

# The Evolution of Galaxies Mergers to $z \sim 3.5$

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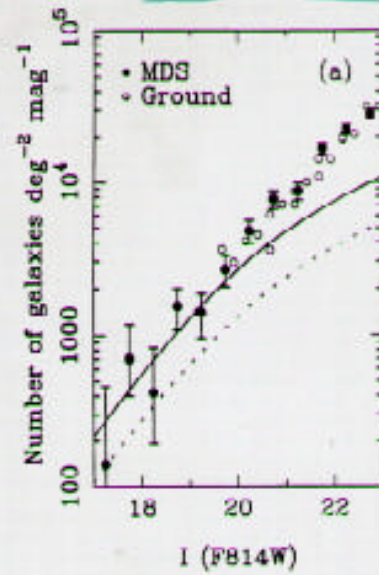
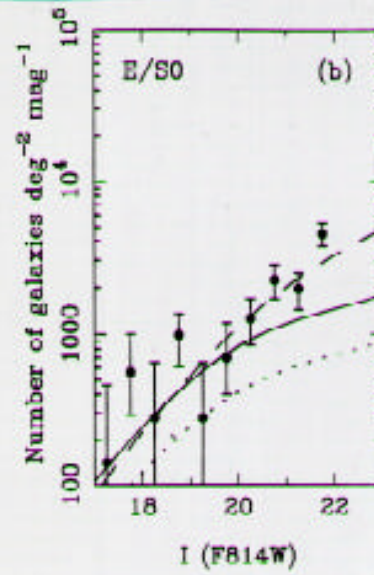
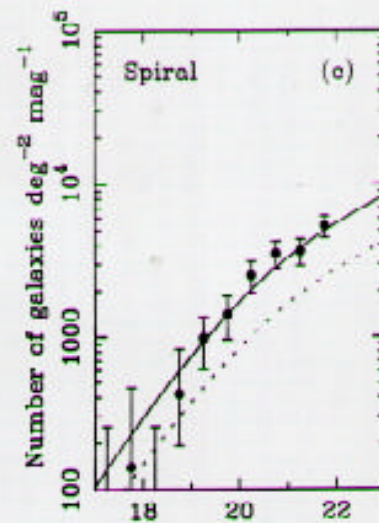
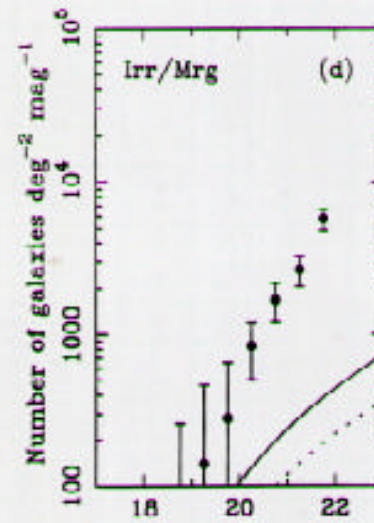
Collaborators: Mark Dickinson, Matt Bershadsky, Jay Gallagher and  
NICMOS HDF team

# Why Study Interacting Galaxies?

- Are interactions/mergers a (or the) primary mechanism for forming galaxies?
- Do interactions/mergers drive the evolution of galaxy morphology and structure?
- Are starbursts/AGN triggered by interactions/mergers?
- How do galaxy interactions/mergers evolve with cosmic time, and relate to star formation, history, nuclear activity and mass assembly?

***Solution: Look at high redshift***

# HST MEDIUM-DEEP SURVEY



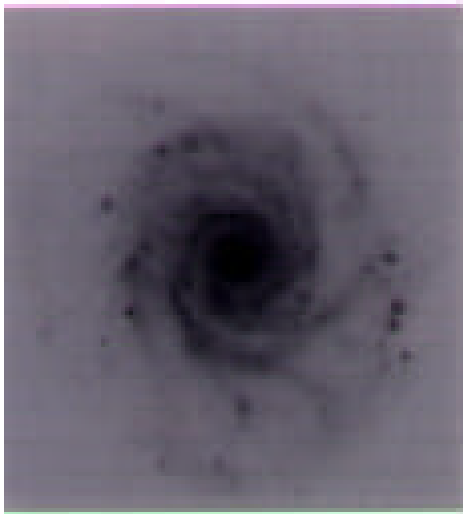
# Physical Morphology

- Philosophy behind method
- Nearby Galaxies
  1. Calibration
  2. Robust Method (Noise, Resolution, Center)
  3. Correlations with Galaxy Populations
- Galaxy Asymmetry

