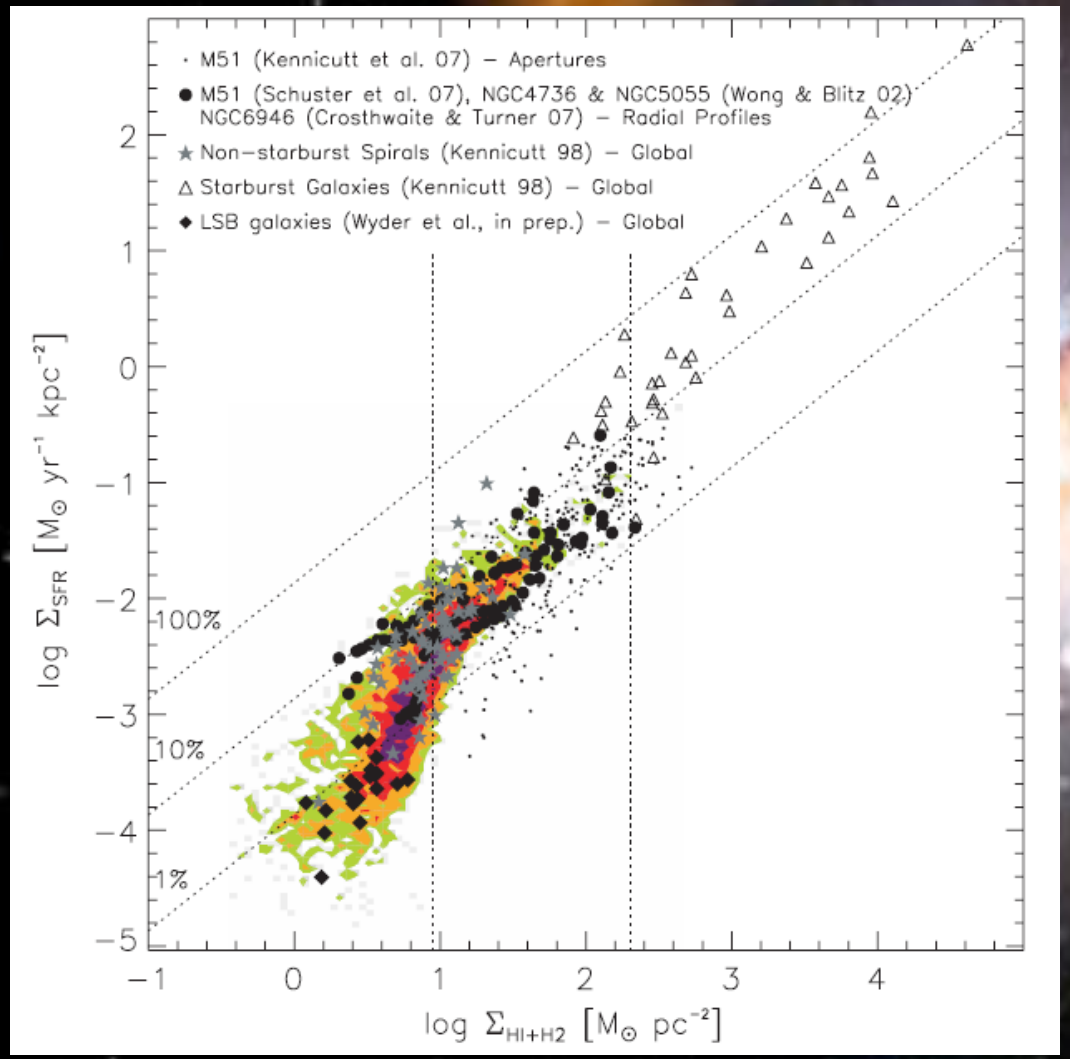
SUNBIRD Multi-λ KINEMATICS

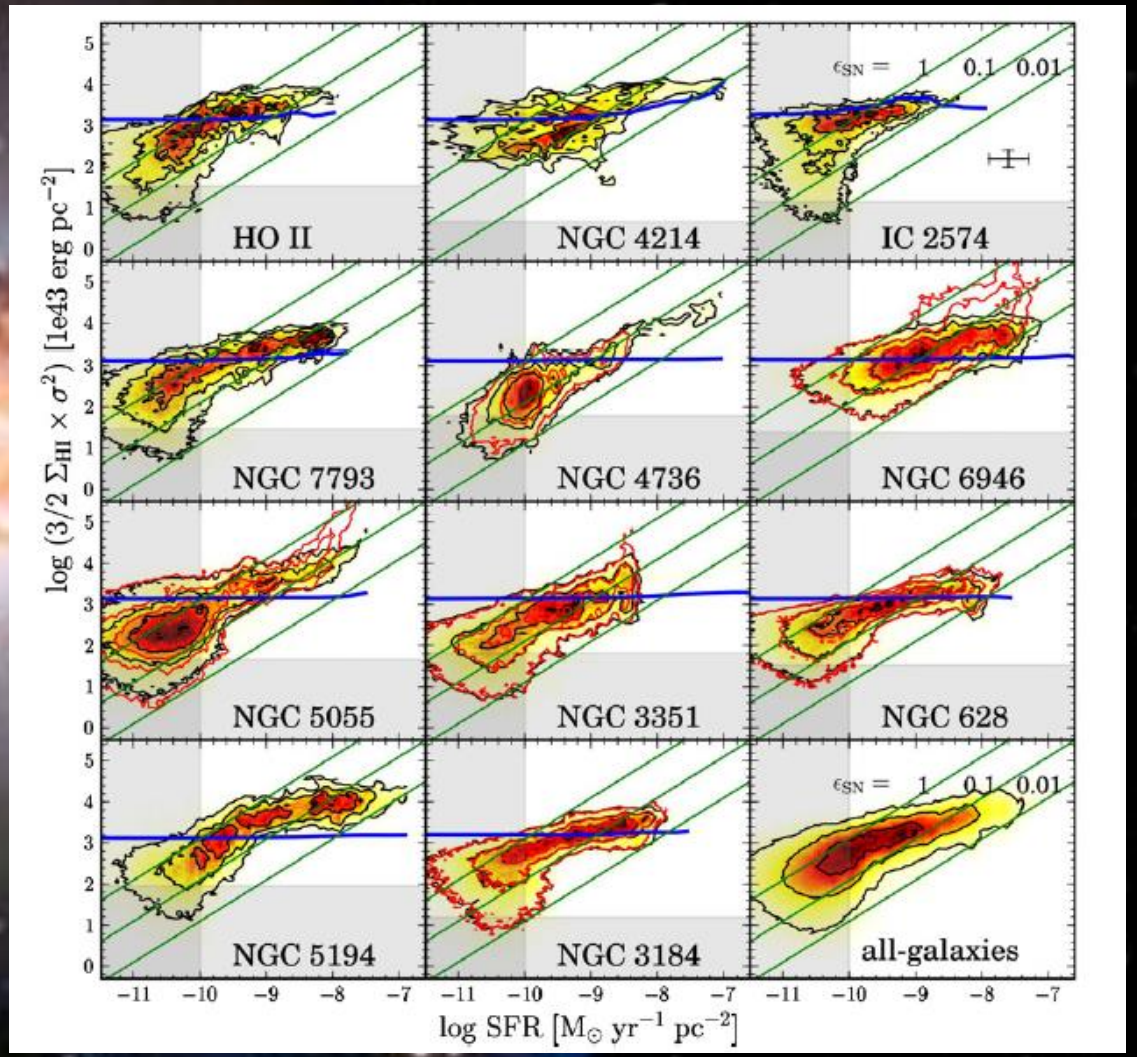
Moses Mogotsi

+ Väisänen P.[1], Ramphul R.[1], Tafere M., Kuncarayacti H.[2], Kotilainen J.[2], Kool E.[3], & SUNBIRD Team

[1]South African Astronomical Observatory (SAAO); [2]University of Turku; [3]Macquarie University

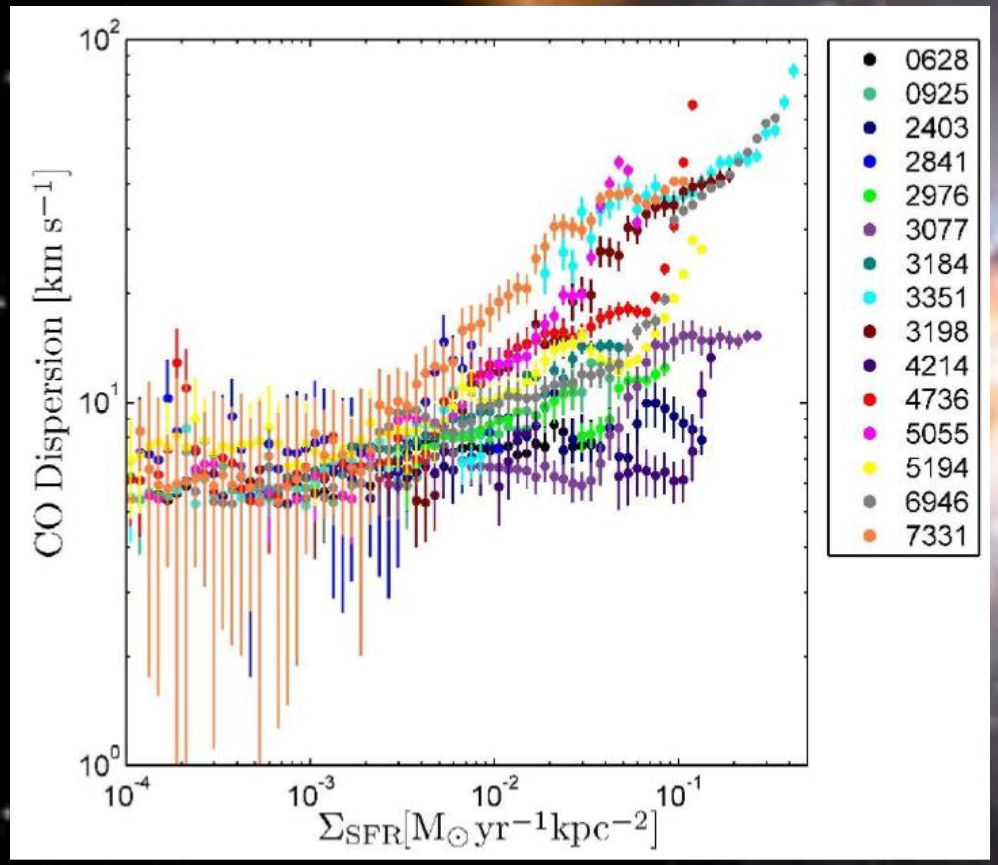


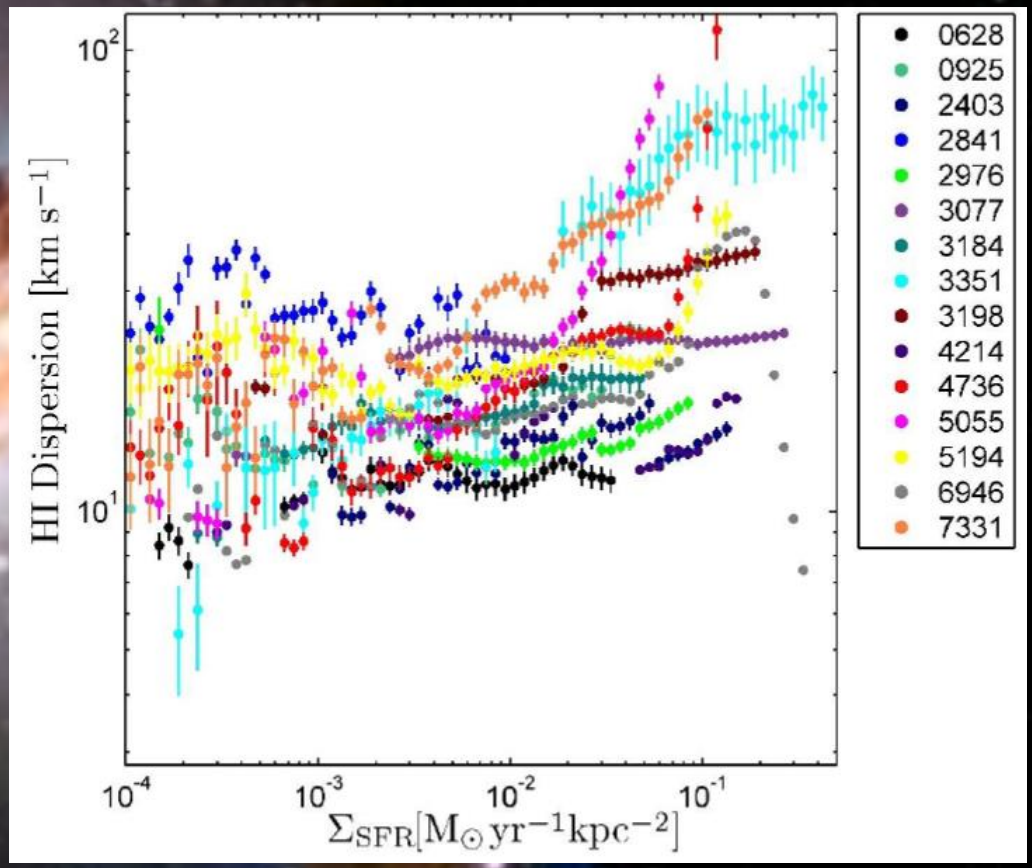
Bigiel+ 2008



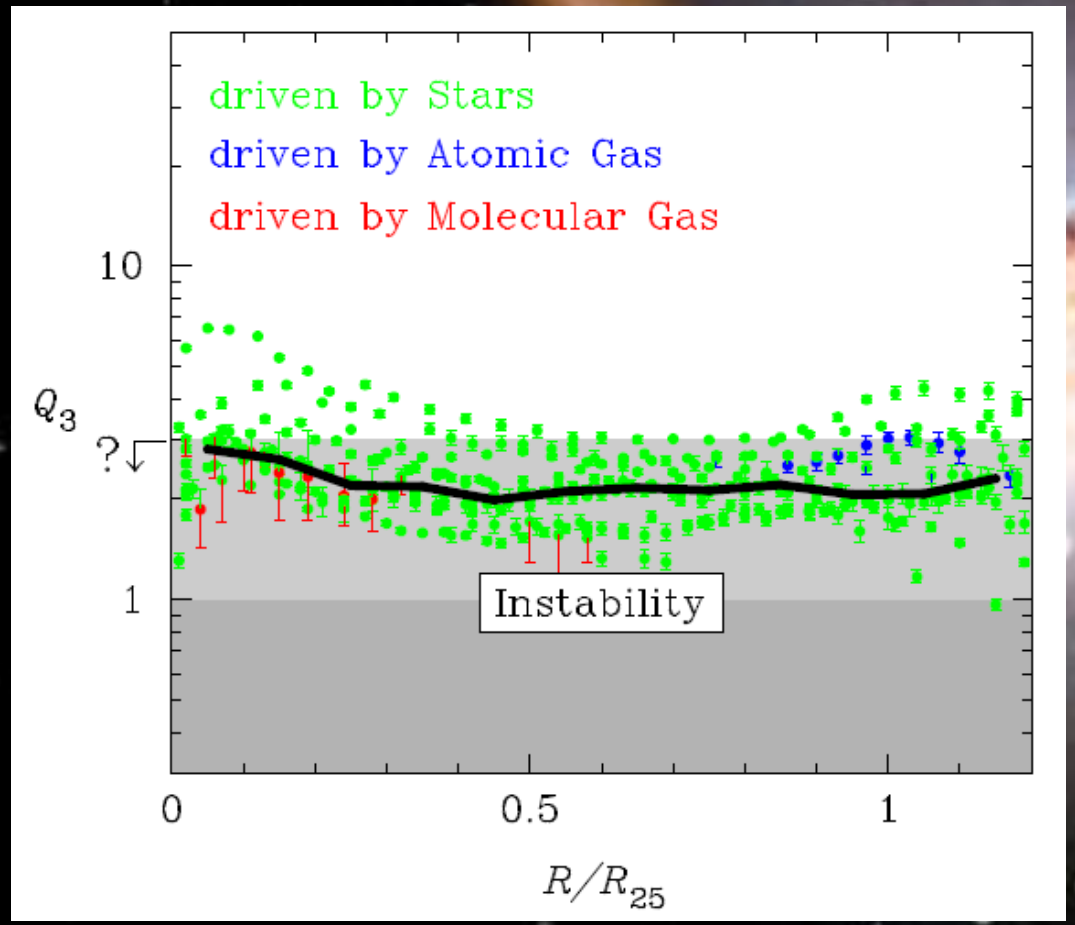
Tamburro+ 2008

Feedback?

