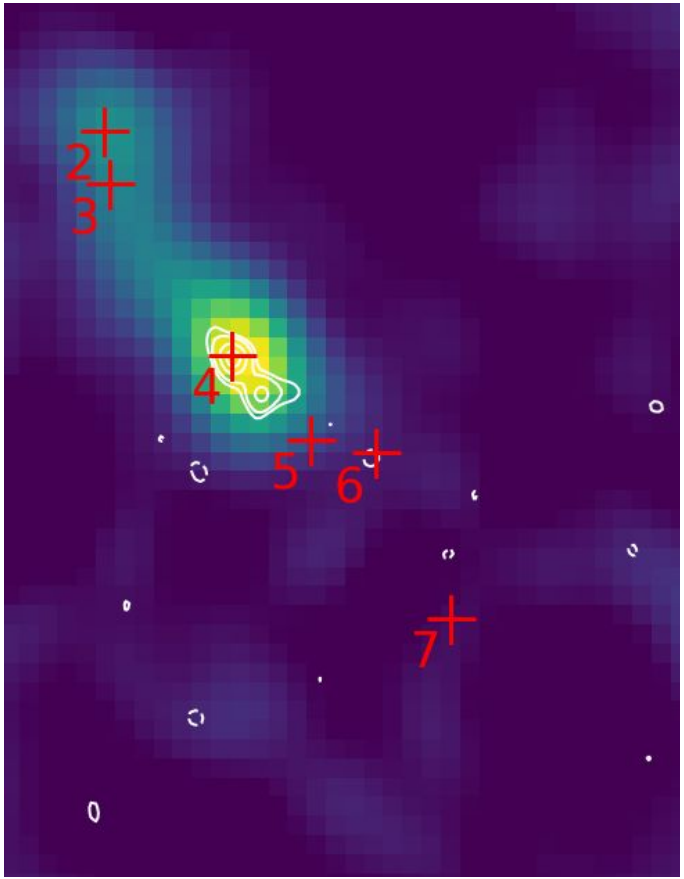
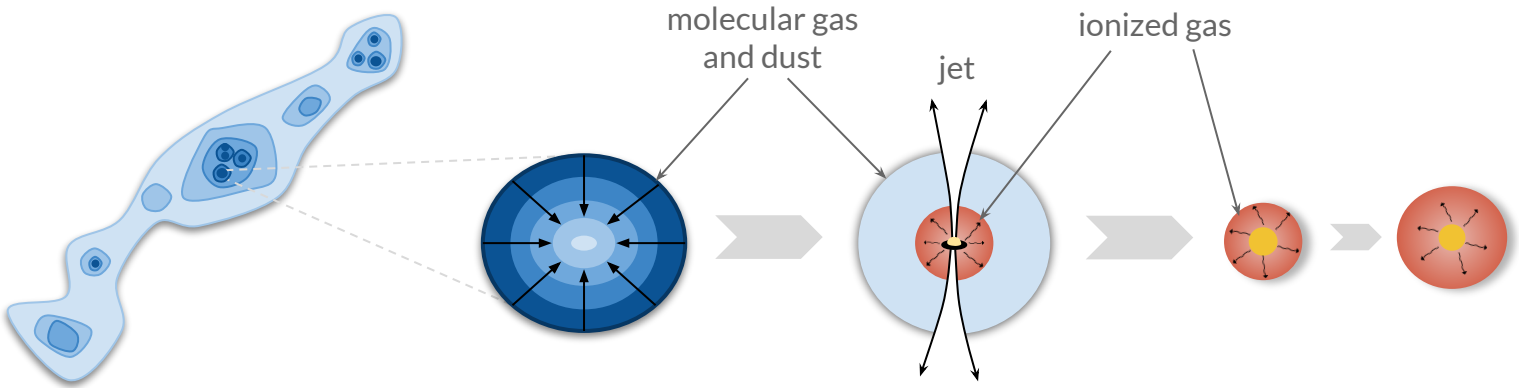


Water masers in the ionized jet IRAS 19035+0641 A

Tatiana M. Rodríguez, Emmanuel Momjian, Peter Hofner, Anuj P. Sarma, Esteban D. Araya, Viviana Rosero

38 New Mexico Symposium
Feb 17, 2023

Core accretion model for high-mass star ($M_\star > 8\ M_\odot$) formation



(Based on the original cartoon by Dr Cormac R. Purcell)