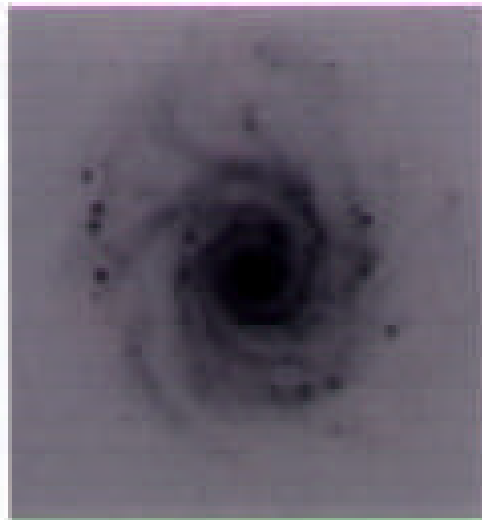
# Galaxy Asymmetry

- Physical Measure (e.g. Rix & Zaritsky 1995; Conselice 1997)
- Morphological Parameter (e.g. Schade et al. 1995; Abraham et al. 1996; Conselice 1997; Conselice et al. 2000a,b)
- Two Kinds of Asymmetry
  - a. Dynamic – Galaxy Interactions
  - b. Flocculent – Star Formation
- Correlation with color and kinematics
  - a. Can use to trace evolution of galaxy populations
  - b. Can be used to find objectively galaxy mergers/interactions