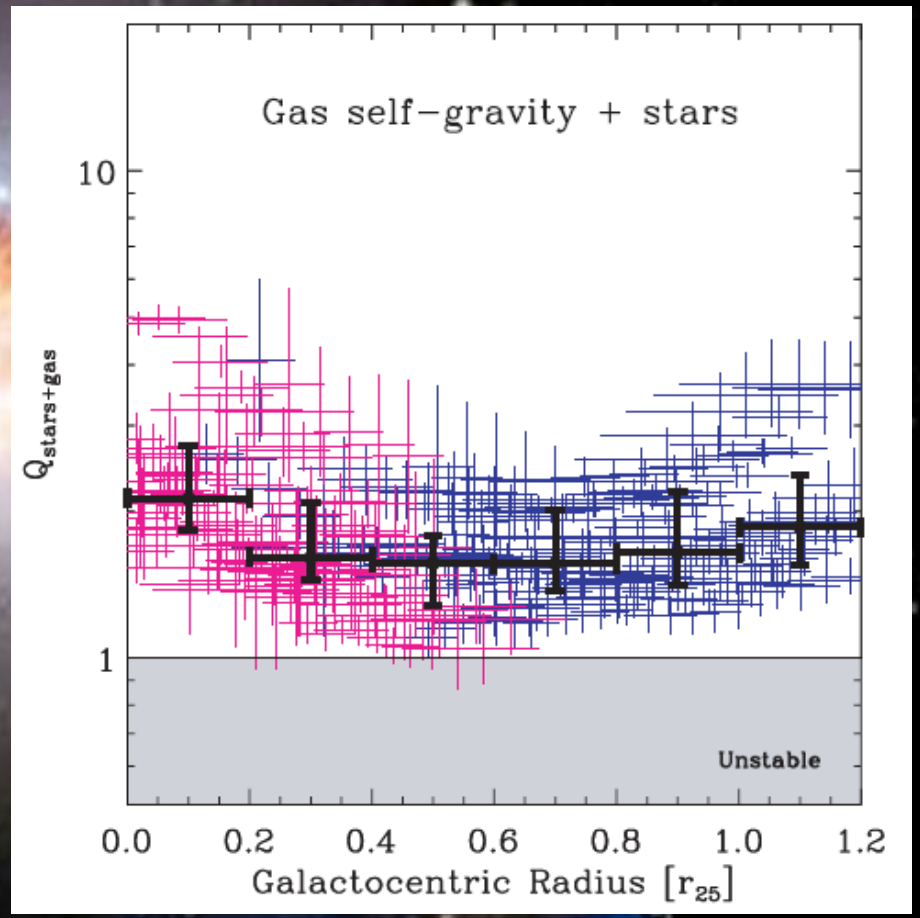

CO Dispersion [km s^{-1}]
$\Sigma_{SFR}[M_\odot yr^{-1}kpc^{-2}]$
0628
0925
2403
2841
2976
3077
3184
3351
3198
4214
4736
5055
5194
6946
7331


HI Dispersion [km s^{-1}]
$\Sigma_{SFR}[M_\odot yr^{-1}kpc^{-2}]$
0628
0925
2403
2841
2976
3077
3184
3351
3198
4214
4736
5055
5194
6946
7331

Disc Stability

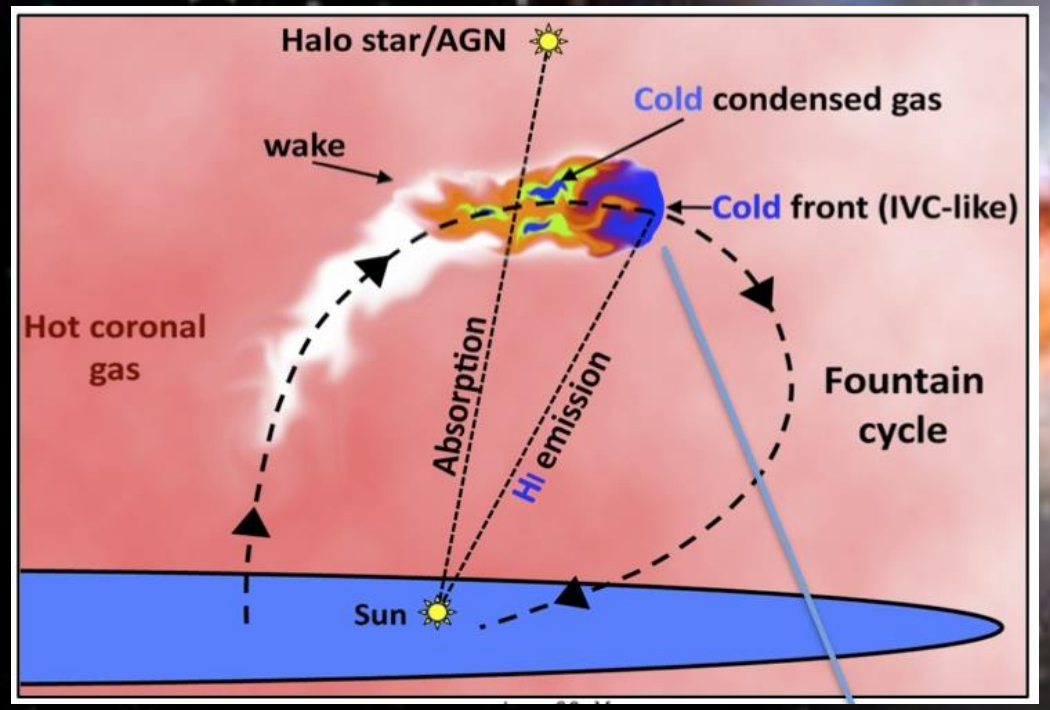


Romeo & Mogotsi 2017

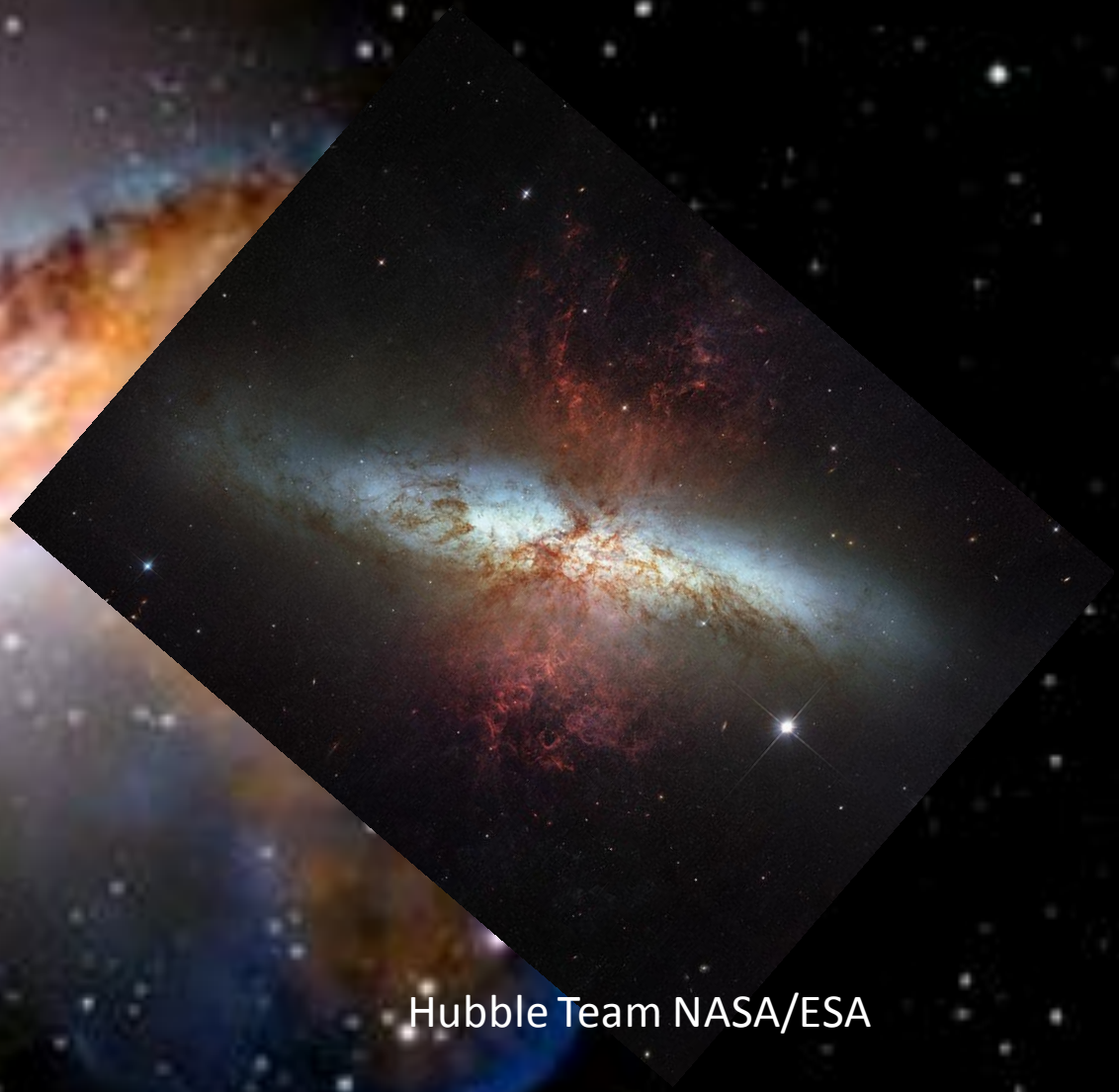


Leroy+ 2008

Feedback



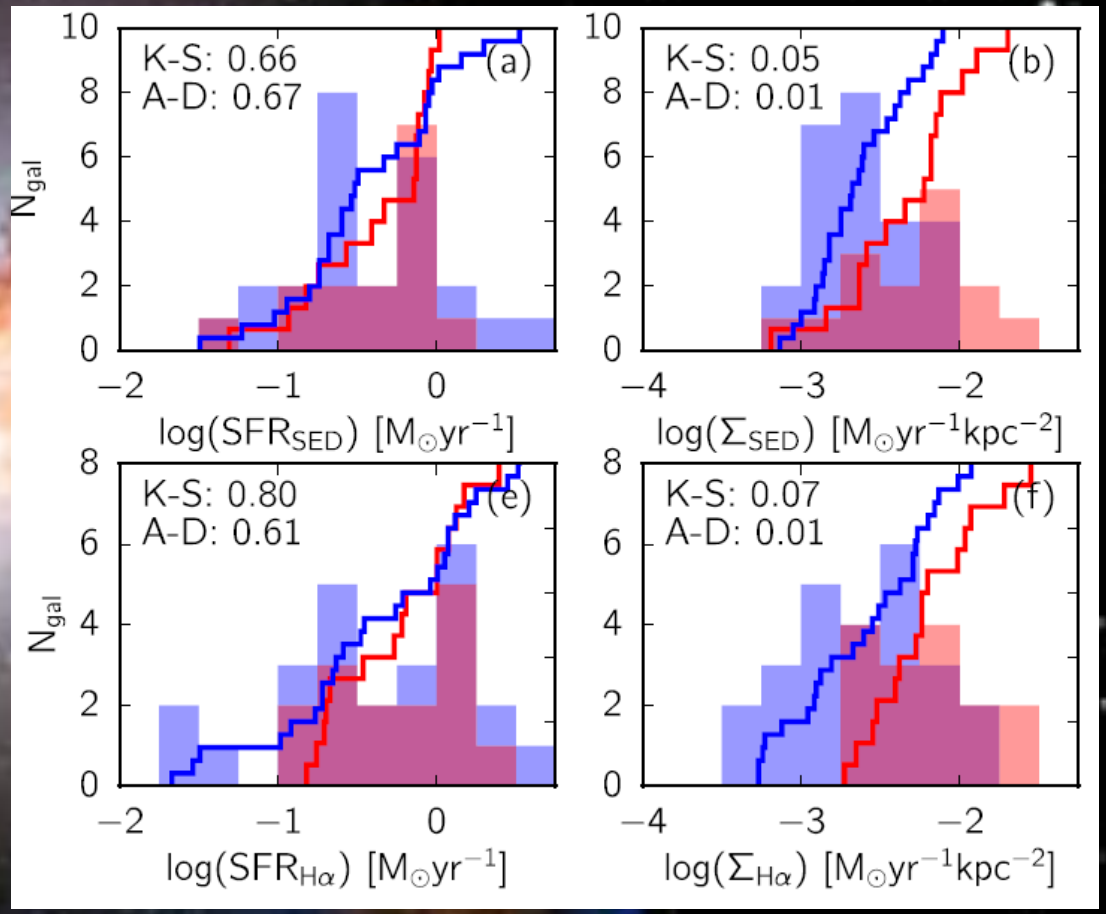
Fraternali+ 2014



Hubble Team NASA/ESA

Galaxies are Windy…

- Wind-dominated (red) versus non-dominated (blue)
- Find winds across large ranges of SFR
- Wind dominated galaxies tend to only found at high SFR



