

Title: The Stellar Components of Nearby Galaxy Clusters

Date: Apr 30, 2009 11:45 AM

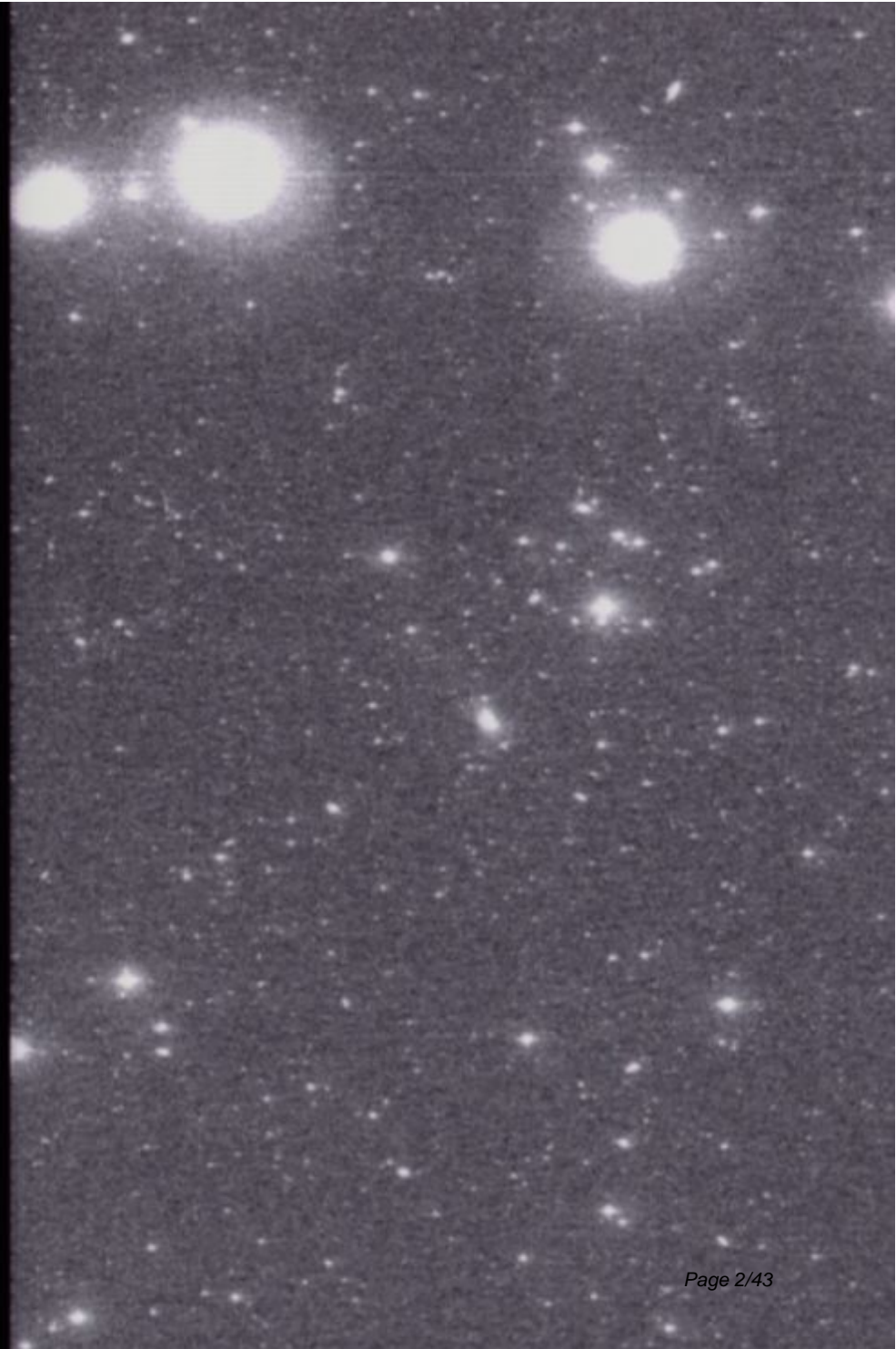
URL: <http://pirsa.org/09040055>

Abstract: A detailed understanding of galaxy clusters is essential in limiting the potential for systematic effects in the use of galaxy clusters for cosmological measurements. I will synthesize our current work on understanding the stellar components of galaxy clusters, including the intergalactic stellar populations and the structural relationship between stellar populations in galaxies and clusters. Ultimately, the characterization of the relationship between dark matter halos and the stellar populations within them will play a key role in unraveling what clusters tell us about the Universe.

The Stellar Components of Nearby Galaxy Clusters

Dennis Zaritsky

University of Arizona



Why do we (i.e. you) care about stellar components?

Why do we care about stellar components?

- what's happening



1E0657-56 (the "bullet cluster")

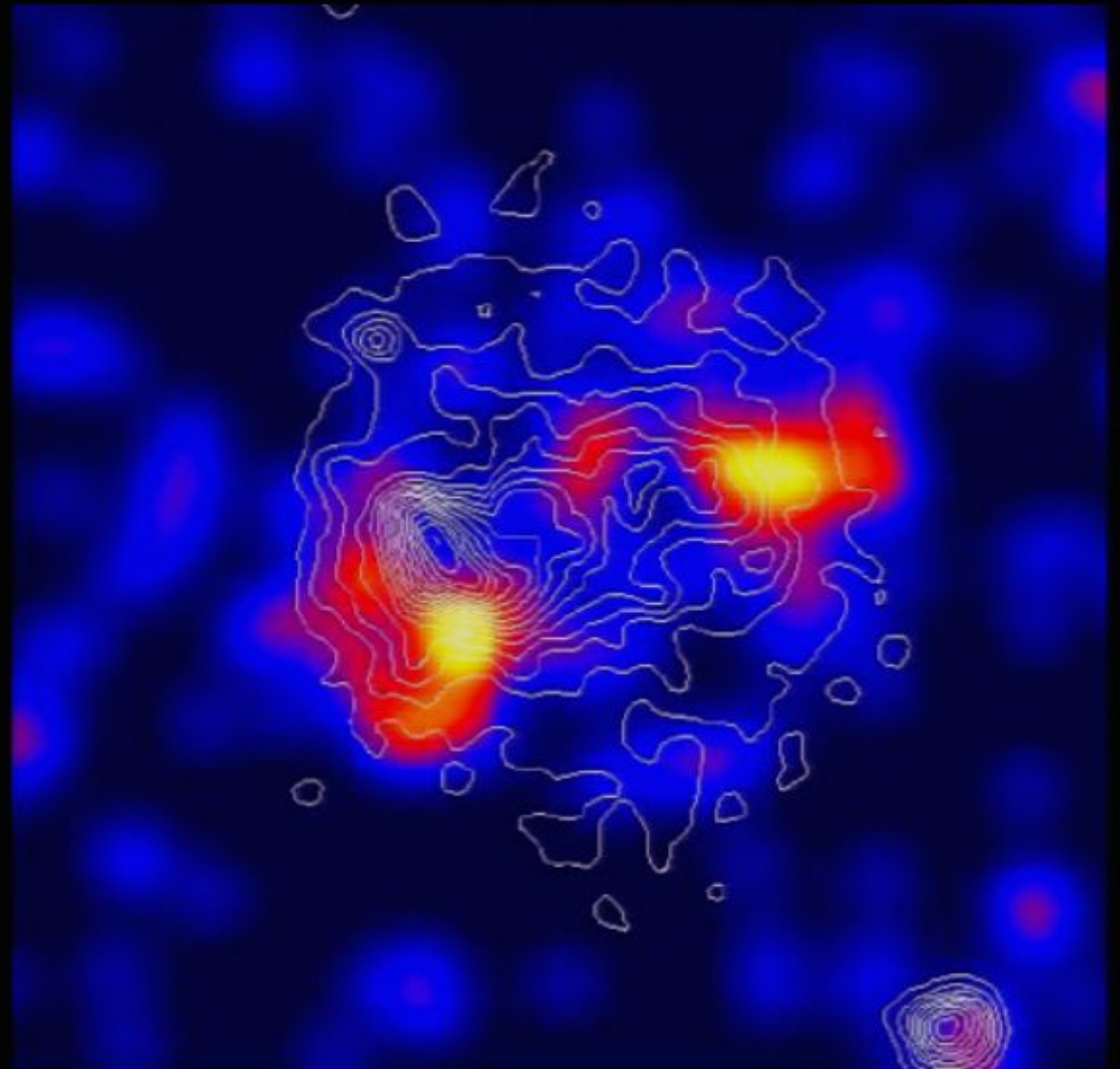
pink = plasma
blue = lensing mass
image = stars