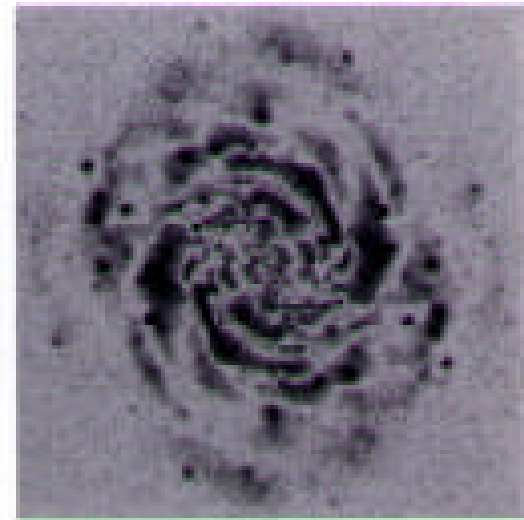
## Asymmetry Computation



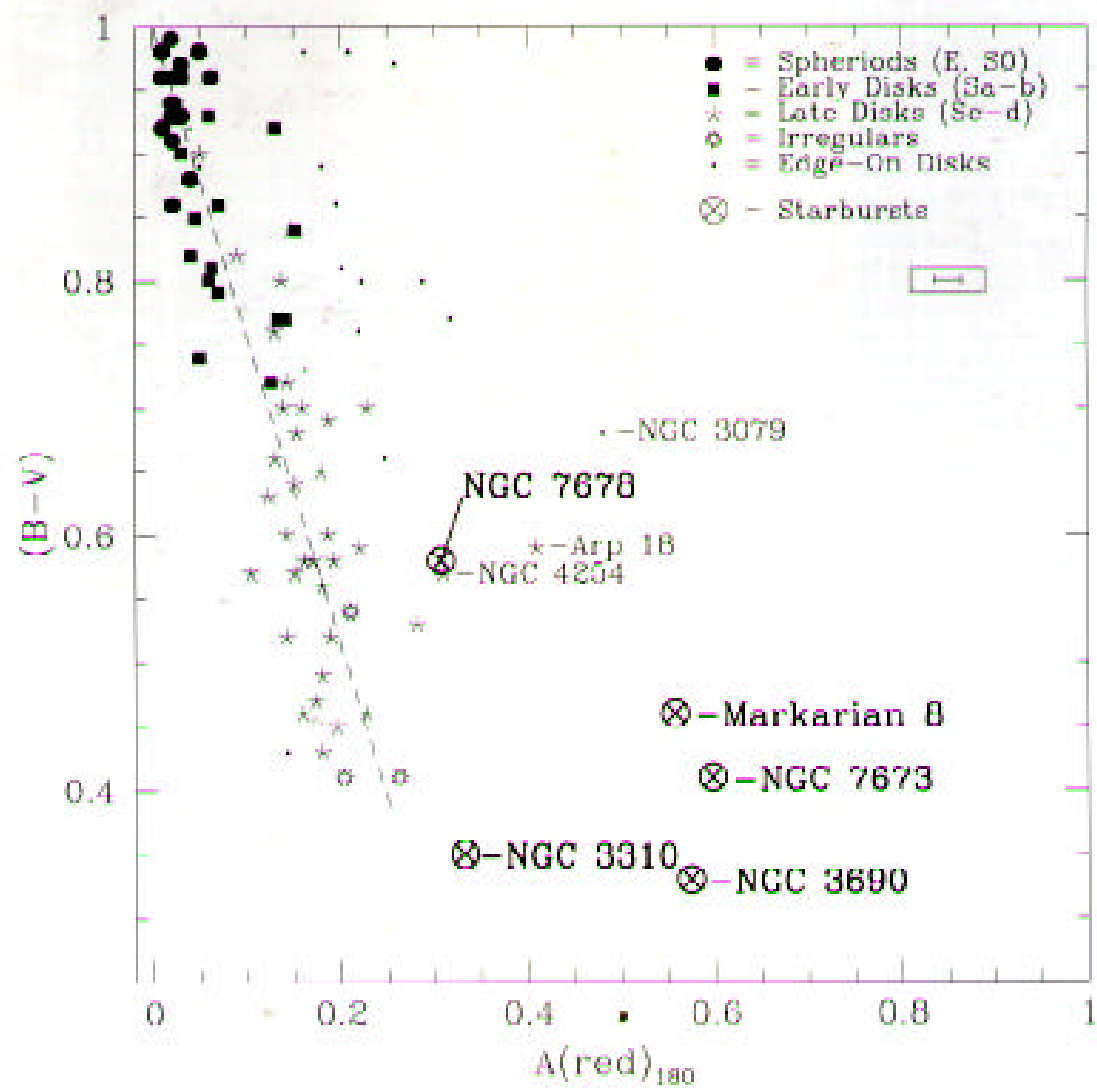
Original



Rotated

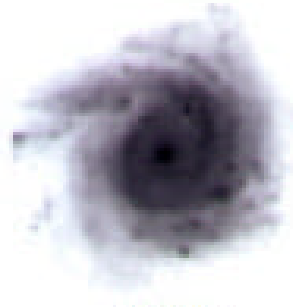


Subtracted

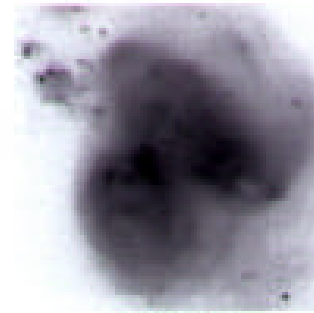




