Modelling Hierarchical Clustering —

Examples in action

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Supervisors: Prof. Brad Gibson

Dr. Daisuke Kawata

Dr. Paul Nulsen

Abstract

Through the investigation of the closest group of interacting galaxies, the Magellanic Clouds and Milky Way Galaxy, we hope to understand the process of Hierarchical clustering in more detail.

Introduction

Hierarchical Clustering

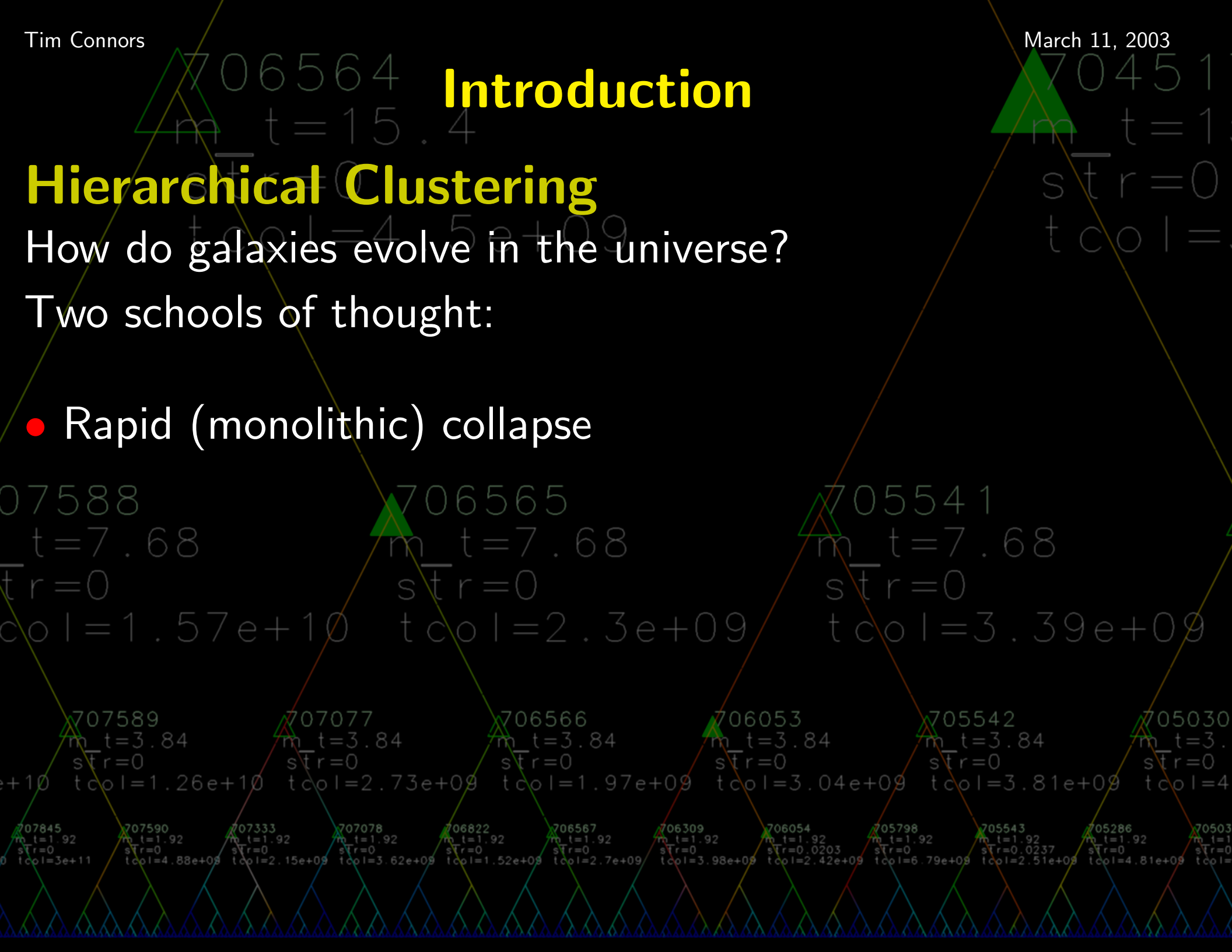How do galaxies evolve in the universe?

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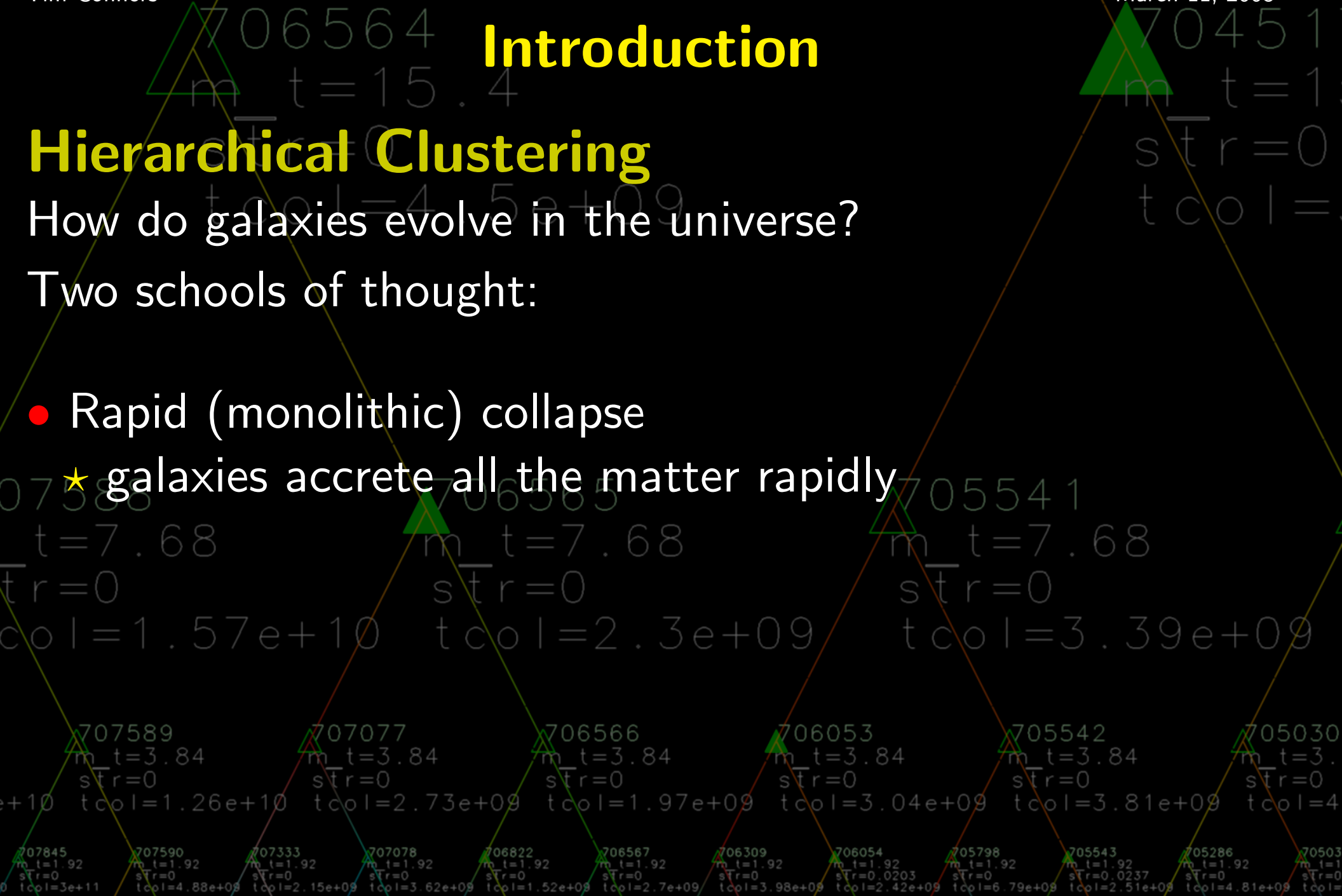 - ⋆ galaxies accrete all the matter rapidly

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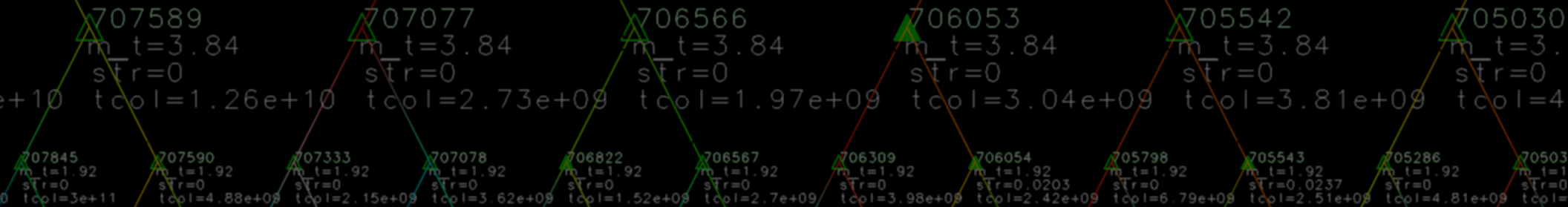
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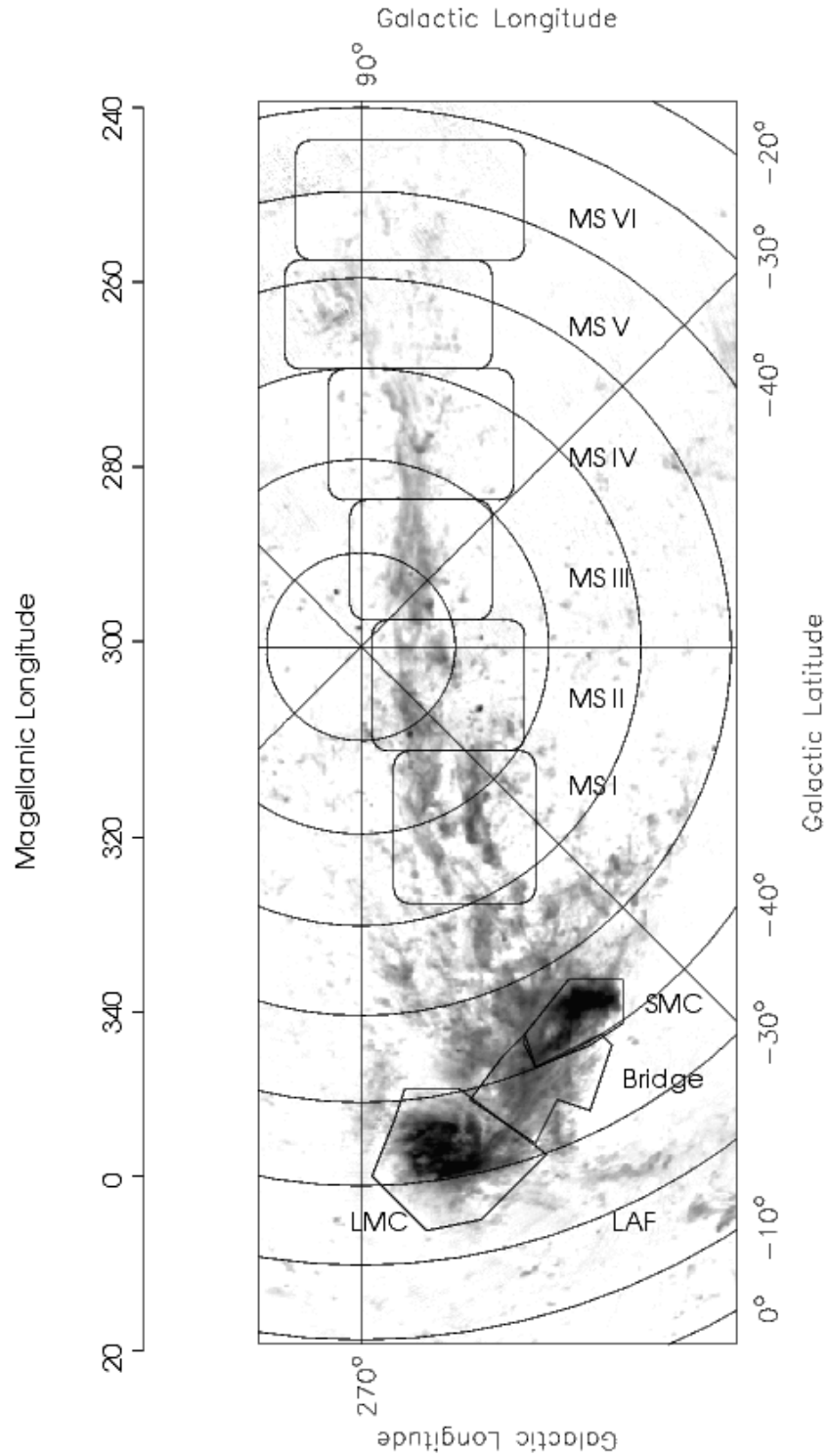Mathewson et $al.$ (1974) discovered the Magellanic stream in HI

