

A Giant Molecular Halo around the $z=2$ Spiderweb proto-cluster

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“Spiderweb Galaxy”

(MRC 1138-262)

Carilli et al 1997

25 kpc

$z = 2.16$

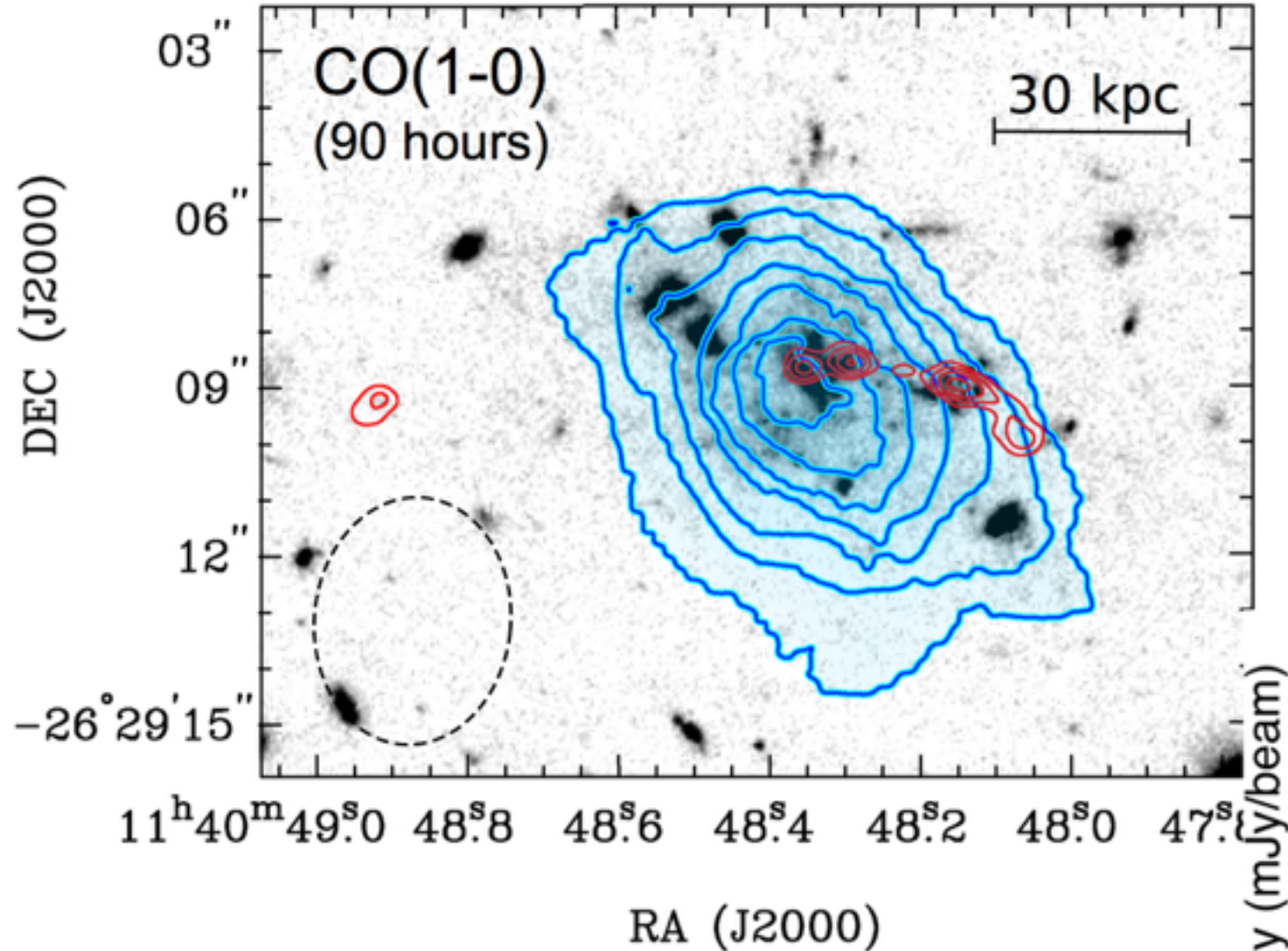
(23% of age Universe)

