

The Starburst Mode of Star Formation in Low Mass Galaxies

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Star formation drives galaxy evolution...

What drives star formation?



What is a starburst?

Multi-wavelength Survey of Starburst Dwarf Galaxies

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GALEX Galaxy Evolution Explorer



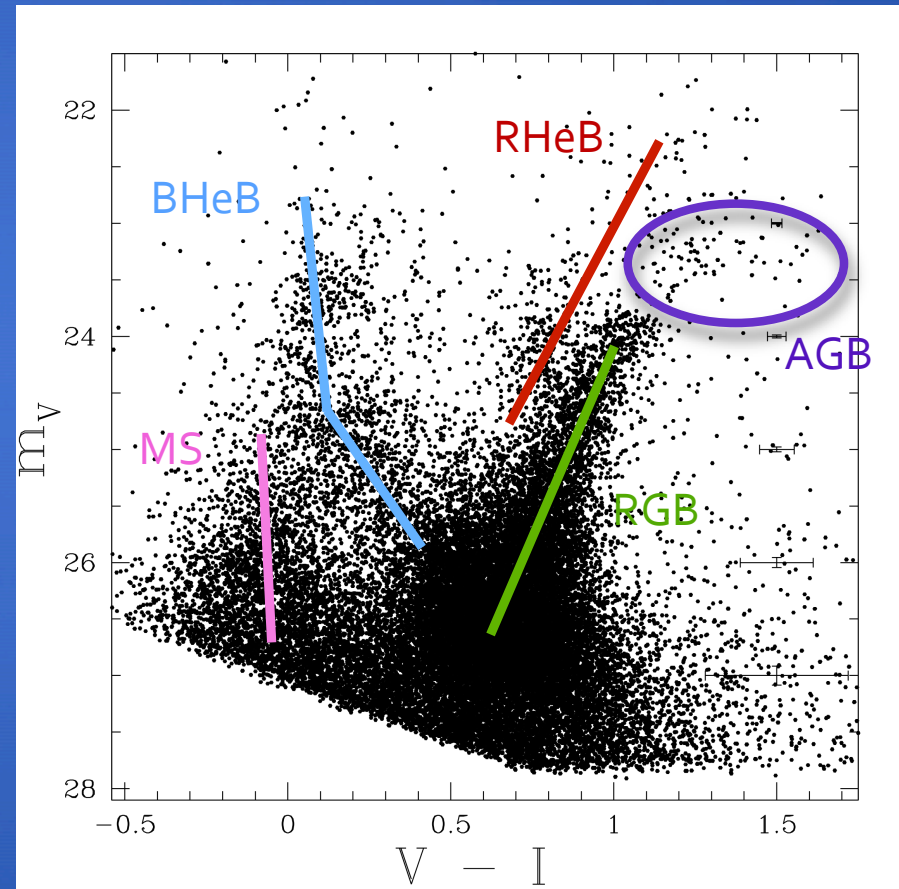
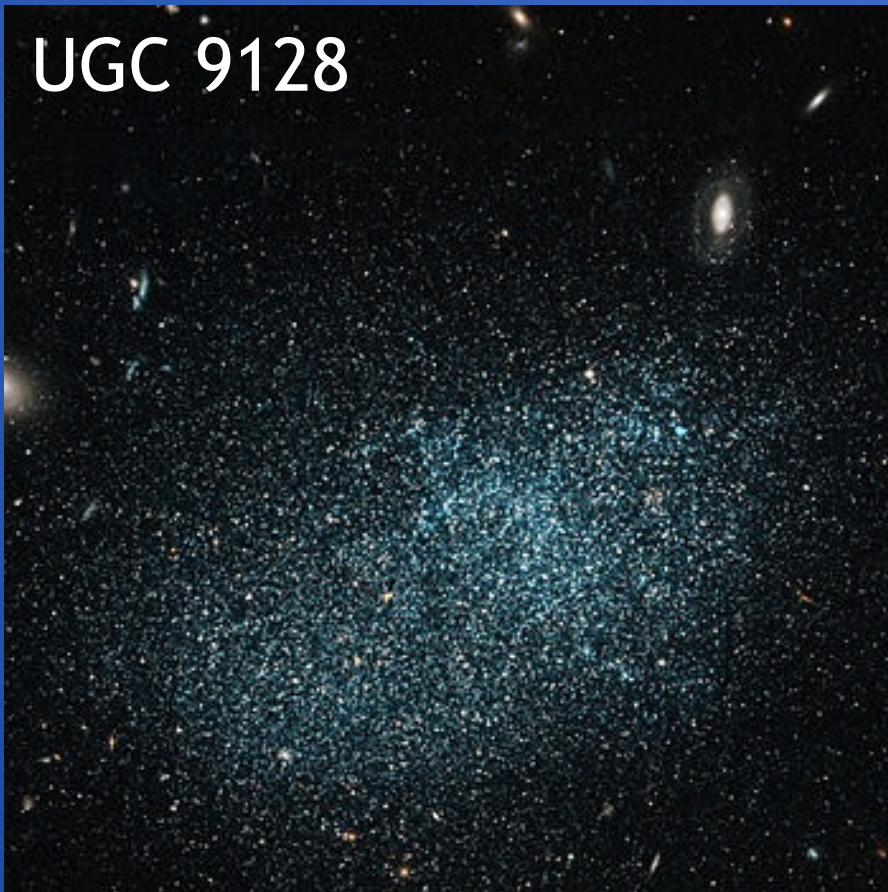
Galaxy	GALEX	HST	MIPS
Antlia Dwarf	✓	✓	✓
DDO 165	✓	✓	✓
ESO 154-23	✓	✓	✓
Holmberg II	✓	✓	✓
IC 2574	✓	✓	✓
IC 4662	✓	✓	✓
NGC 625	✓	✓	✓
NGC 784	✓	✓	✓
NGC 1569	✓	✓	✓
NGC 2366	✓	✓	✓
NGC 4068	✓	✓	✓
NGC 4163	✓	✓	✓
NGC 4214	✓	✓	✓
NGC 4449	✓	✓	✓
NGC 5253	✓	✓	✓
NGC 6789	✓	✓	✓
NGC 6822 1	✓	✓	✓
NGC 6822 2	✓	✓	✓
NGC 6822 3	✓	✓	✓
UGC 4483	✓	✓	✓
UGC 6456	✓	✓	
UGC 9128	✓	✓	✓