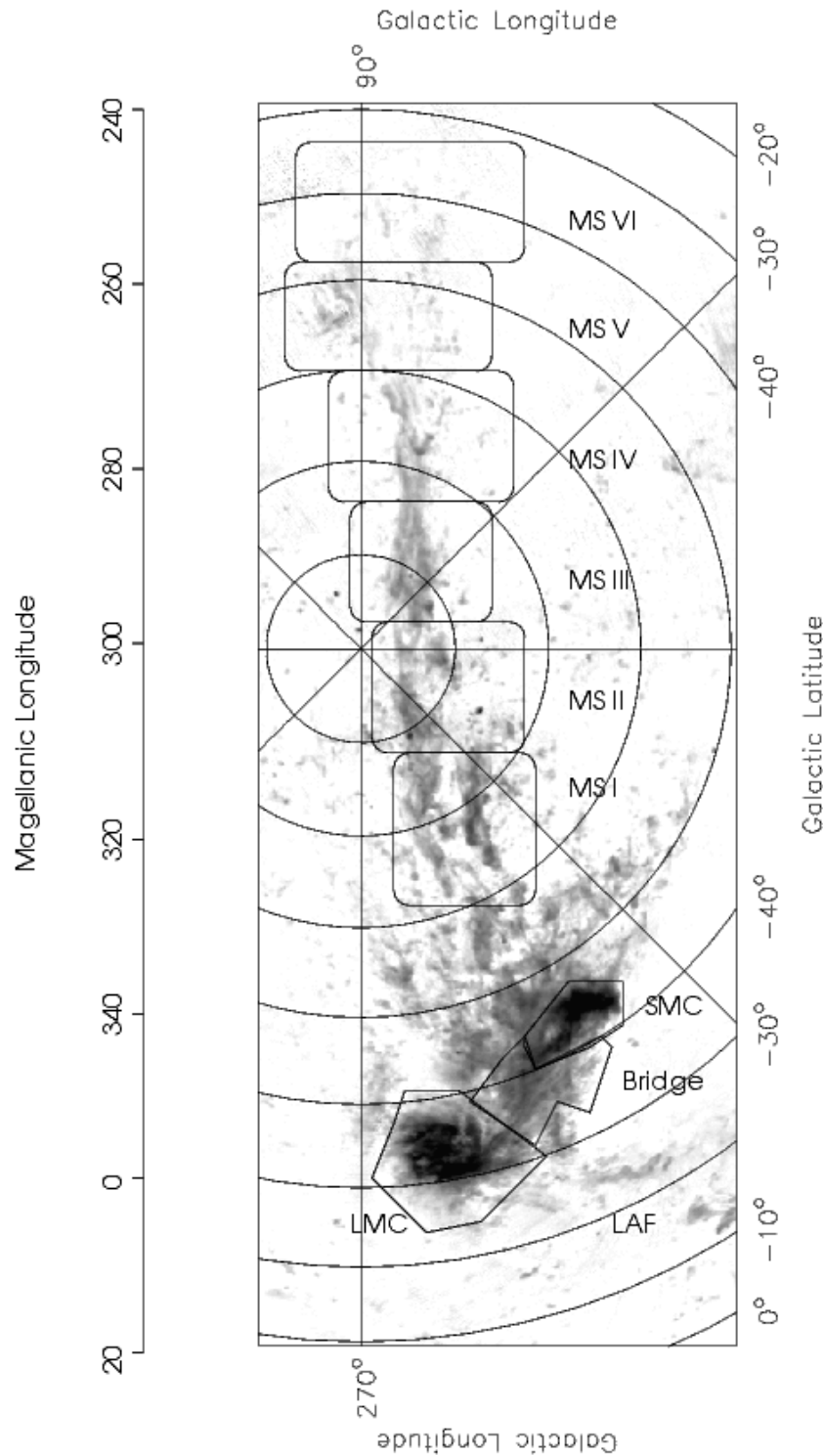*Mike Bessell*

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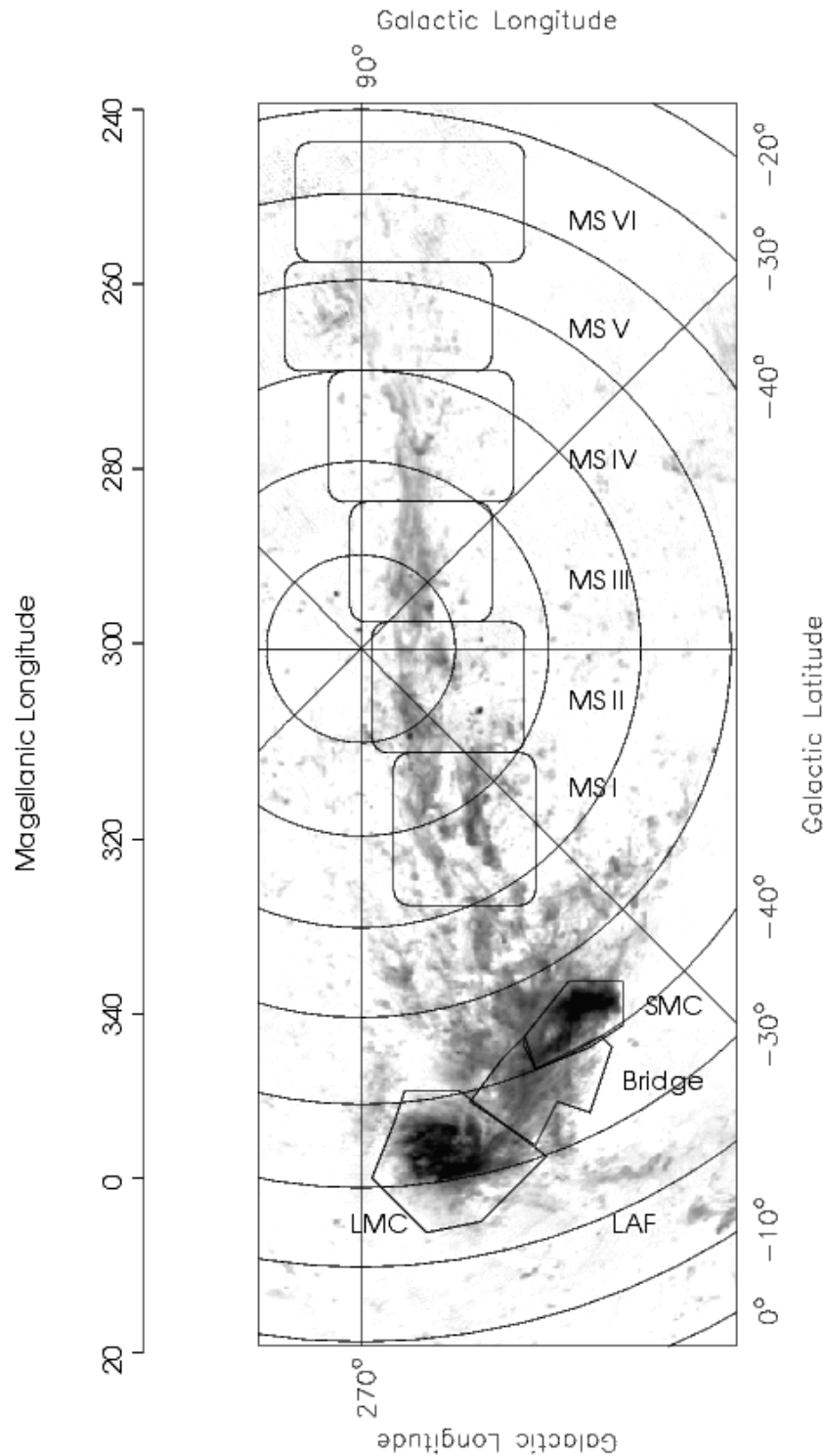Mathewson *et al.* (1974) discovered the Magellanic stream in HI

