A wide-angle tail galaxy at z = 0.53 in the COSMOS field

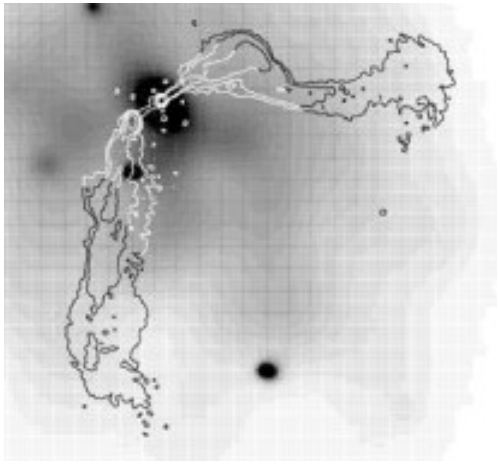
Antonija Oklopčić[1]

V. Smolčić[2,3,4], S. Giodini[5], G. Zamorani[6], L. Birzan[7], E. Schinnerer[8], C.L. Carilli[9], A. Finoguenov[5], S. Lilly[10], A. Koekemoer[11], N.Z. Scoville[2]

[1] University of Zagreb, [2]California Institute of Technology, [3]Argelander Institute for Astronomy, [4]ESO ALMA COFUND Fellow, [5]Max Planck Institut für Extraterrestrische Physik, [6]INAF – Osservatorio Astronomico di Bologna, [7]Leiden Observatory, [8]Max Planck Institut für Astronomie, [9]National Radio Astronomy Observatory, [10]ETH – Zürich, [11]Space Telescope Science Institute

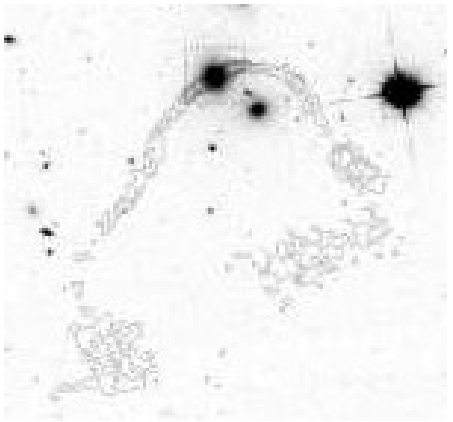
Wide-angle tail (WAT) galaxies

- Galaxies with radio jets bent in a wide “C” shape
- Dense environments (galaxy clusters or groups)
- Very massive galaxies (Burns 1981; Owen & Rudnick 1976)



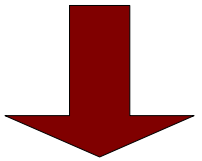
Hardcastle et al. 2005

Hardcastle & Sakelliou 2004



Smolčić et al. 2007

- “C” shape morphology as a result of ram pressure
- Large relative velocities between WATs and the ICM



Galaxy cluster/group merger
(Pinkney et al. 1994; Loken et al. 1995)

Other indicators of merger connected to WATs:

- X-ray substructure (Burns et al. 1994; Gomez et al. 1997)
- elongation of the X-ray emission along the line that bisects the WAT (Gomez et al. 1997)
- significant offset of the WAT from the X-ray centroid (Sakelliou & Merrifield 2000)