ACS $g_{475} + I_{814}$ + Radio VLA 8 GHz

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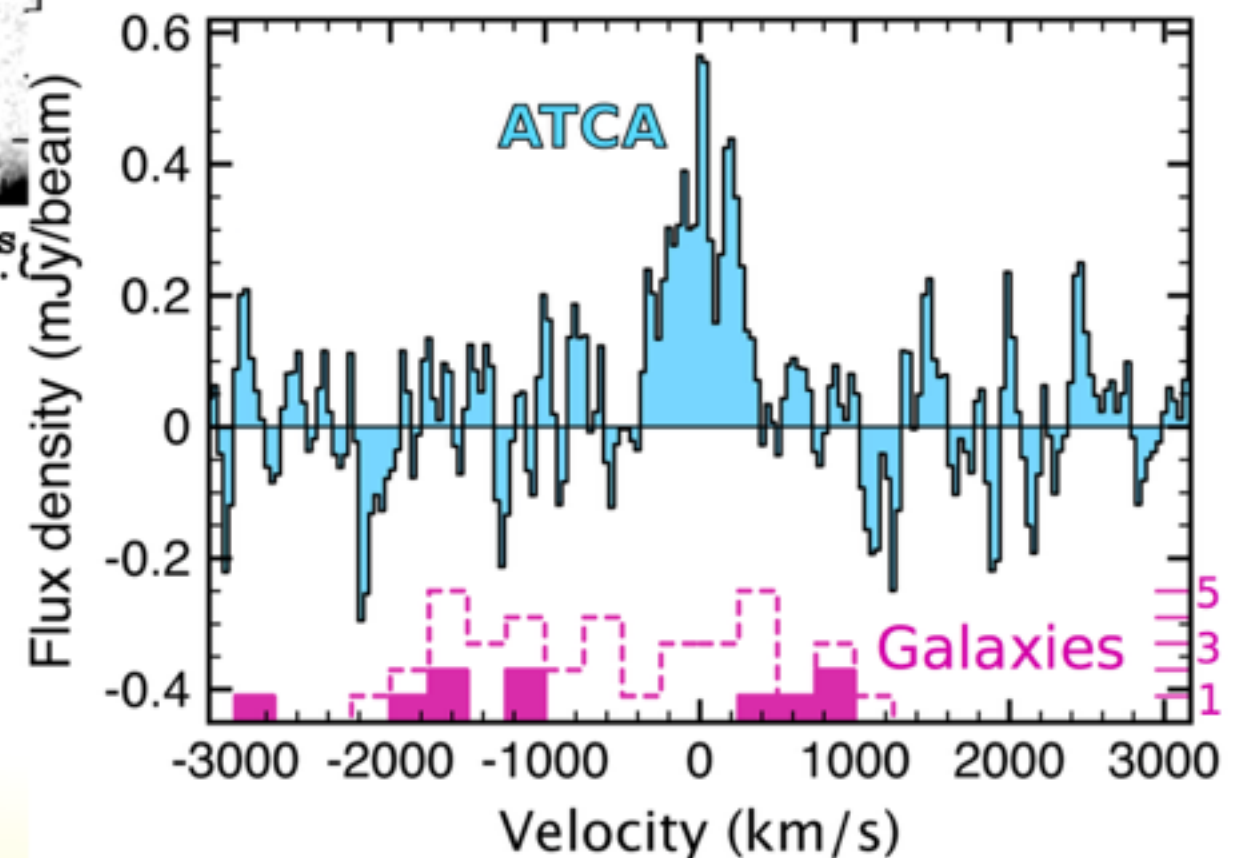
Radio 8GHz