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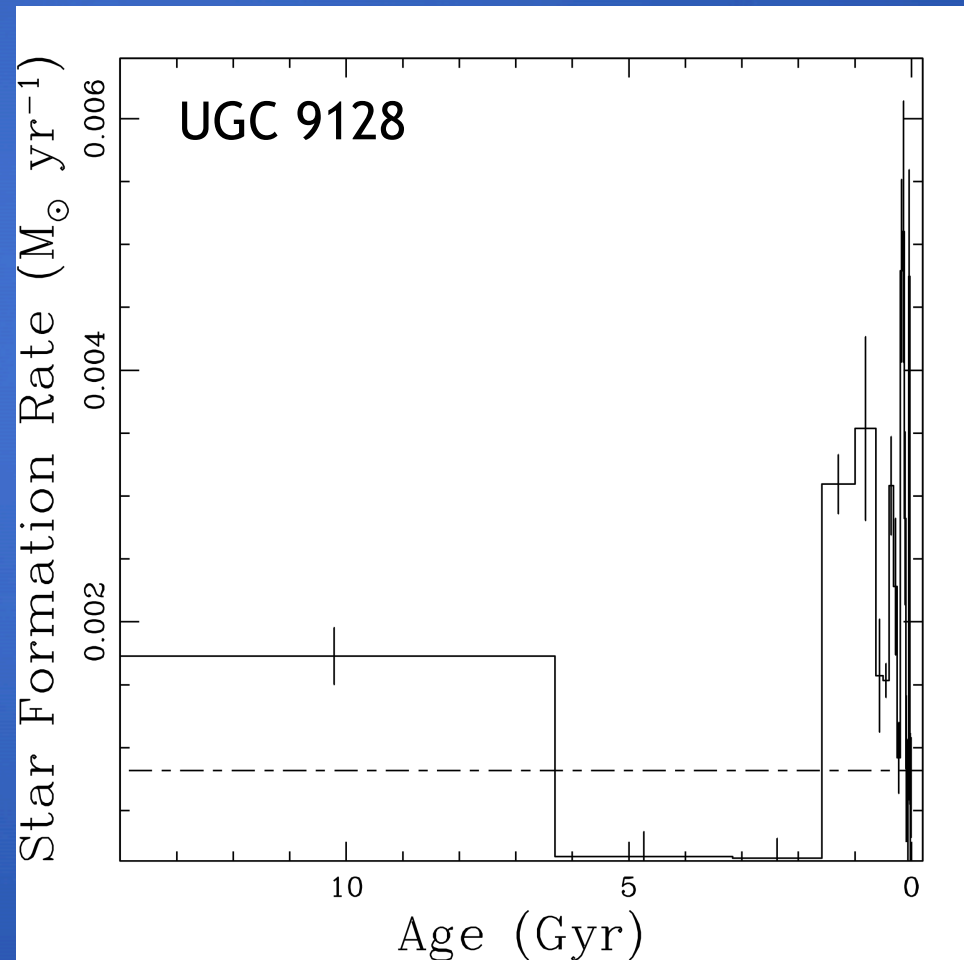
Reconstructing star formation histories