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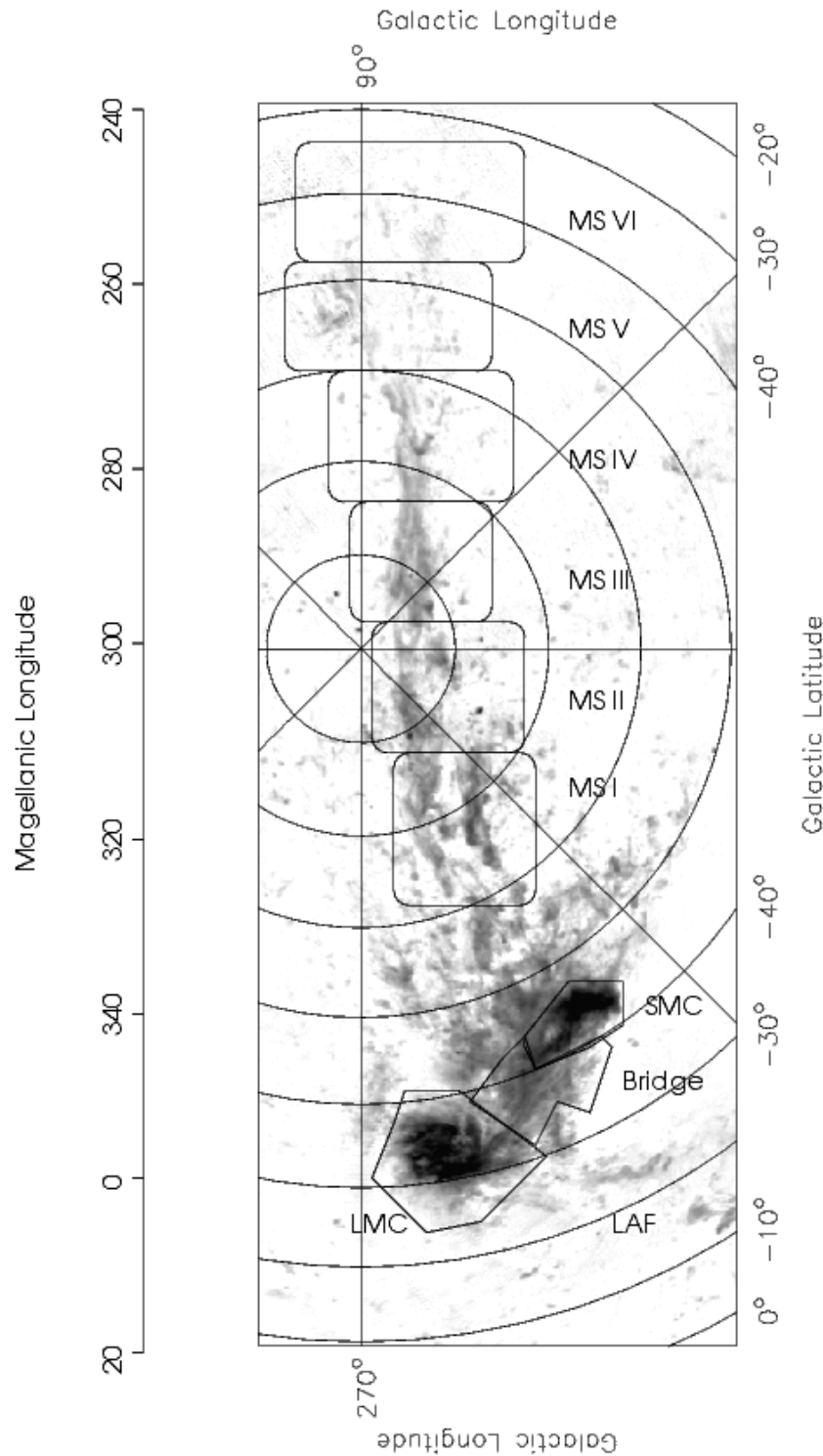
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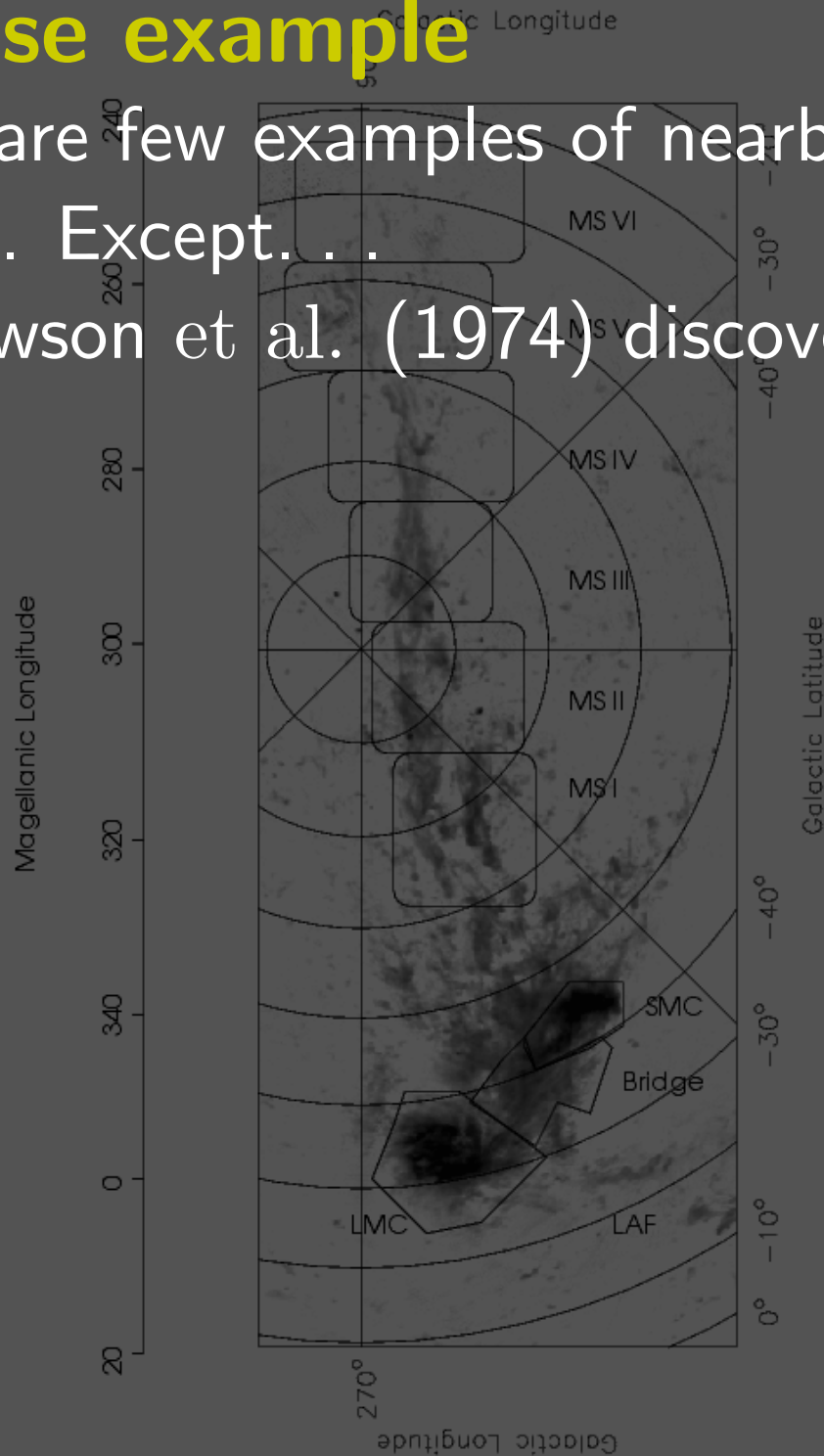
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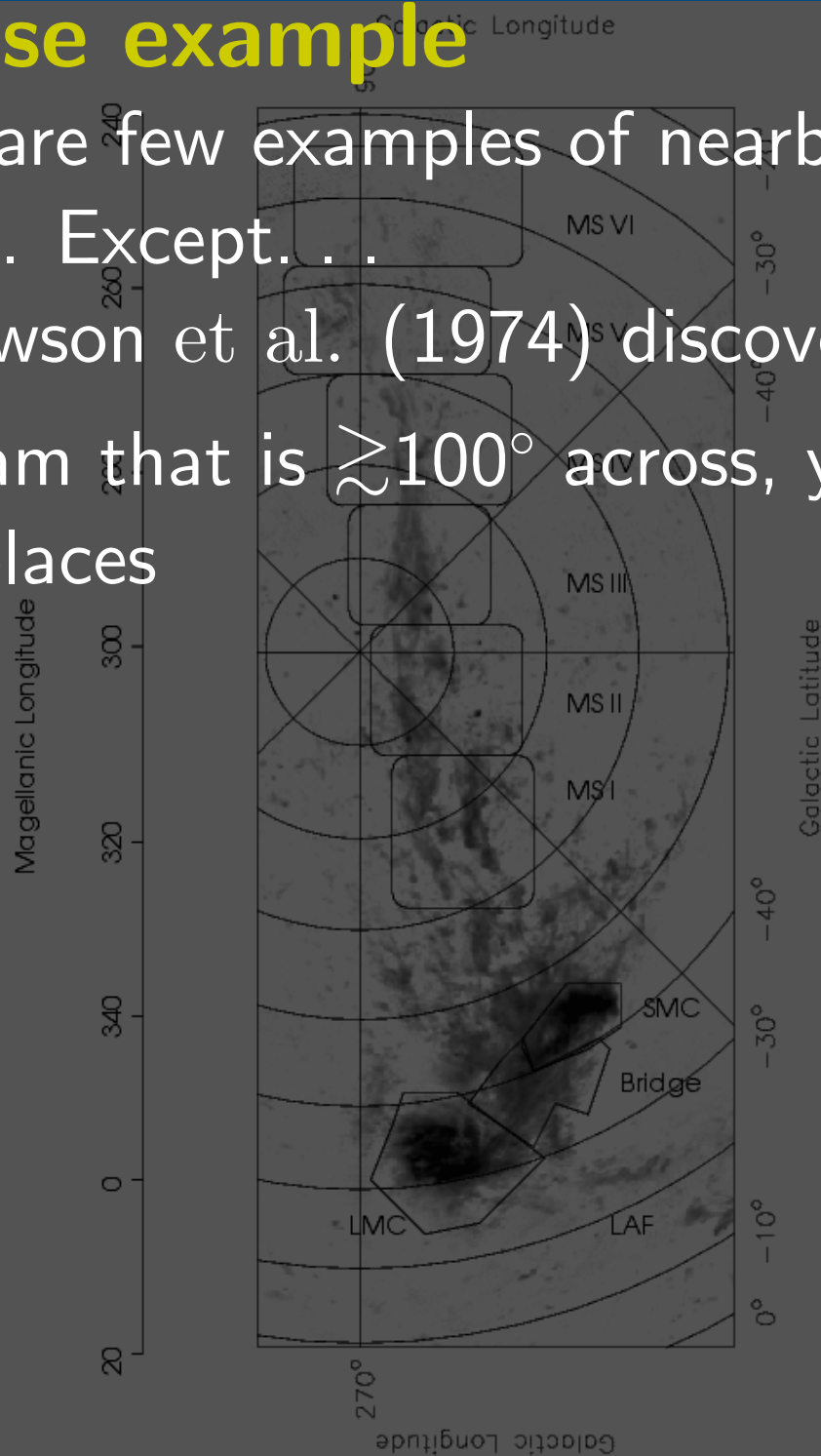
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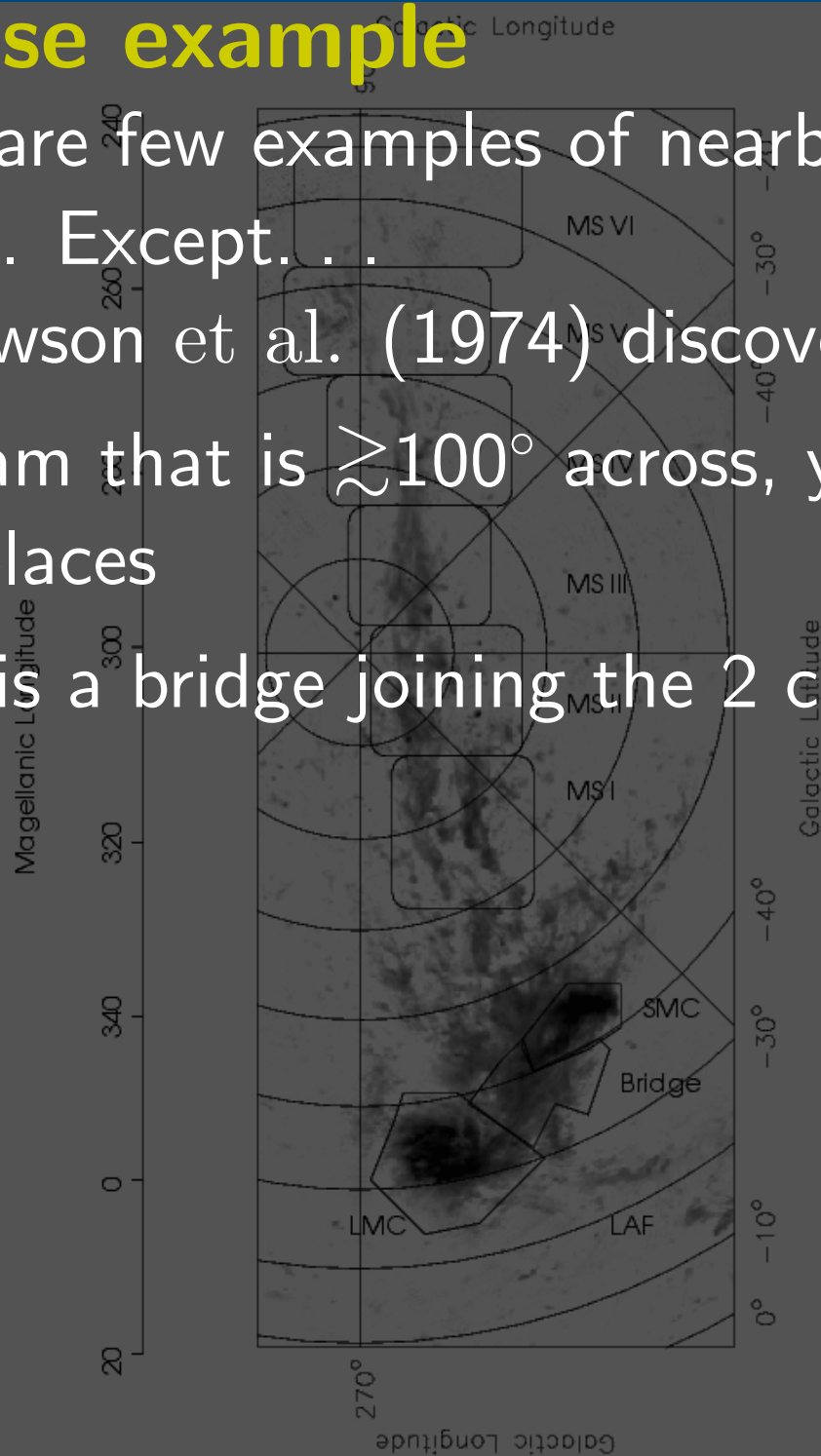There is a bridge joining the 2 clouds