ATCA



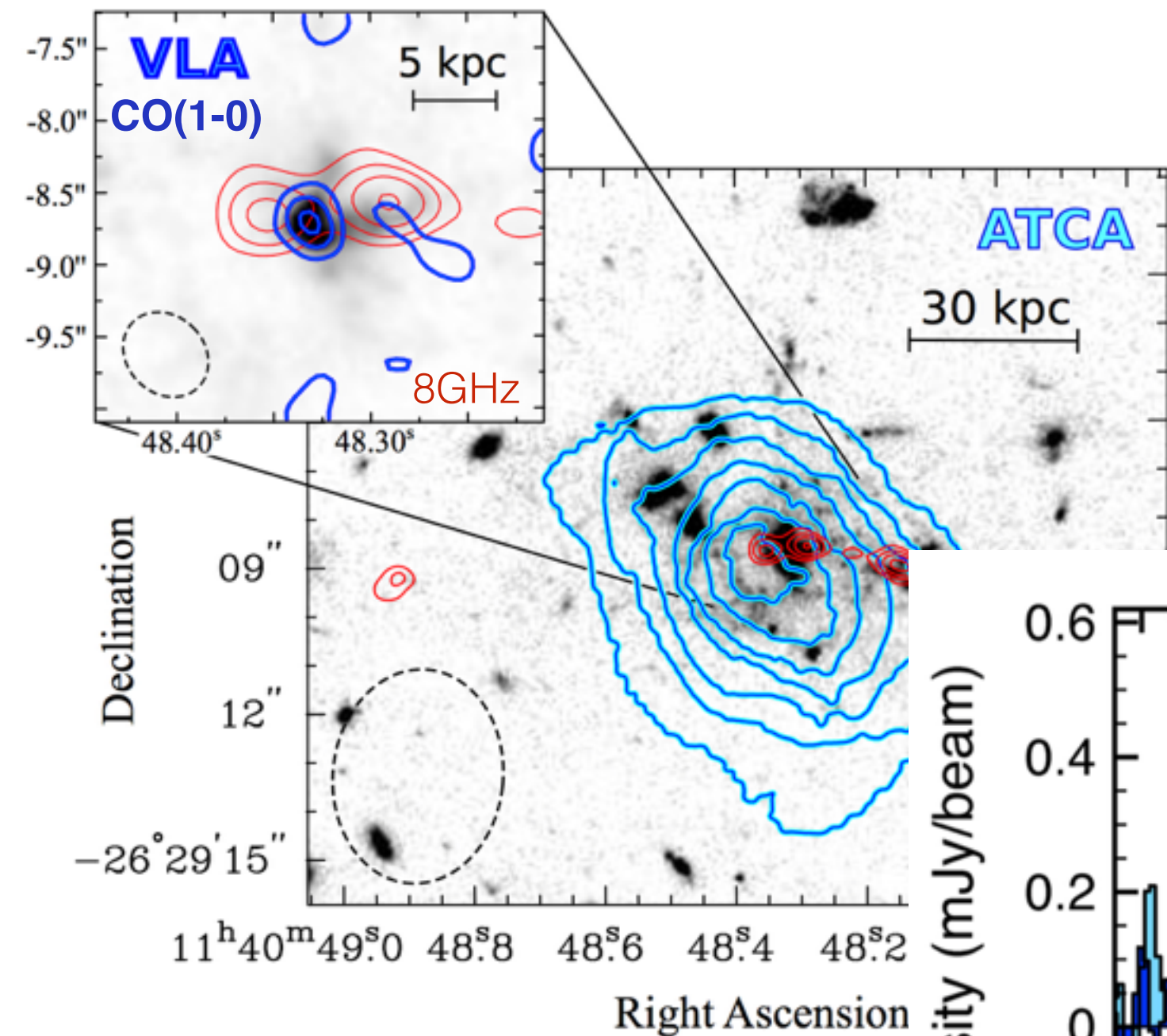
Spiderweb Galaxy

MRC1138-262 (z=2.2)