UGC 9128

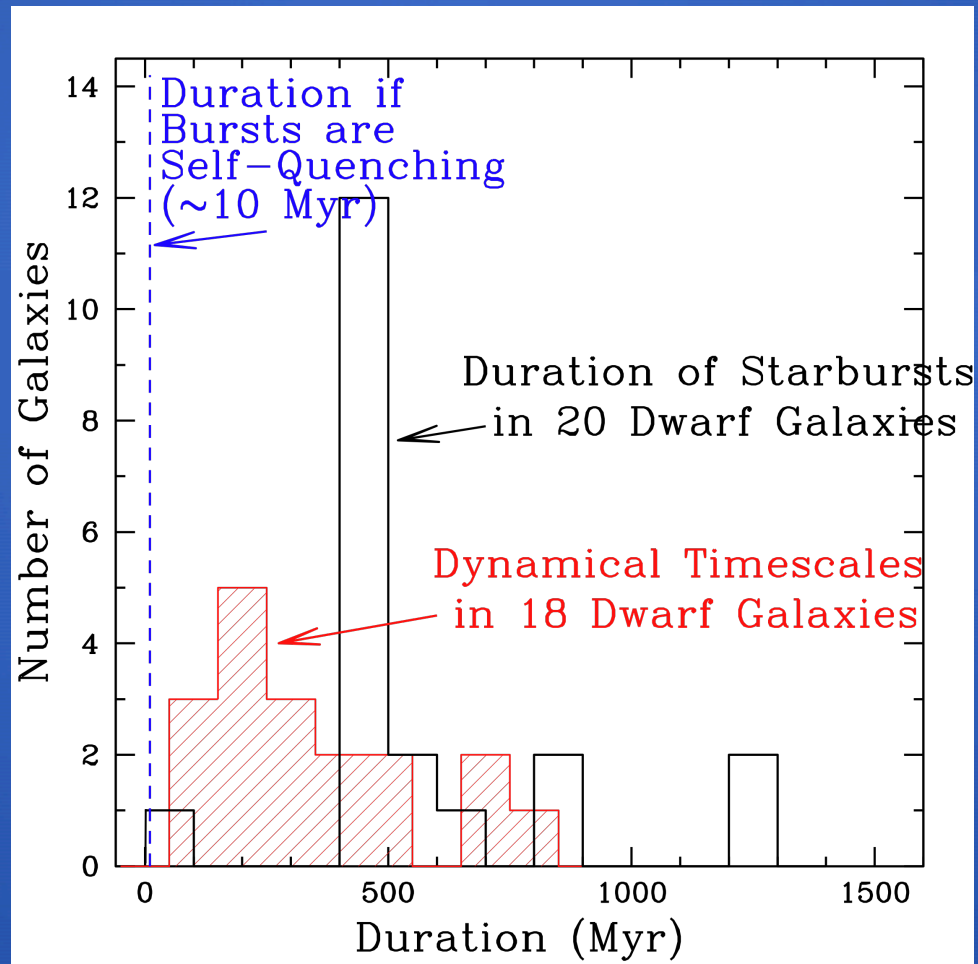


Star Formation Histories

- High fidelity photometry
- Stellar Evolutionary Models
- Initial mass function
- Binary Fraction
- $Z(t)$
- $SFR(t)$