Clowe, Bradac, Gonzalez, Markevitch,
Randall, Jones, & Zaritsky 2006

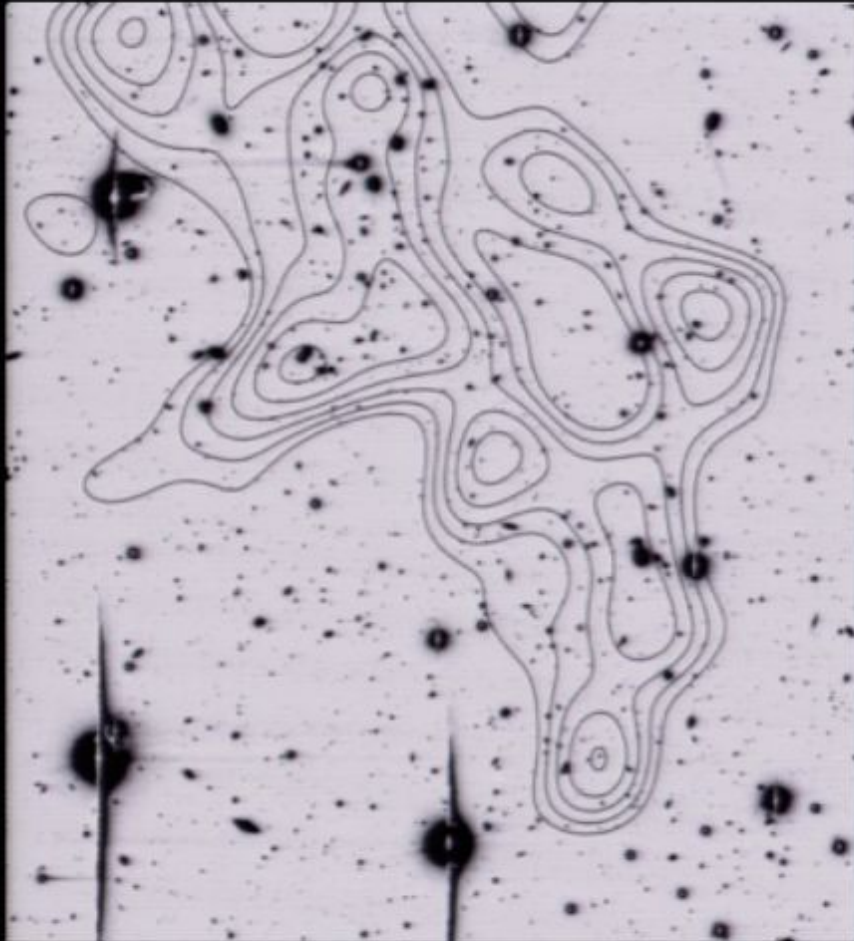
Abell 754

contours = plasma
colors = galaxies

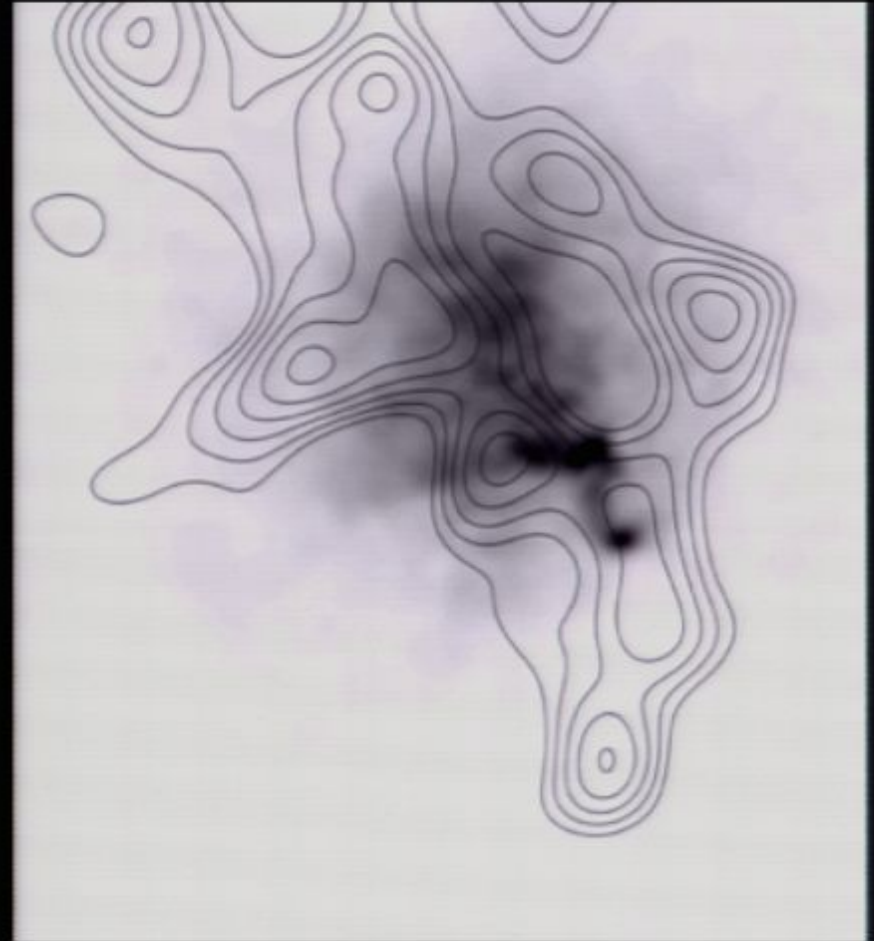


Zabludoff & Zaritsky 1995

Abell 520



galaxies

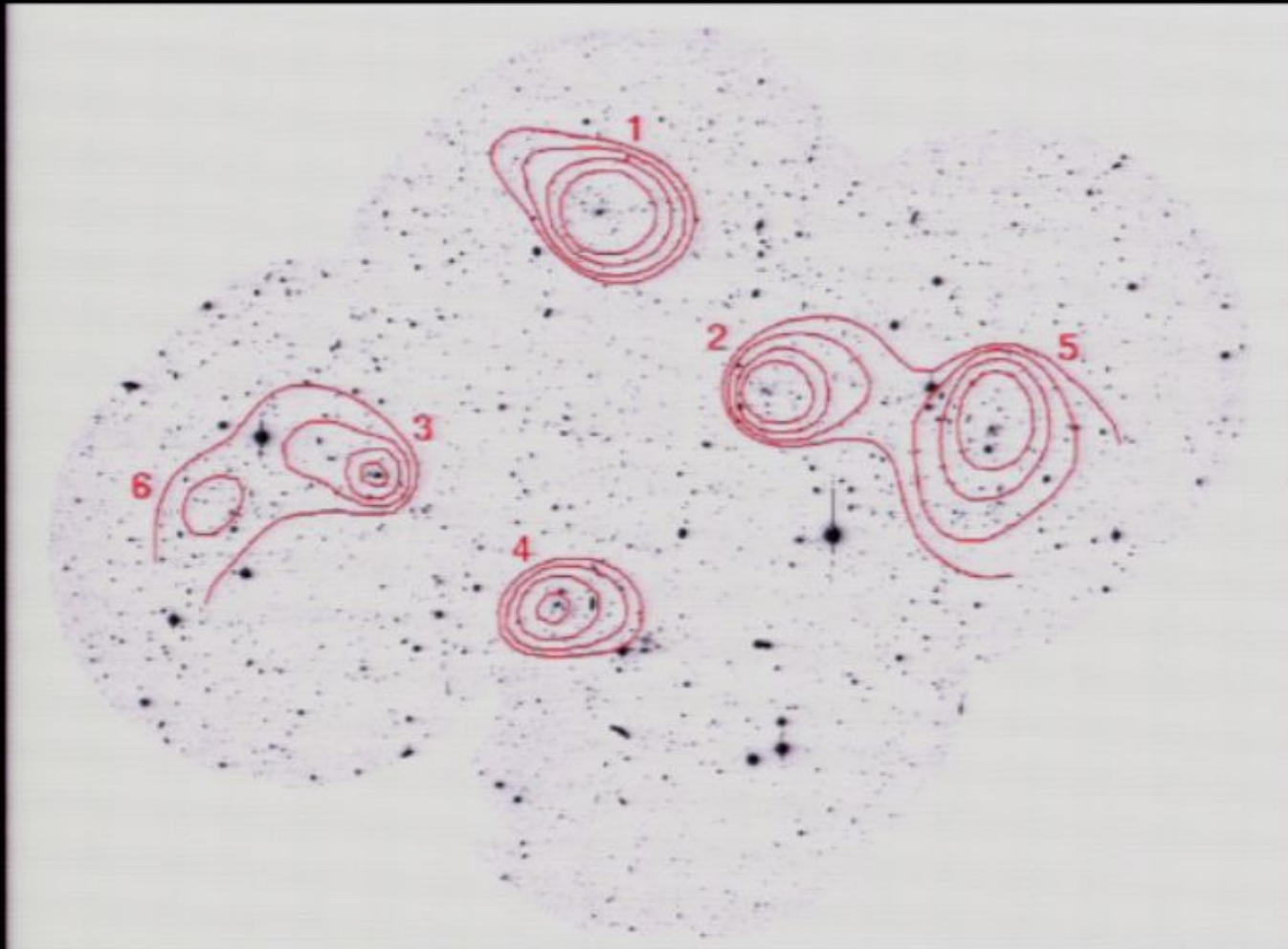


plasma

contours = lensing mass

Clowe et al. in prep.

SG1120-1202



contours = plasma

see Gonzalez, Tran, Conbere, & Zaritsky 2005

Why do we care about stellar components?

- what's happening
- what happened

Formation of BCG + ICL



Dubinski 1998

Formation of BCG + ICL



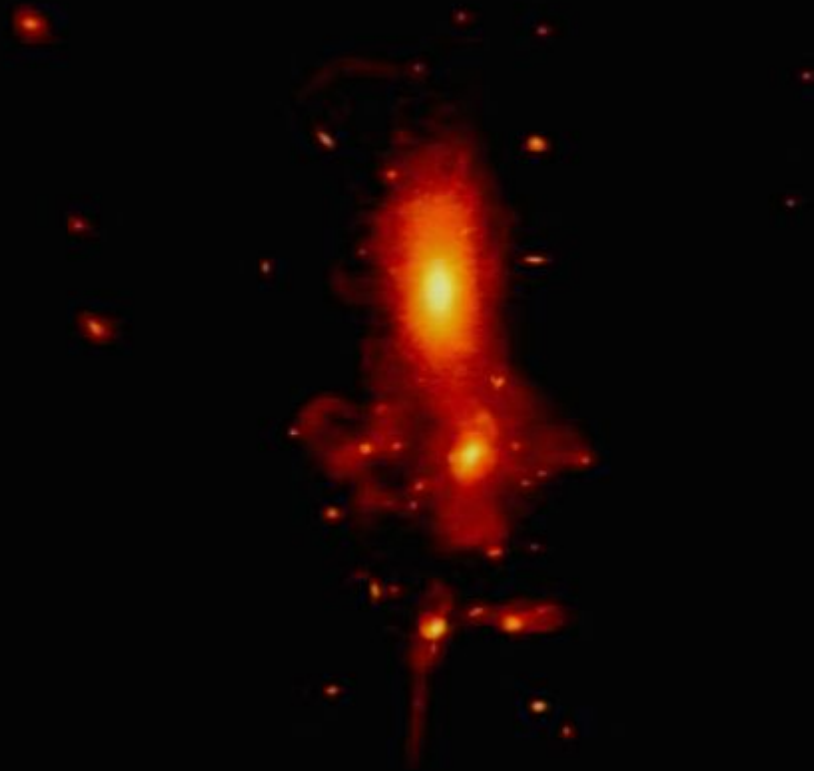
Dubinski 1998

Formation of BCG + ICL



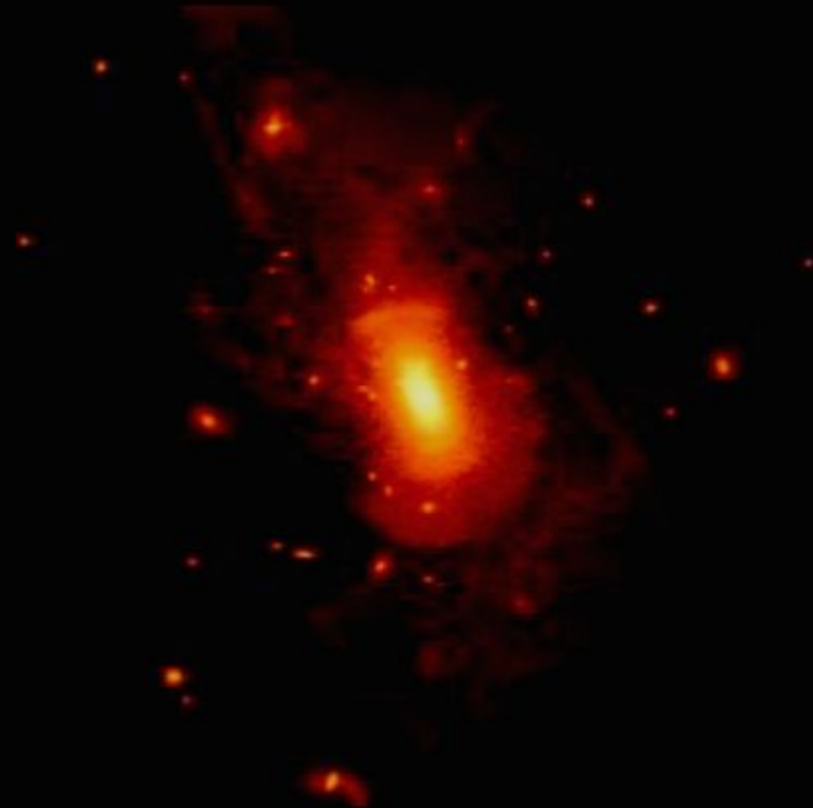
Dubinski 1998

Formation of BCG + ICL



Dubinski 1998

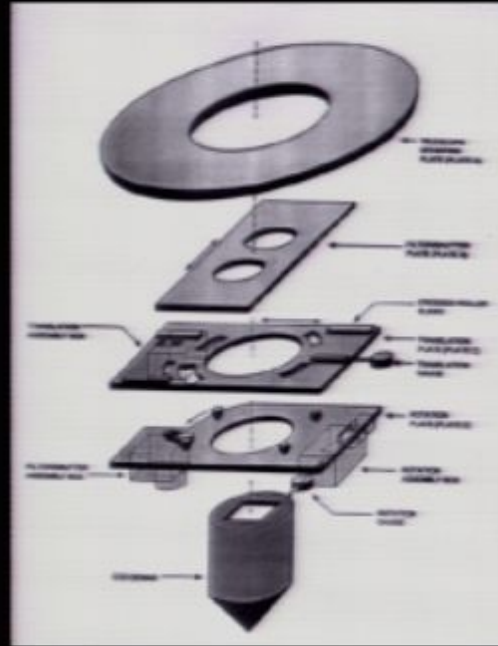
Formation of BCG + ICL



Dubinski 1998



+

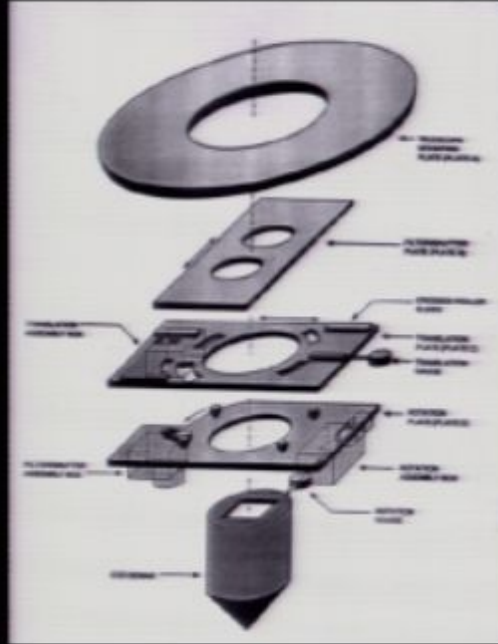


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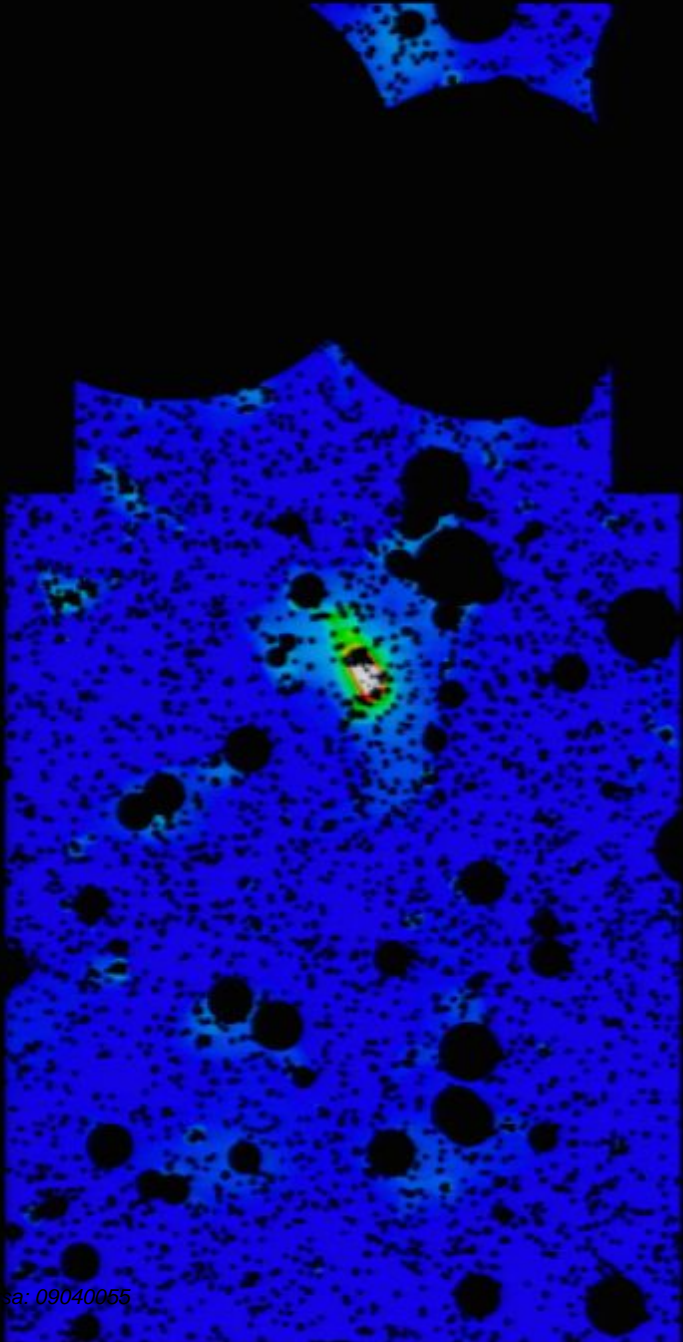
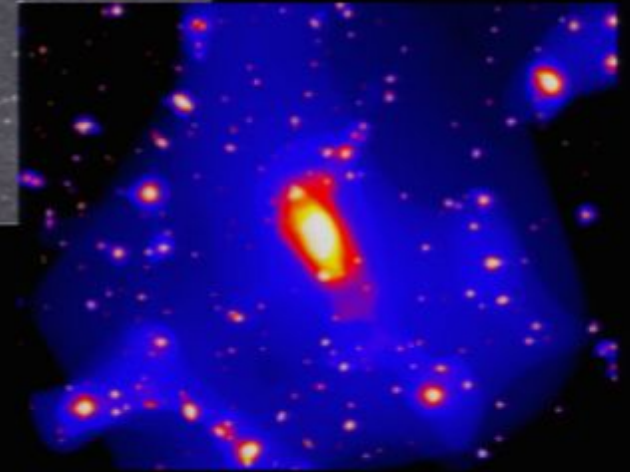
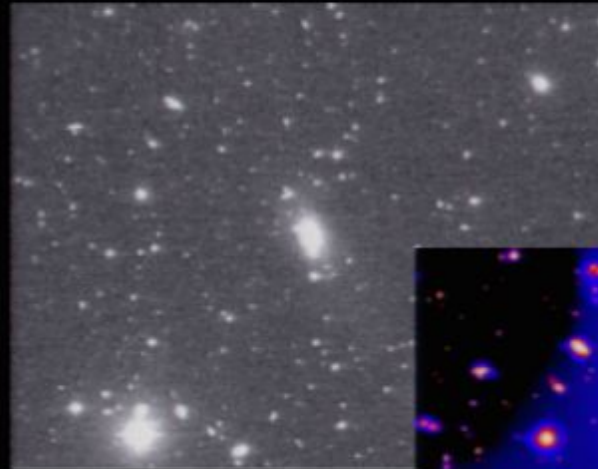


