# ASTROPHYSICS SEMINAR SERIES


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# Outflows from the Magellanic Clouds: A Case-Study in Ram Pressure Stripping, Galactic Winds, and Galaxy Evolution

The Magellanic System is an excellent, nearby case-study in galaxy formation and galaxy dynamics. As the Large and Small Magellanic Clouds (LMC and SMC) orbit around each other, they fling material behind them, forming the Trailing Magellanic Stream, an immense reservoir of gas that may someday fall into the Milky Way and enhance our Galactic ecosystem by providing more fuel to form stars. Observations point to a complicated origin for the Stream, with a dominant contribution from tidal stripping but also features that resemble past outflows swept away by ram pressure, like chimney smoke in a wind.

I will present hydrodynamic simulations of ram pressure stripping, supernova-driven outflows, and trailing filament formation behind the LMC. We find that even weak fountain flows, produced by clustered supernovae and solely thermal wind driving, are capable of being expelled from the galaxy if ram pressure is present. Preliminary tests of an LMC model with magnetic fields and cosmic ray driven winds are underway. Given our close proximity to the Clouds, we are in a great position to constrain our model with detailed, multi-wavelength observations, allowing us to test the influences of various small-scale processes on a galaxy's gas cycle. I'll present a few ways in which I am exploring the macroscopic effects of cosmic ray microphysics on galaxies and the circumgalactic medium, as well as insights we can gain from mock observations of our Magellanic Clouds simulations.

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