Starburst durations of 100's Myr



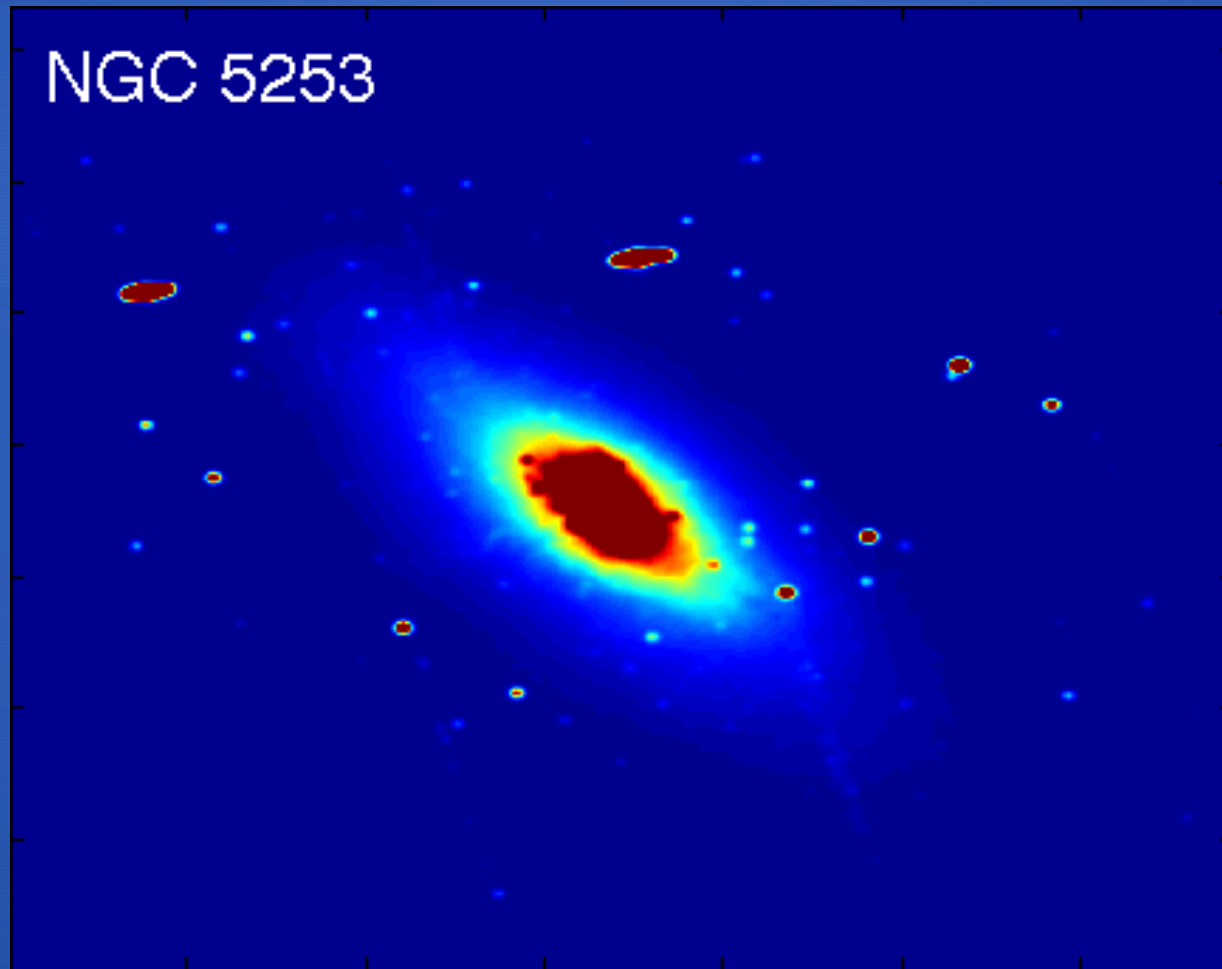
(McQuinn et al. 2010a, b)

Where are the Sites of Recent SF?