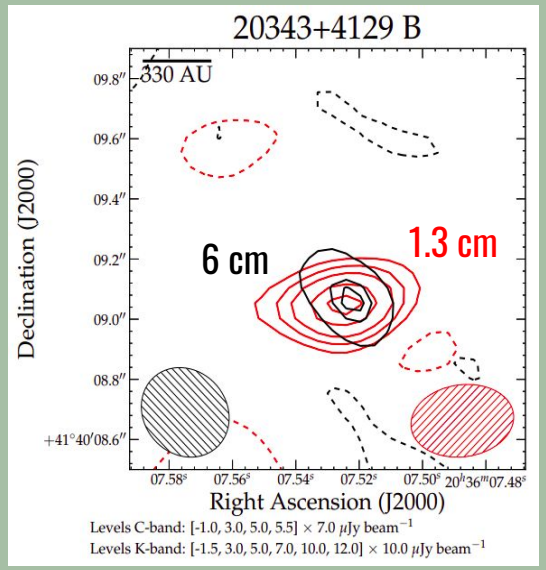
The nature and role of **ionized jets** and **magnetic fields** in high-mass star formation (HMSF) is not well understood

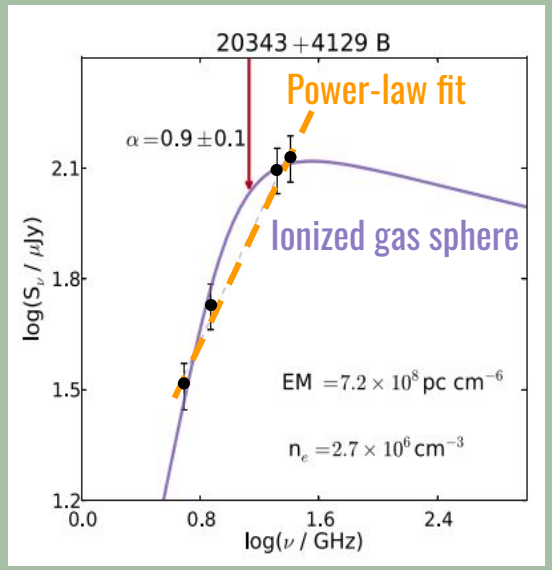
H_2O masers arise in shocked regions and are propense to Zeeman splitting

H_2O masers in jets are a great tool to study both jets and magnetic fields in HMSF

Ionized jets from high-mass protostars: Rosero et al. survey

Rosero et al. (2016, 2019) → more than 20 jet *candidates*





Rising spectral index but unresolved (~0.3")

Jet or H II region?

Their morphology might tell us!

