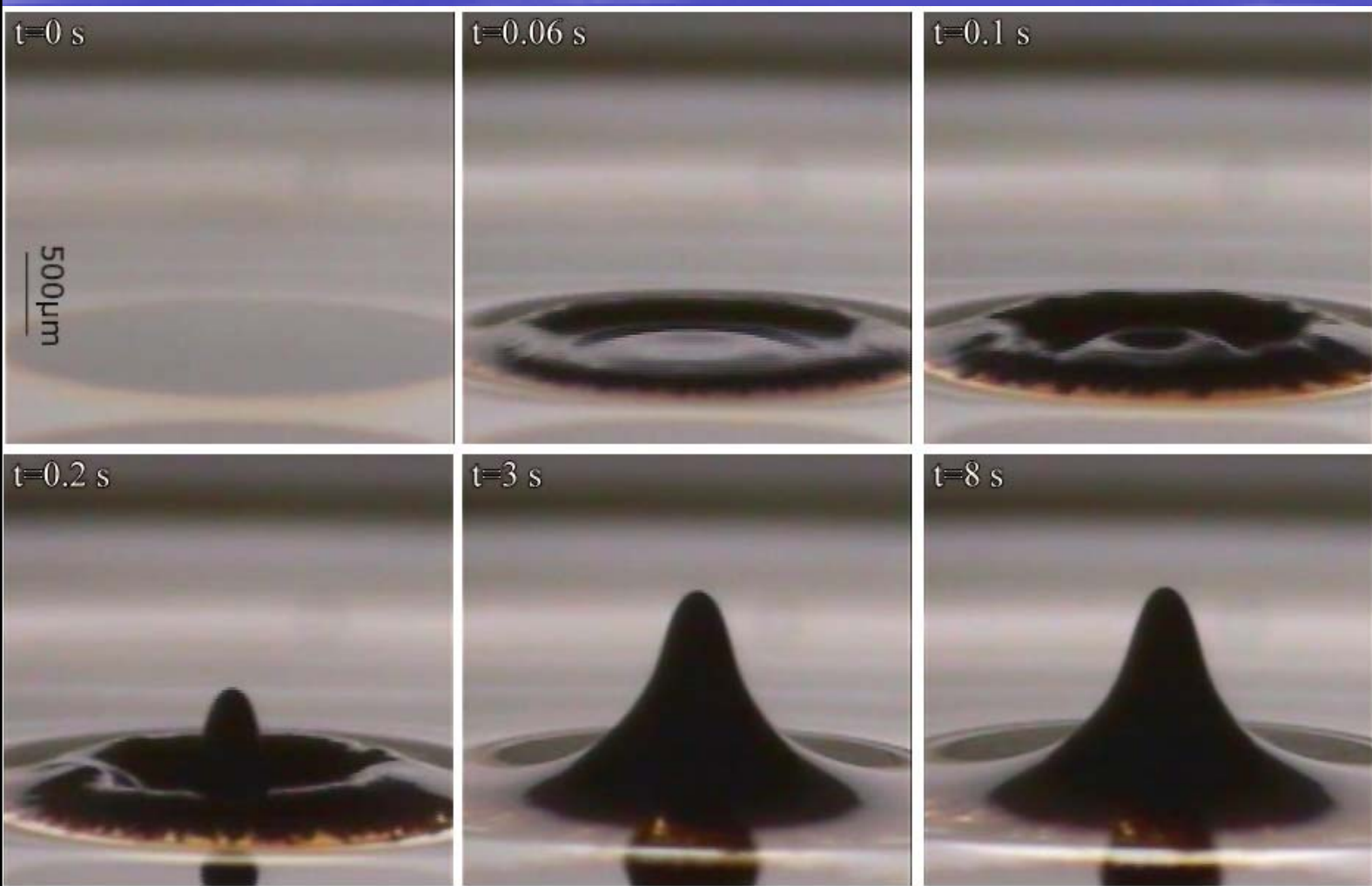


# Rosensweig Instability in a Fluid Layer

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When a ferrofluid is subjected to a sufficiently strong vertical magnetic field, visually striking peaks are formed on its free surface, known as the Rosensweig instability. The images show an interesting pattern-forming instability occurring when a ferrofluid droplet is immersed in a thin layer of a nonmagnetic fluid [1]. Evolution of the Rosensweig instability in the formation of a newly discovered fluid annulus is first observed to exceed the interface as shown at  $t=0.06$  s. As the instability proceeds, a central peak is formed at the middle of the annulus at  $t=0.1$  s and  $0.2$  s. The instability develops continuously and results in a dominant peak in a state of equilibrium at  $t=3$  s and  $8$  s.

[1] Chen, Ching-Yao, Liu, J.-F. and Wang, L.-C., *Magneto hydrodynamics*, 46, 3, 235, 2010.