GALAXIES

Magellanic tug-of-war

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Image adapted from D. L. Nidever et al. *Astrophys. J.* **723**, 1618–1631 (2010), AAS/IOP.

The Magellanic Stream (MS) is a filament of neutral and ionized gas that forms a backdrop to the Magellanic Clouds. Its origin was largely unknown until five years ago when Andrew Fox and collaborators used the Hubble Space Telescope (HST) and the Very Large Telescope to measure elemental abundances along two lines-of-sight through the Stream, finding that the metallicity of the probed gas matched that of the Small Magellanic Cloud (SMC) ~2 Gyr ago, when the gas would have been tidally stripped from the dwarf galaxy. Now, Fox et al. have compounded their previous research by observing with HST seven further lines-of-sight through the foreground counterpart of the Stream, called the Leading Arm (LA), which is in the process of accreting onto the Milky Way.

Abundances in the LA (derived from absorption lines against background active galactic nuclei) are again consistent with a historical SMC metallicity. The lines-of-sight, at different positions along the LA,

tentatively show a metallicity gradient, indicating that the LA may have formed through a number of formation episodes rather than a single episode. A few observations directed through peripheral parts of the LA suggest (kinematically) that it extends 20° farther across the sky than previously thought, creating a debris field of 60° × 80° in extent. Overall, these combined views of the MS and LA indicate that the Large Magellanic Cloud (LMC) is winning its tidal tug-of-war with its near neighbour, extracting these filaments 1.5–2.5 Gyr ago in a close encounter. The SMC is not toothless, however, since a single narrow component of the MS bears the higher metallicity signature of the LMC (P. Richter et al. *Astrophys. J.* **772**, 111; 2013).

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