Ho+ 2016

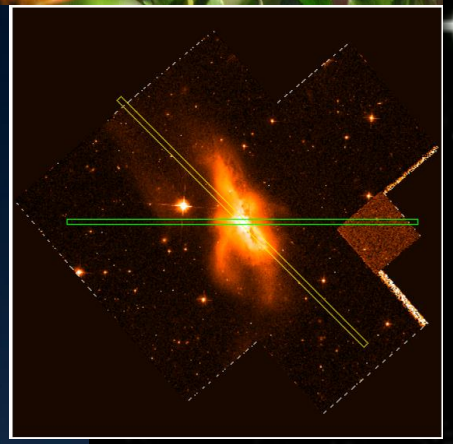
LIRGS/ULIRGS

- Luminous Infrared Galaxies (LIRGS) and Ultraluminous Infrared Galaxies (ULIRGS)
- LIRGS: $10^{11}L_{sol} < LIR < 10^{12}L_{sol}$ Sanders & Mirabel (1996)
- ULIRGS: $10^{12}L_{sol} < LIR < 10^{13}L_{sol}$

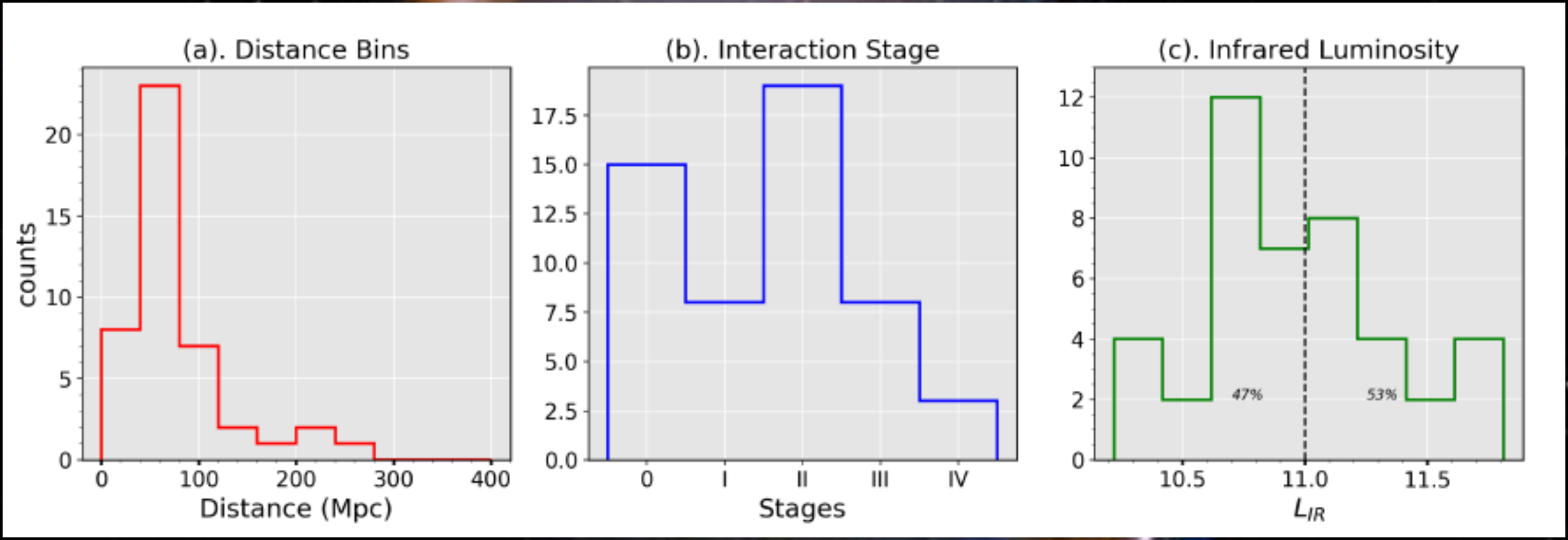
- Gas Rich
- Most show signs of interaction or merger (higher fraction of mergers at higher luminosity)

SUNBIRD Kinematics Observations

- SUperNovae and StarBursts and in the InfraReD
- SALT RSS Observations of starbursts, LIRGS, ULIRGS…
- 54 Targets
- 155 Observations
- PG900 : Stellar Populations
- PG1800, PG3000 : Kinematics



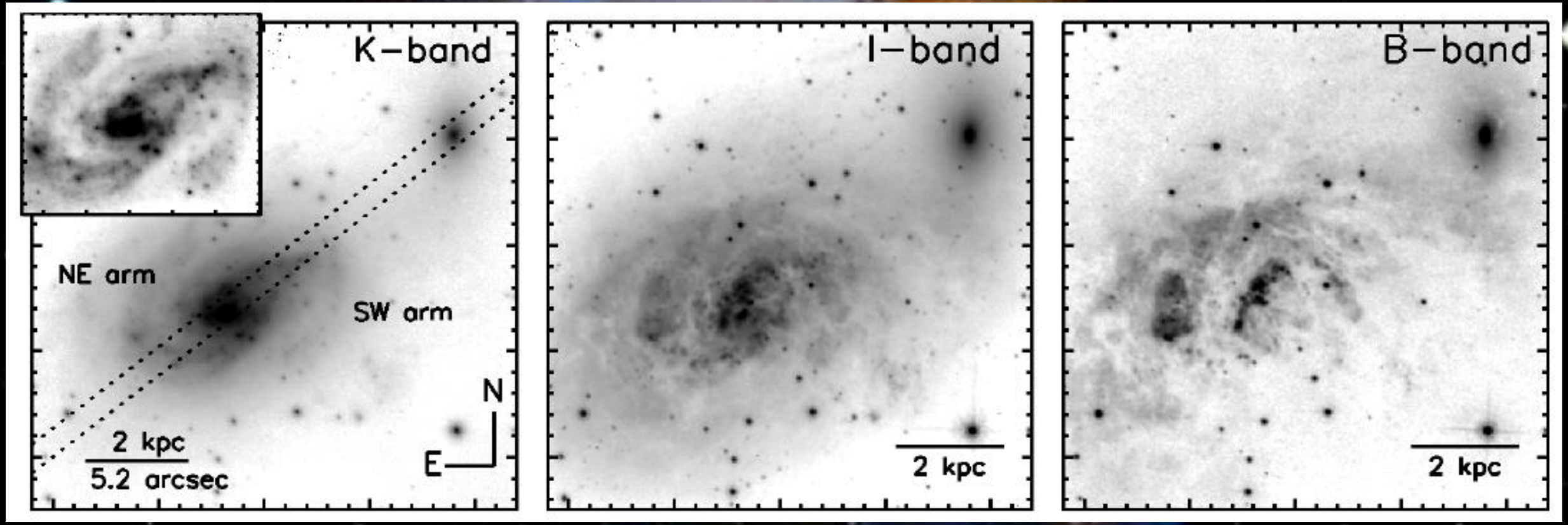
SUNBIRD Observations (SALT)



Rajin Ramphul PhD Thesis

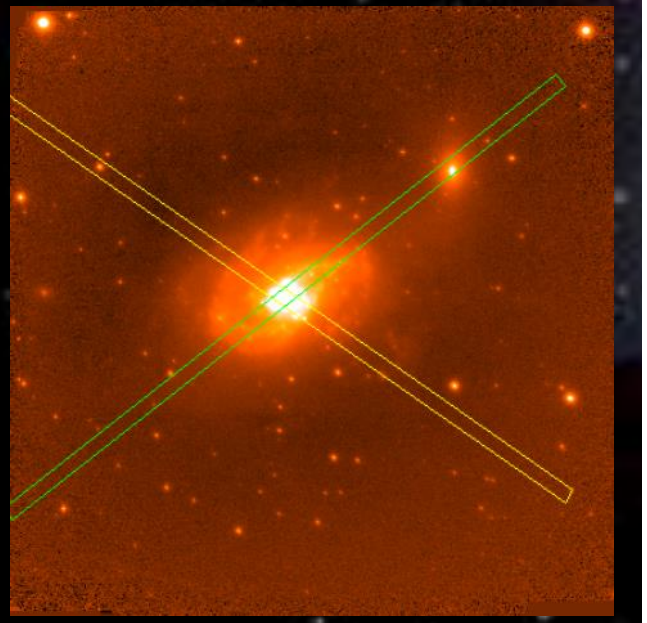
IRAS18293-3413

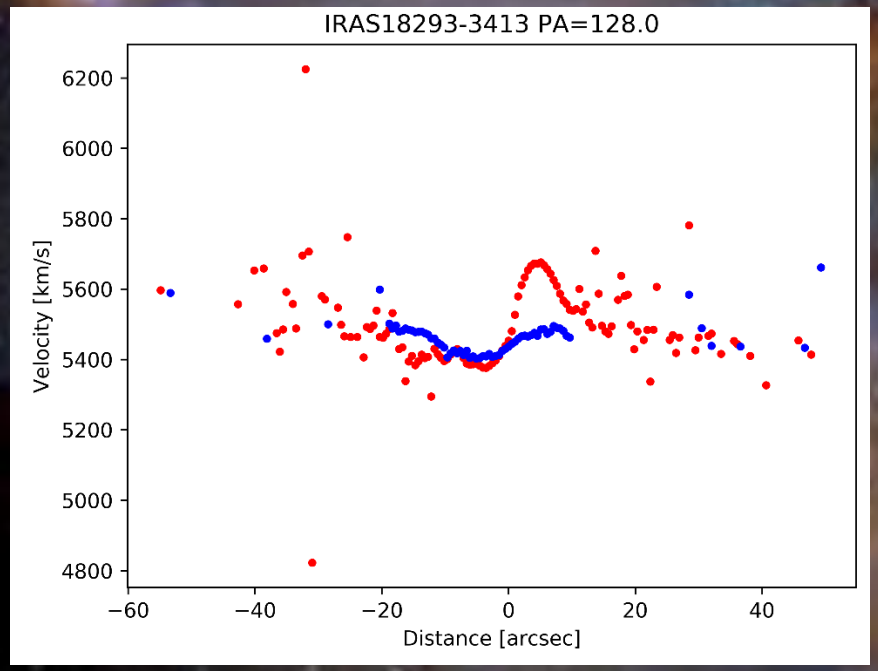
- D=75.7Mpc
- Stellar Mass = $10^{10.63}$ Msol
- SFR = $10^{2.04}$ Msol/yr

