that's me!

The HI Structure of the Local Volume Dwarf Galaxy Pisces A

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Based on **Beale et al. 2019, submitted**

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Motivation

- What can **gas** tell us about the processes of **dwarf galaxy evolution**?
- What role does the **cosmic environment** play?

Data & Methods

- Resolved HI imaging ➟ kinematics and morphology of the neutral component!
- Varied imaging parameters to capture extended **and** compact emission
  - spatial resolution ~ 34" – 62"
  - spectral resolution ~ 1 – 4 km/s
  - RMS noise ~ 1.4 – 2.4 mJy/bm

Results

Component	v_{sys} (km/s)	M_{HI} (10^5 $M_\odot$)
Galaxy only	236	79
NE-lo	227	2.8
NE-md	243	6.4
NE-hi	277	4.3
NC (not shown)	220	1.1
SW (not shown)	214	3.1

Disturbed HI morphology indicates that Pisces A has moved from the Local Void to a higher-density filament.

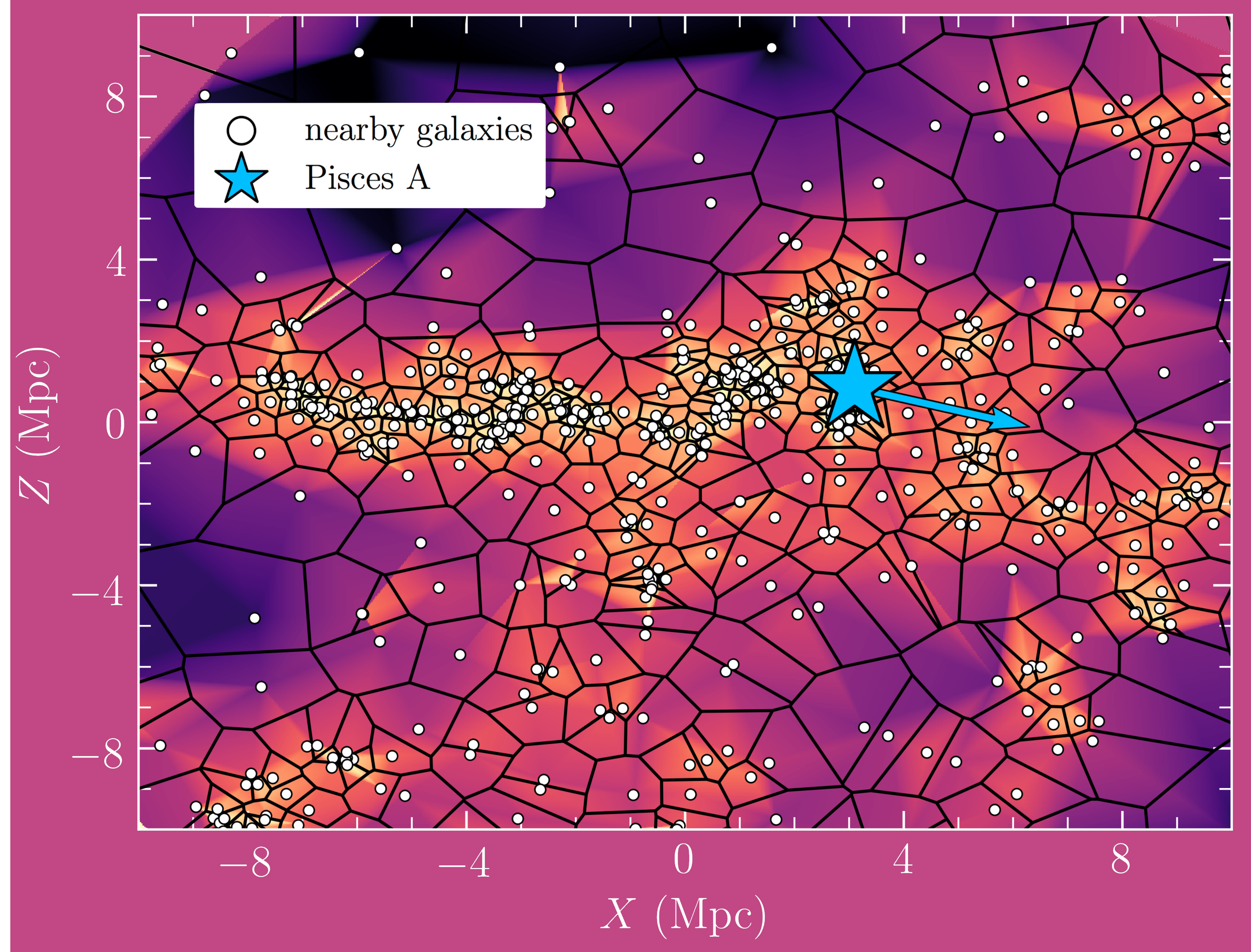

Fig. 1: Cosmic density field[1] around Pisces A (blue star). Voronoi cells are in black. The Z-axis points towards the Local Void. Blue arrow denotes the direction of the **northeast extension (NE)**.