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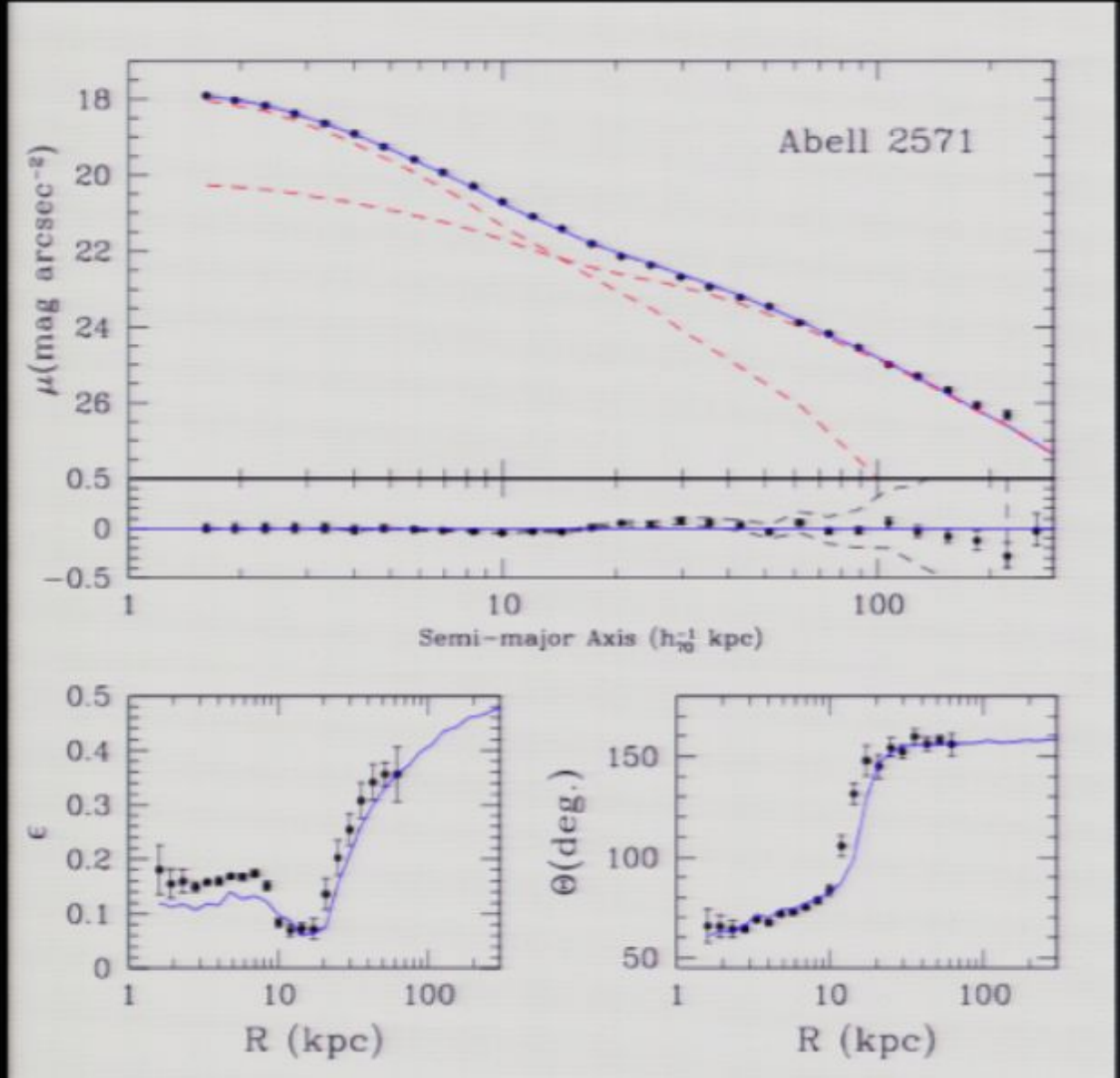




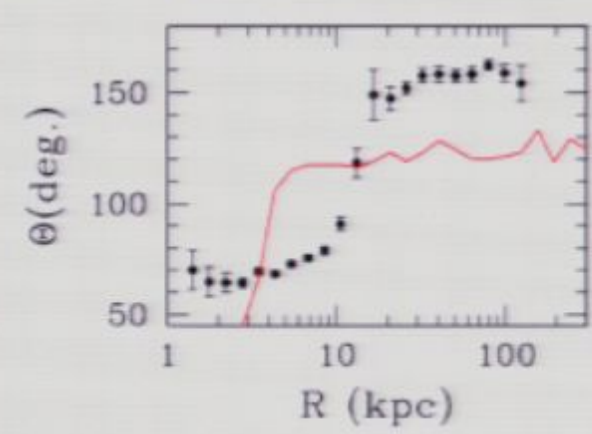
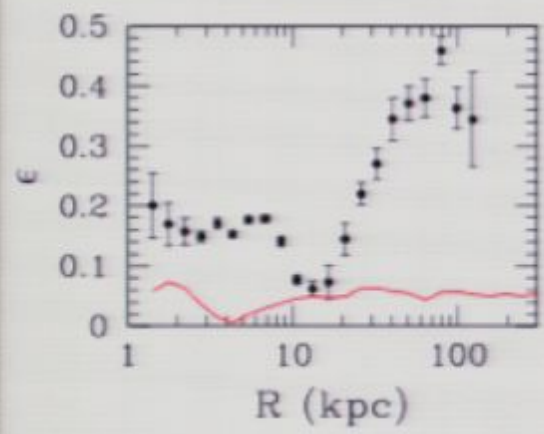
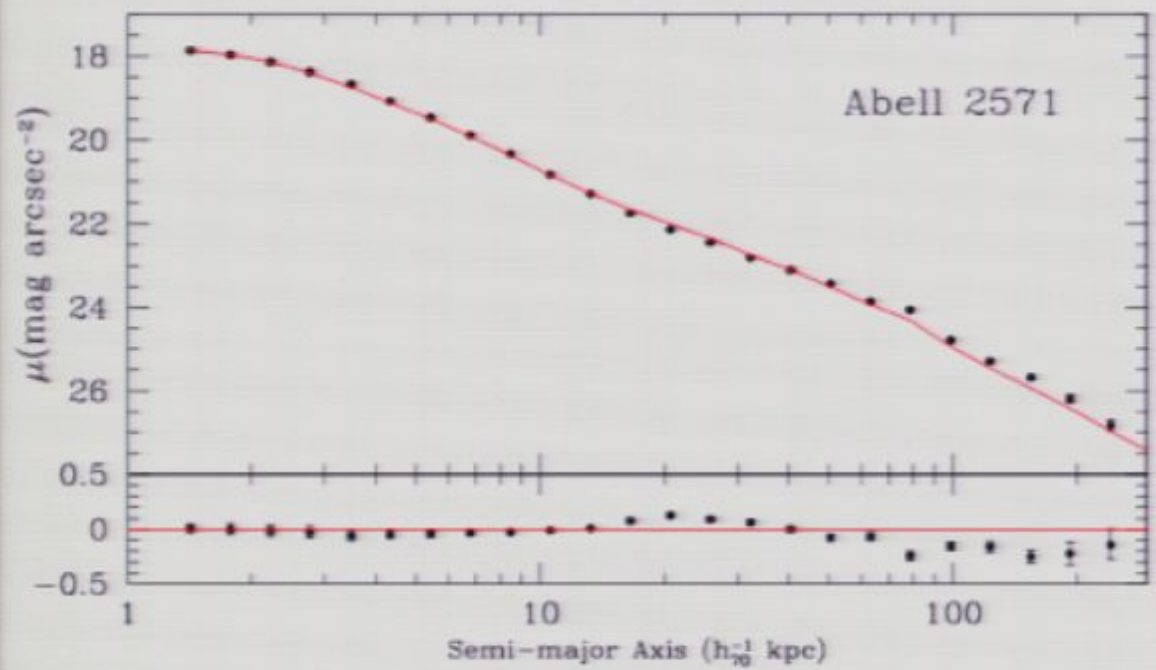
Gonzalez, Zabludoff,
Zaritsky & Dalcanton 2000