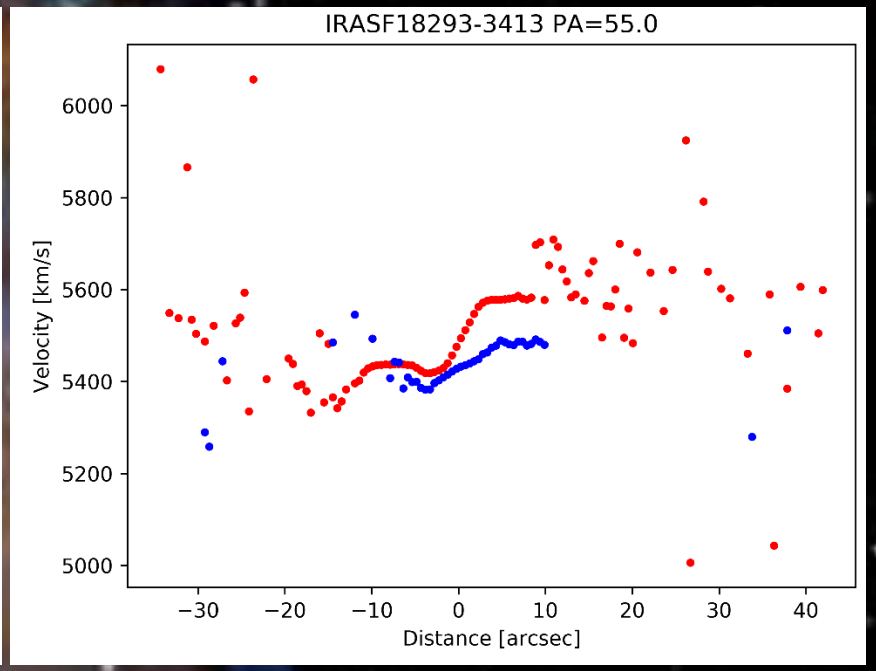


Vaisanen+2008

IRAS18293-3413 SALT



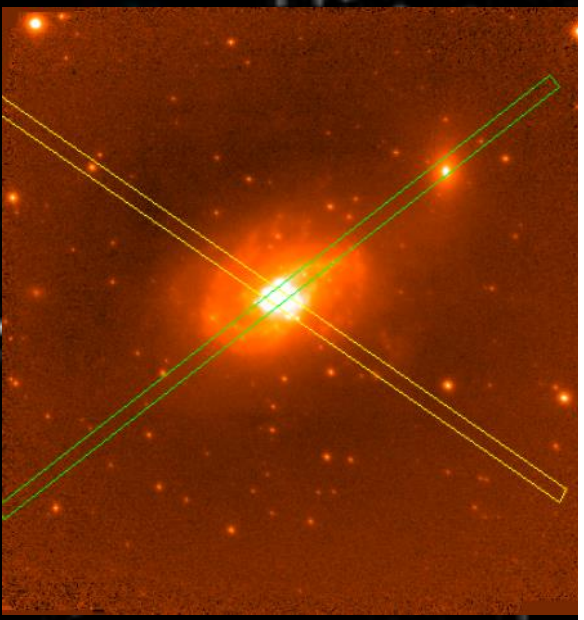


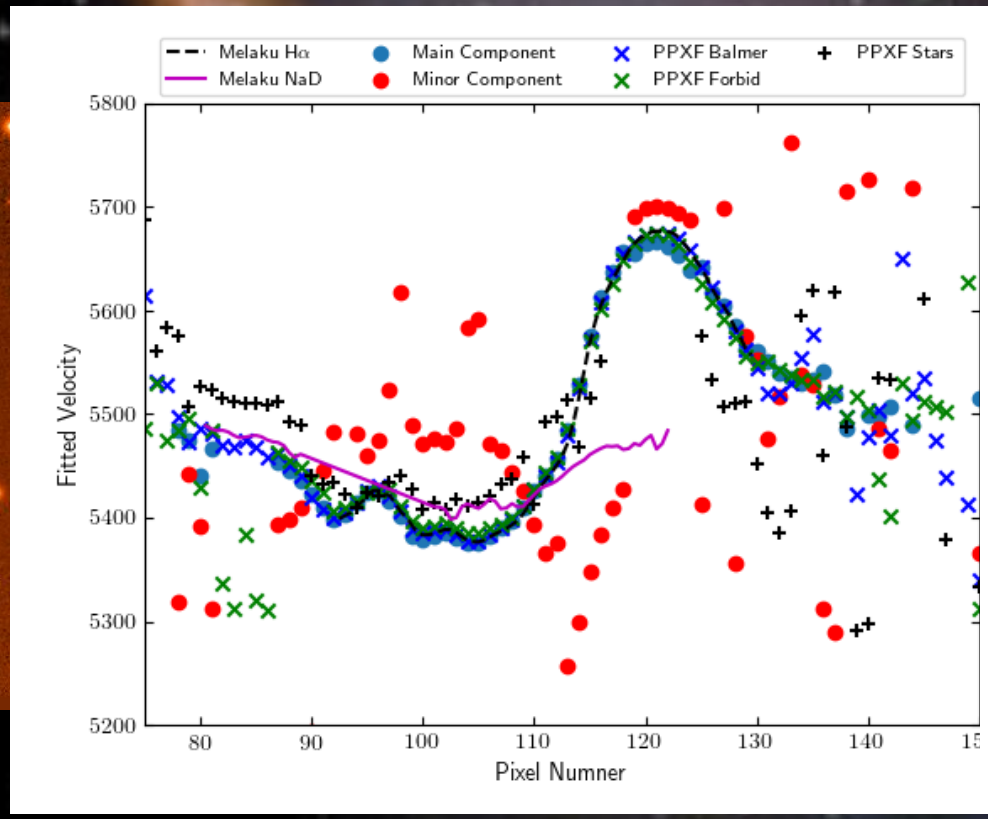


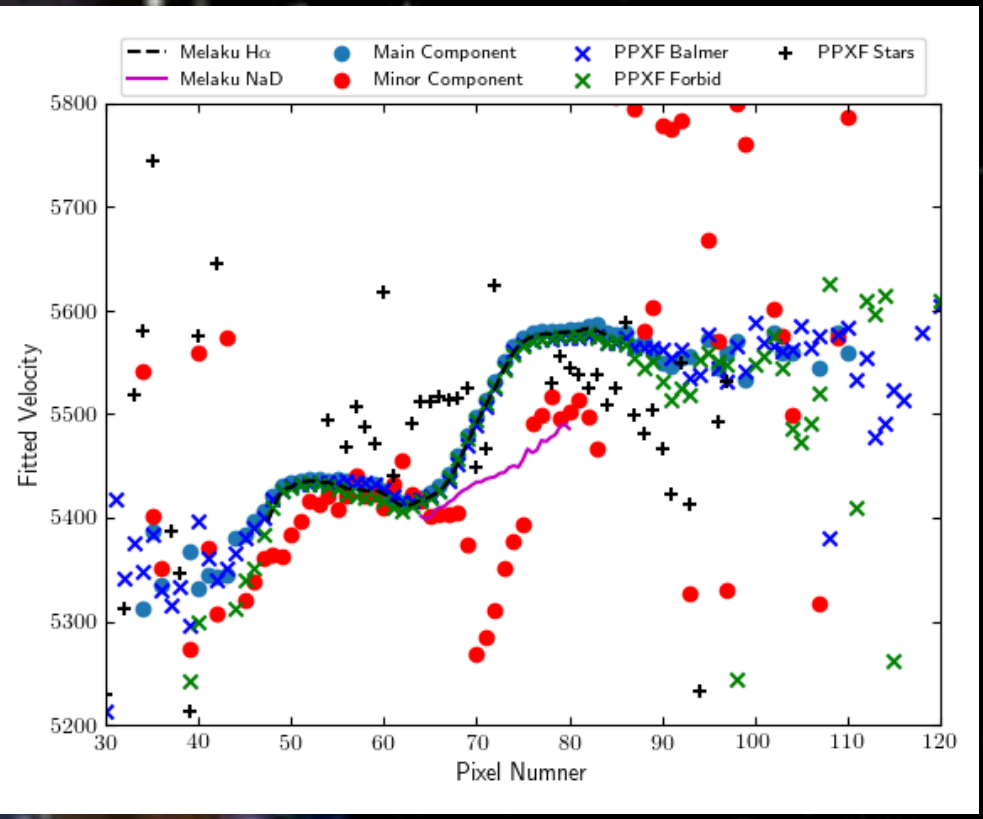
IRAS18293-3413 SALT

PA=128

PA=55







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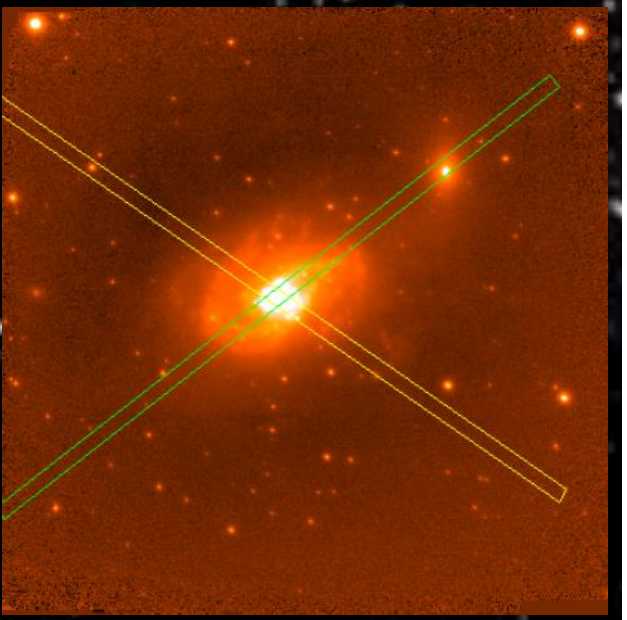

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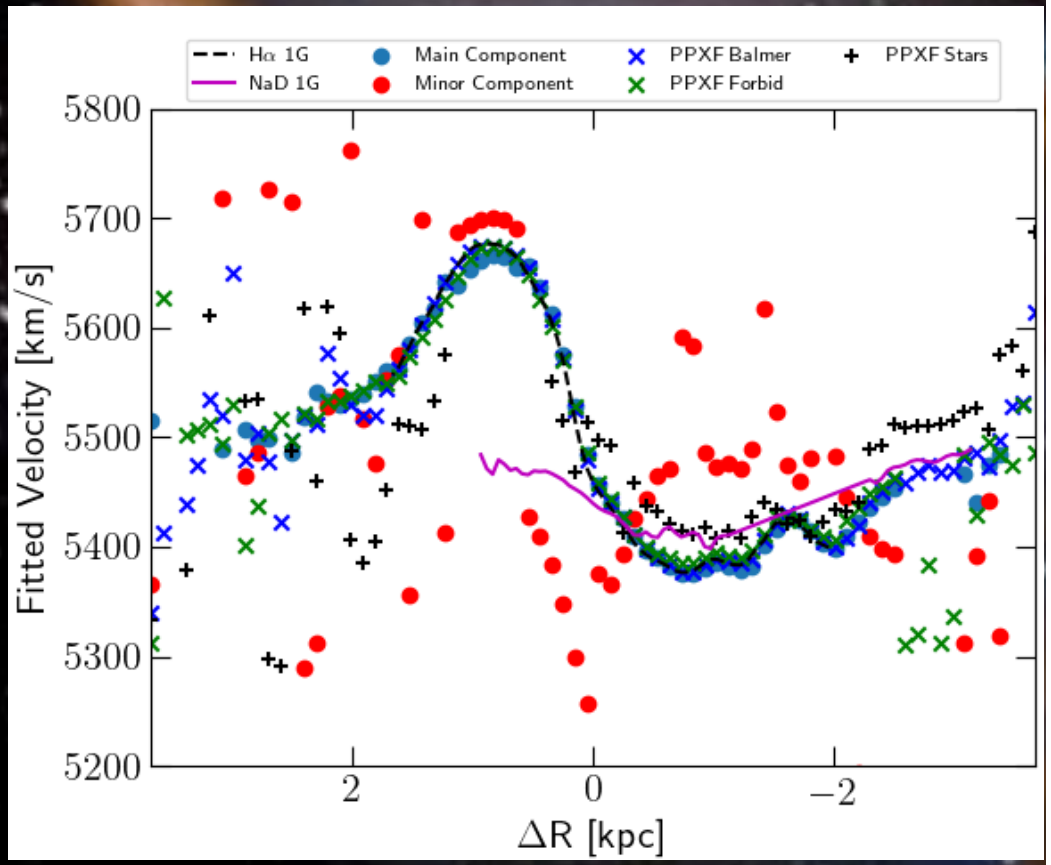
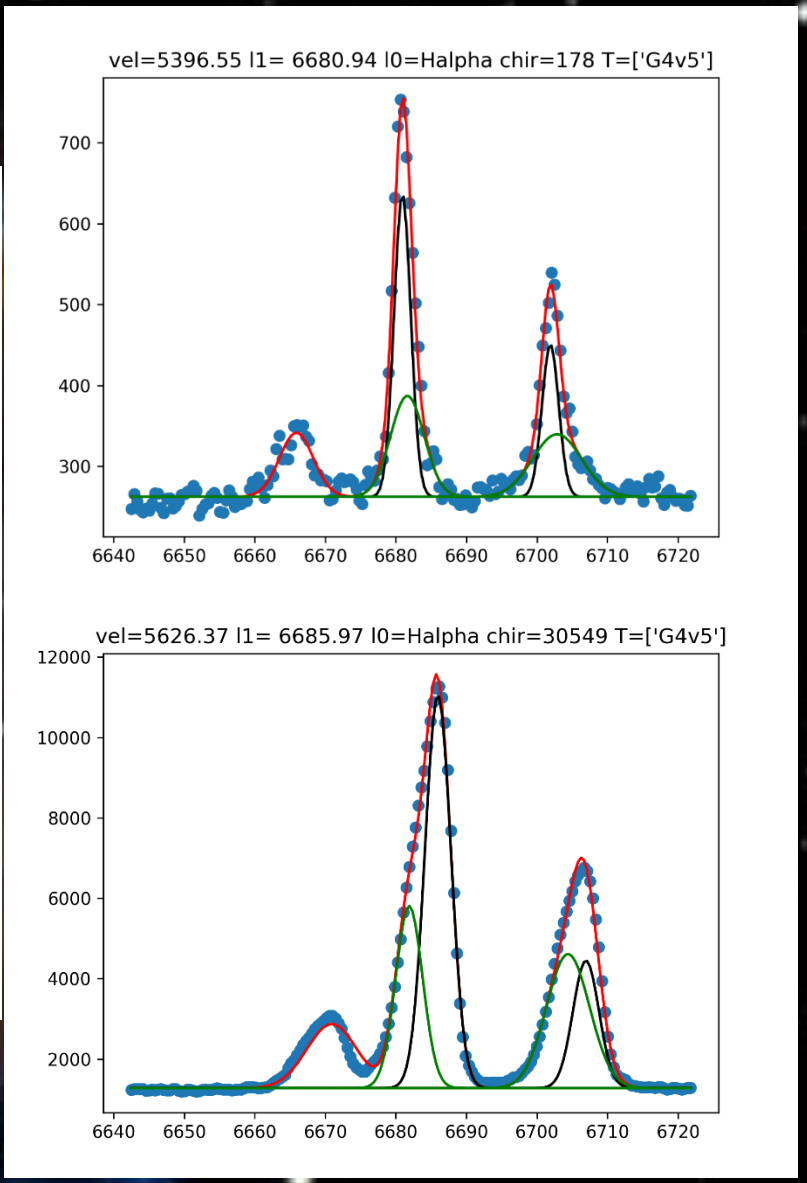
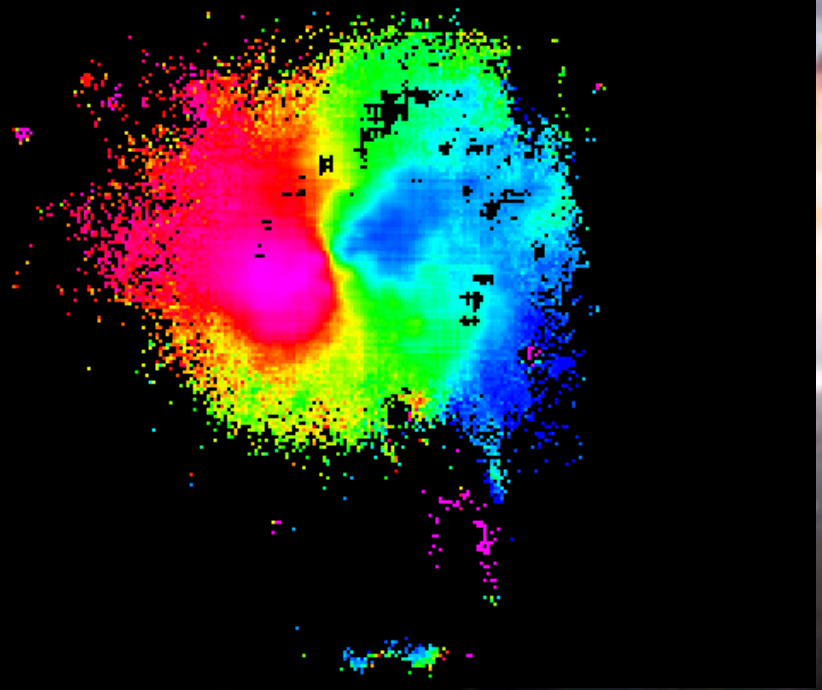
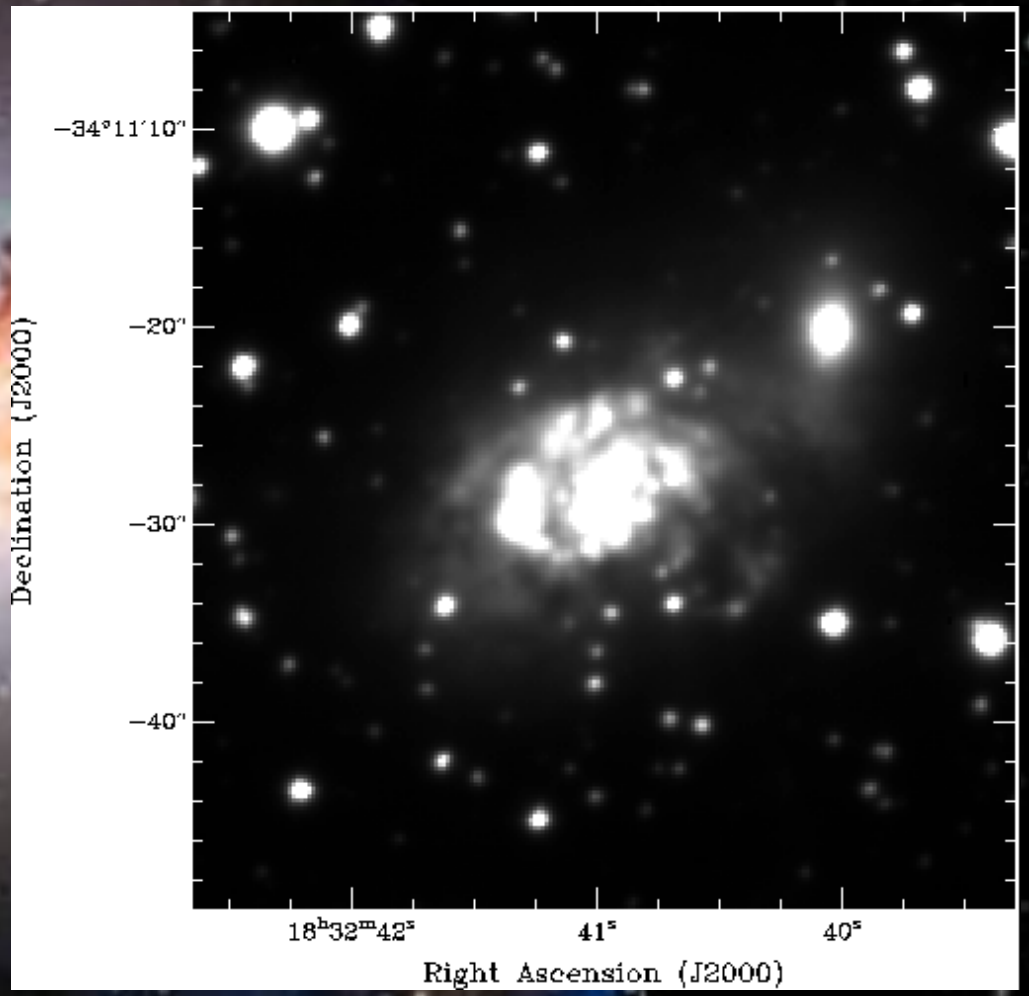