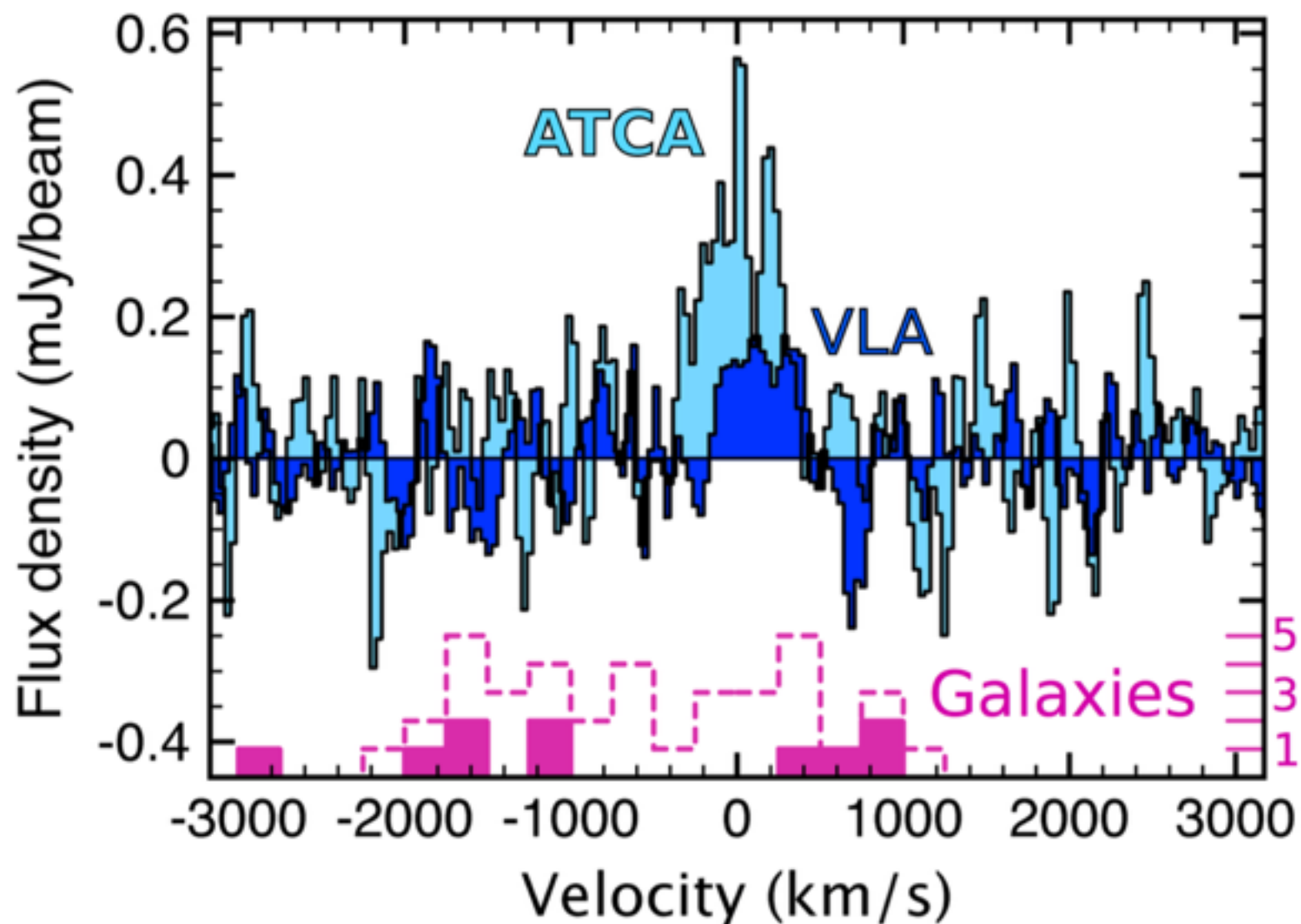
$$L'_{\text{CO}} = 5.6 \times 10^{10} \text{ K km/s pc}^2$$

VLA sees only 32% of ATCA flux!