Gonzalez, Zabludoff, & Zaritsky 2005

“typical” case



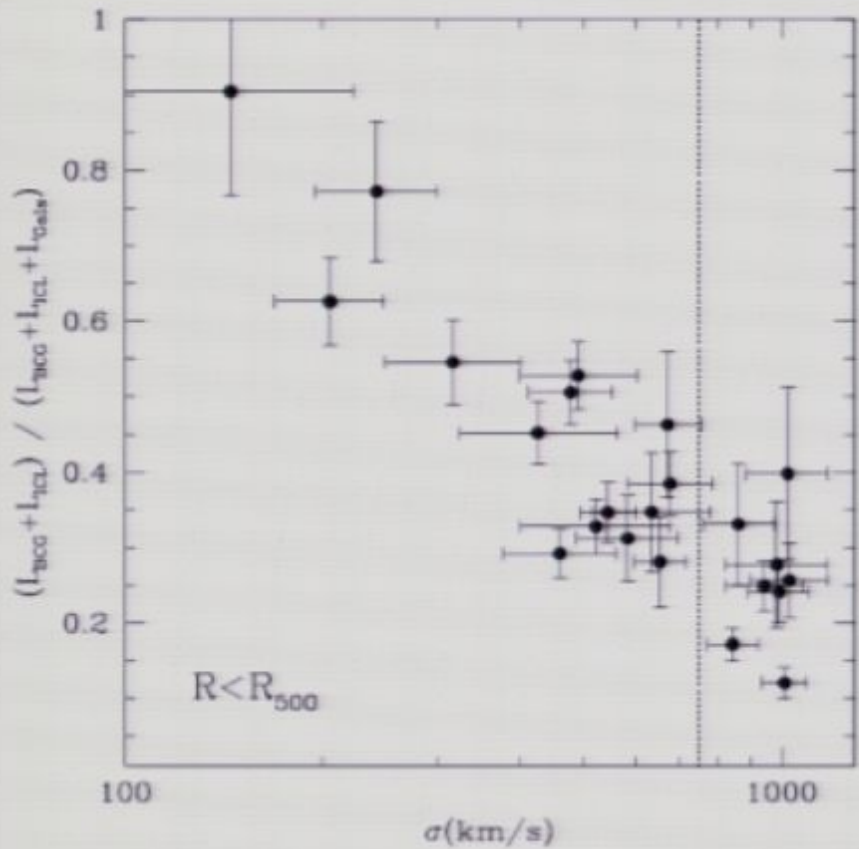
two $r^{1/4}$ components



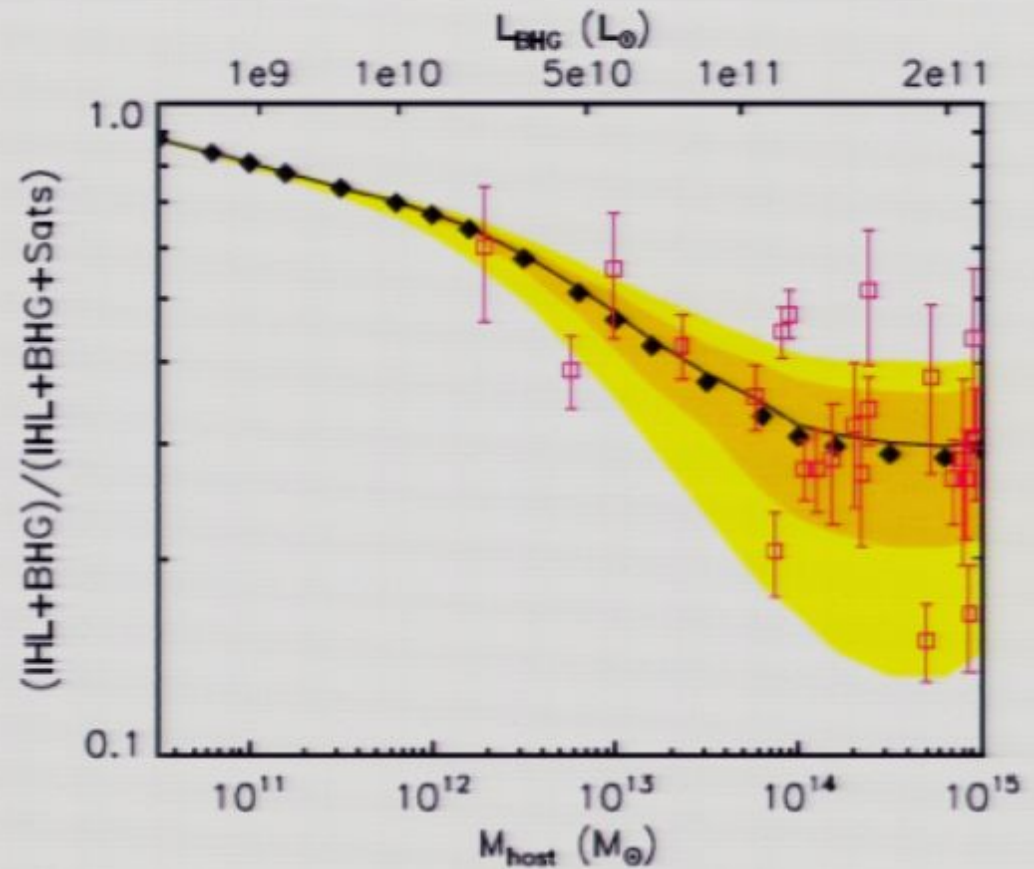
single Sersic ($r^{1/n}$) component

BCG-ICL alignment angle





Gonzalez, Zaritsky & Zabludoff 2007

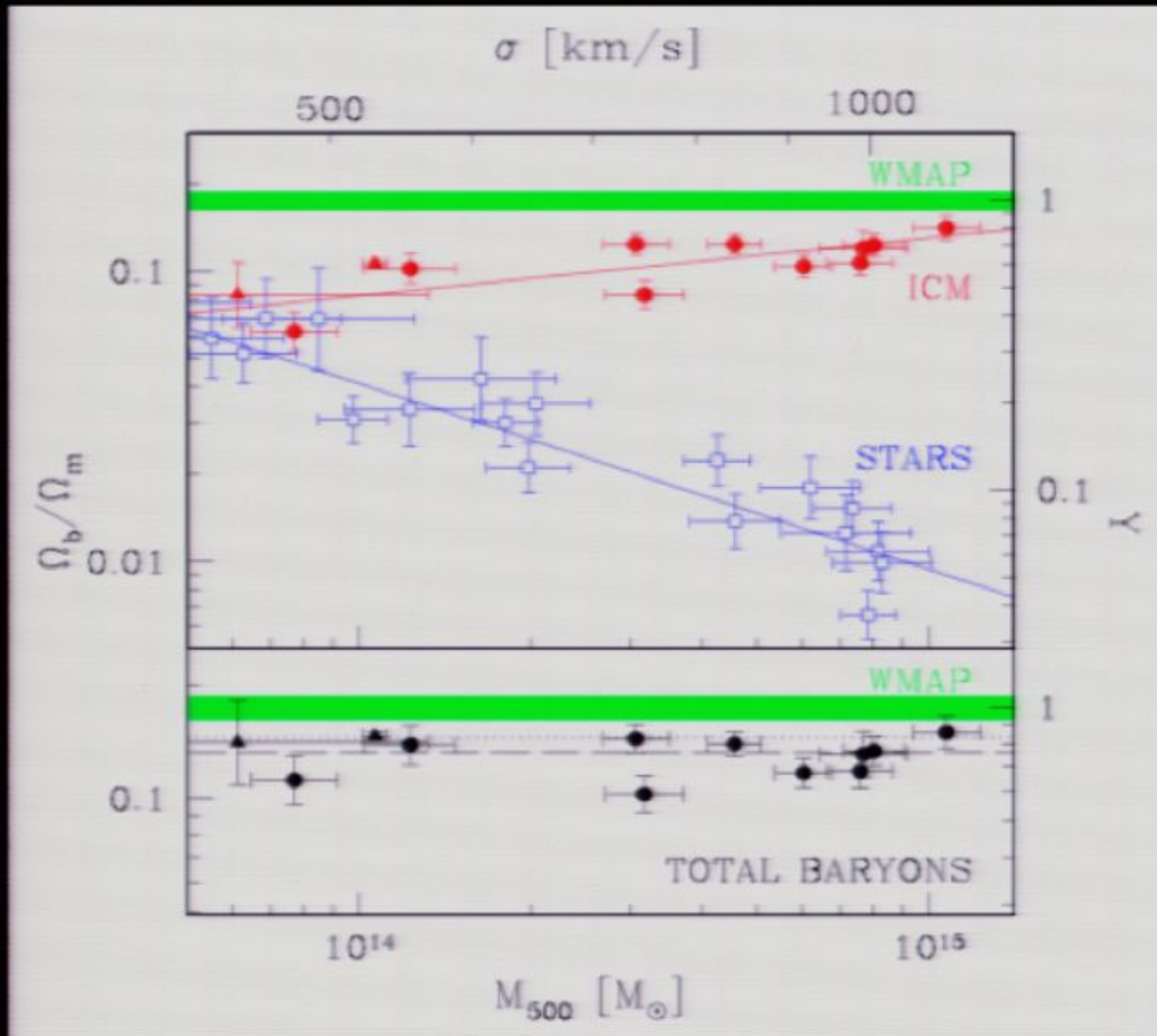


Purcell, Bullock, & Zentner 2008

Why do we care about stellar components?

- what's happening
- what happened
- who participated

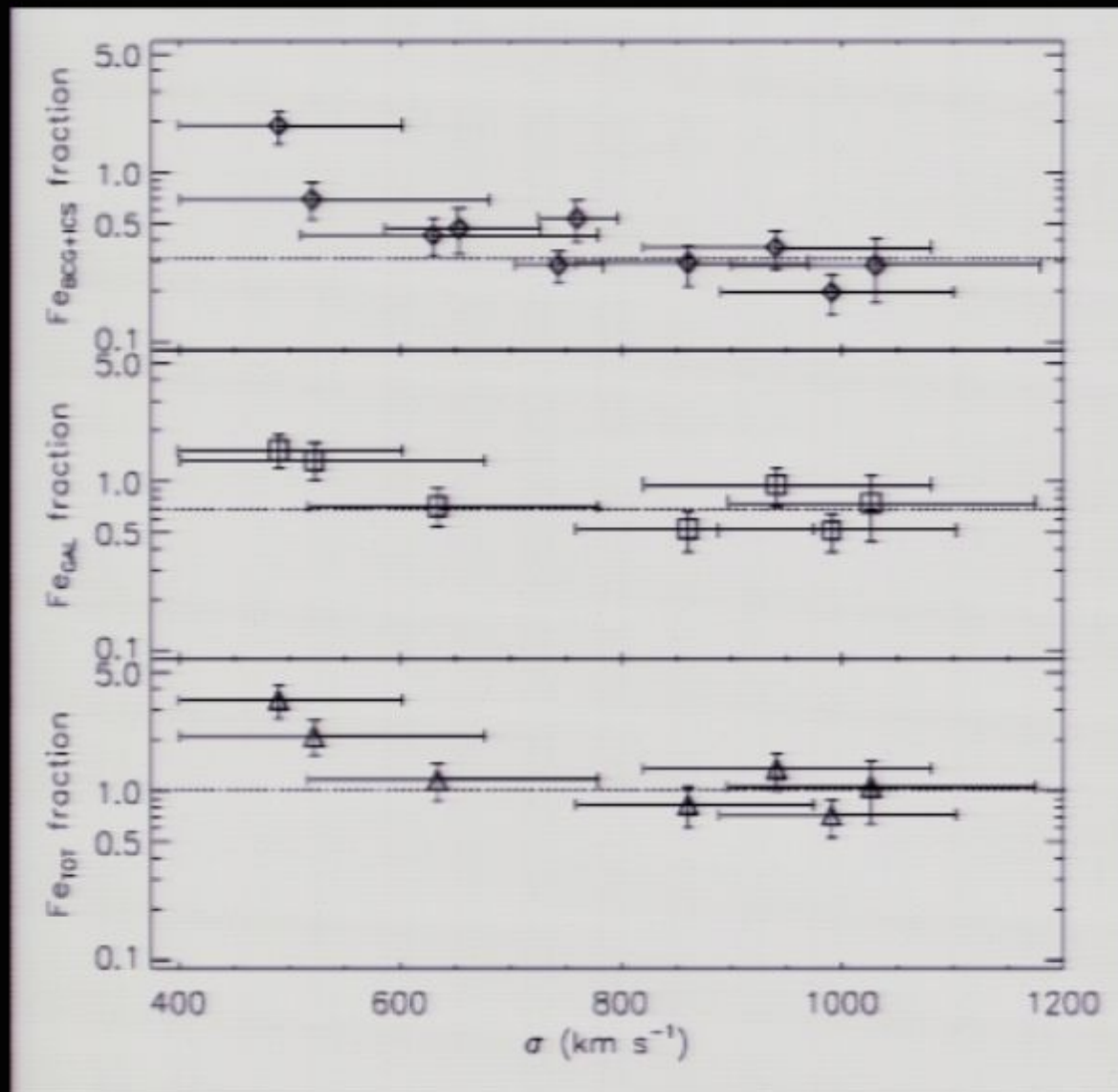
a full accounting?

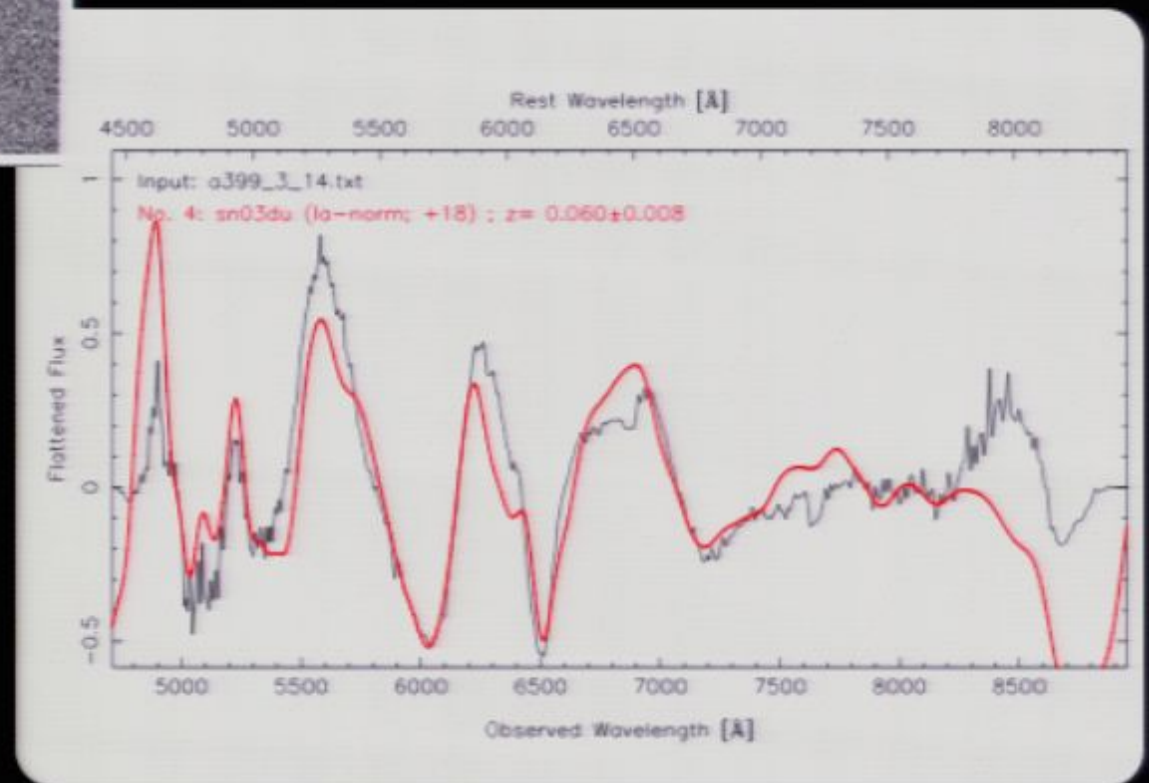
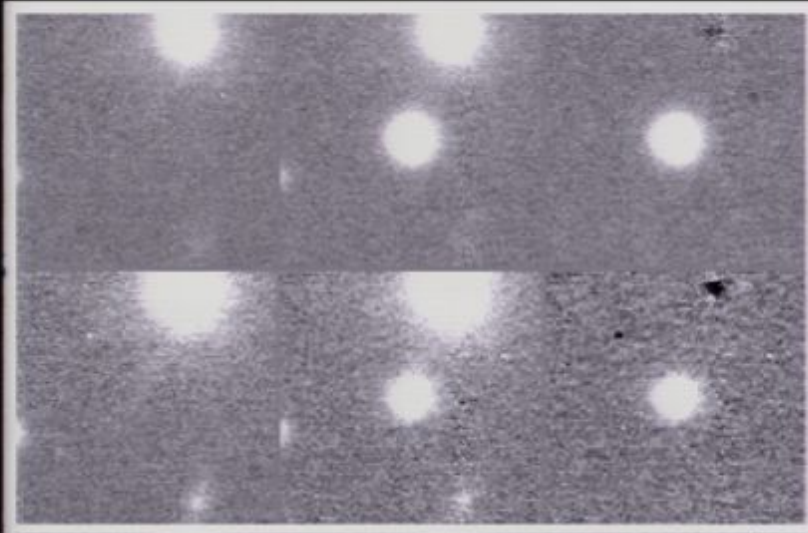


BCG+ICS

Galaxies
(85% metal loss)