IRAS18293-3413 MUSE follow-up

Velocity Field





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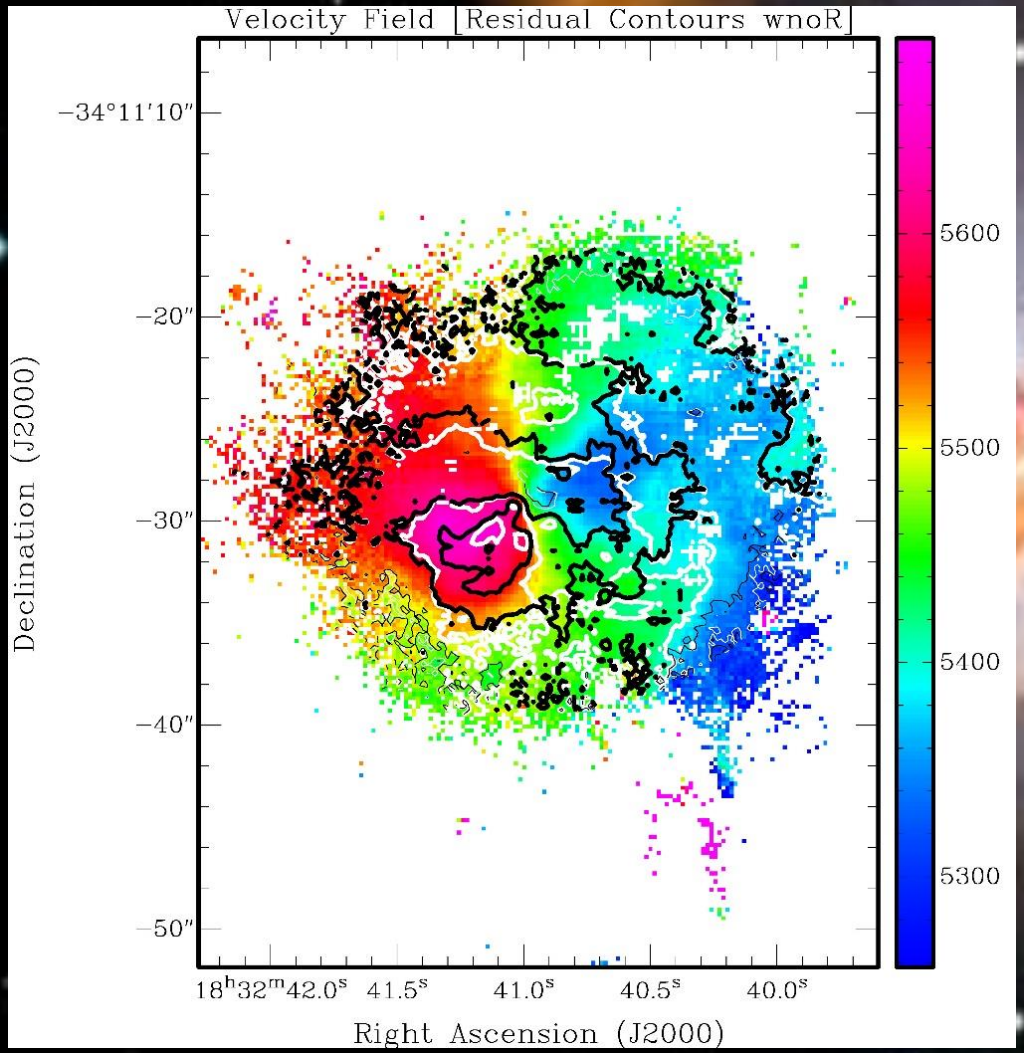
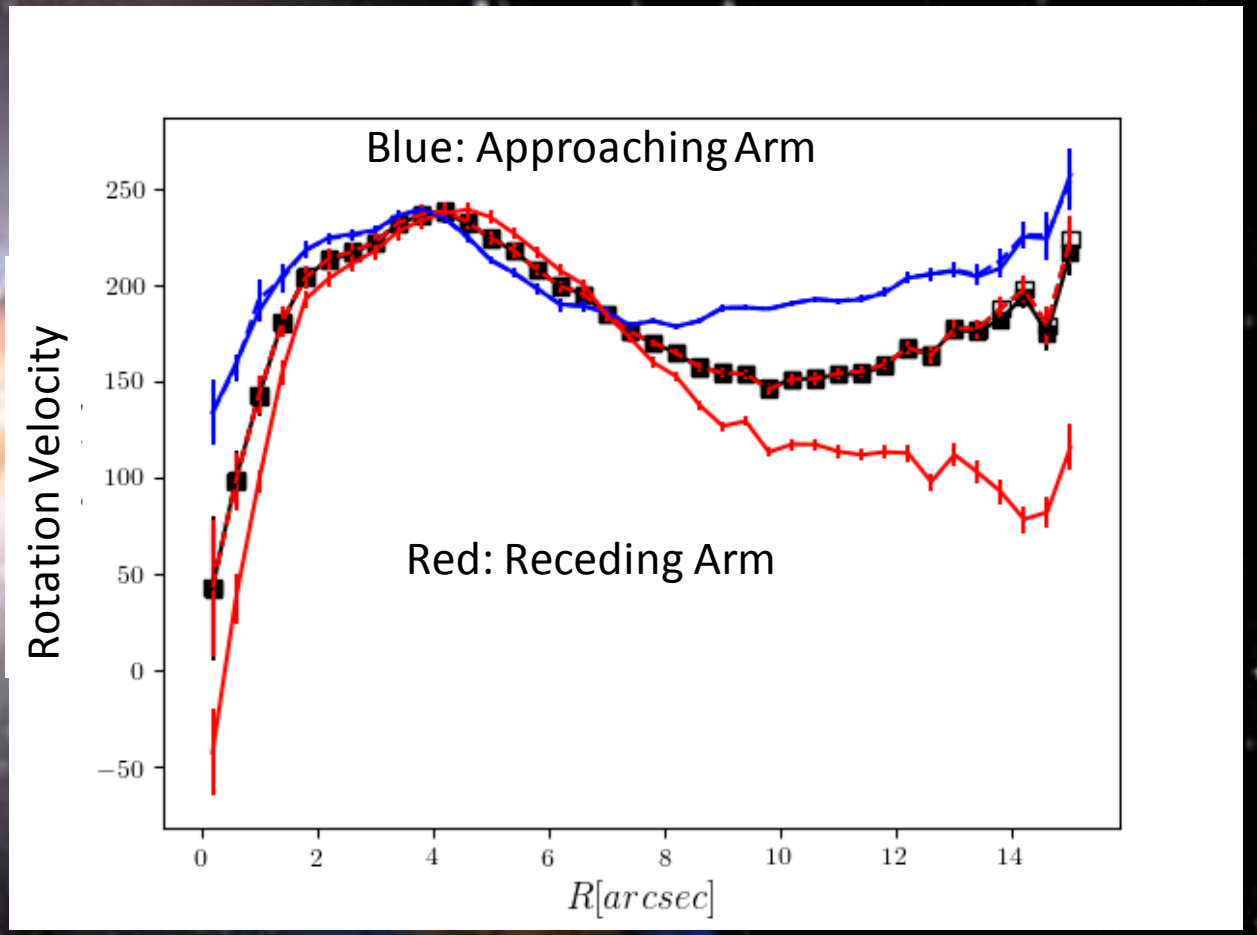
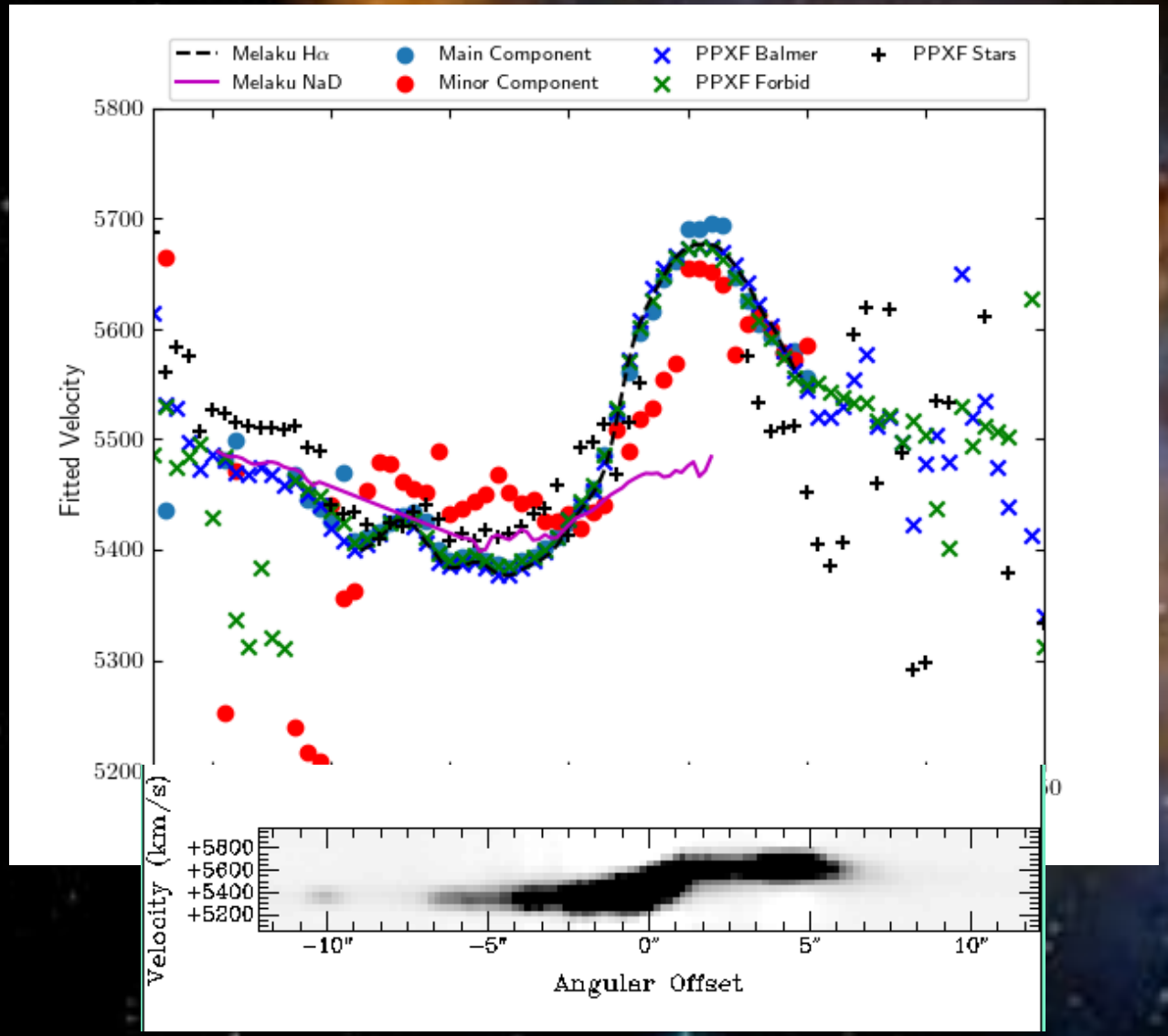
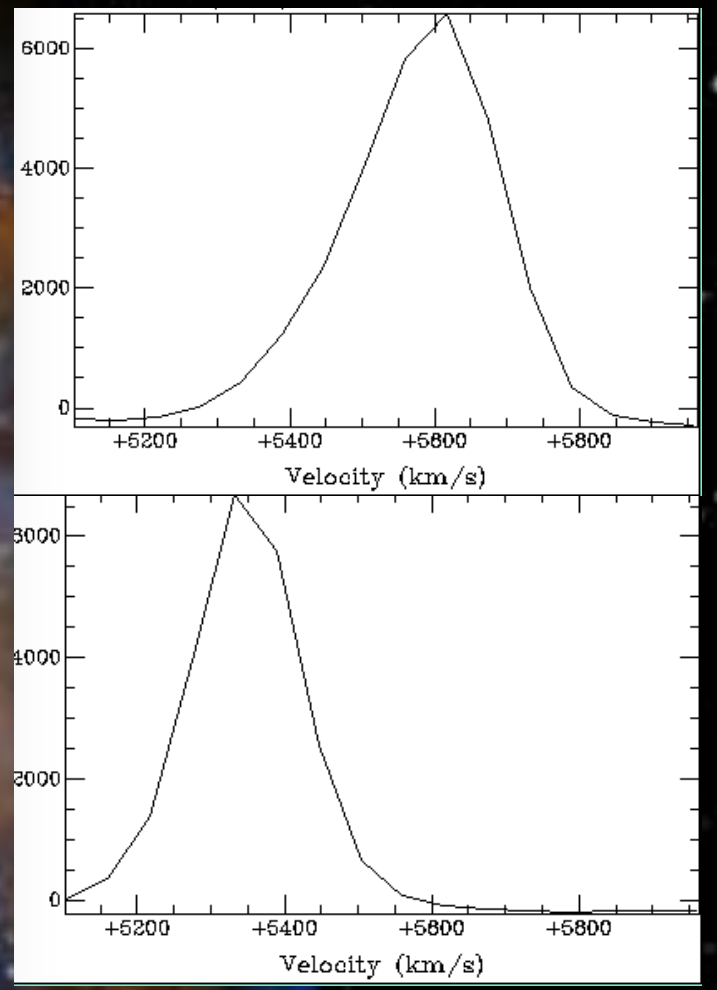