CWAT-02

- WAT galaxy at z = 0.53
- Located in the COSMOS survey 2□° field

- one – sided jet
- Giodini et al. 2010

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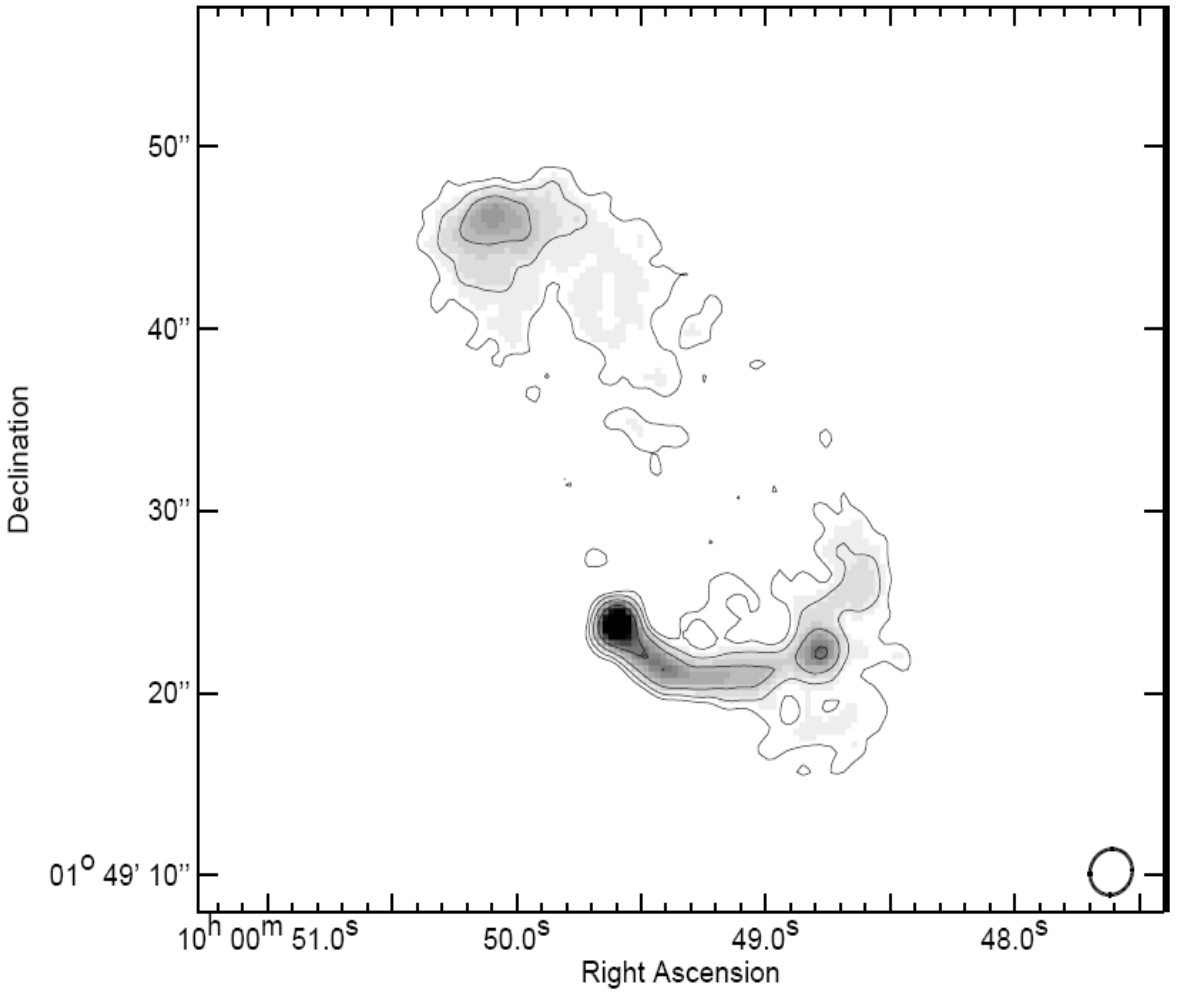
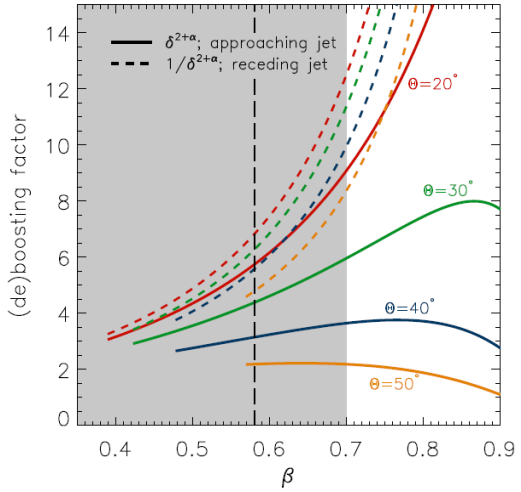
missing baryon problem



- Oklopčić et al. 2010, ApJ, 713, 484

CWAT-02's radio jets

- Highly asymmetric jets due to Doppler beaming
- Estimating the (de)boosting factor