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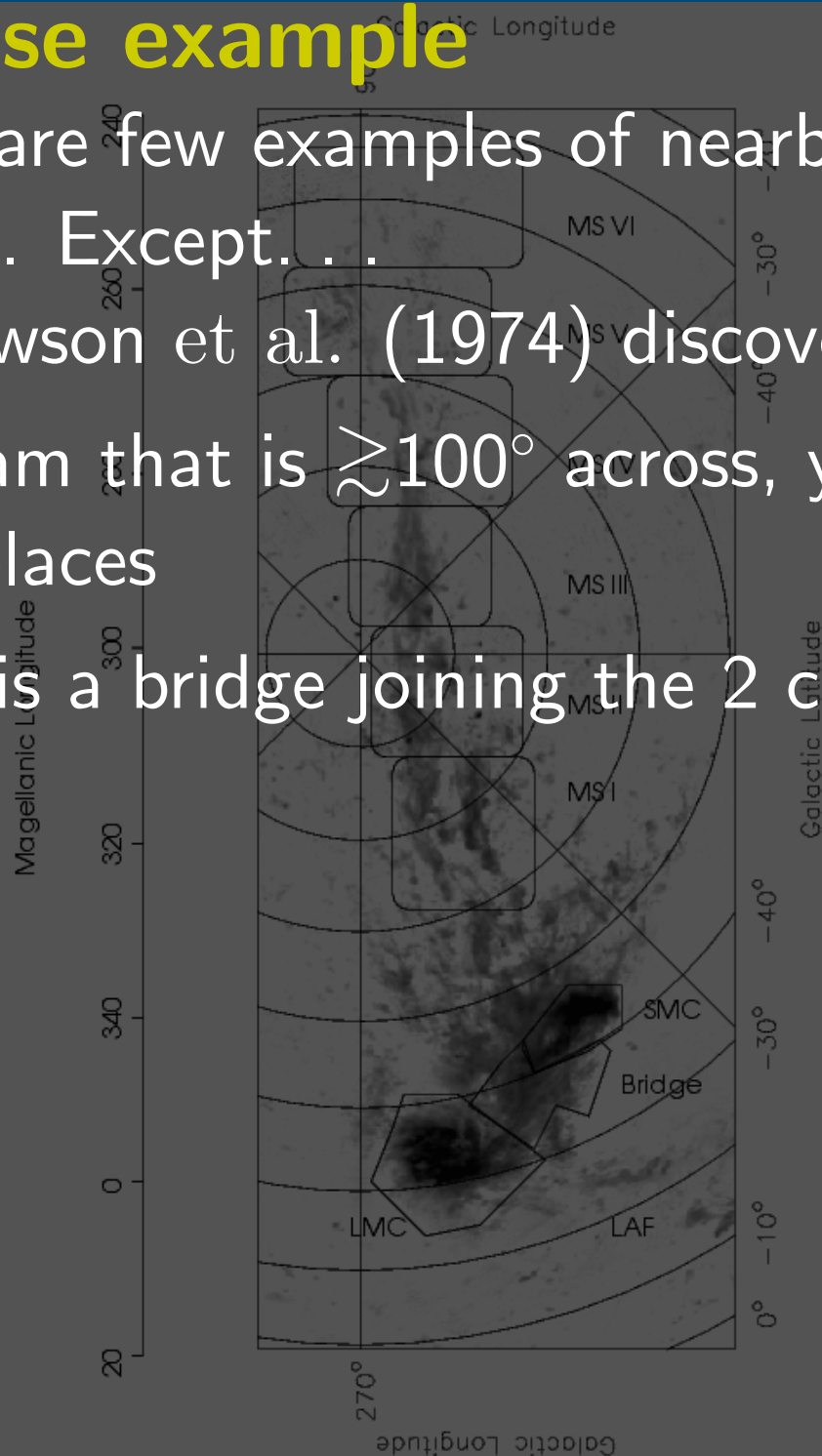There is a smooth transition of velocities