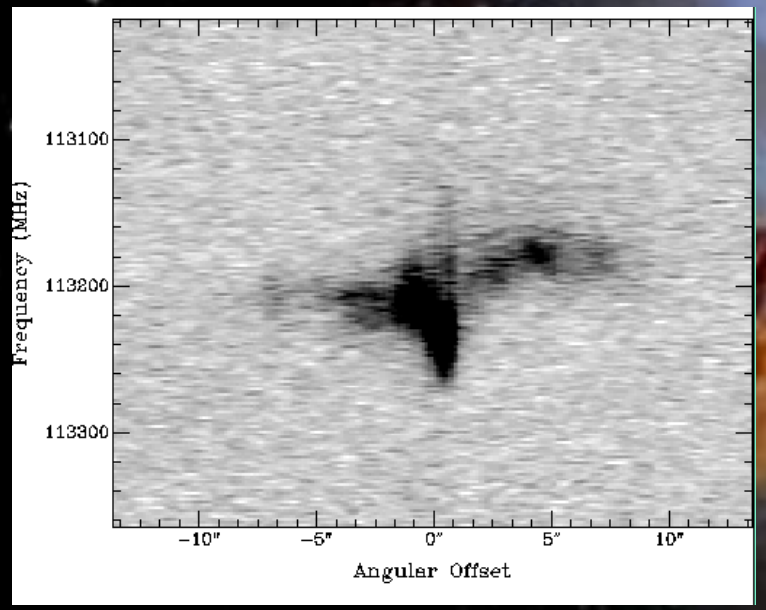
IRAS18293-3413 SALT + MUSE

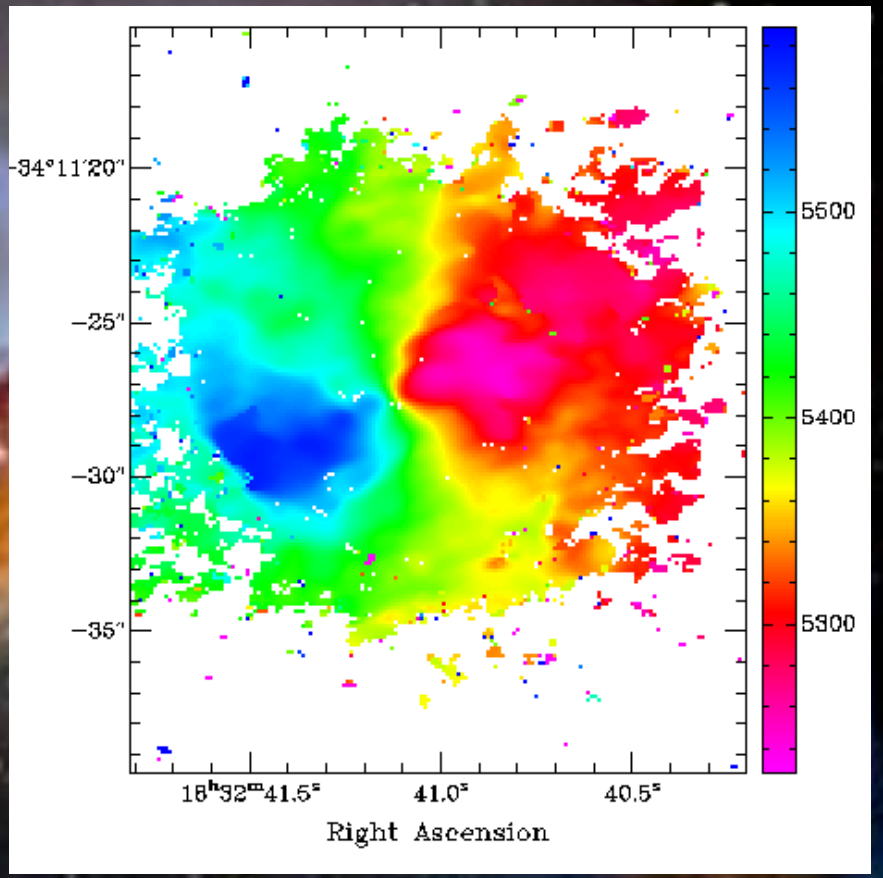


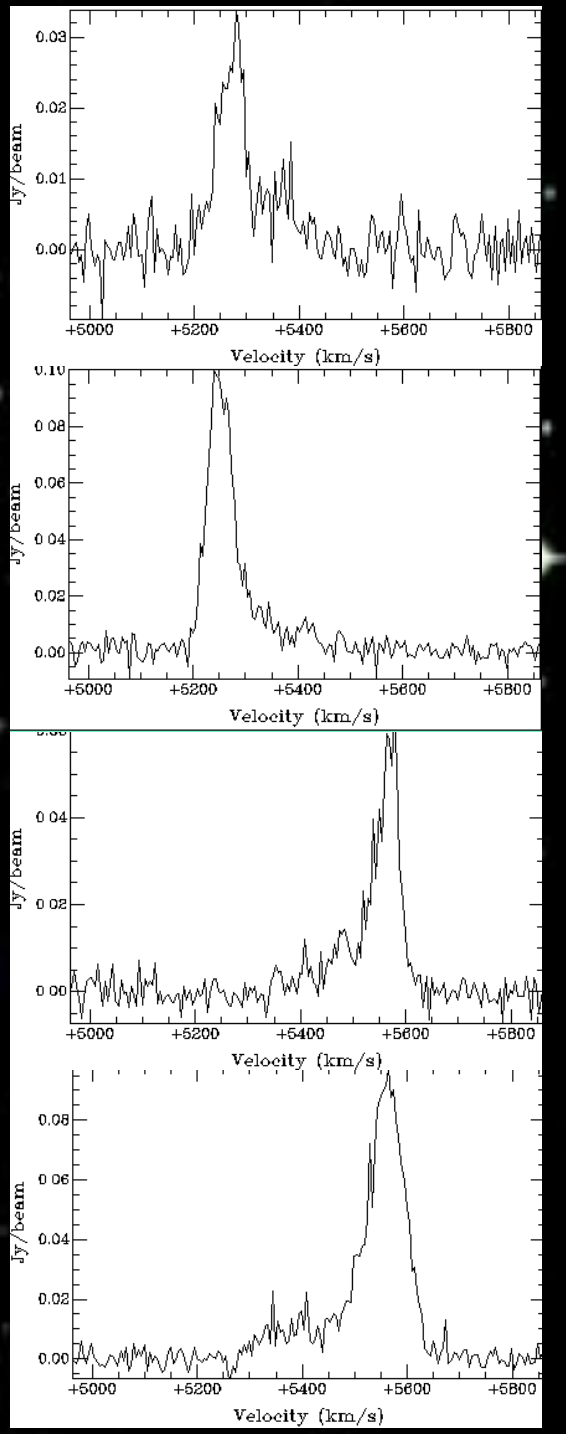


IRAS18293-3413 CO

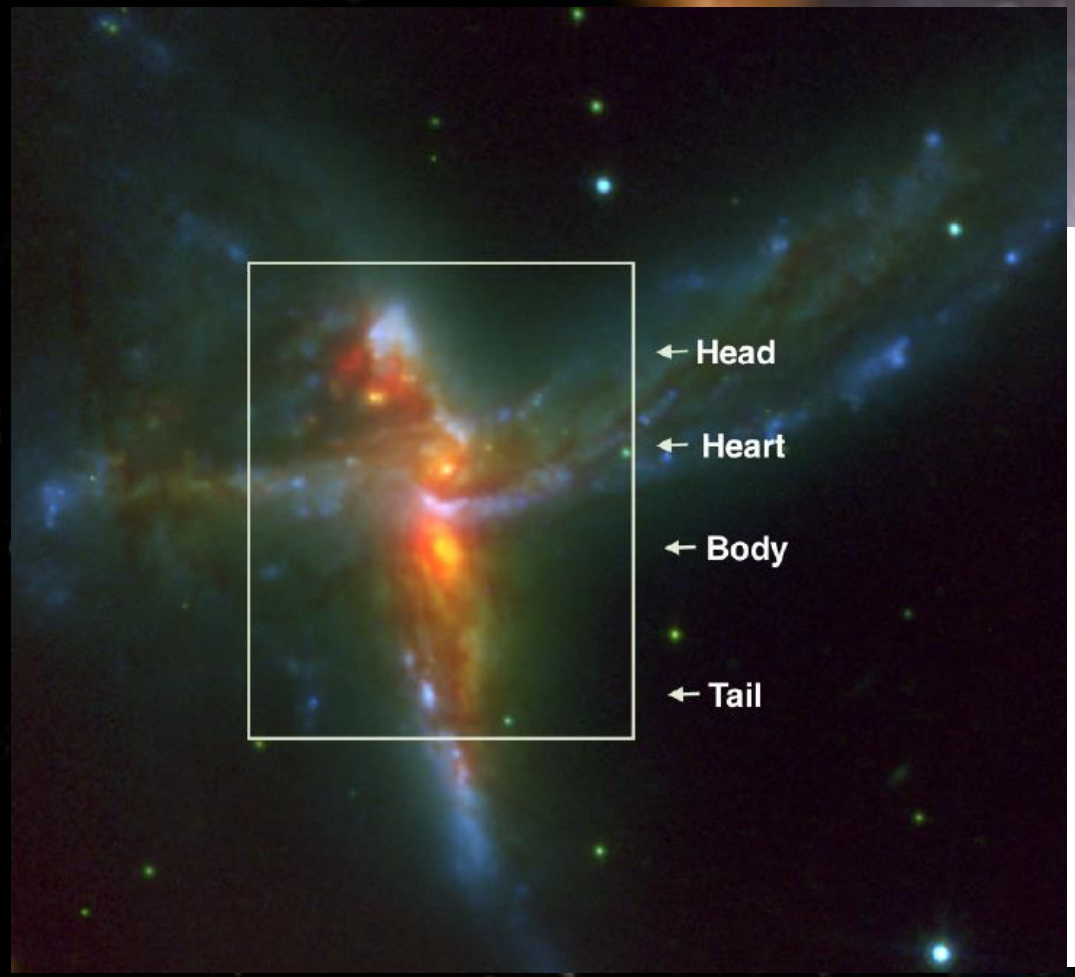
Minor Axis velocity excess



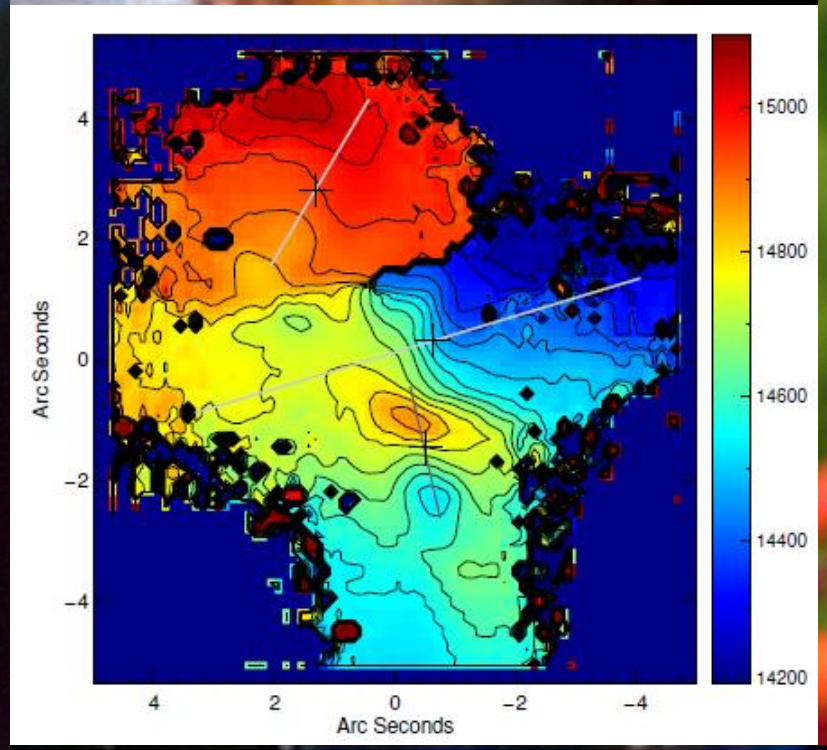




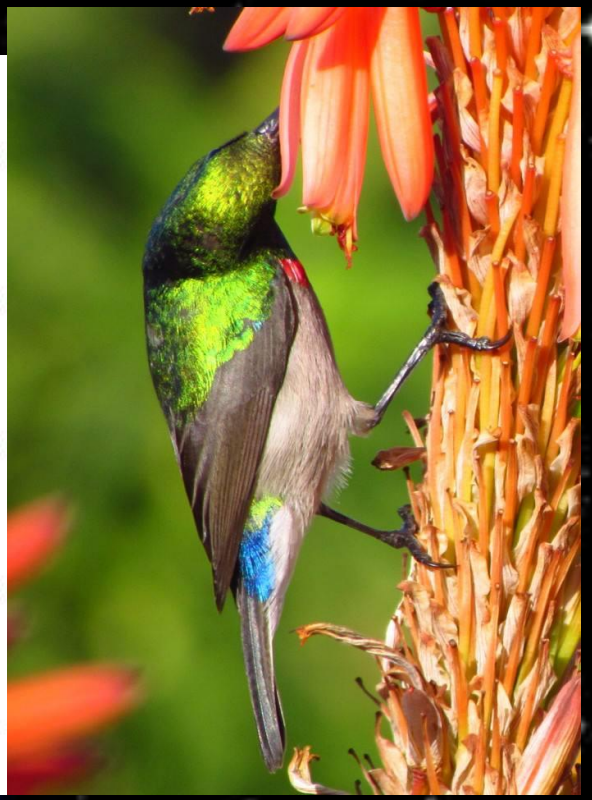
IRAS19115-2124 (aka The Bird)