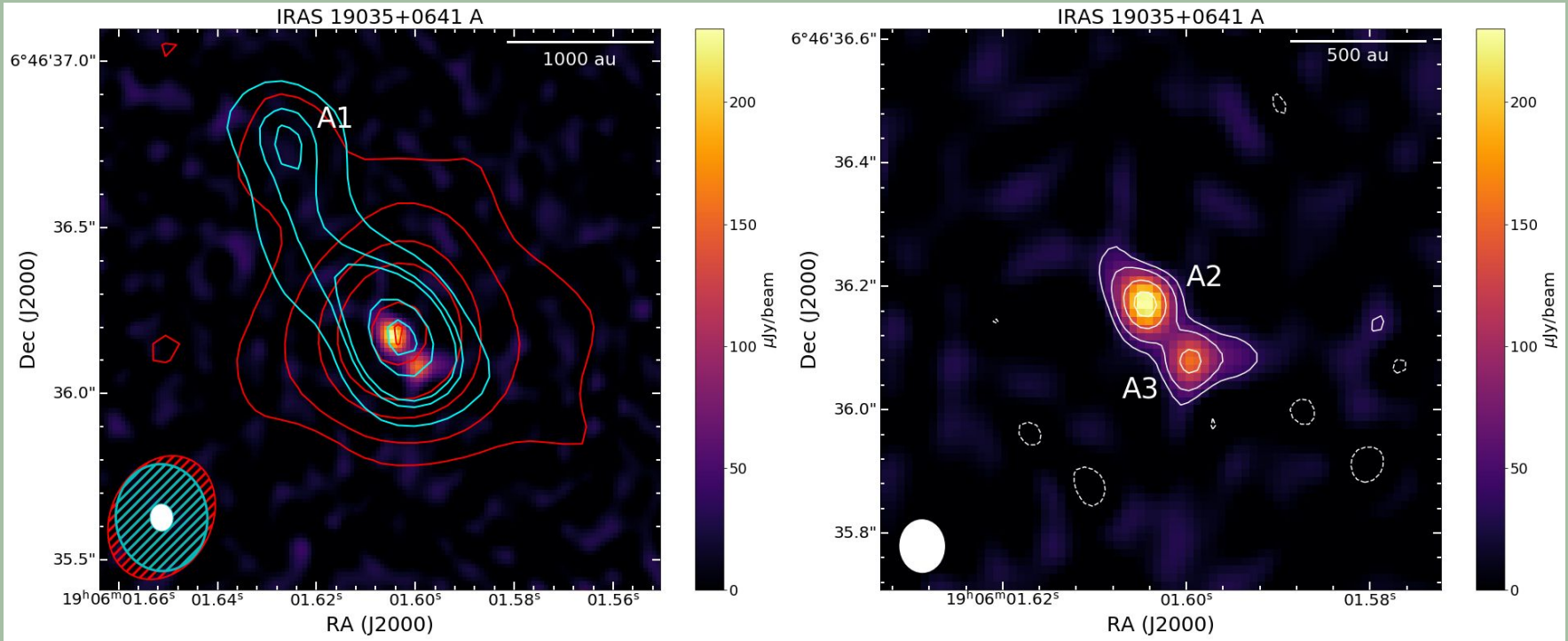
Ionized jets from high-mass protostars: a VLA quest for resolution

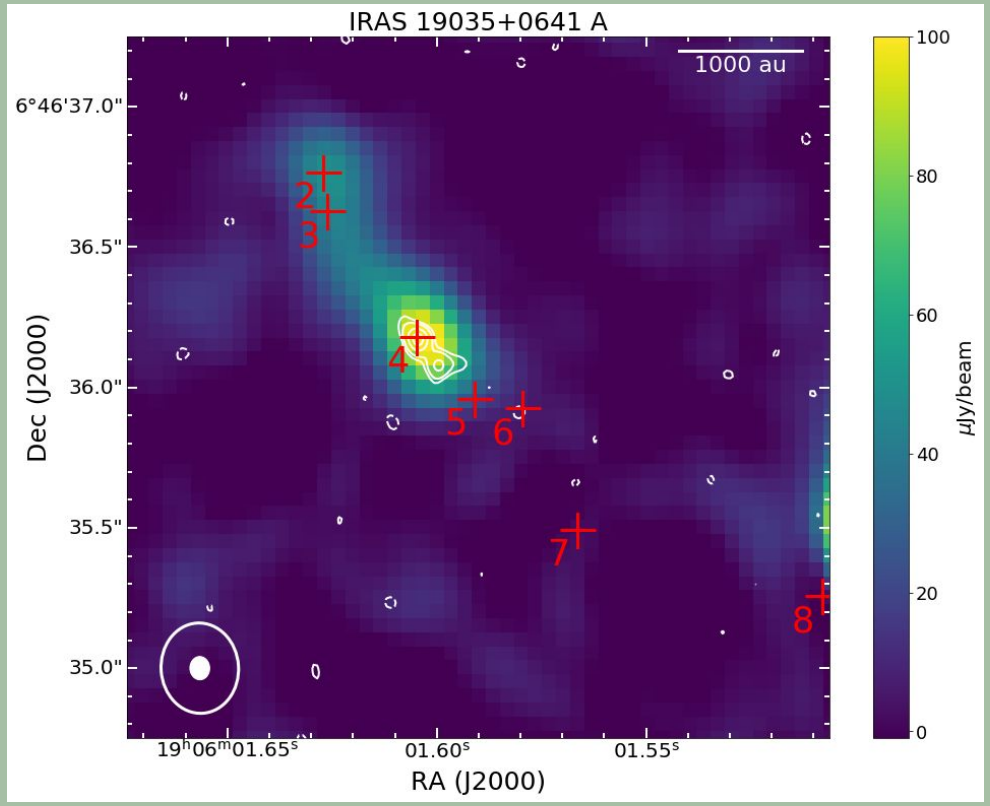
Observations:

- 3x resolution (~0.1'')
- K-band (18-25 GHz)
- 23 target regions
- Completed in semester 2022A

Case study before survey paper: IRAS 19035+0641 A

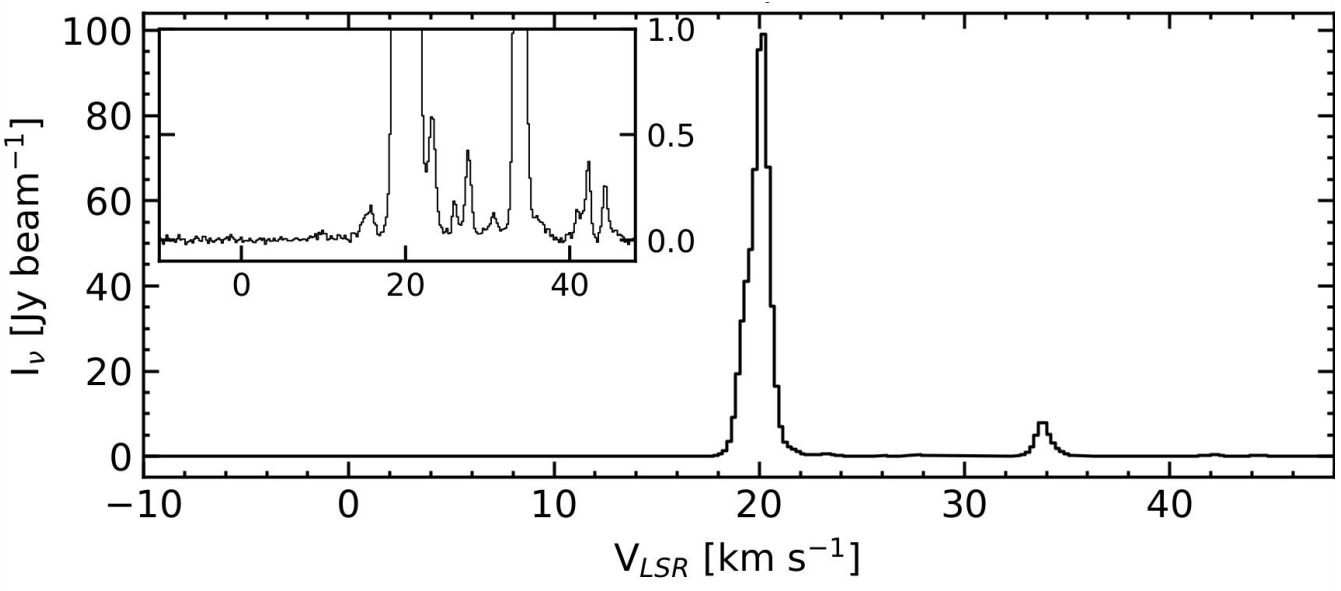
Case study: IRAS 19035+0641 A





22.2 GHz H_2O masers in IRAS 19035+0641 A

- Byproduct of the continuum observations
- Aligned with the jet

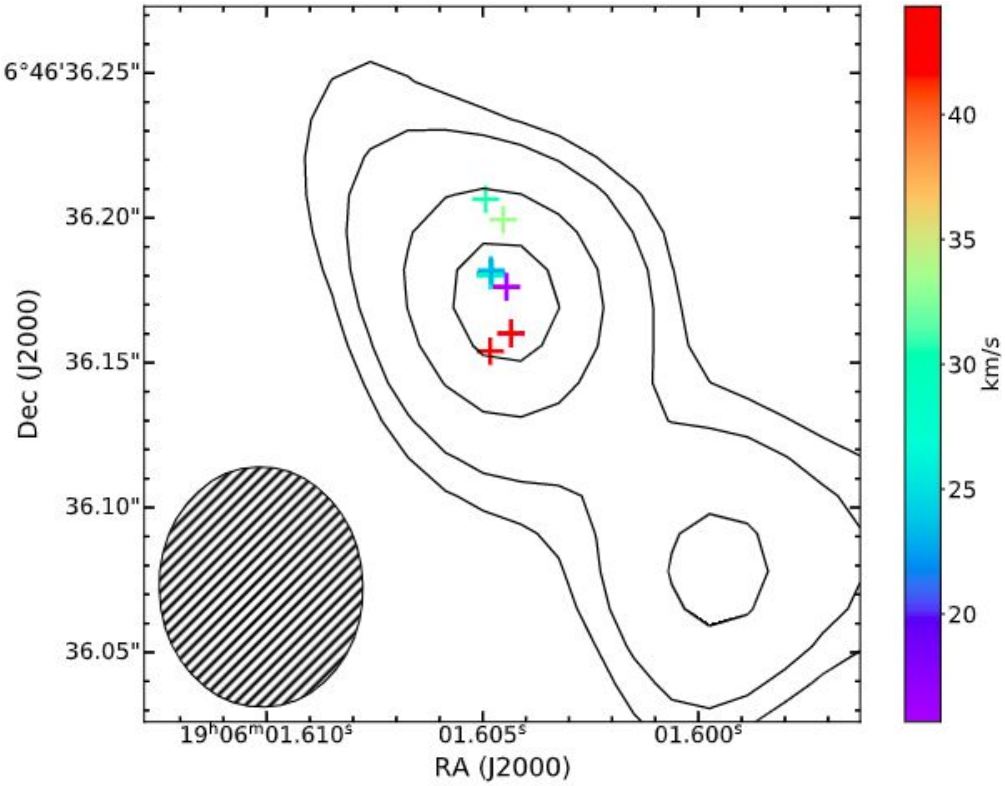


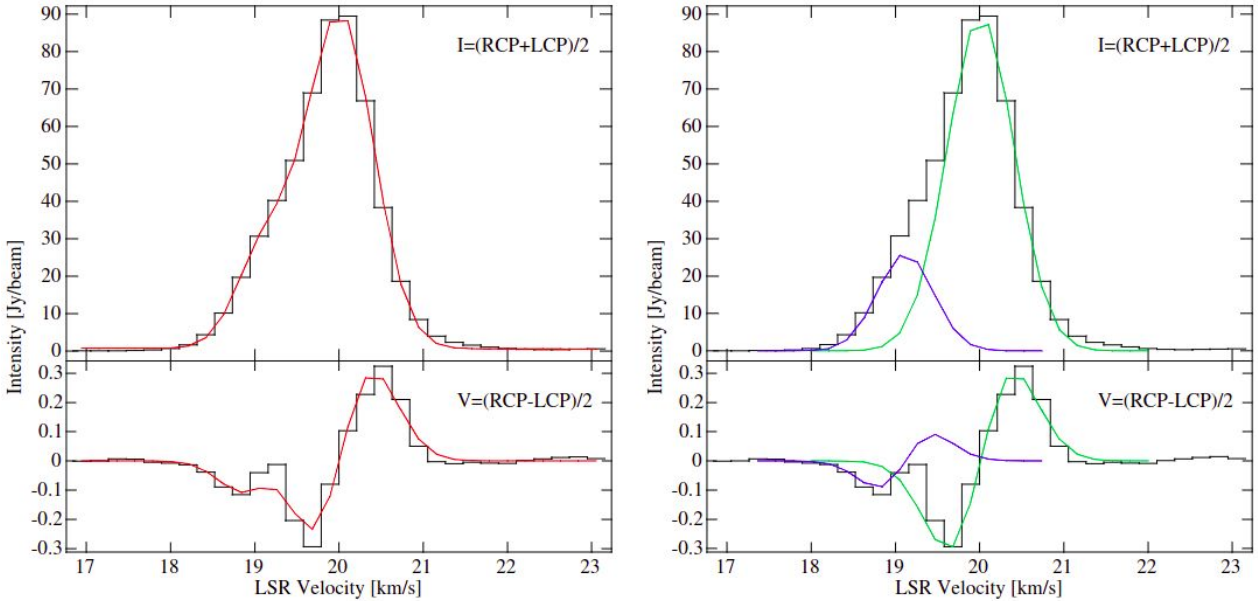
22.2 GHz H_2O maser #4 in IRAS 19035+0641 A

- ~ 100 Jy/beam peak
- Several smaller peaks
- ~35 km/s velocity range

22.2 GHz H_2O maser #4 in IRAS 19035+0641 A

Positions obtained from Gaussian fit to each peak, color-coded by velocity





Potential Zeeman splitting detection in maser #4

- 2 Gaussian components
- $V = zB_{LOS}\, dI/d\nu$
- B_{LOS}~ 156 and 135 mG

Thank you!

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