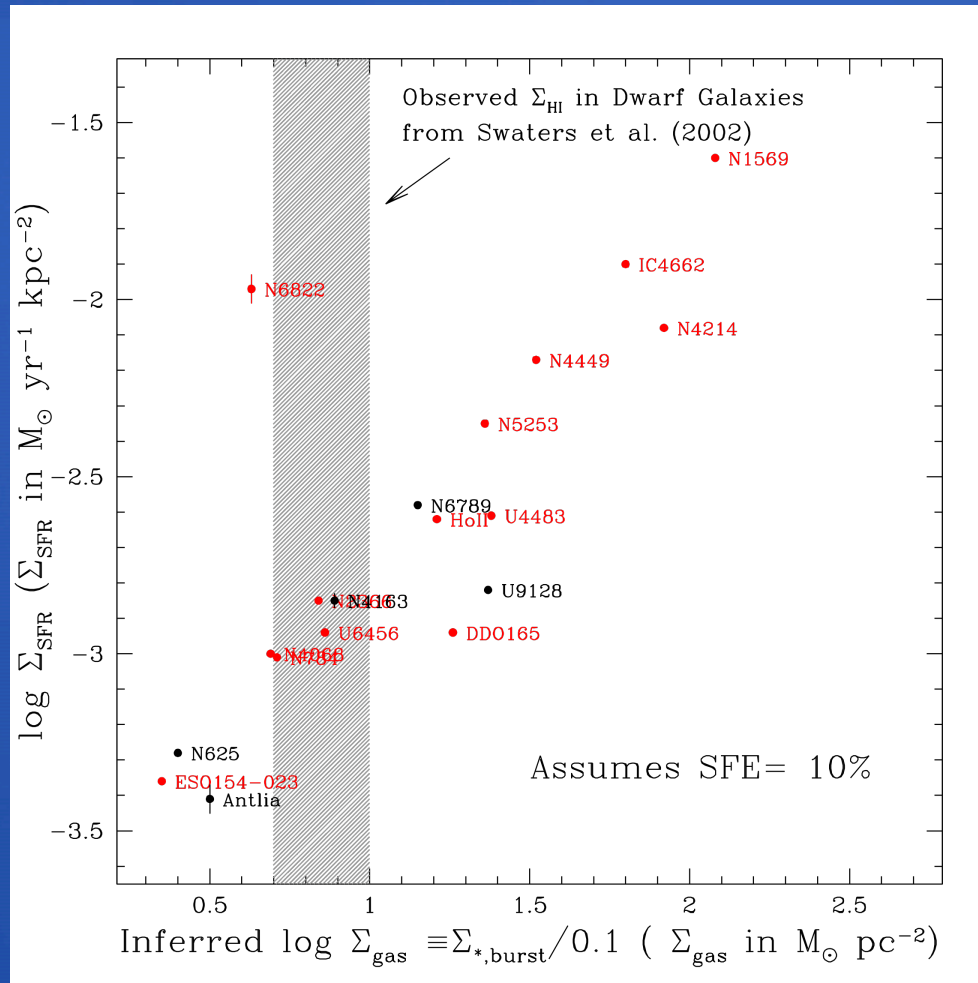
From broadly distributed...

Where are the Sites of Recent SF?



To centrally concentrated

Inferred gas surface densities at the onset of the bursts: up to $100 M_{\odot} \text{pc}^{-2}$



McQuinn et al. 2012

- Implies significant reservoirs of molecular gas
- X_{CO} factors up to 40x Galactic values

A new paradigm of starburst dwarf galaxies

- Longer lived starbursts of *at least* a few 100 Myr
- Spatial distribution lies on a continuum from centrally concentrated to broadly distributed
- Bias in identifying starbursts in systems with centrally concentrated SF
- Estimated gas surface densities imply significant molecular gas content and higher X_{CO} factors

Gravitational Interactions?