- D=200 Mpc
- SFR ~ 190 M_{sol}/yr

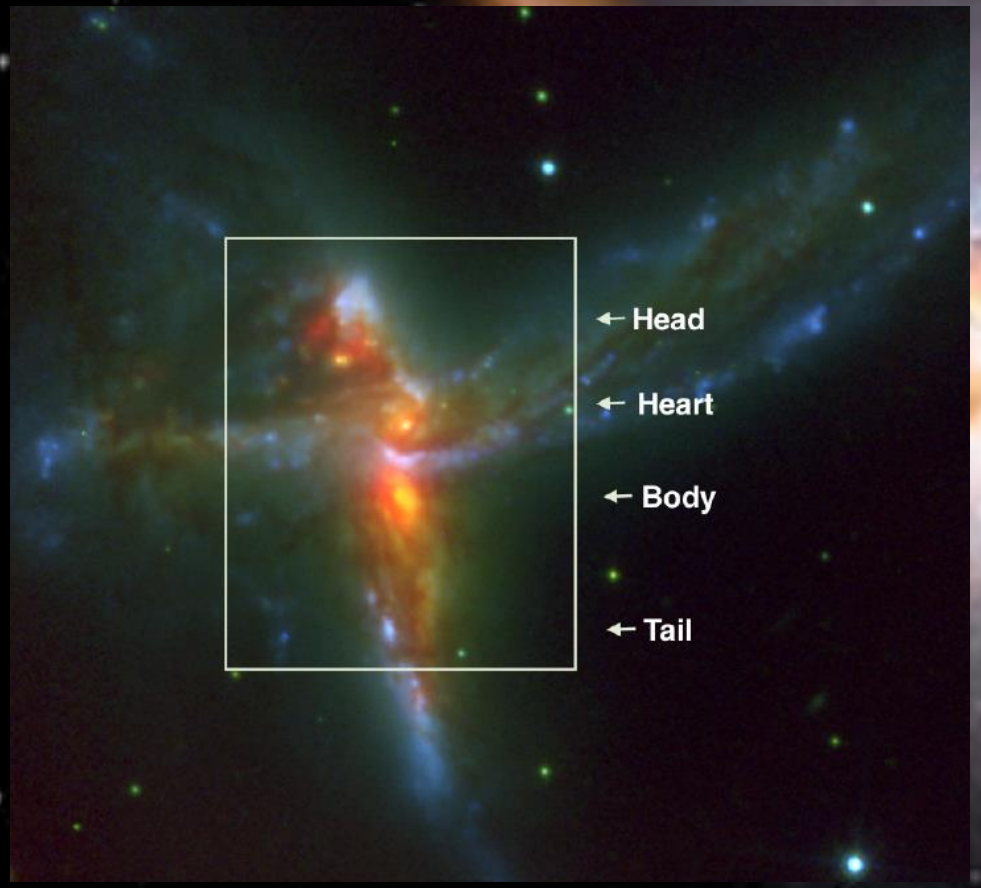


H2 1-0 (S1)

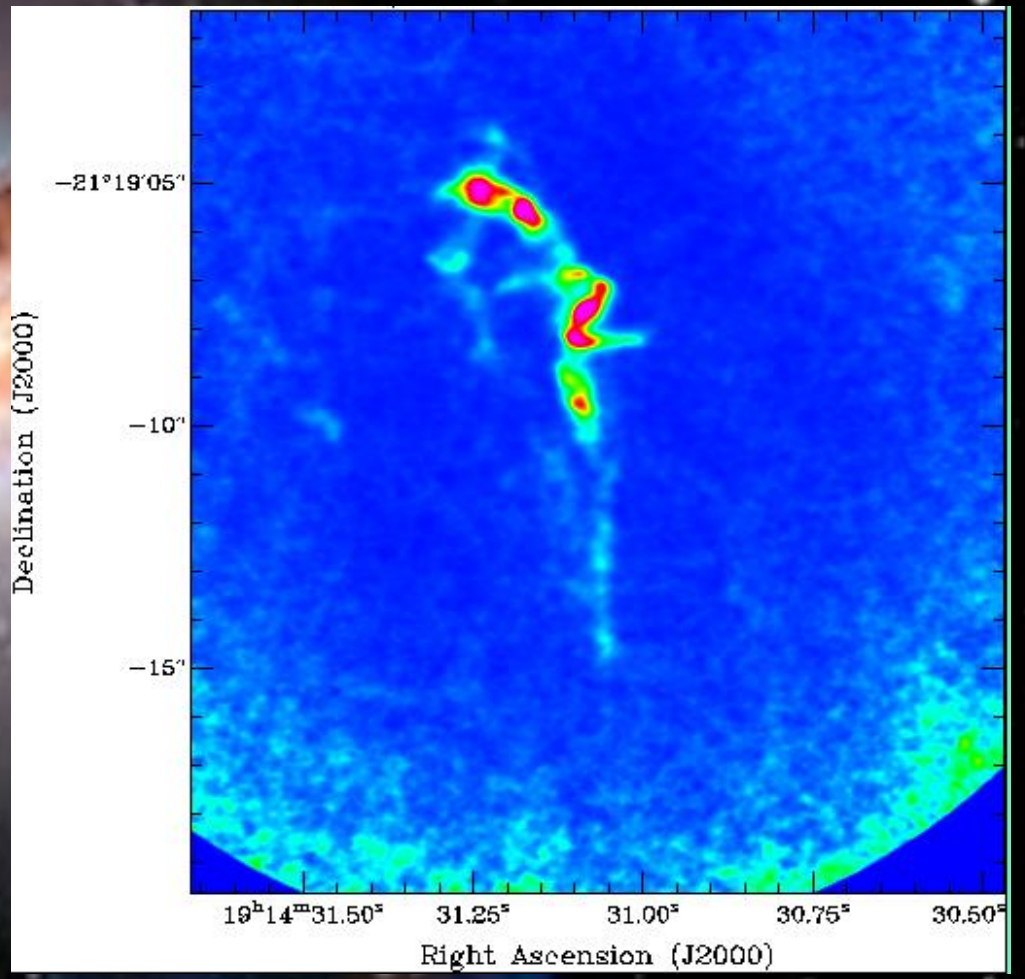


Vaisanen+ 2017

The Bird: CO (J=3-2)

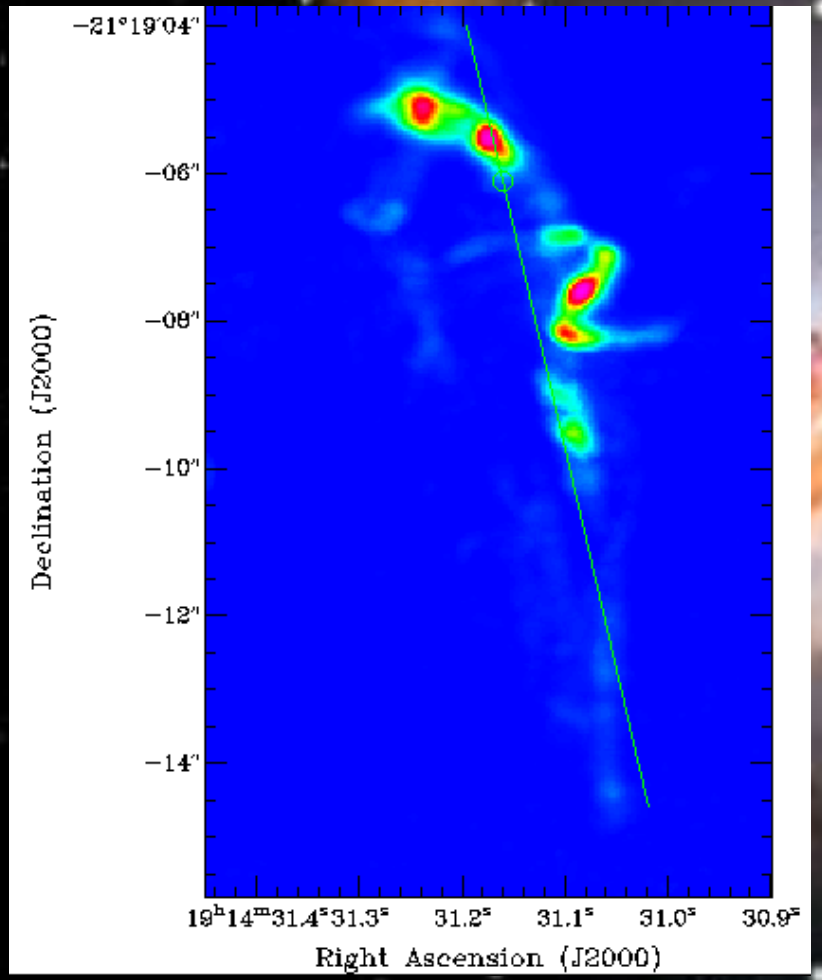


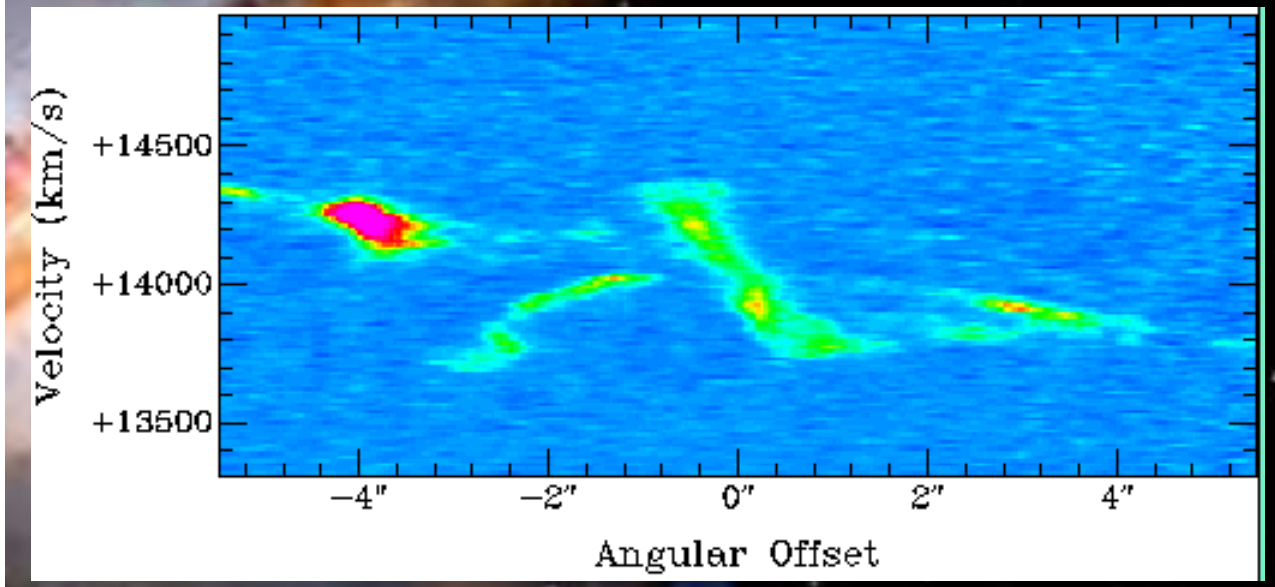
K-Band + HST I & B Bands



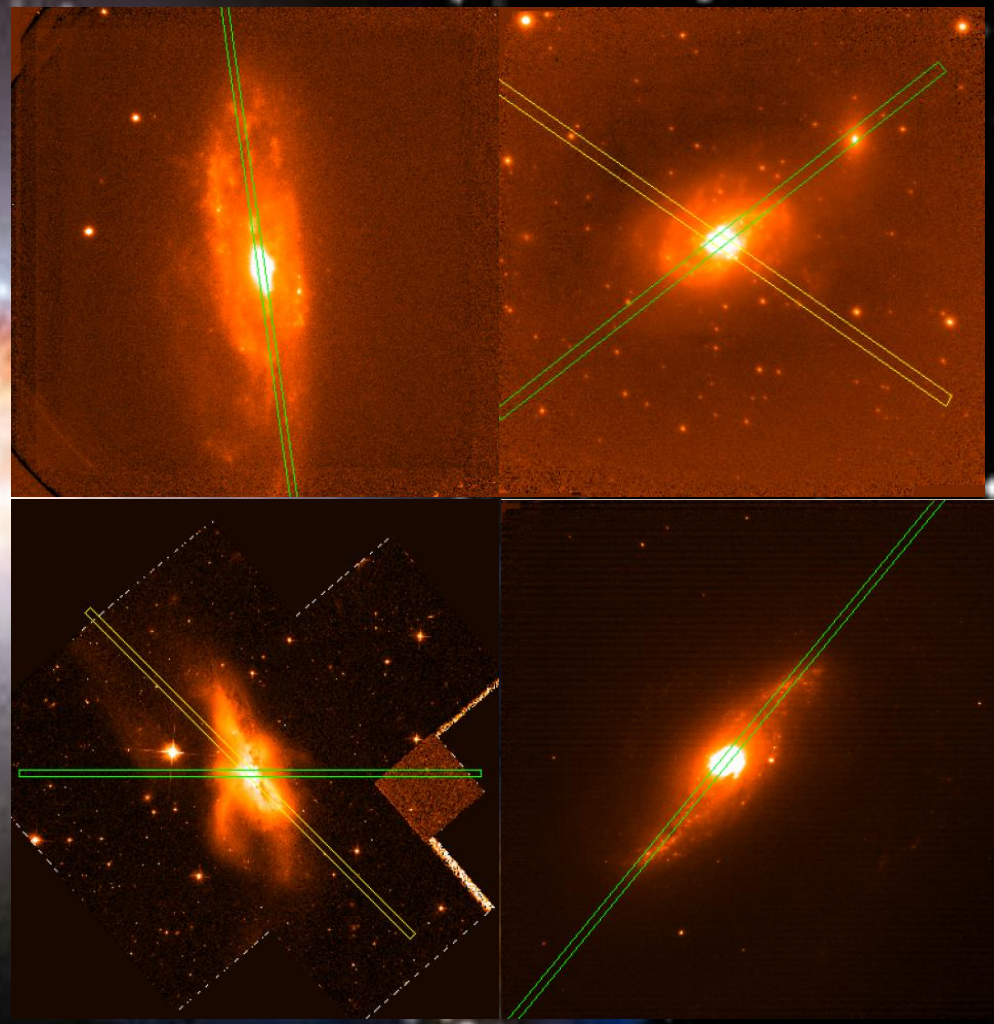
ALMA CO (J=3-2)