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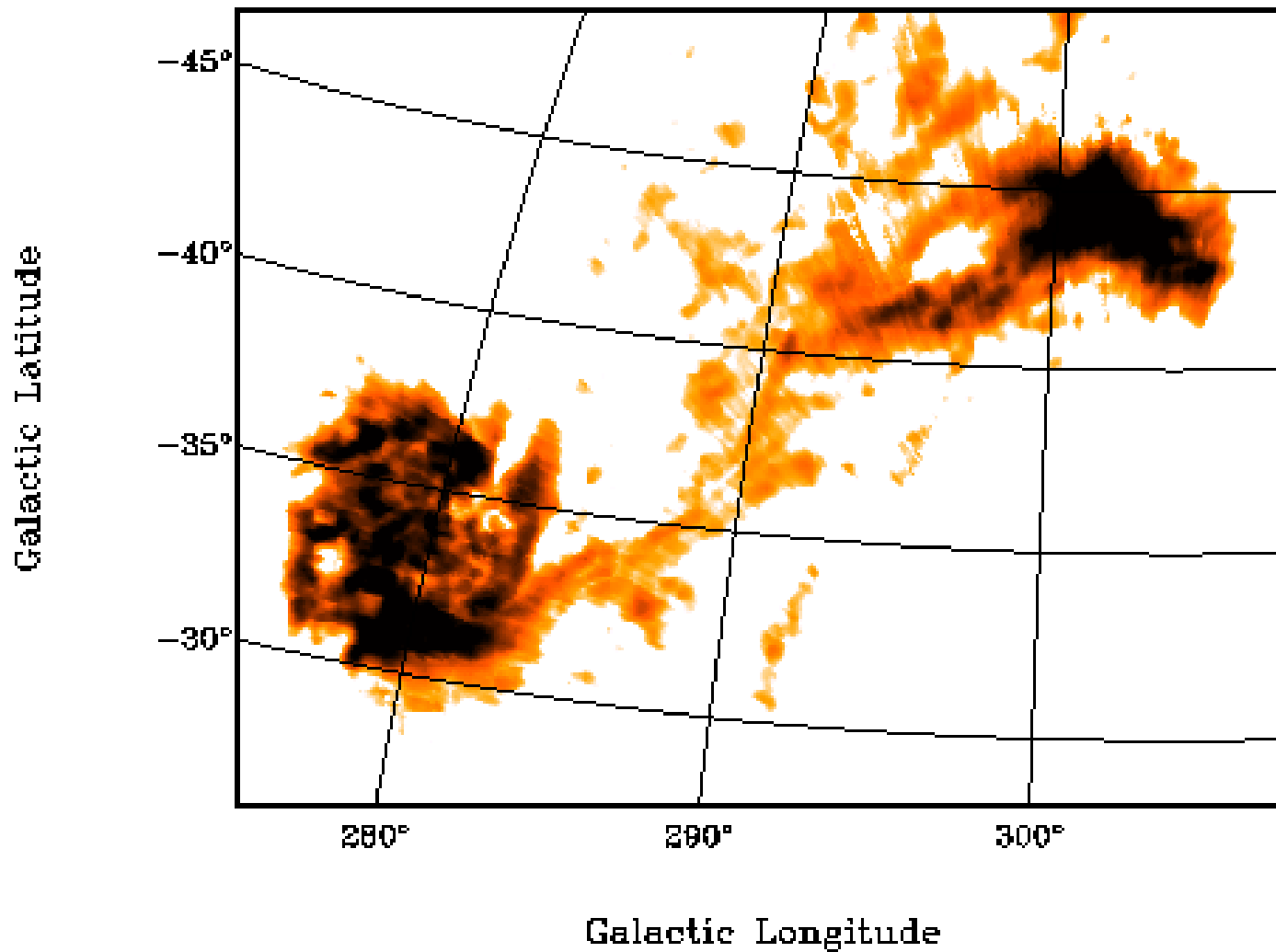
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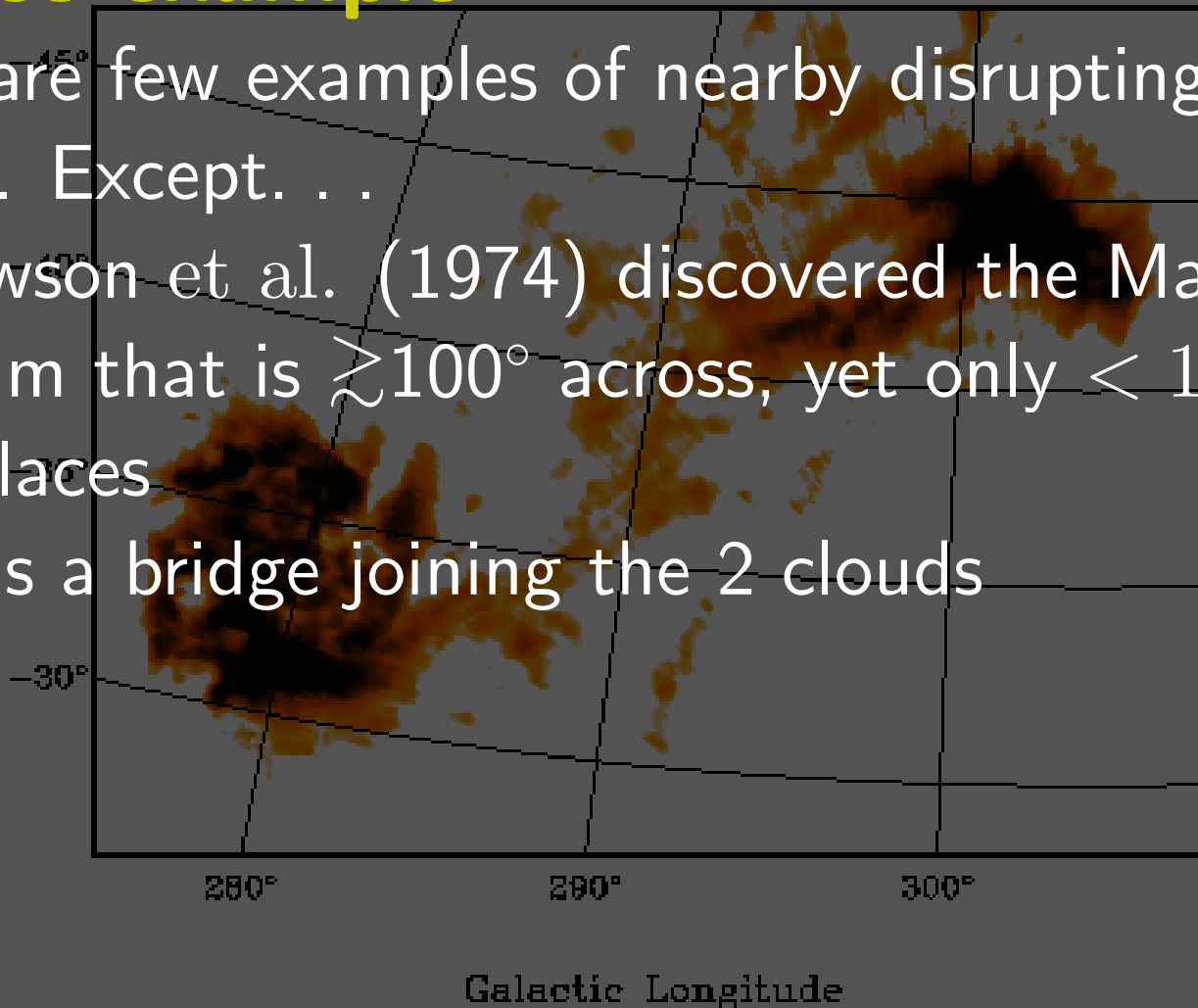
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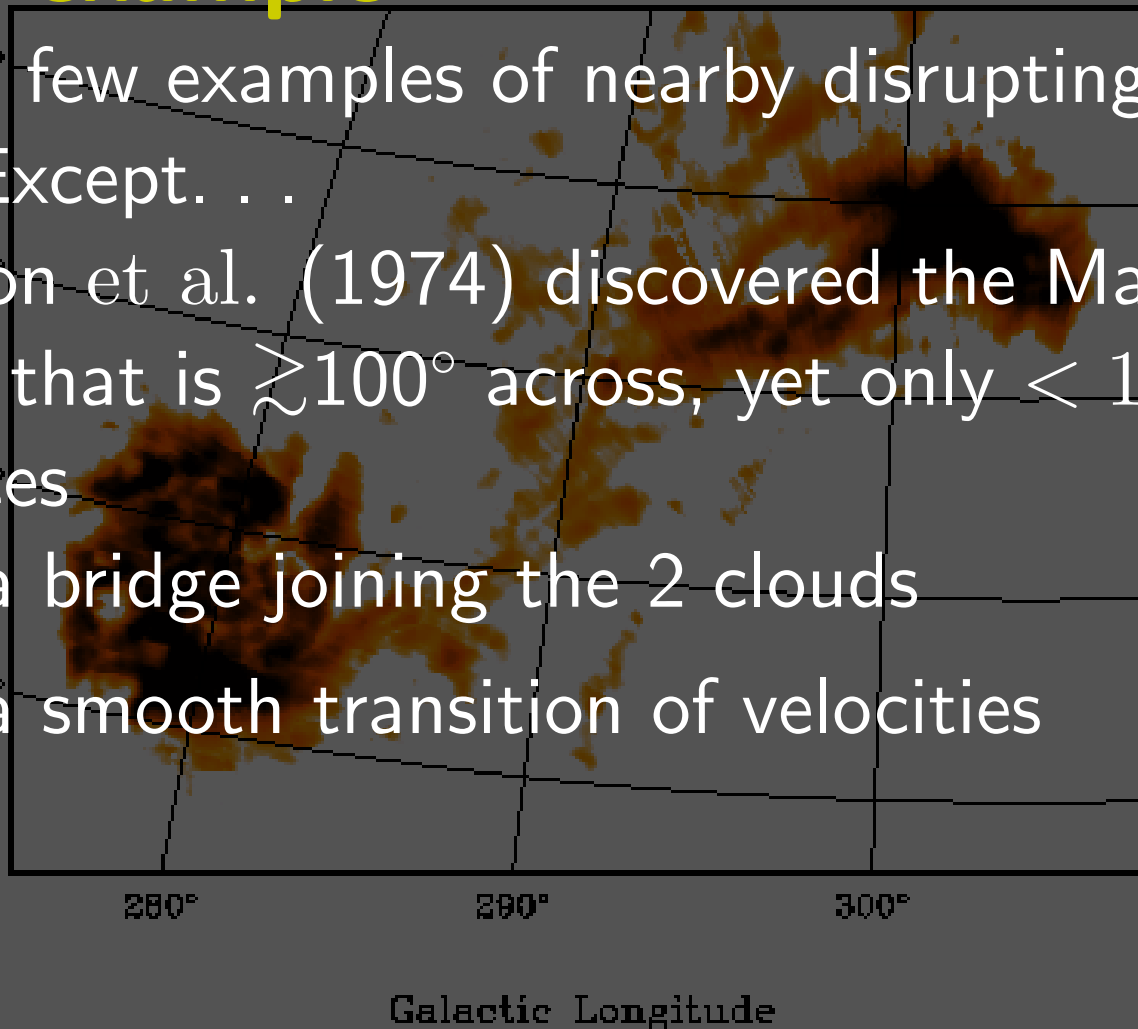
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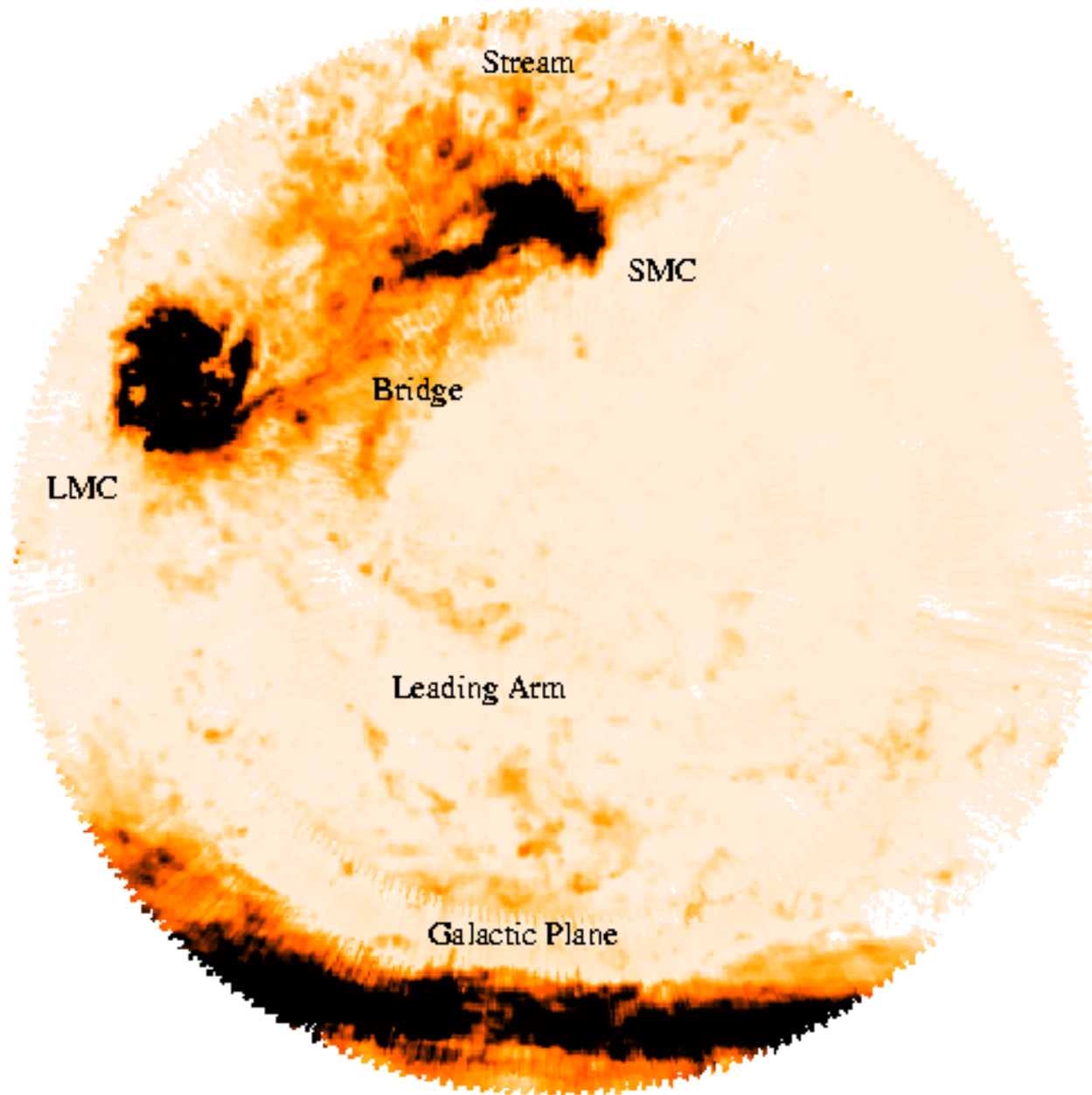
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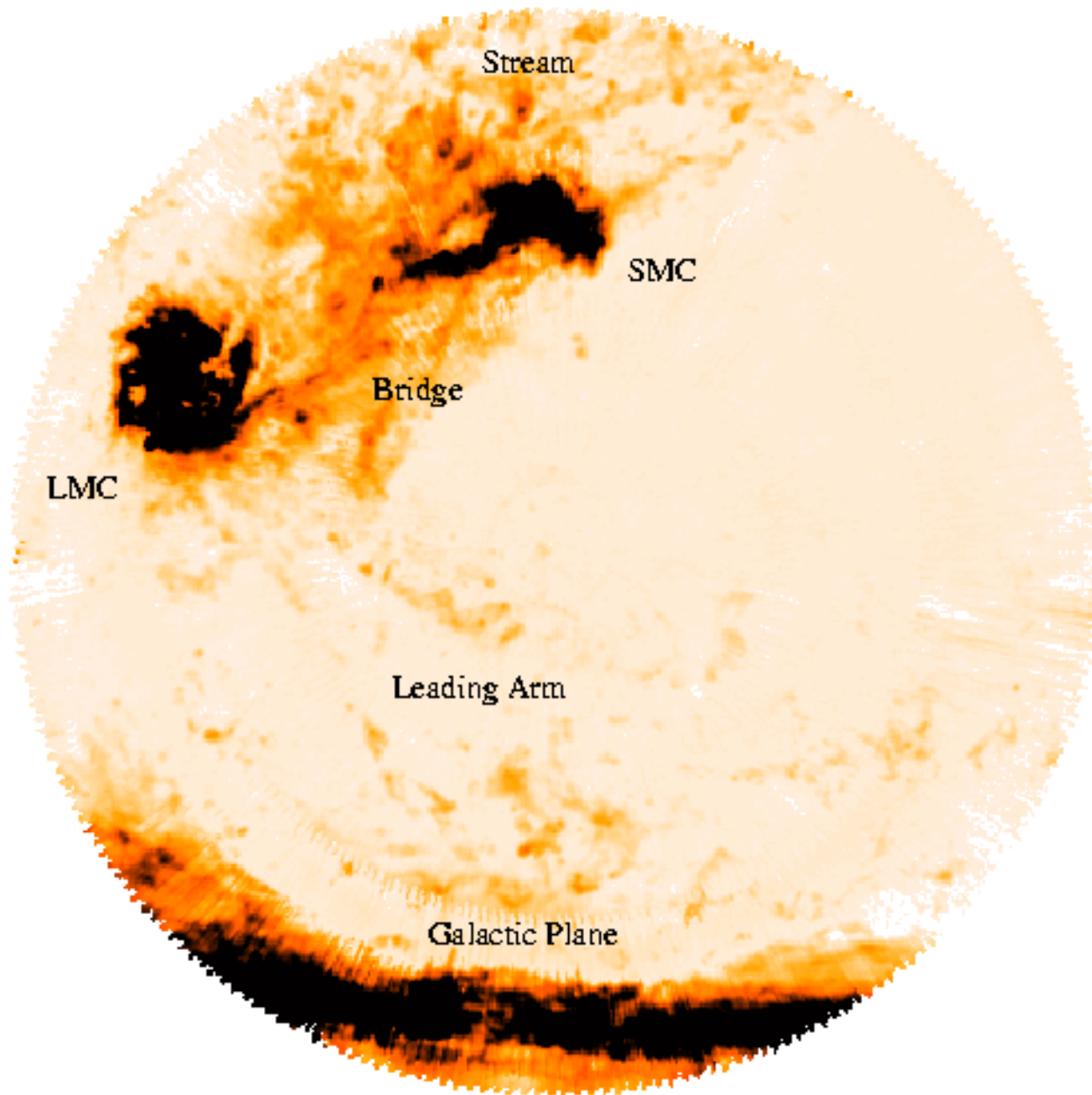
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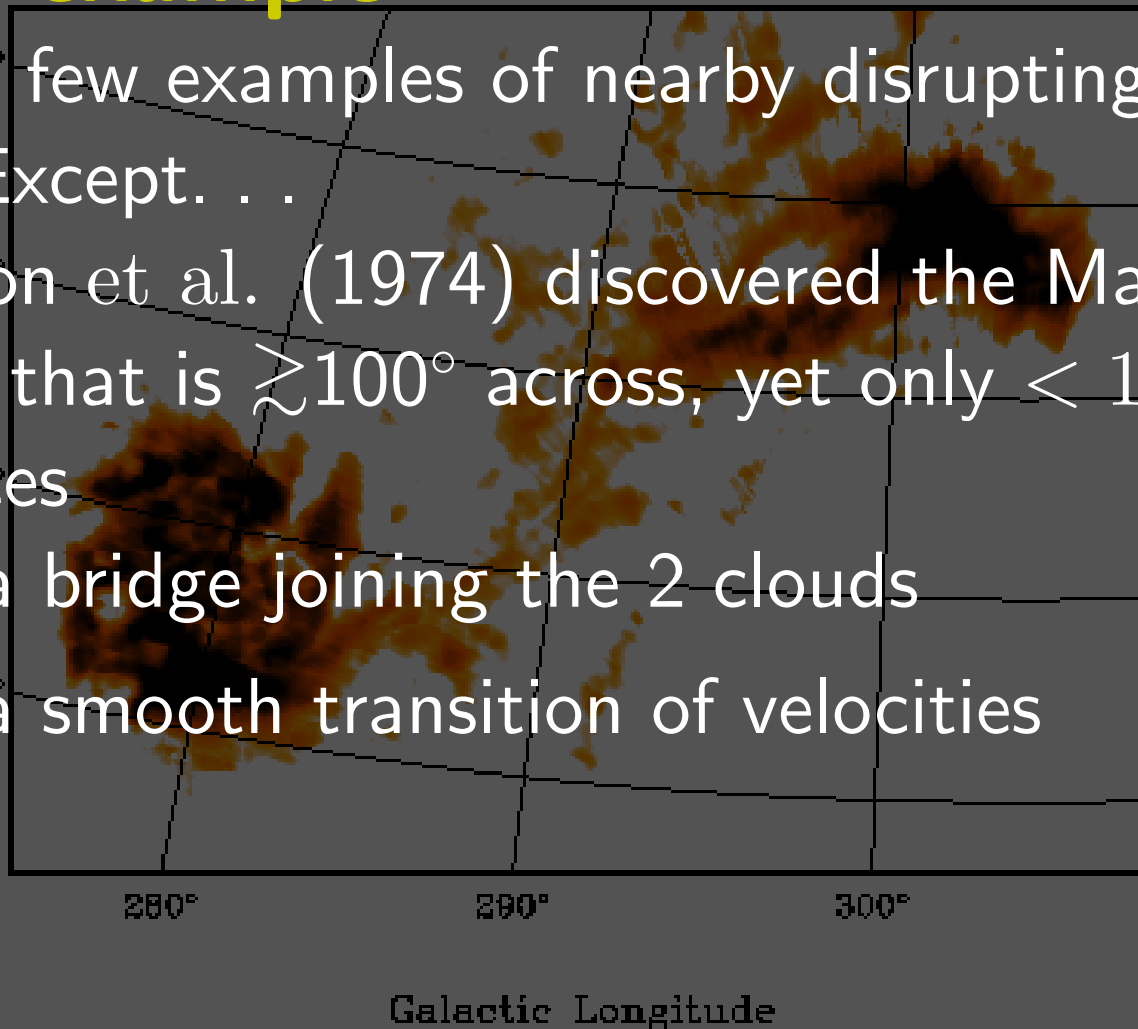
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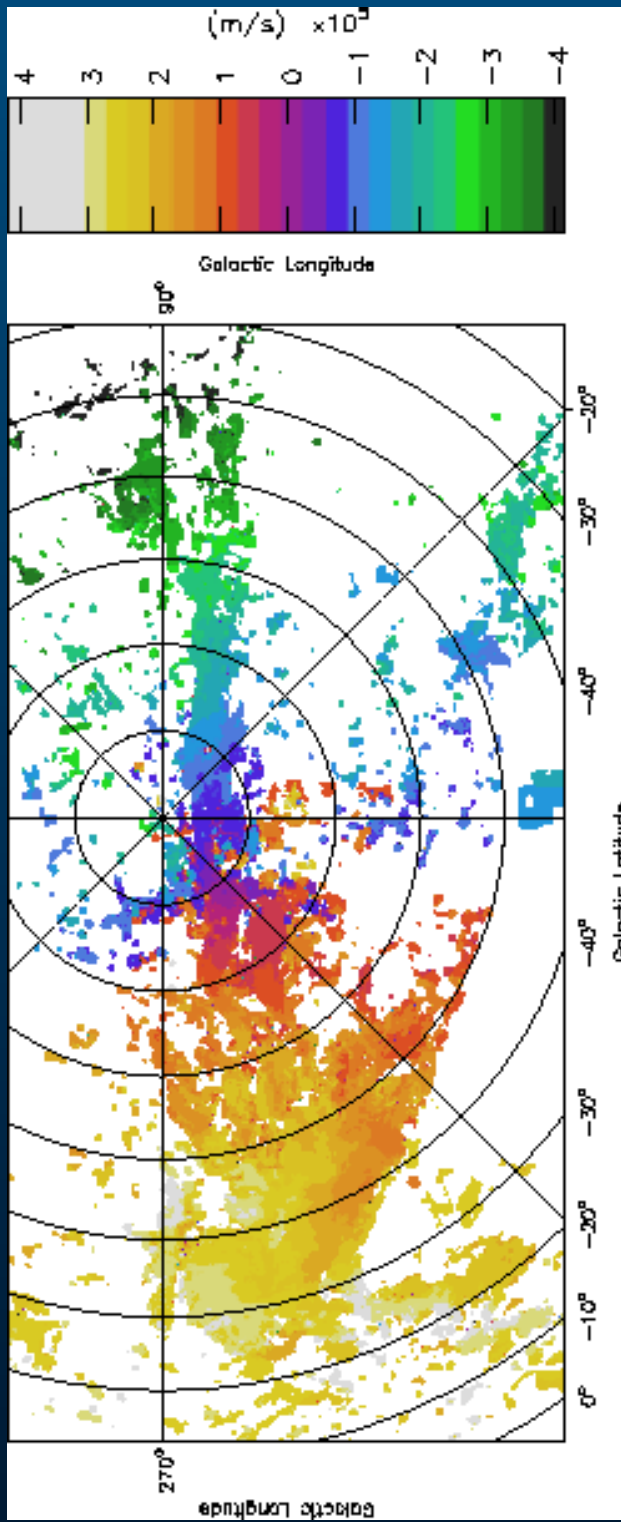There are few examples of nearby disrupting systems around. Except. . .