Total





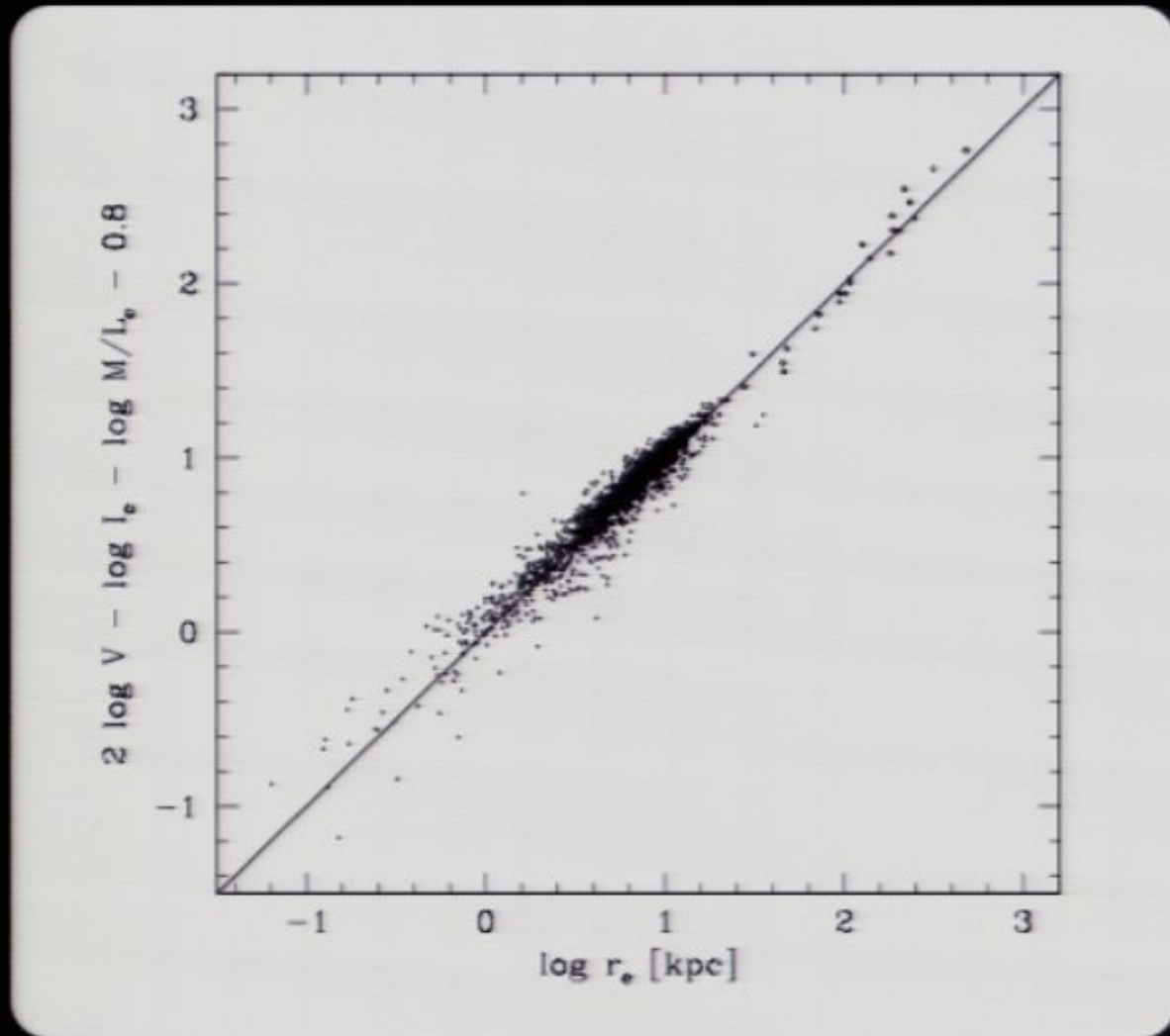
preliminary rate

$$= 0.039^{+0.025}_{-0.023} \text{ SN}/100 \text{ yr}/10^{10} M_{\odot}$$

Sand et al. in prep

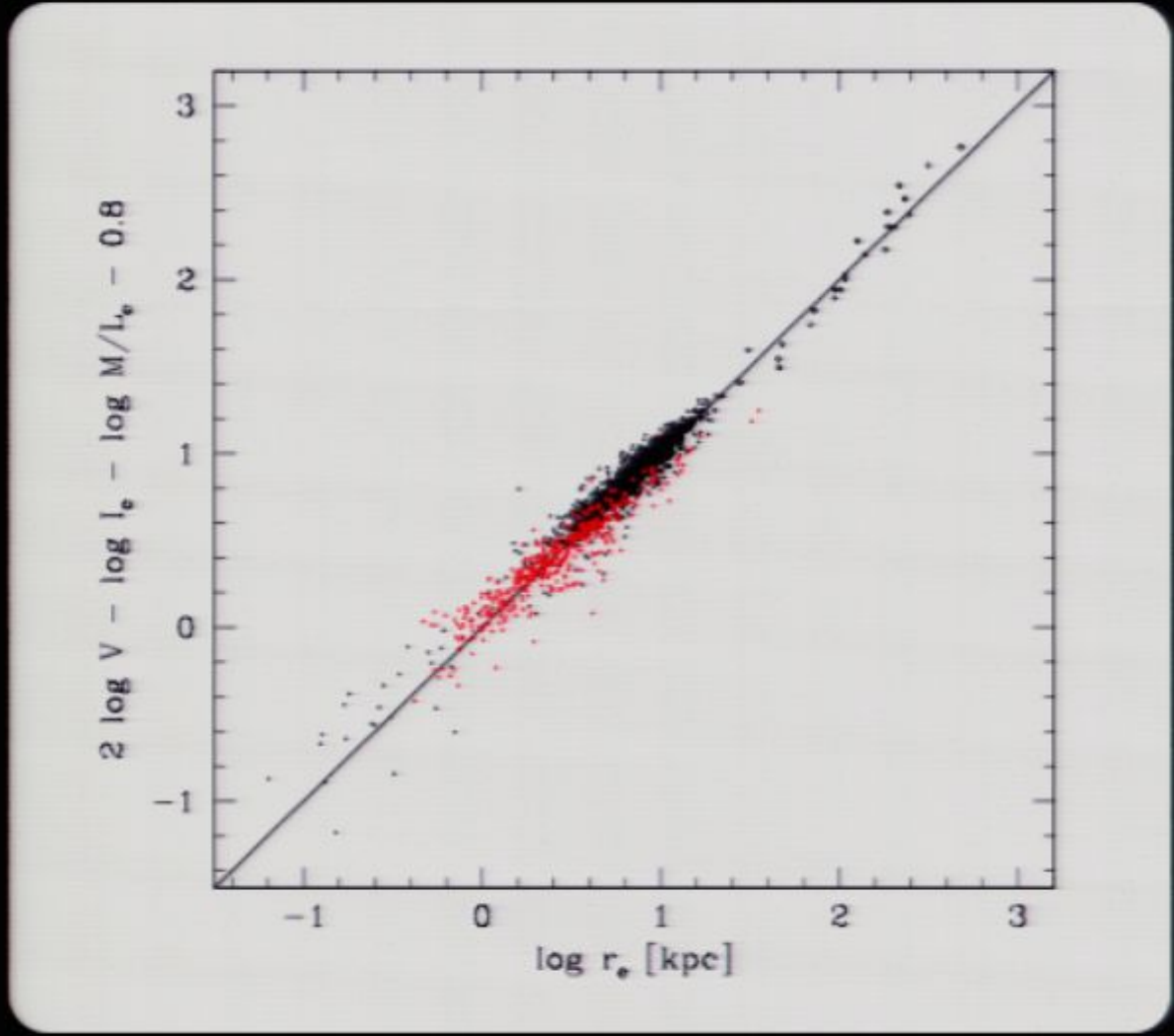
Why do we care about stellar components?

- what's happening
- what happened
- who participated
- how did this happen?