The Bird: CO (J=3-2)



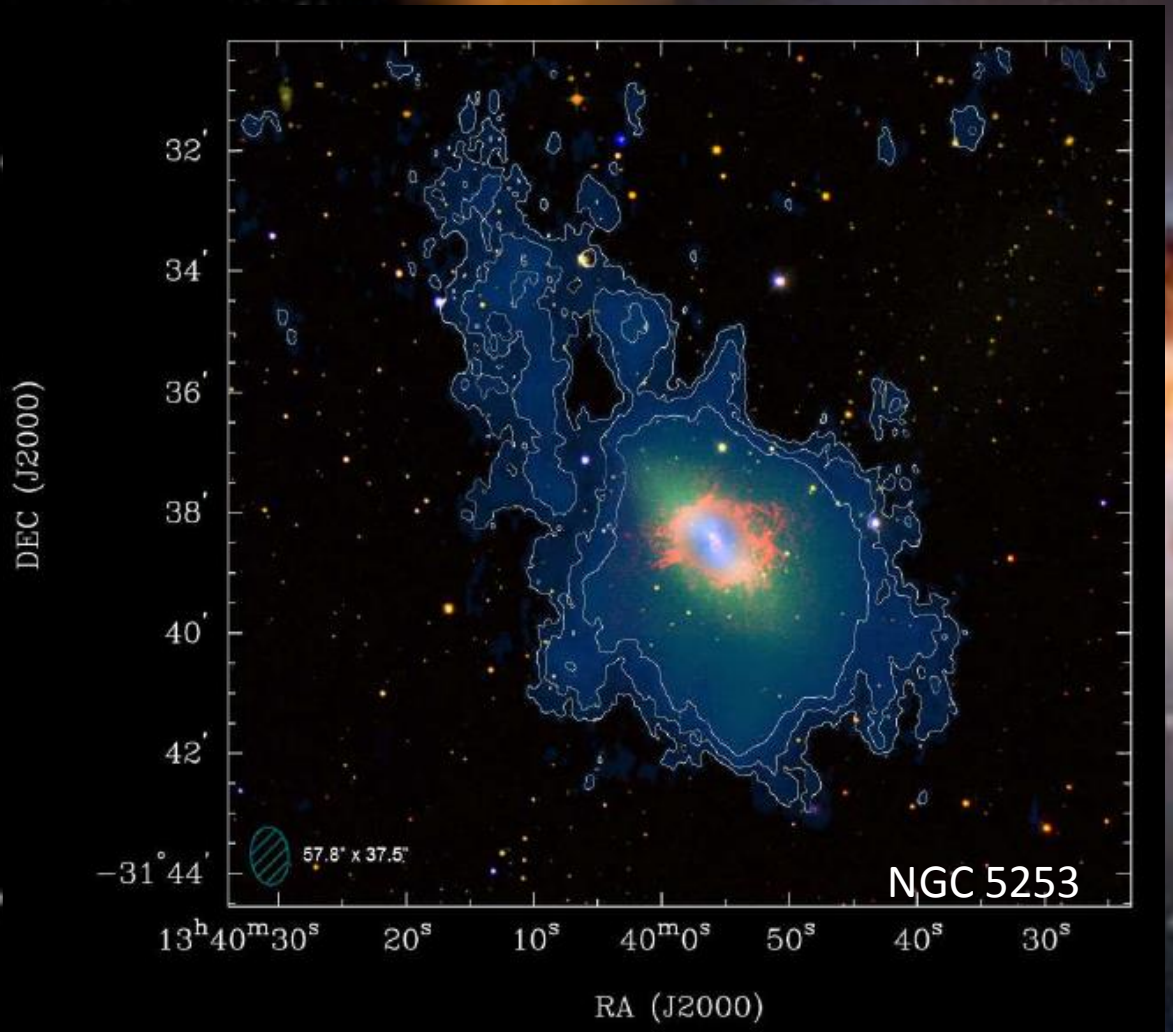


HI Future… environments



de Blok+ 2018

HI Future: Accretion versus Outflow

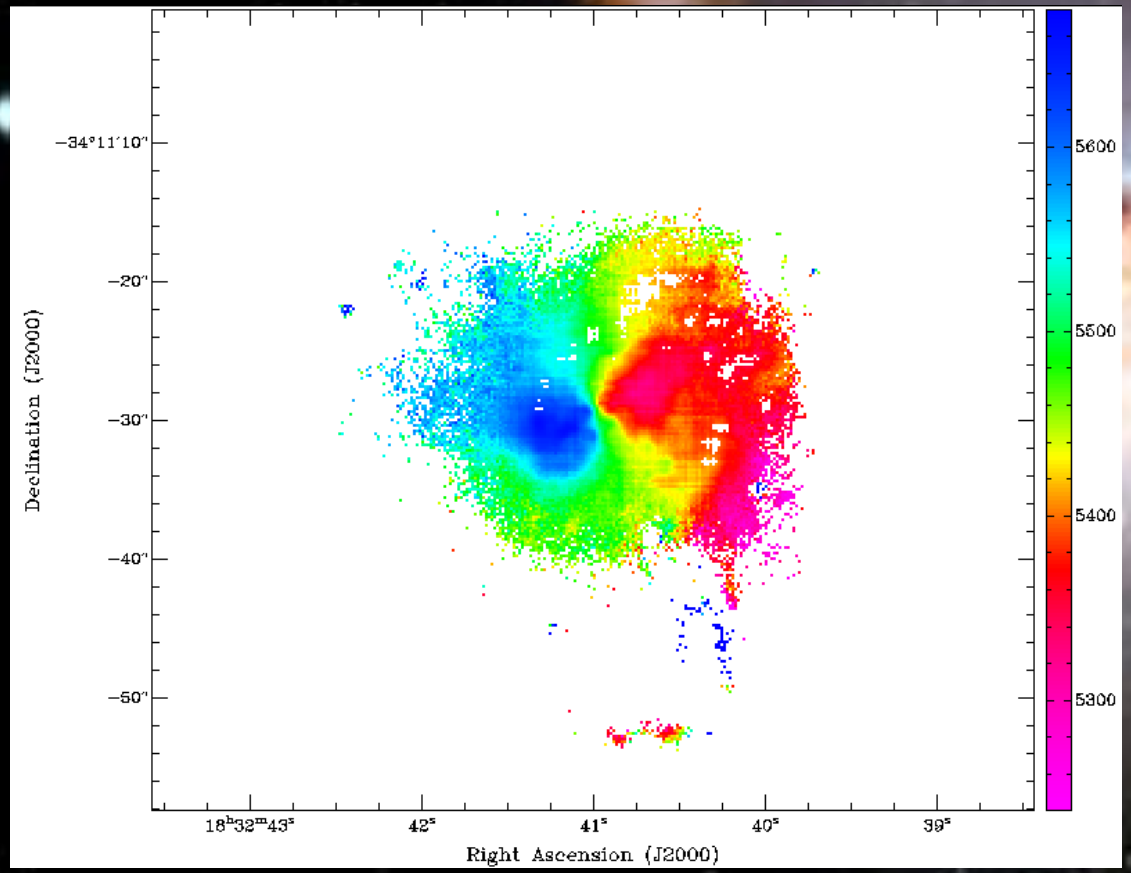


MeerKAT

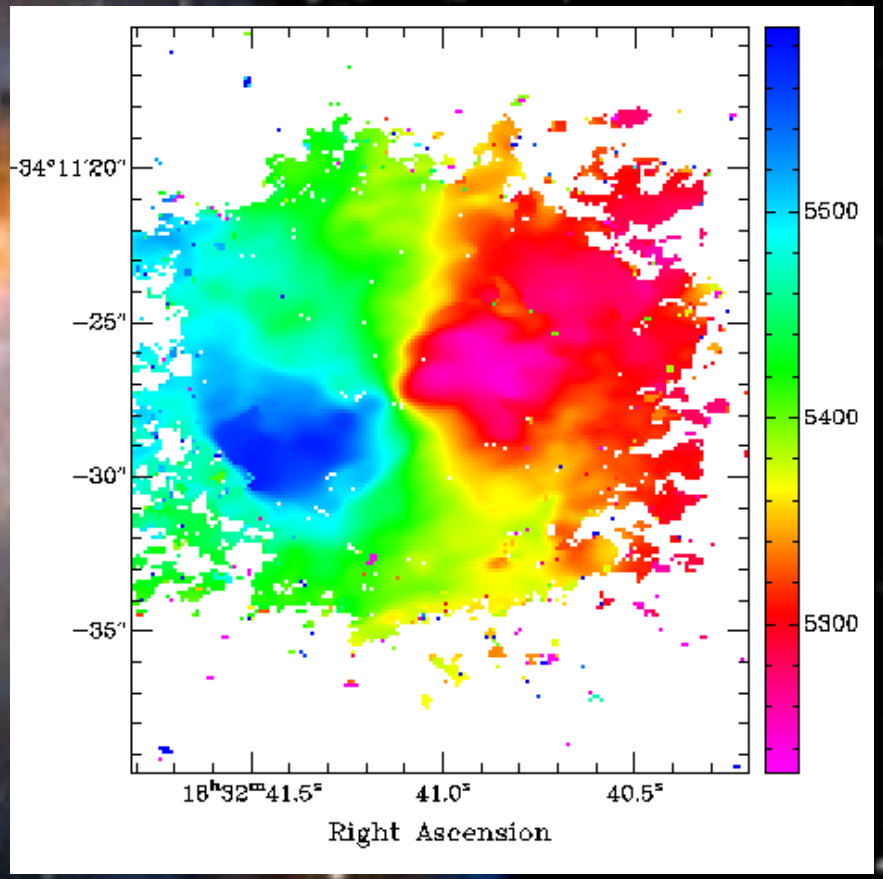
Lopez- Sanchez + 2011

IRAS18293-3413 MUSE + ALMA

MUSE Hα Velocity Field



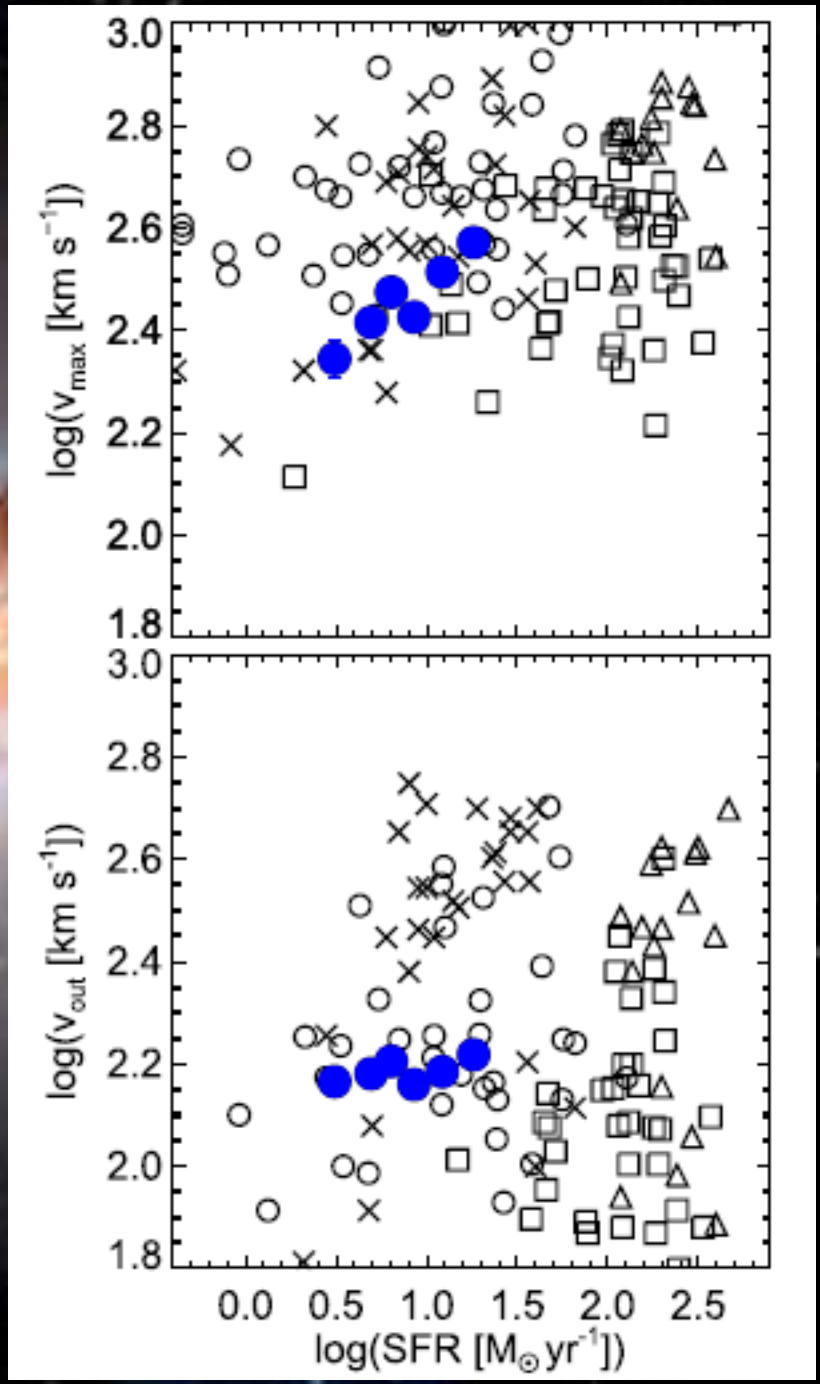
ALMA CO(J=1-0) Velocity Field



Outflow Measurements

- Maximum Outflow Velocity : Max velocity at 90% of flux
  - Correlation
- Bulk Outflow Velocity : Mean velocity of outflow component
  - No Correlation

Sugahara+ 2017



IRAS18293-3413