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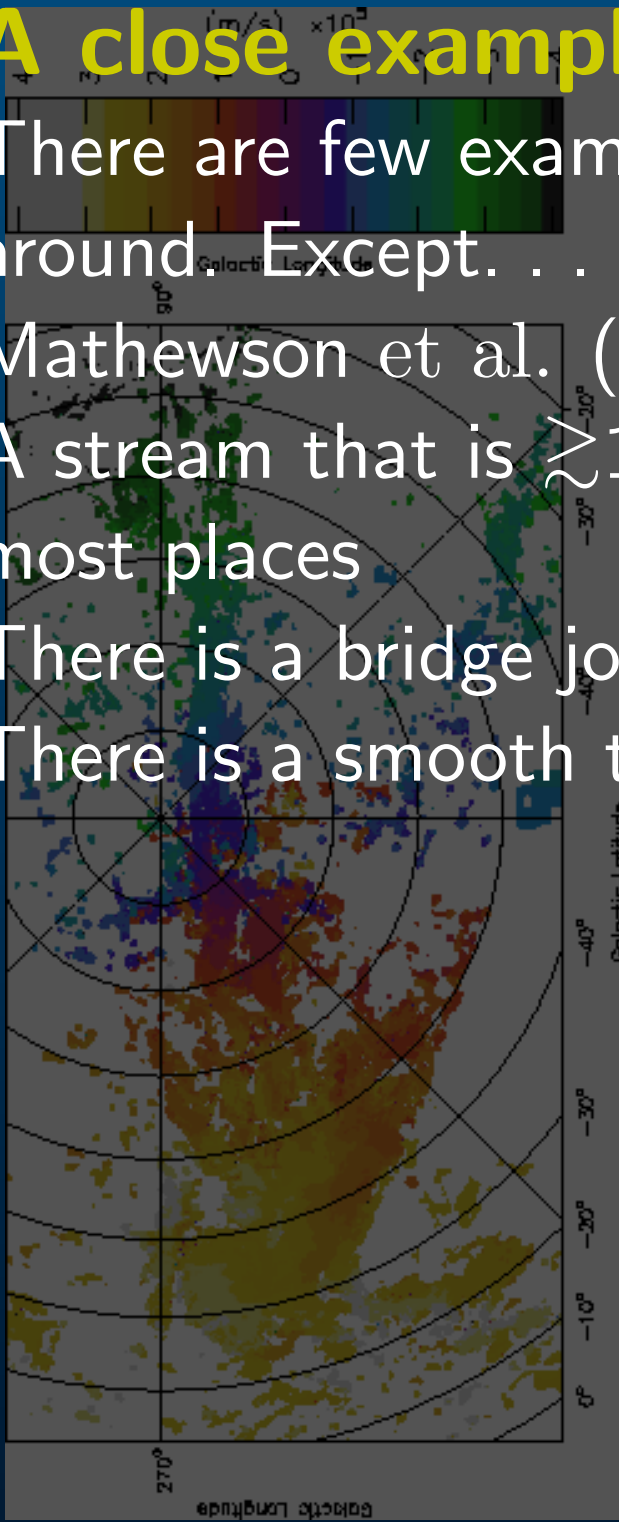Leading arm feature stretches below galactic plane