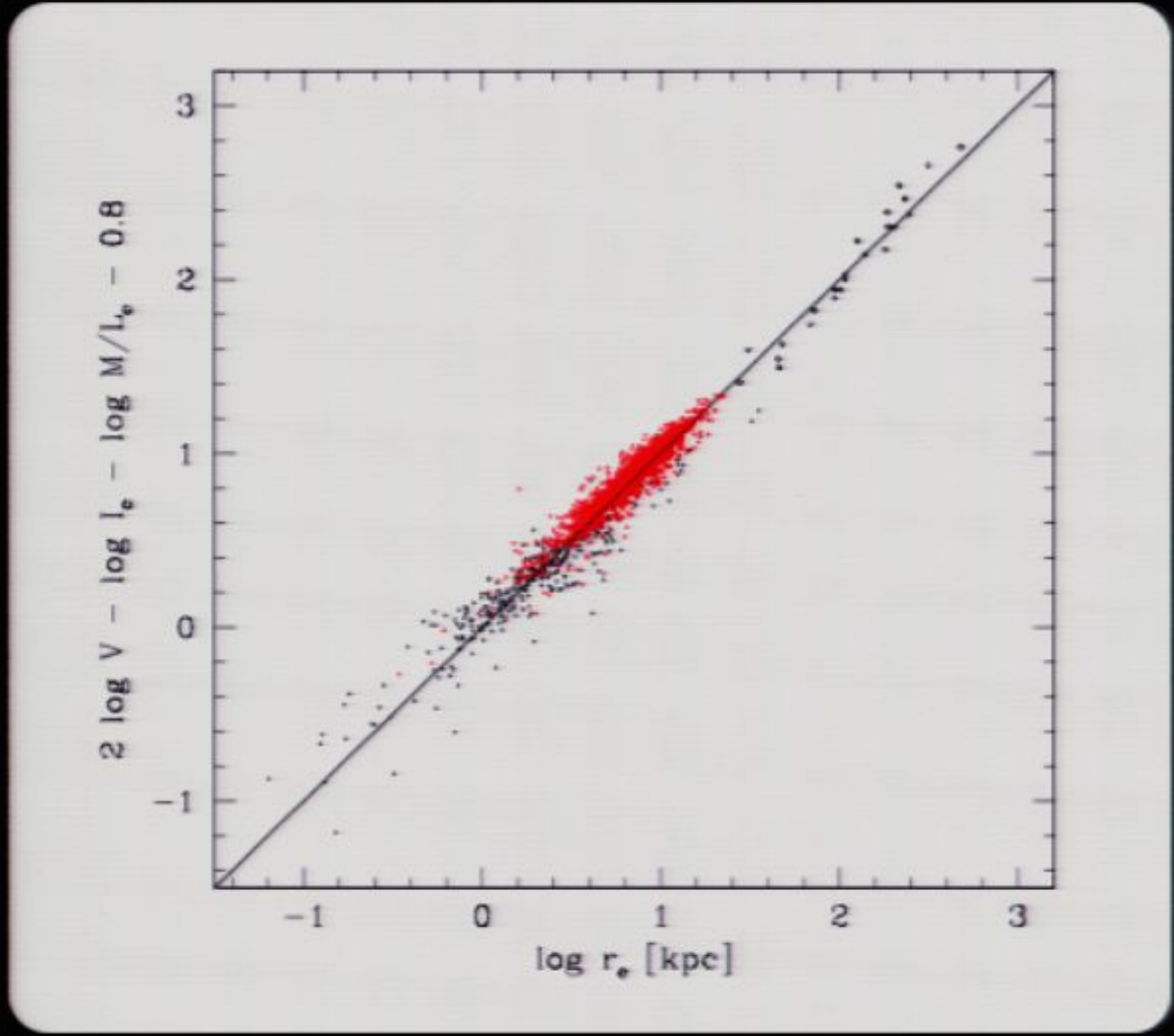


Zaritsky, Gonzalez, & Zabludoff 2006

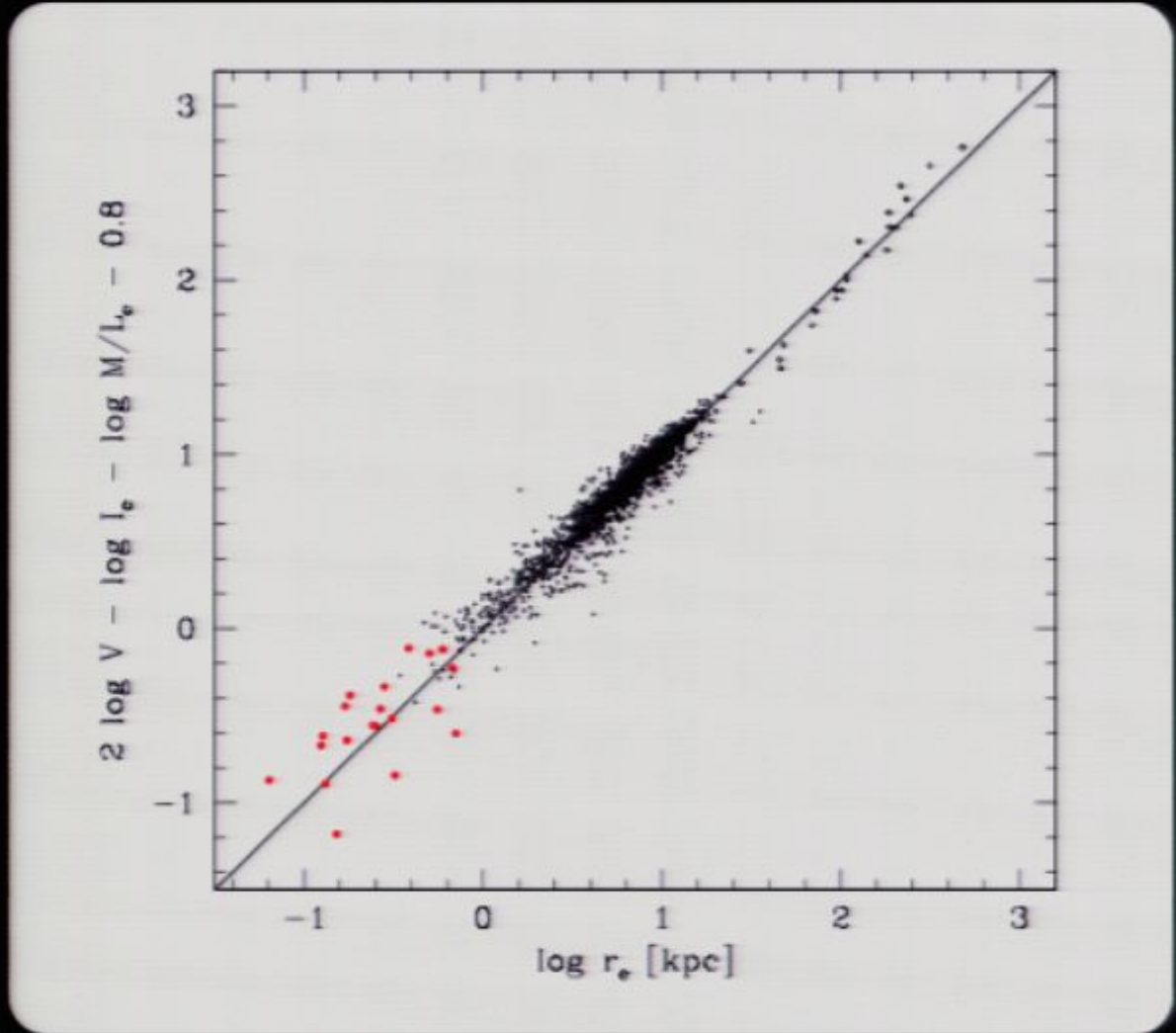
Zaritsky, Zabludoff, & Gonzalez 2008



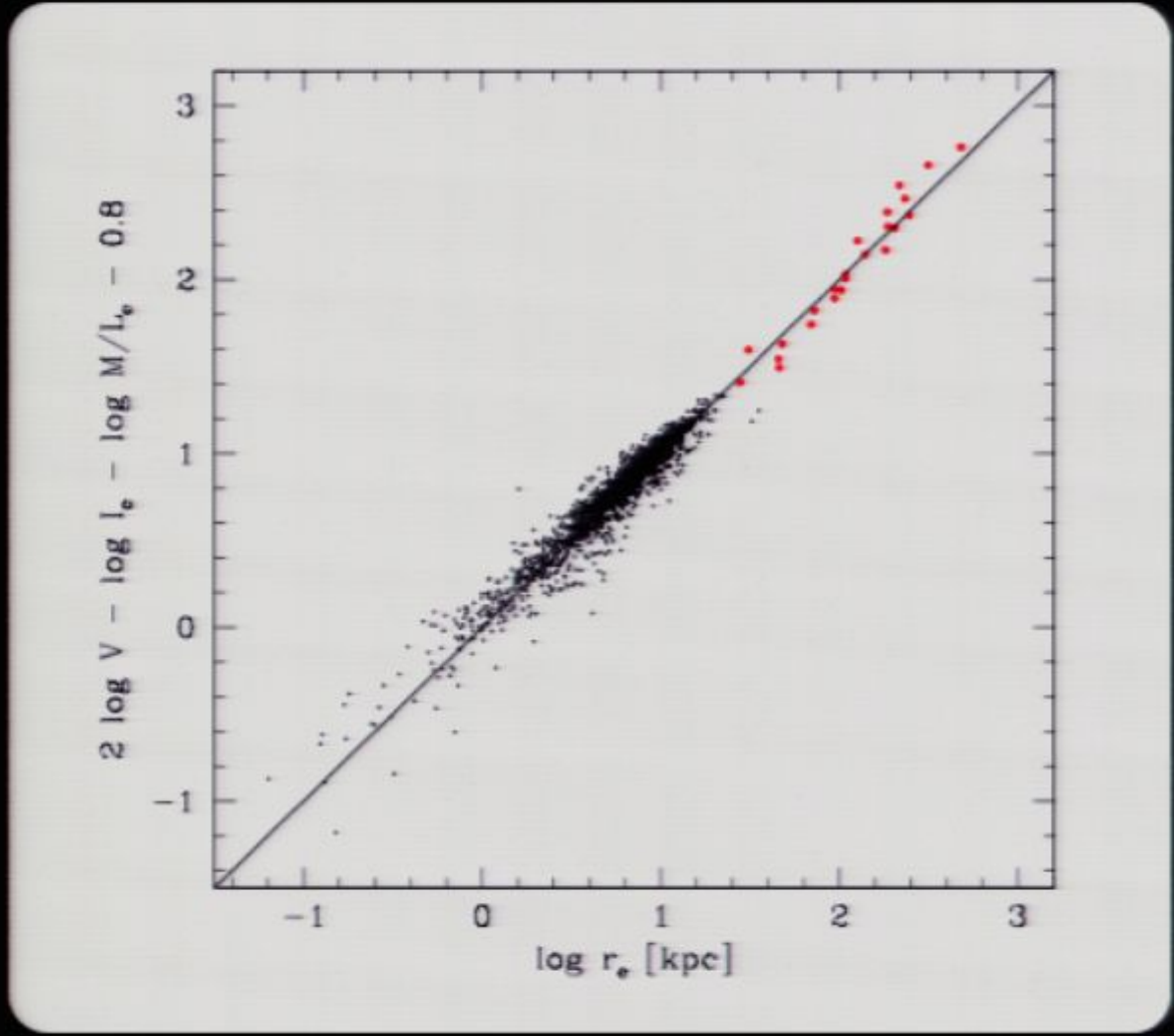
ellipticals



spirals



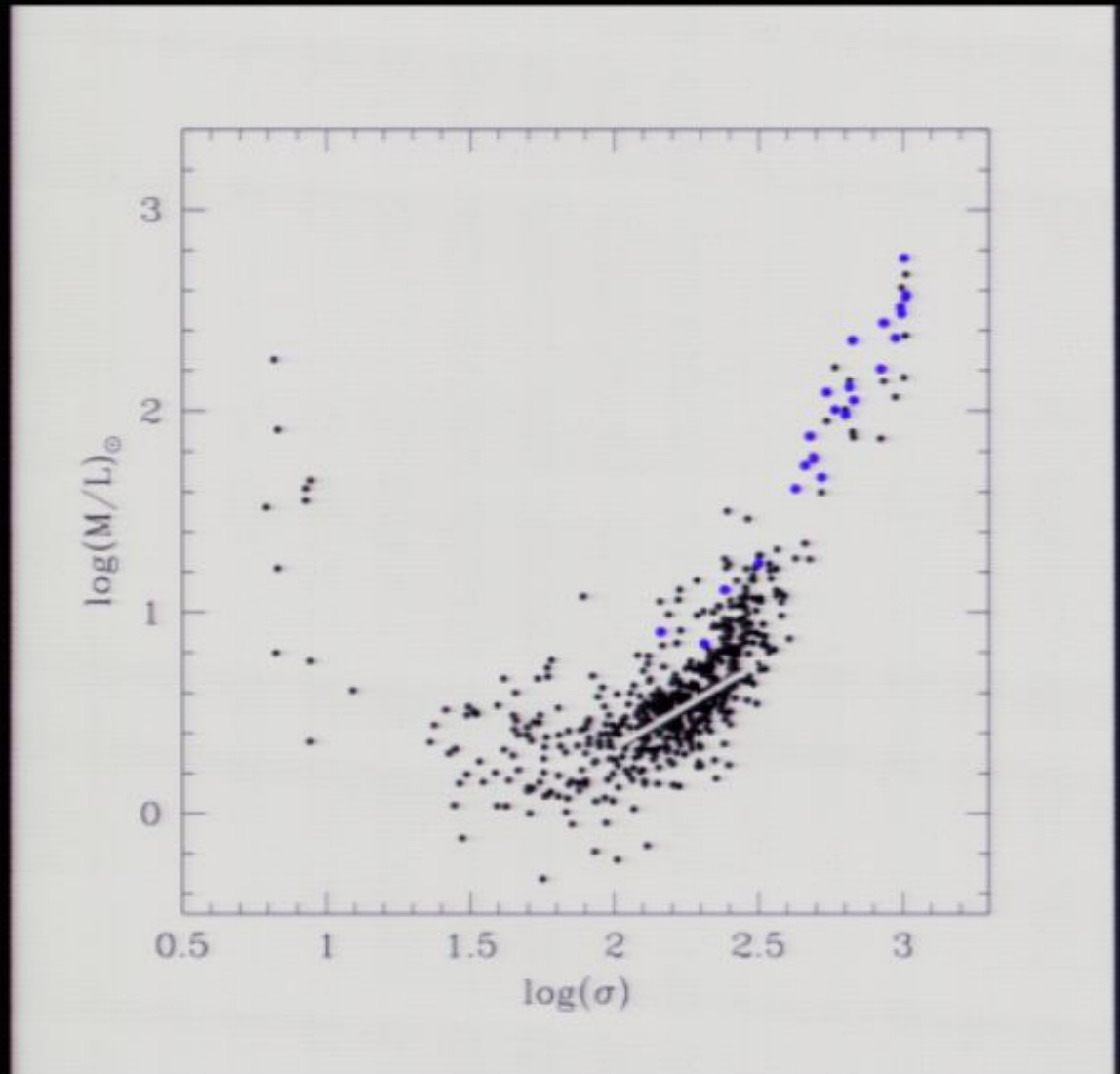
local group dwarfs

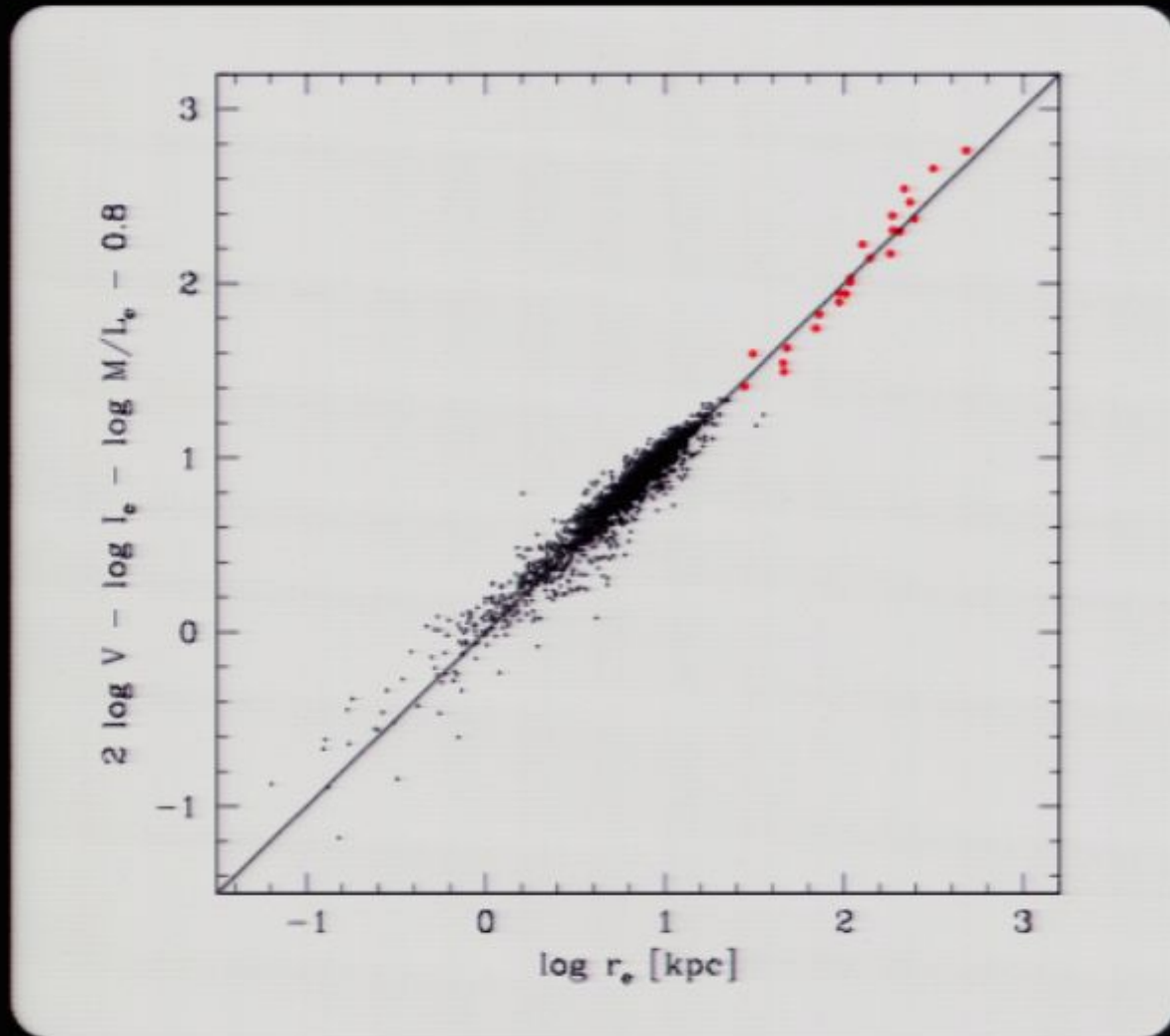


galaxy clusters

black => fitting
formula

blue => stars &
x-ray determined
masses

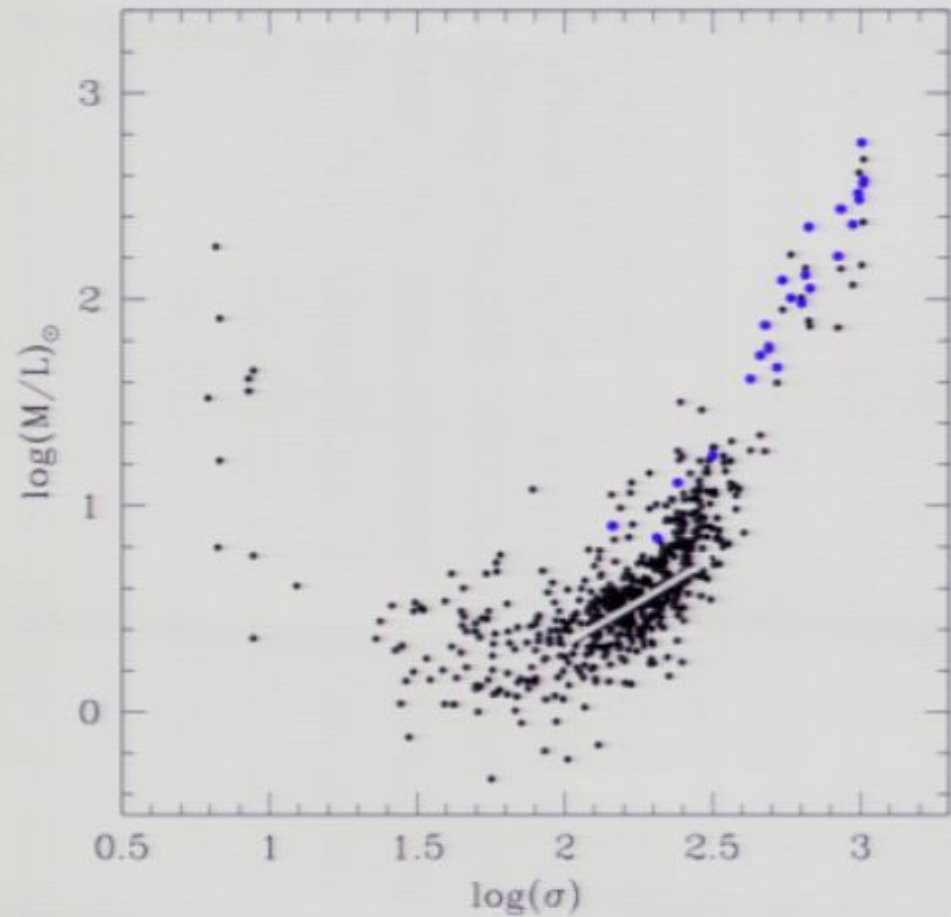




galaxy clusters

black => fitting
formula

blue => stars &