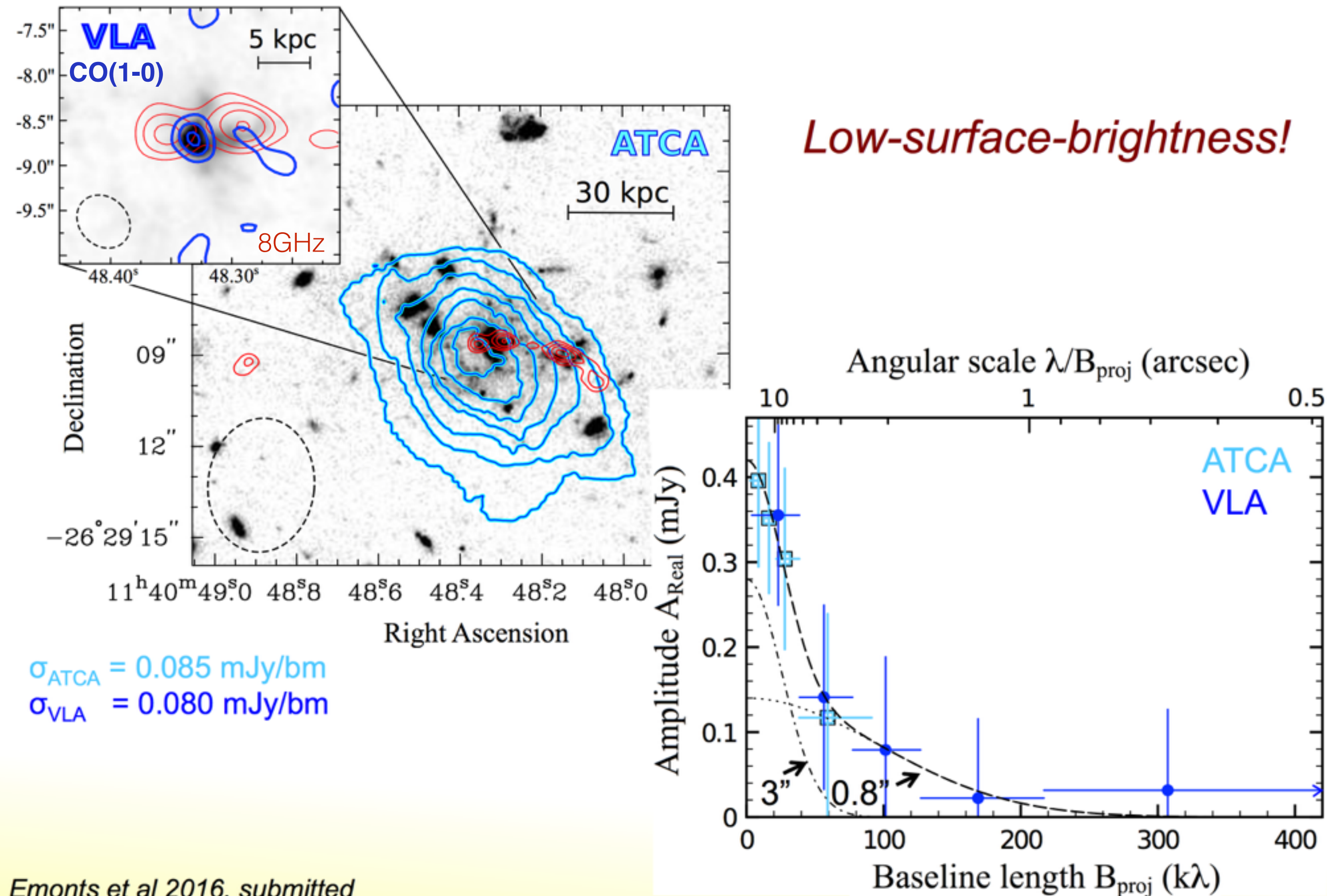


Low-surface-brightness!

$$\sigma_{\text{ATCA}} = 0.085 \text{ mJy/bm}$$
$$\sigma_{\text{VLA}} = 0.080 \text{ mJy/bm}$$

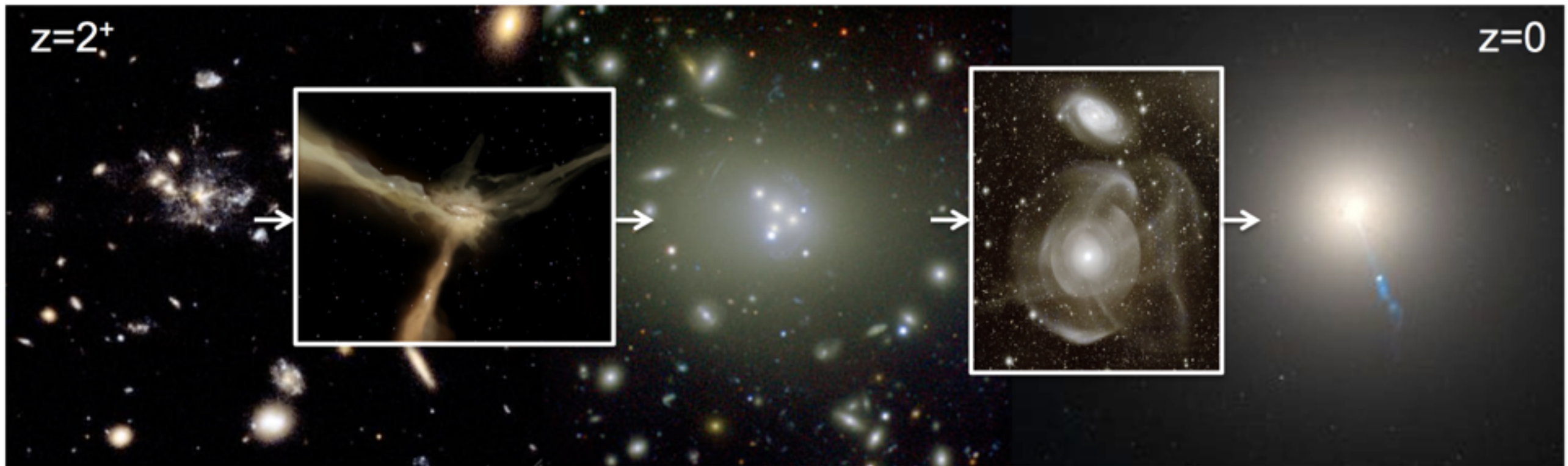


VLA sees only 32% of ATCA flux!



Science Question

Evolution: How do proto-cluster radio galaxies evolve into giant central cluster ellipticals?



Early phase:
Cold gas accretion

Late phase:
Galaxy mergers