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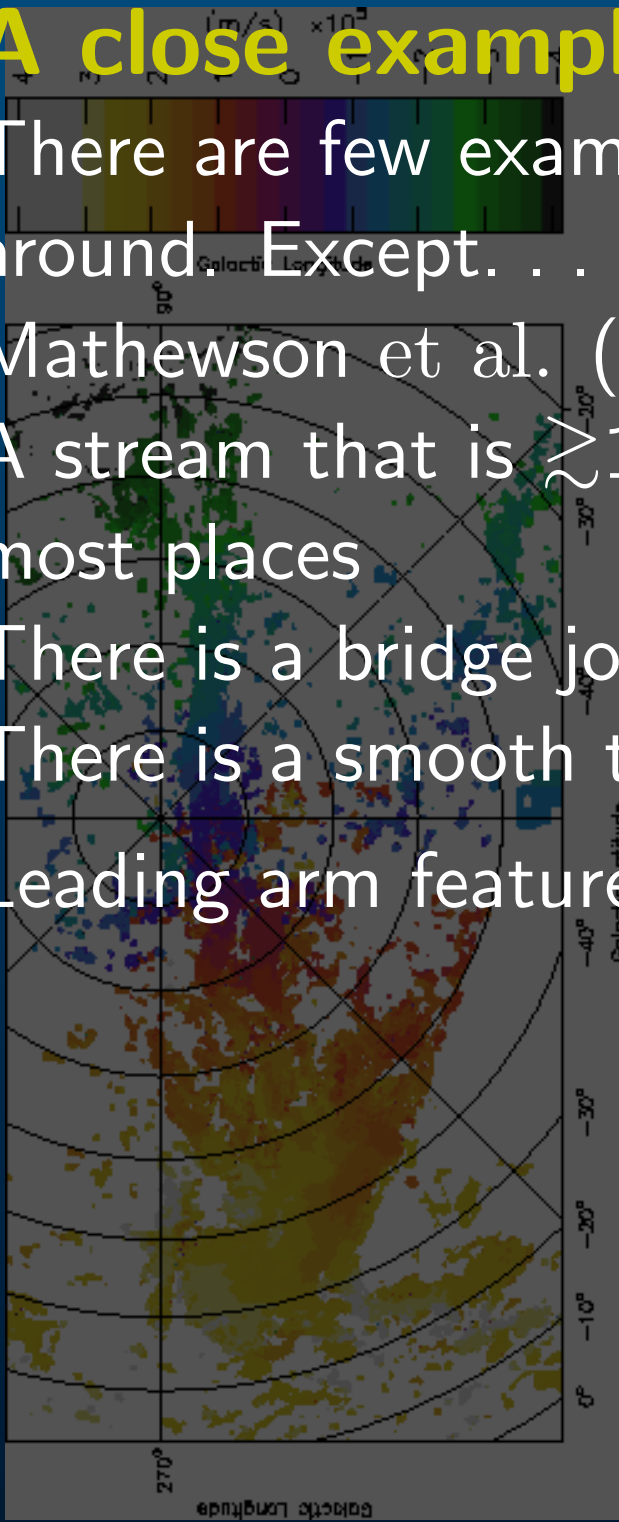
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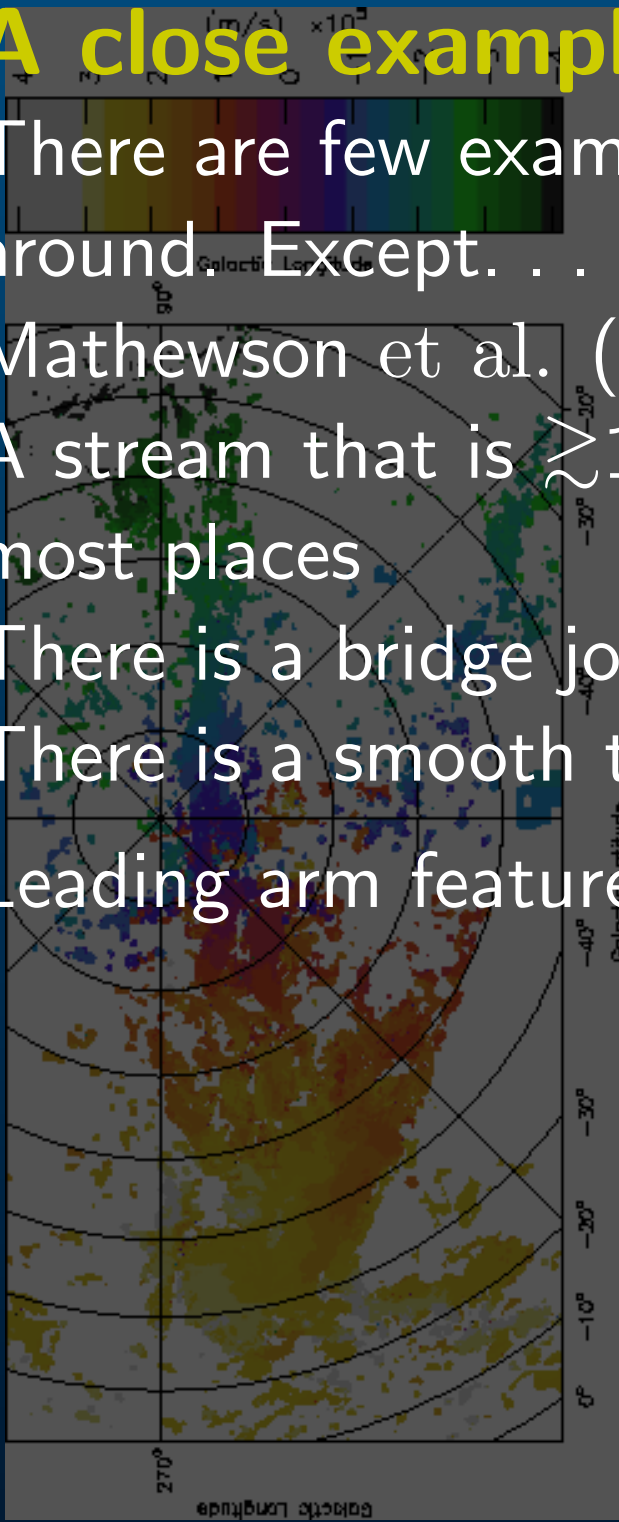Presence of leading arm spelled death of one theory — tidal interaction wins out