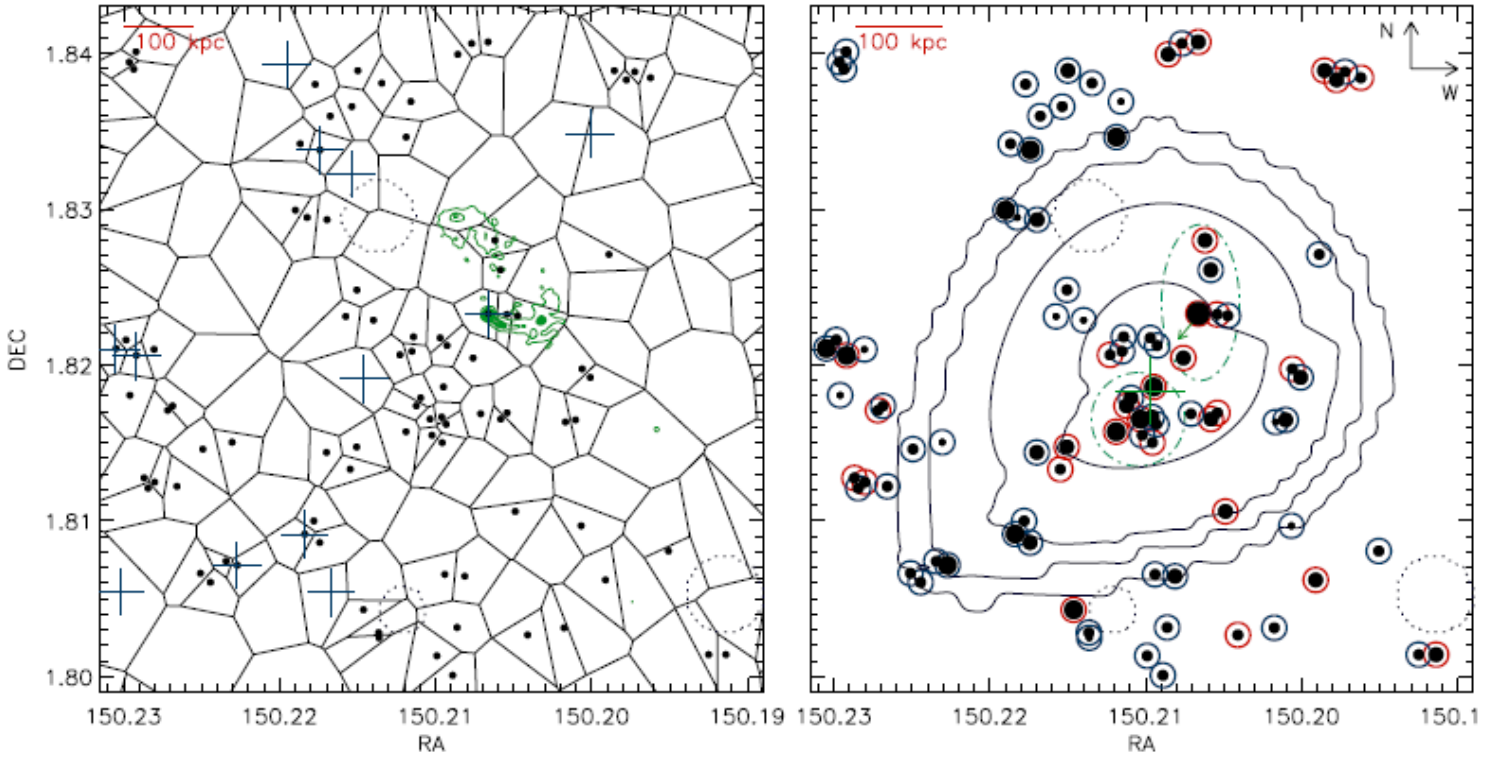


Total observed jet flux is by a factor of ≤ 5 higher than the intrinsic jet flux.