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masses



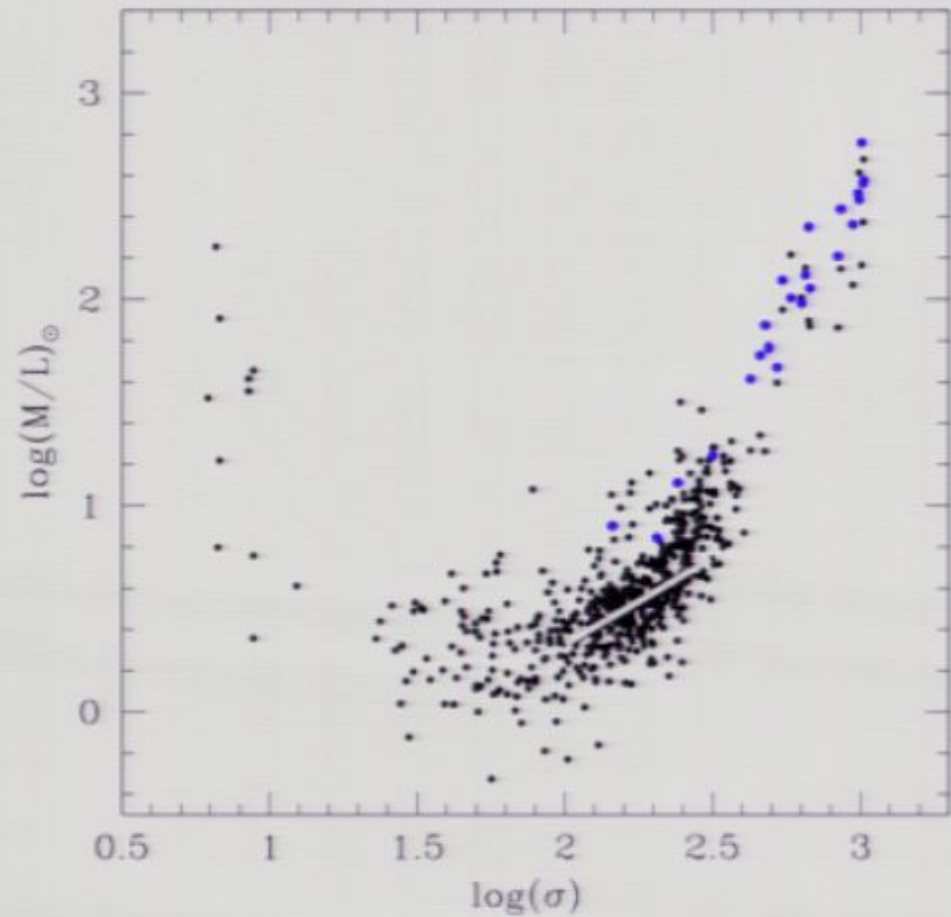
SUMMARY

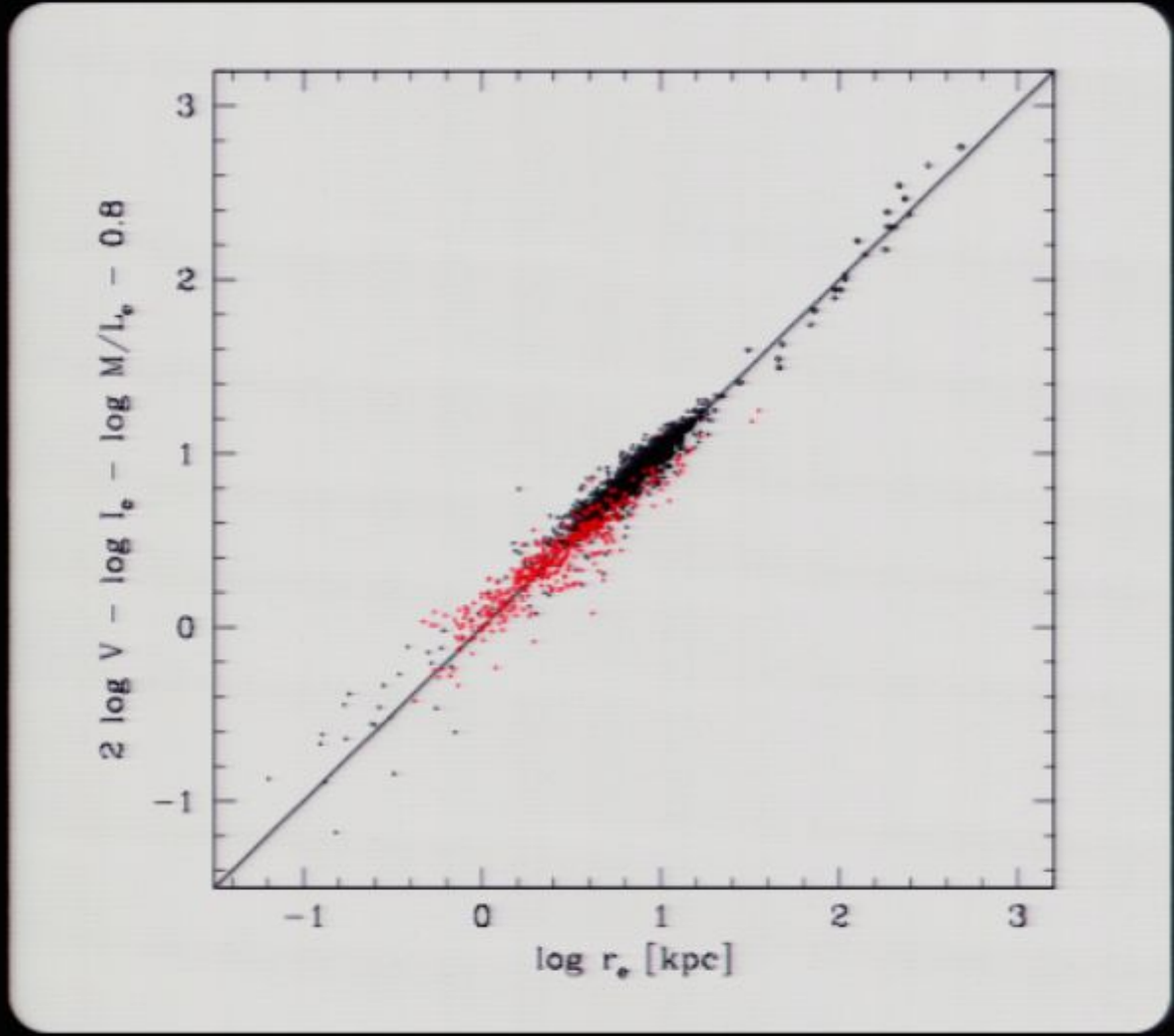
- what's happening (mergers/dark matter)
- what happened (ICL as a witness to the past)
- who participated (baryon & metal accounting)
- how did this happen?

(constraints from a single scaling
relation -path to z & σ ?)

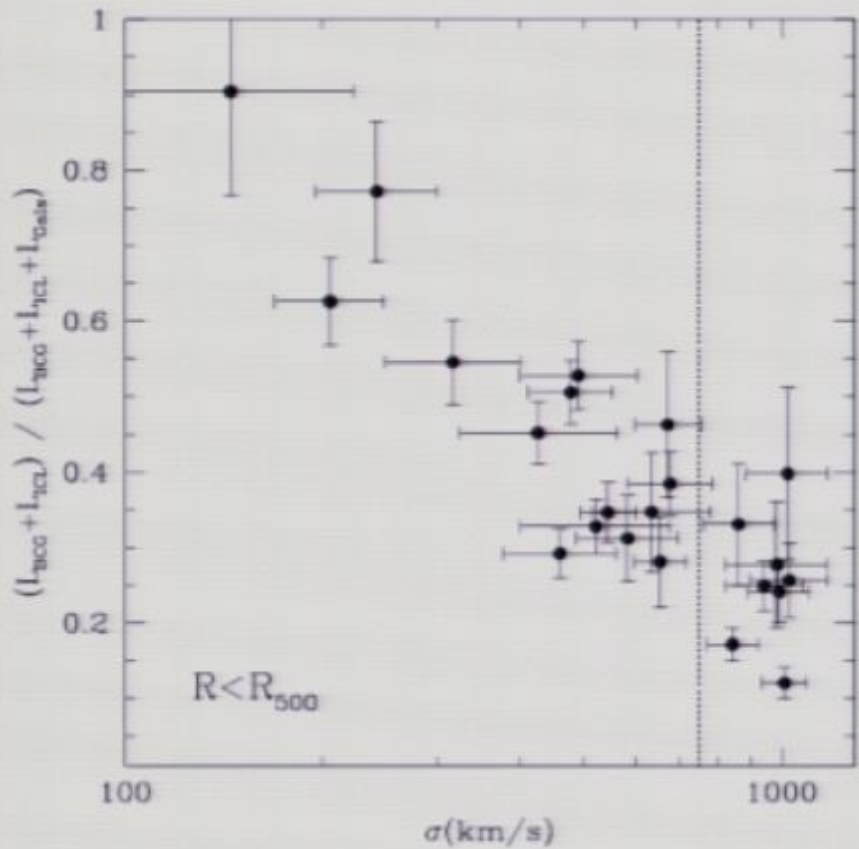
black => fitting
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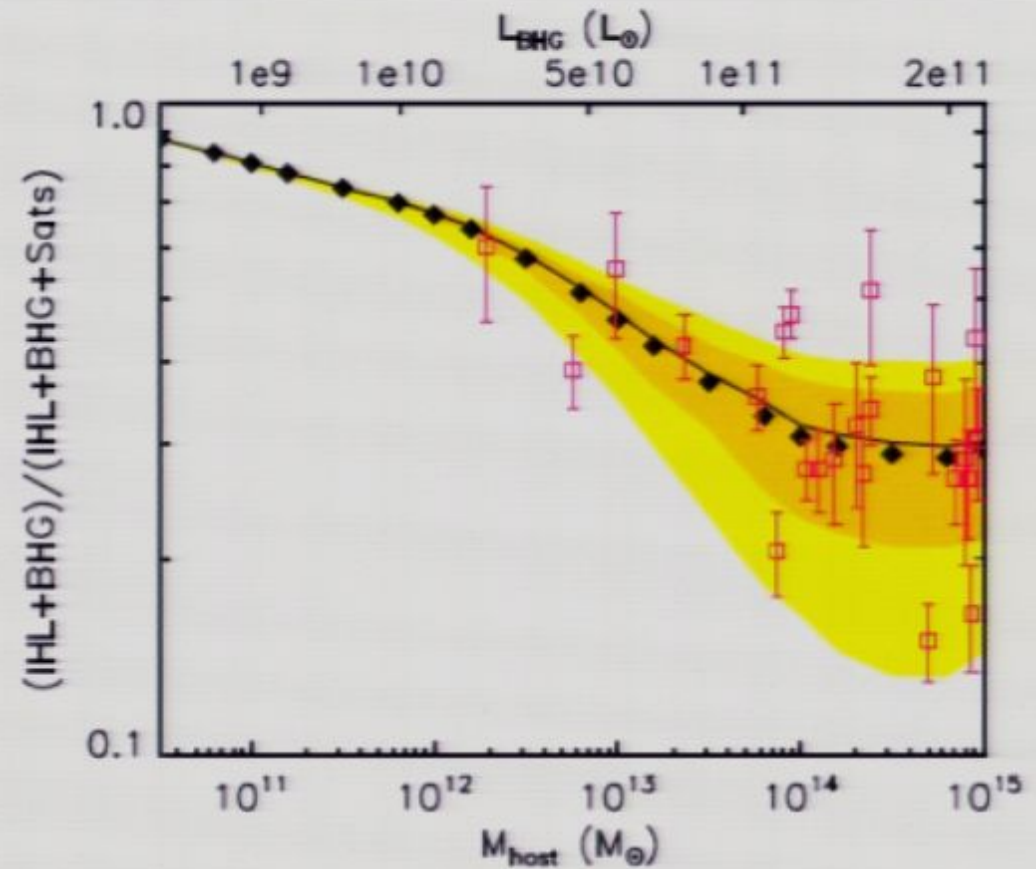