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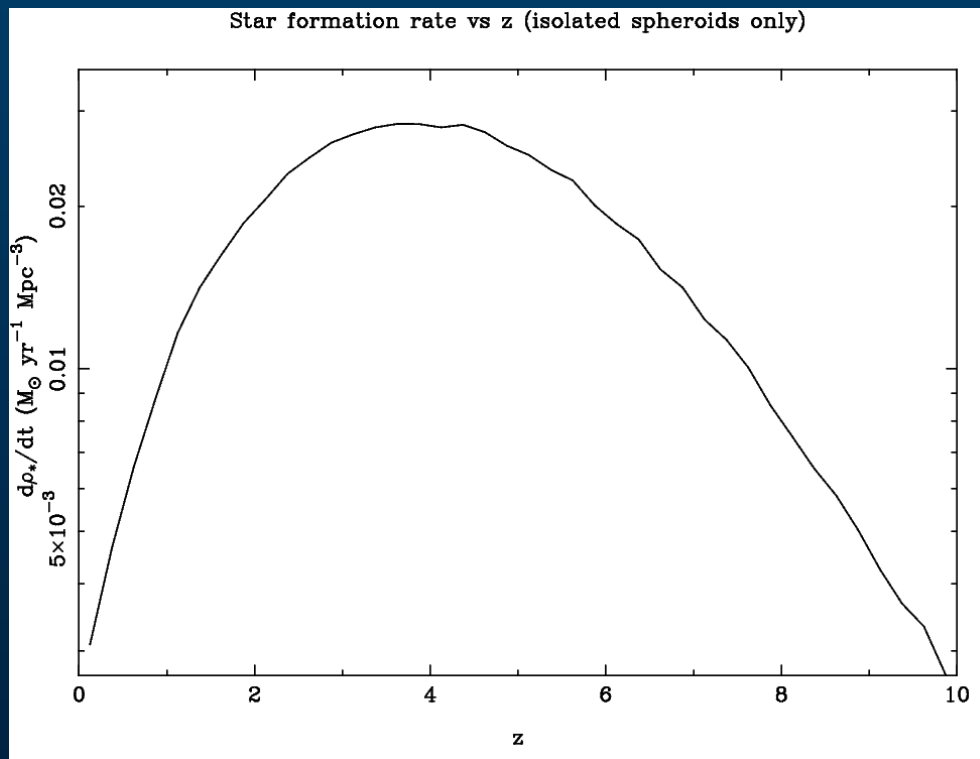
The "Madau plot" (star formation)

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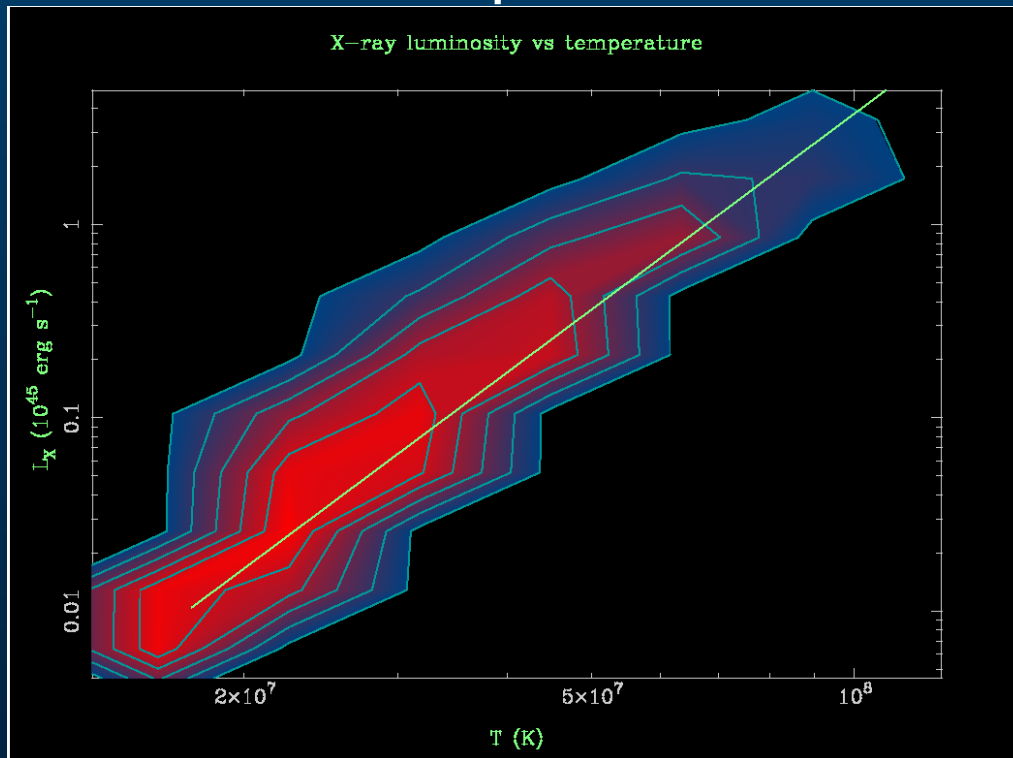
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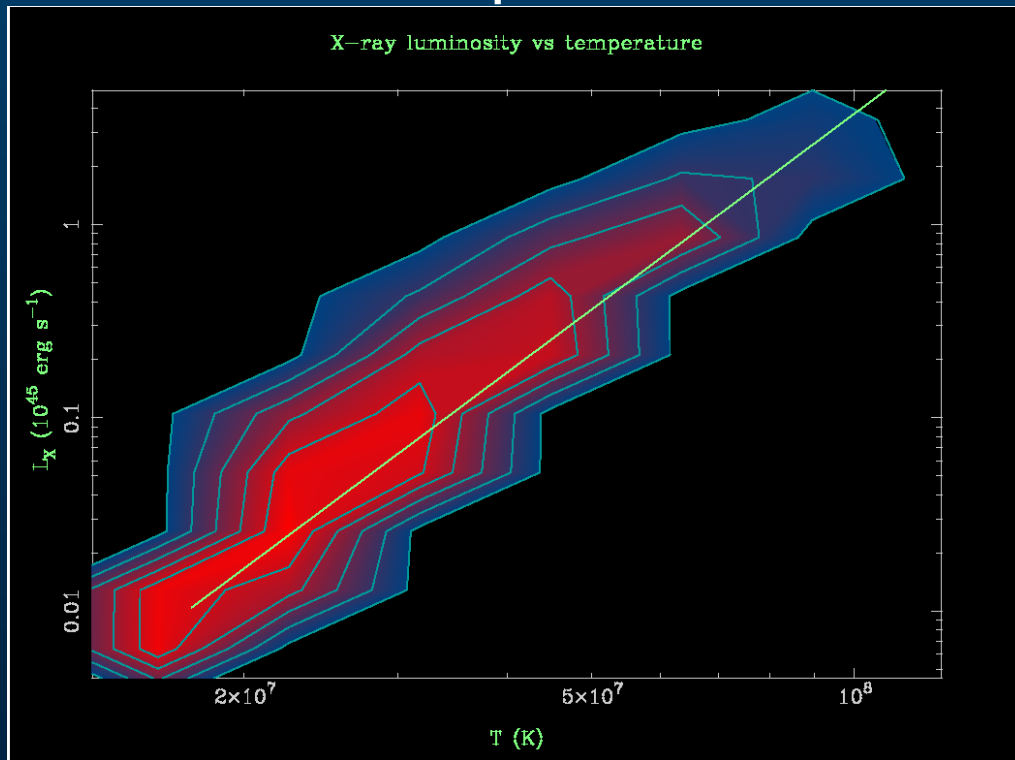
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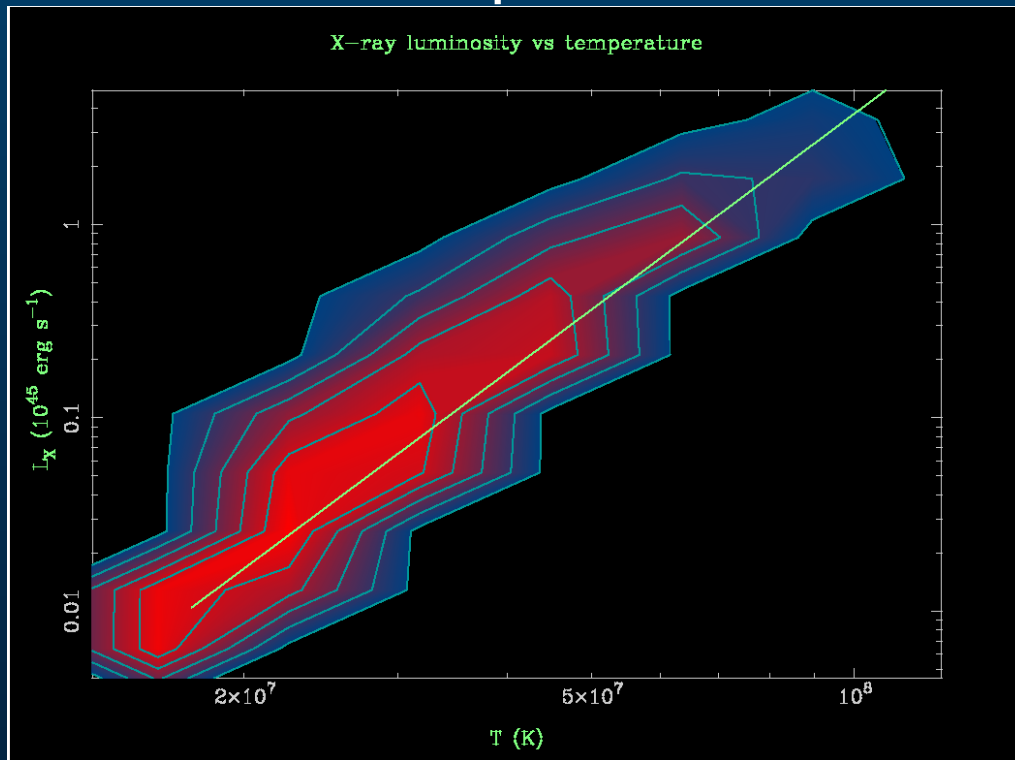
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Turn on hydrodynamics, and make sure HVC structure can be better reproduced. If so, then solved part of the HVC problem (some of them came from the leading arm)!

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And finally, once all the physics is correct, the HVC problem is resolved, the ironing is done, run the simulation forward in time, so that when "they" are observing the Magellanic system 2 Gyr later, they can verify our calculations.