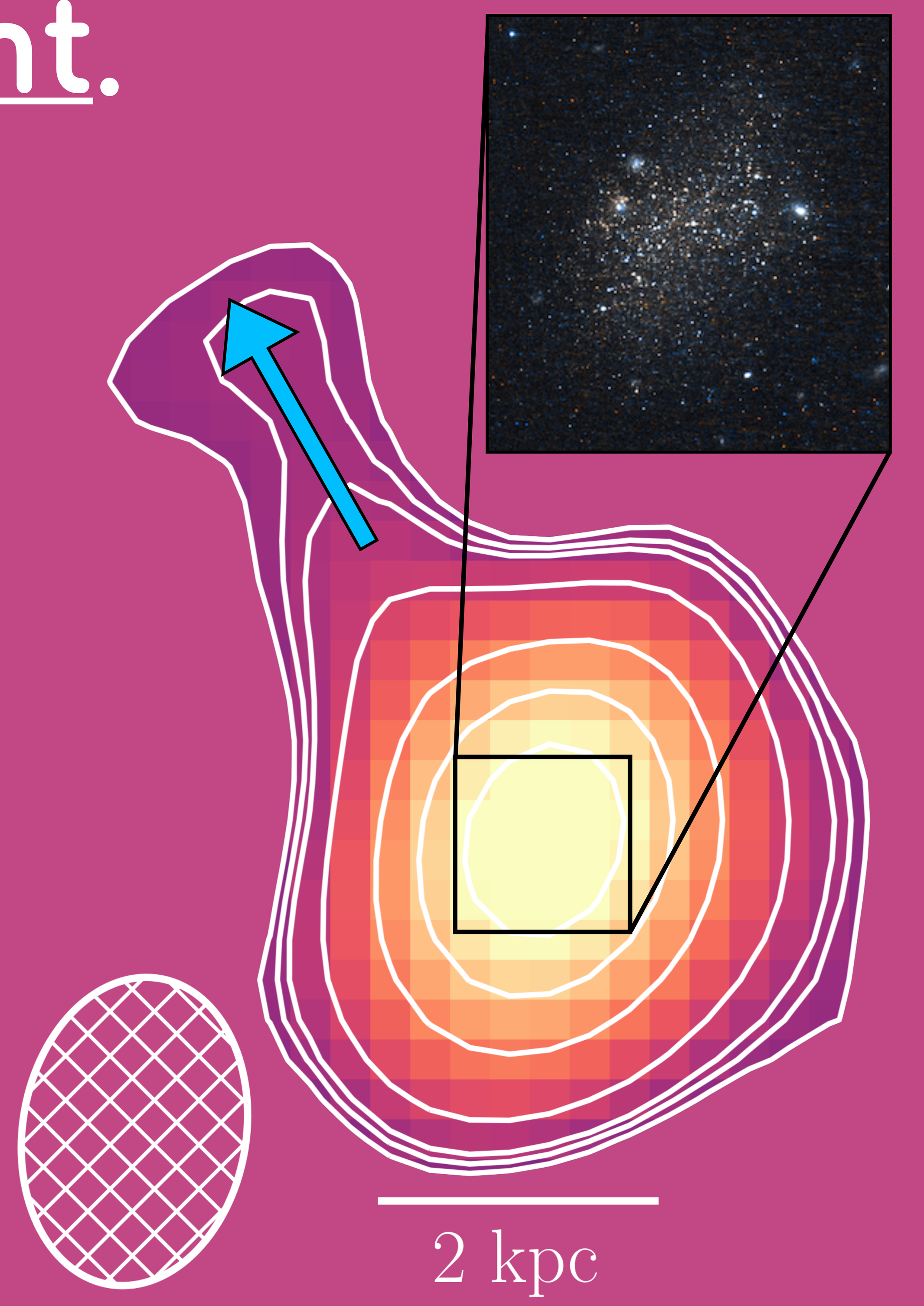

Fig. 2: Cutout of integrated intensity map. Lowest contour is 2σ. Blue arrow is as in Fig. 1. Hatched ellipse is the JVLA beam. **Inset:** Combined F606W/F814W imaging. Credit: E. J. Tollerud[2].

