Galactic conformity at $z < 2$, and the quenching of central / satellite galaxies

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with
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arXiv: 1406.6058
The effect of environment on galaxy properties...

For this talk:

- Use the Halo model language

- Environment = halo properties (mass, gas density and temp. etc.)

- Snapshots in time, **not** evolutionary sequence
Galaxy quenching....

Hot halo + radio mode AGN?

Hartley et al. (2013)
Galaxy quenching....

Or perhaps galaxy mergers?

Di Matteo et al. (2005)

Bell et al. (2012)
And as for satellites....

Galaxies can go through...

Life is tough!

- harassment
- tidal truncation
- ram-pressure stripping
- thermal evaporation
- galaxy-galaxy encounter
- starvation

Illustrated by Aerée Chung

Stars
ISM
ICM
Galactic conformity

Weinmann et al. (2006) + a number of more recent results, all at low redshift.
Data: The UKIDSS UDS DR8

Selection:
K - 24.6 (5σ, AB)

u – 26.8
B – 27.6
V – 27.2
R – 27.0
i – 27.0
z – 26.0
J - 24.9
H - 24.2
Irac 1 – 24.2
Irac 2 – 24.0

Also:
X-ray
24um
sub-mm (HerMES, SCUBA-2)
Radio

>2000 high confidence spec-z
(largely unbiased, inc. UDSz)

Field size: 0.62 sq. deg.
Data: The UKIDSS UDS DR8

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\[ \begin{align*}
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Field size: 0.62 sq. deg.
450 kpc
Results!
Satellite passive ratios

star-forming centrals
low-mass satellites
1.3 < z < 1.9

passive centrals
low-mass satellites
1.3 < z < 1.9

star-forming centrals
high-mass satellites
1.3 < z < 1.9

passive centrals
high-mass satellites
1.3 < z < 1.9
Is halo mass the answer?
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So what is the cause of conformity?

Li & Wang (2013)
Cold gas accreted
Take home points:

1. Galactic conformity exists up to $z \sim 2$

2. Your favourite model for quenching galaxies must predict and explain this effect.

3. Can star-formation feedback can hold the answer? Feel free to tell me why not!