- From the geometry and the bulk speed of the jet we estimate the relative velocity between CWAT-02 and the ICM

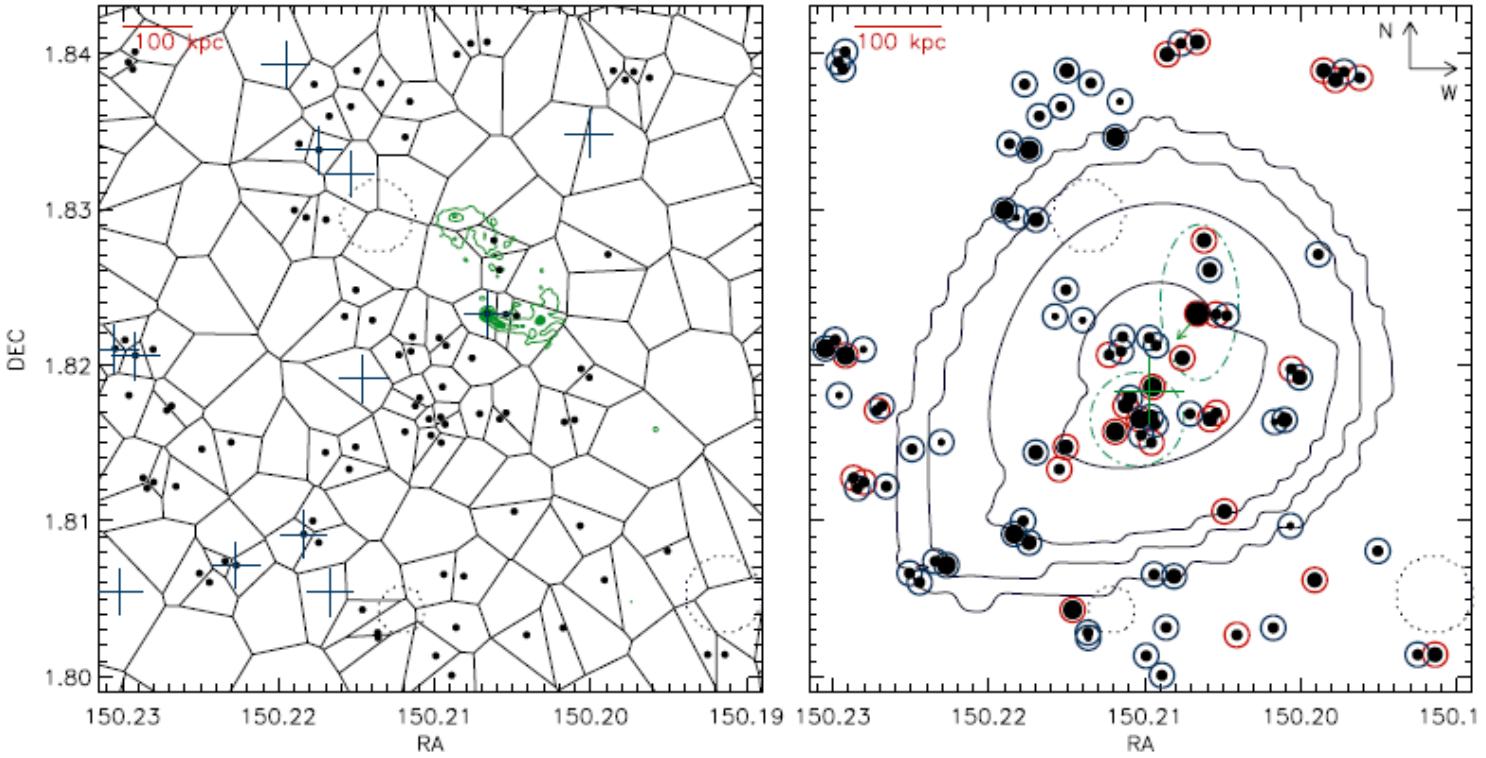
~ 900 km/s

CWAT-02's host group



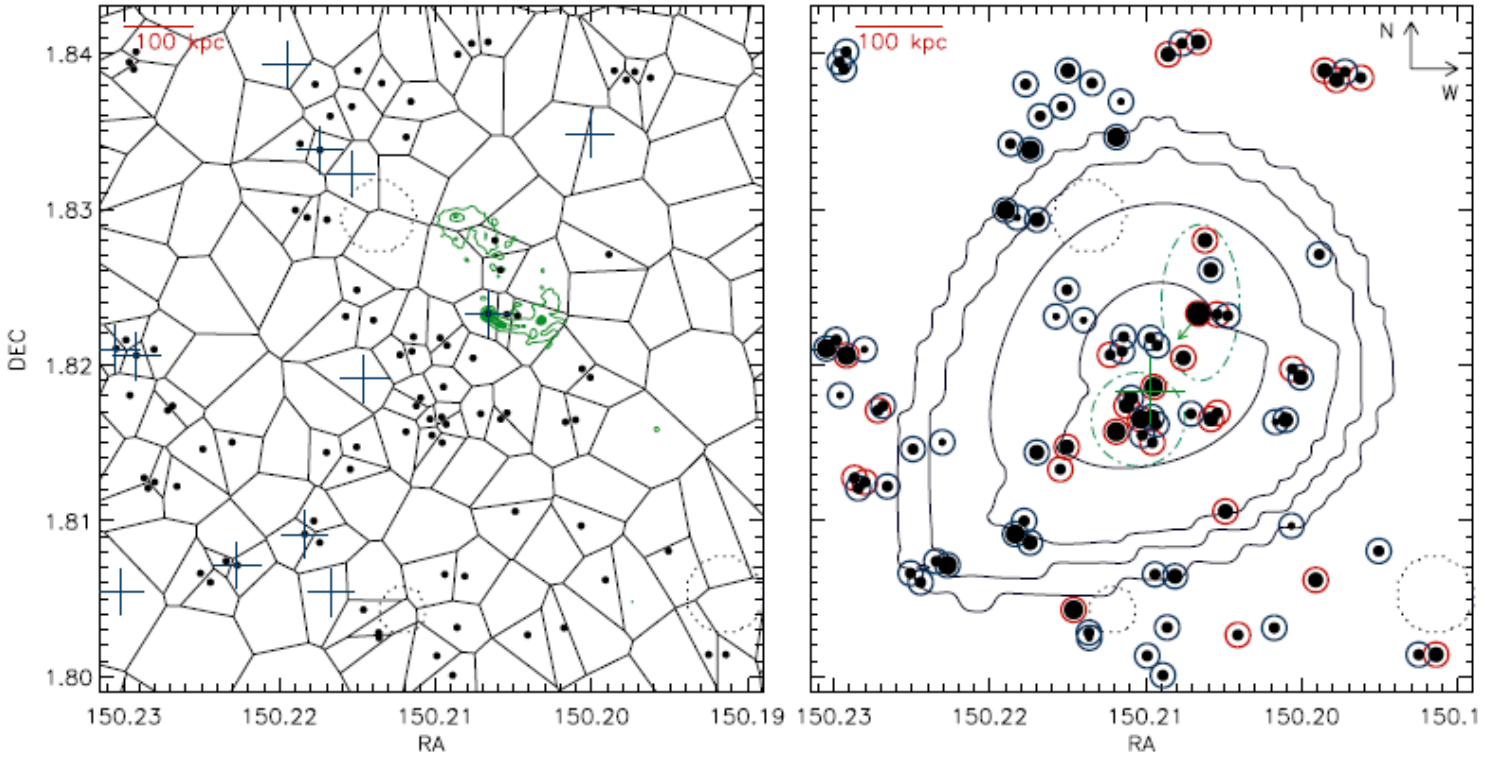
- the most massive galaxy in its group
- offset from the center of the X-ray emission by ~ 120 kpc

CWAT-02's host group



- CWAT-02's projected velocity in the direction of the elongation of the X-ray emission
- the line-of-sight velocity difference between CWAT-02 and the biweight mean of the group is 244 km/s

CWAT-02's host group



Indications of a disturbed, dynamically young system in the process of an ongoing merger

Radio - AGN heating in CWAT-02's host group

- Radio-AGN heating as a solution for the missing baryon problem on galaxy group scales - Giodini et al. 2010
- In case of a merging system radio-AGN can be responsible for the lack of a larger fraction of gas
- Our analysis of CWAT-02's system strengthens the results of Giodini et al.

The radio output energy budget in CWAT-02's host group may be powerful enough to expel baryons from it.