ellipticals

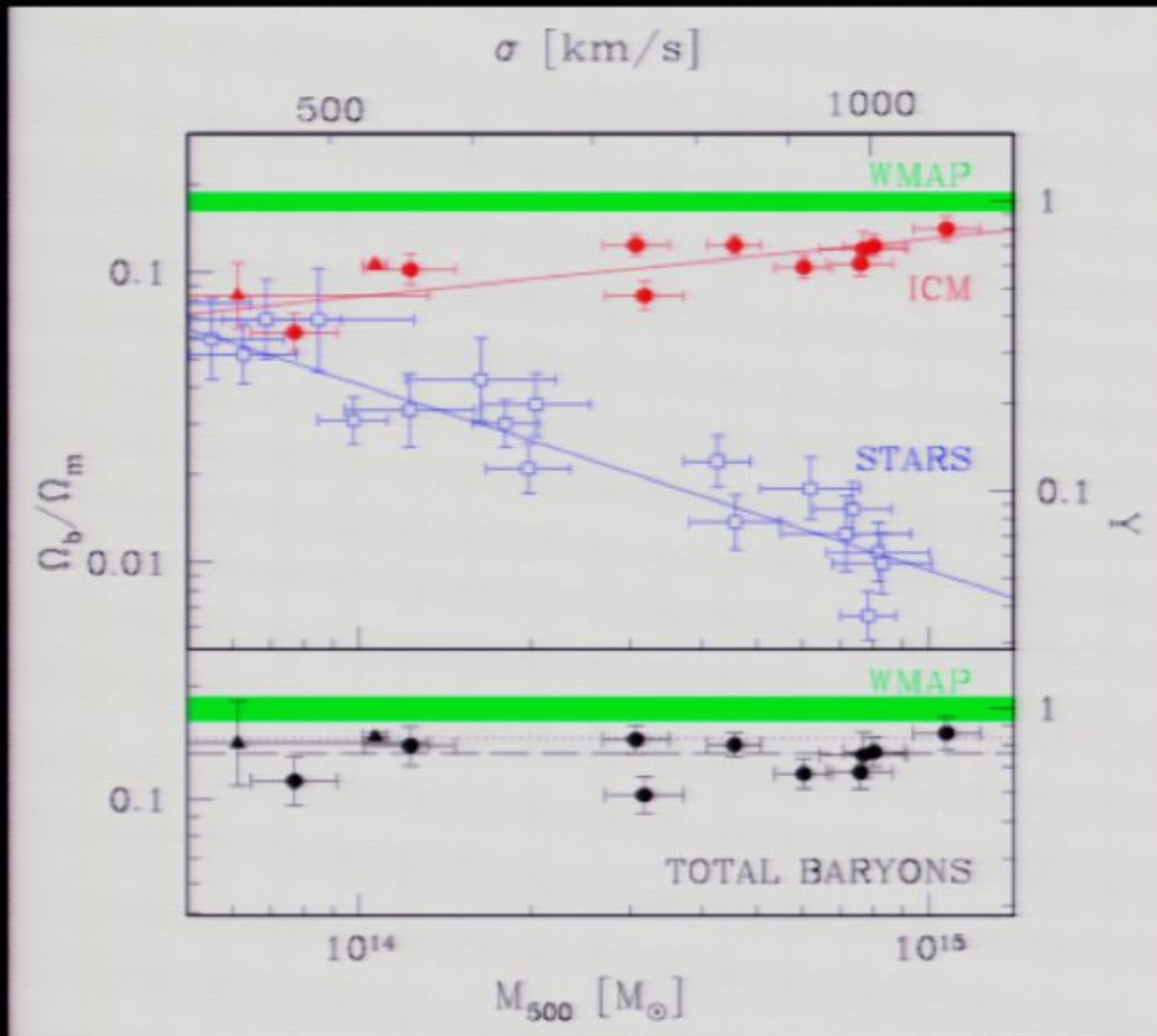


Gonzalez, Zaritsky & Zabludoff 2007

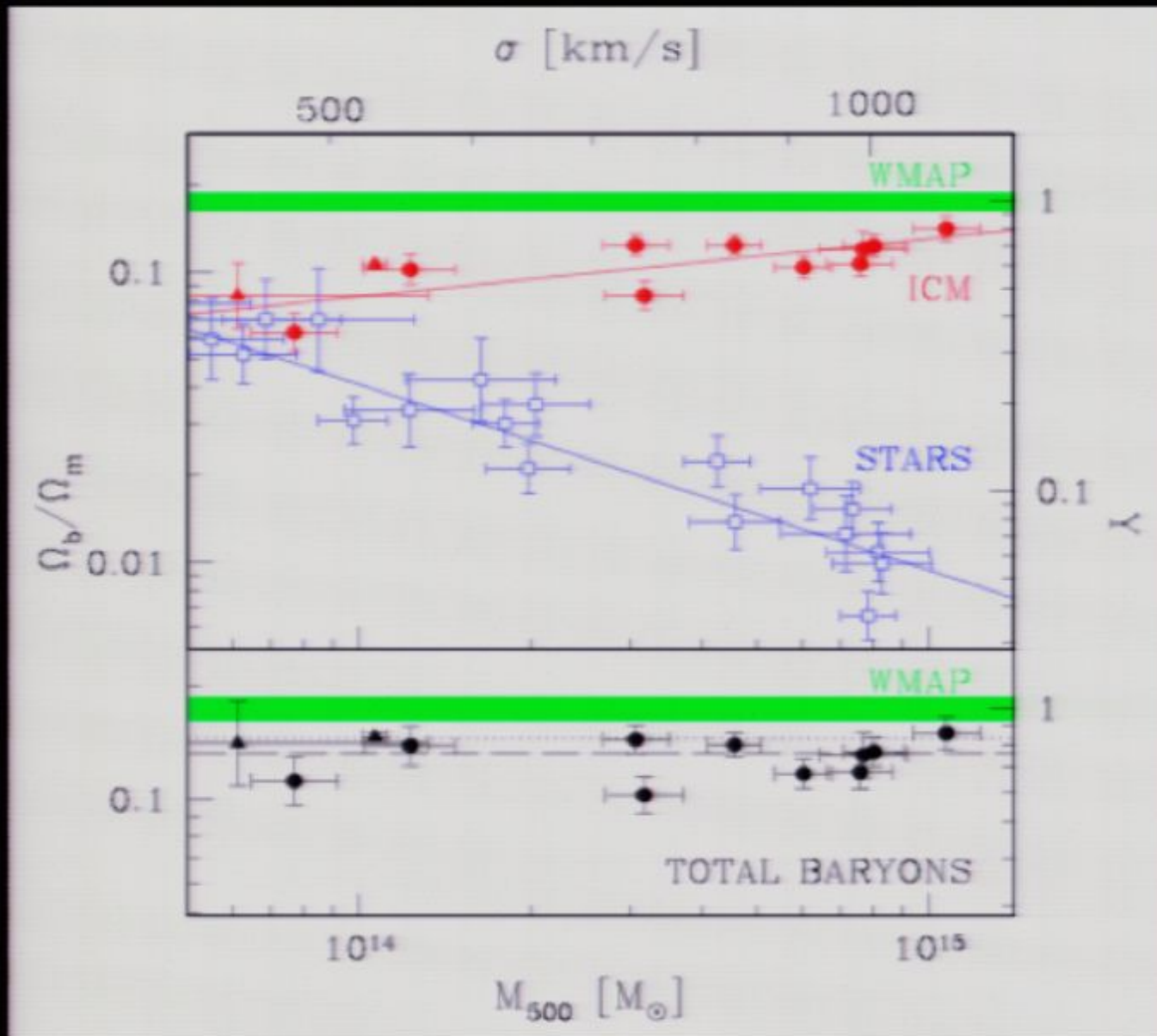


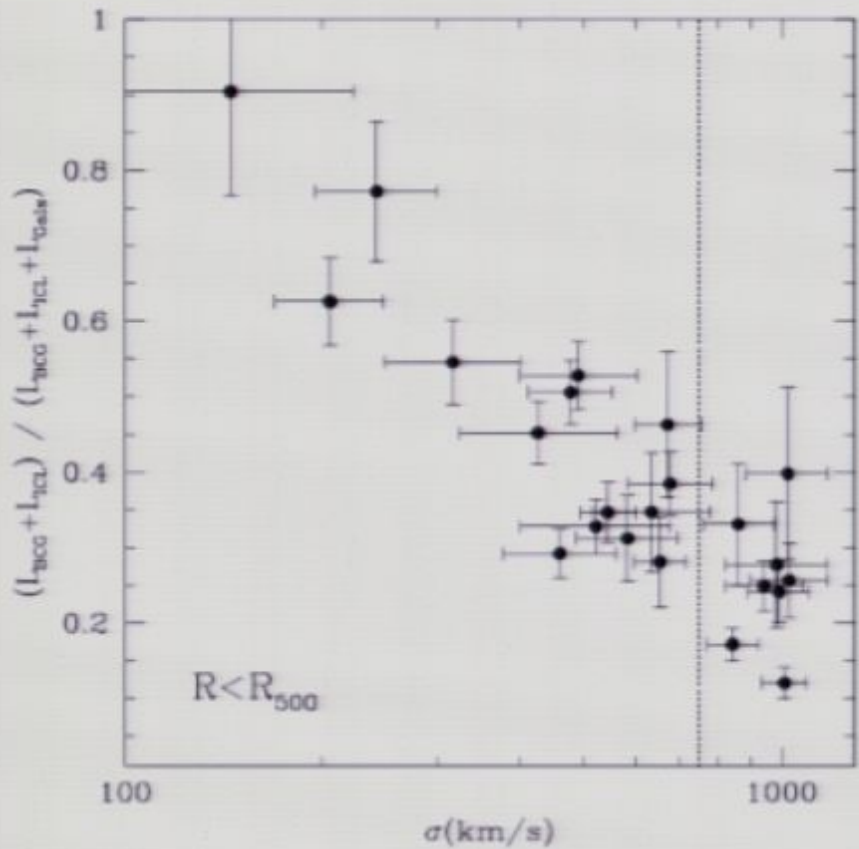
Purcell, Bullock, & Zentner 2008

a full accounting?

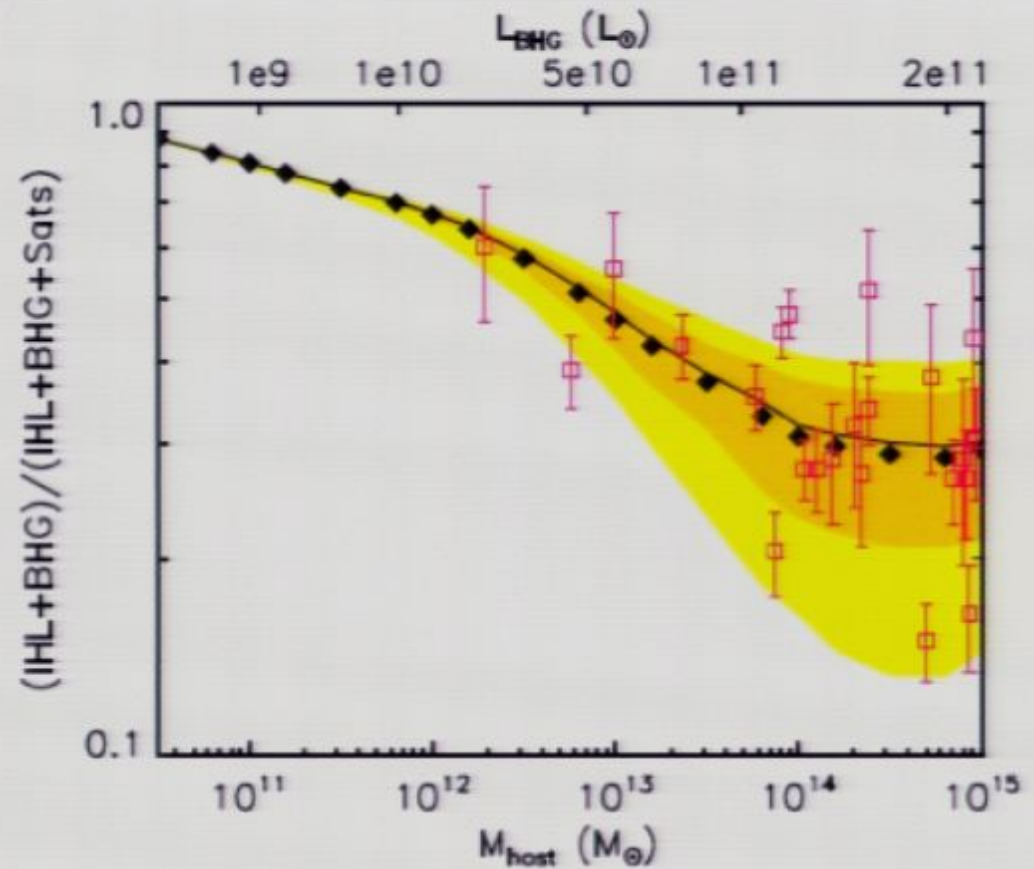


a full accounting?





Gonzalez, Zaritsky & Zabludoff 2007



Purcell, Bullock, & Zentner 2008

a full accounting?

