molecular motors that activate the cellular cytoskeleton.

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