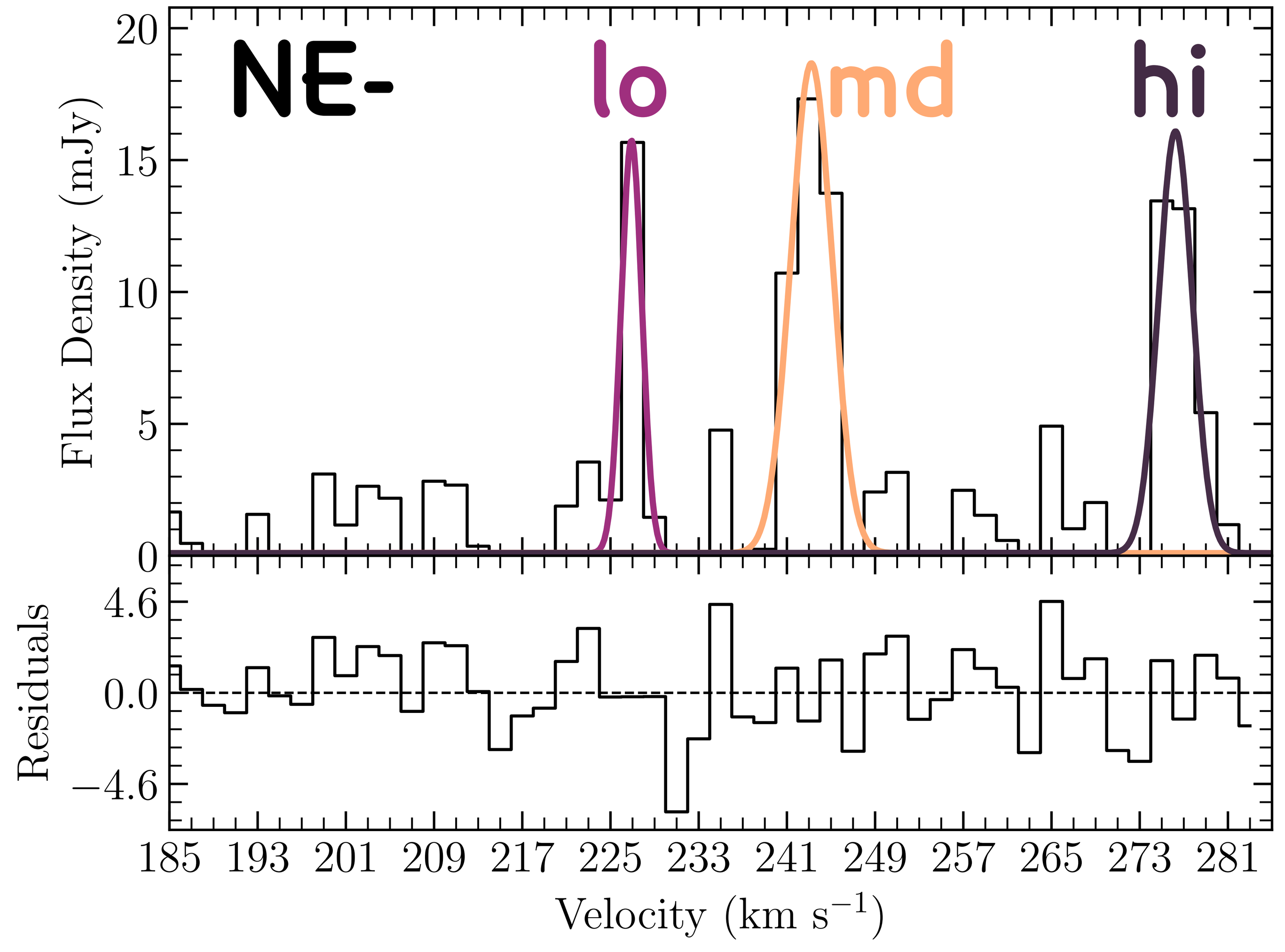

Fig. 3: Kinematic decomposition of the **northeast extension.** Colored lines are best fit Gaussians.

Origin of Disturbed Gas

- Most likely: environmental transition!
  - similar to **void galaxies**[3]
  - lies within **local filament**
  - NE **points along filament**

Conclusions

- Similar to other low-mass dwarfs ($M_{HI}/M_\star \sim 1$)
- Non-rotating gas is **>18%** of total M_{HI}!
- Most likely produced by **falling onto a filament**

Acknowledgements & References

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[1] Sousbie 2011, MNRAS, 414, 350
[2] Tollerud et al. 2016, ApJ, 676, 184
[3] Kreckel et al. 2012, AJ, 144, 16

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