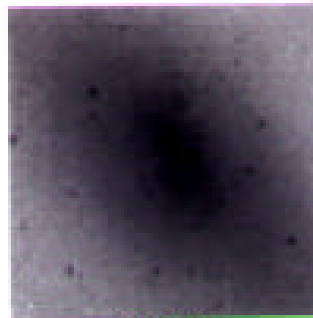
Markarian 8



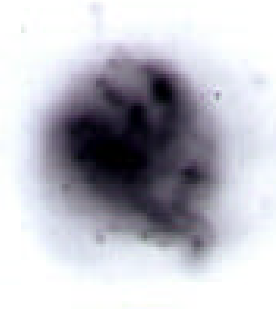
NGC 3311



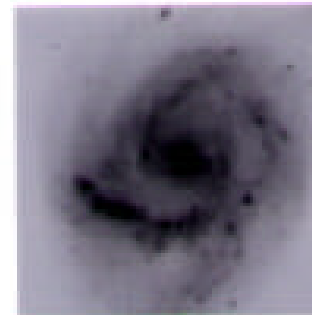
NGC 3921



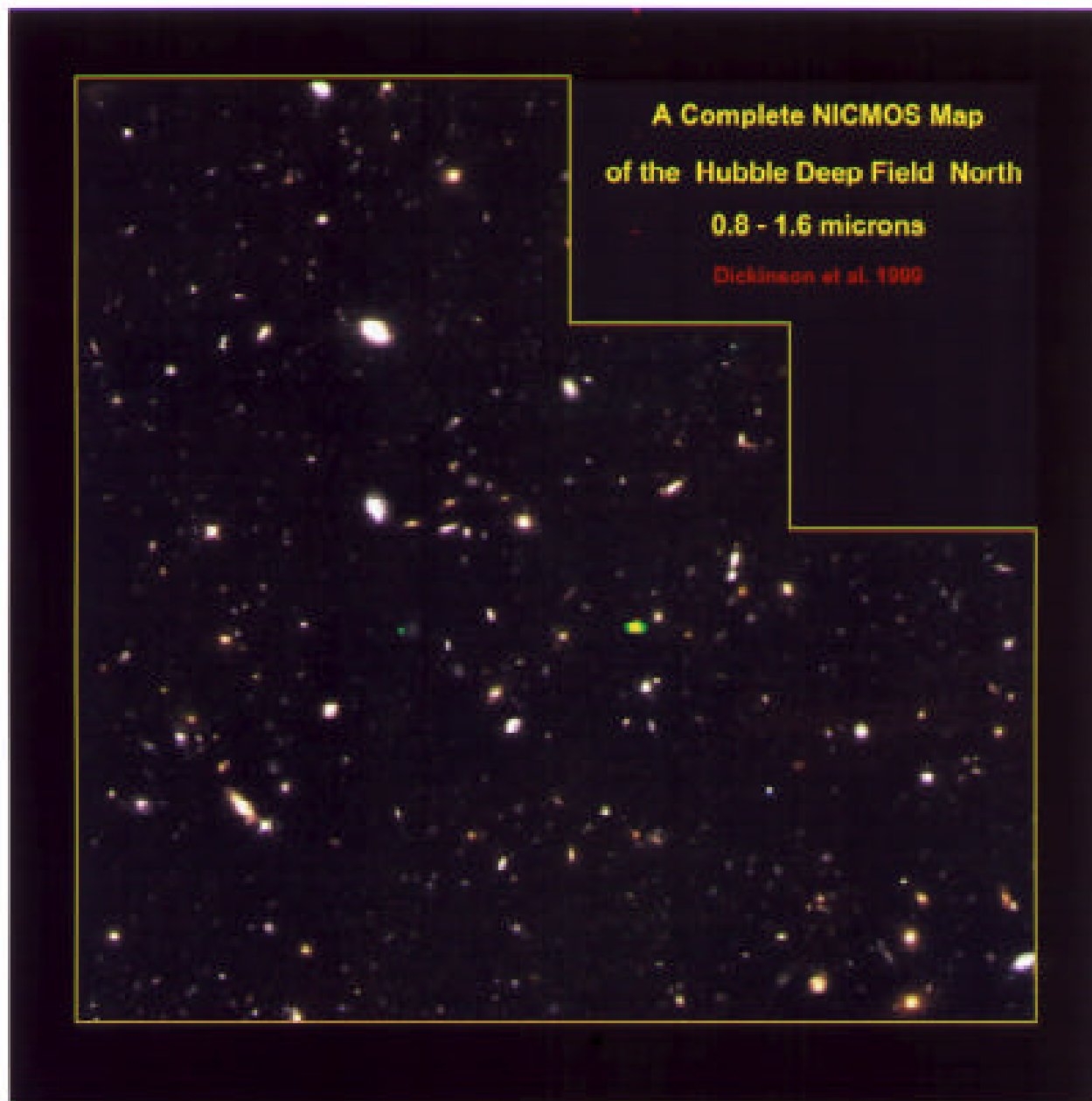
NGC 5251

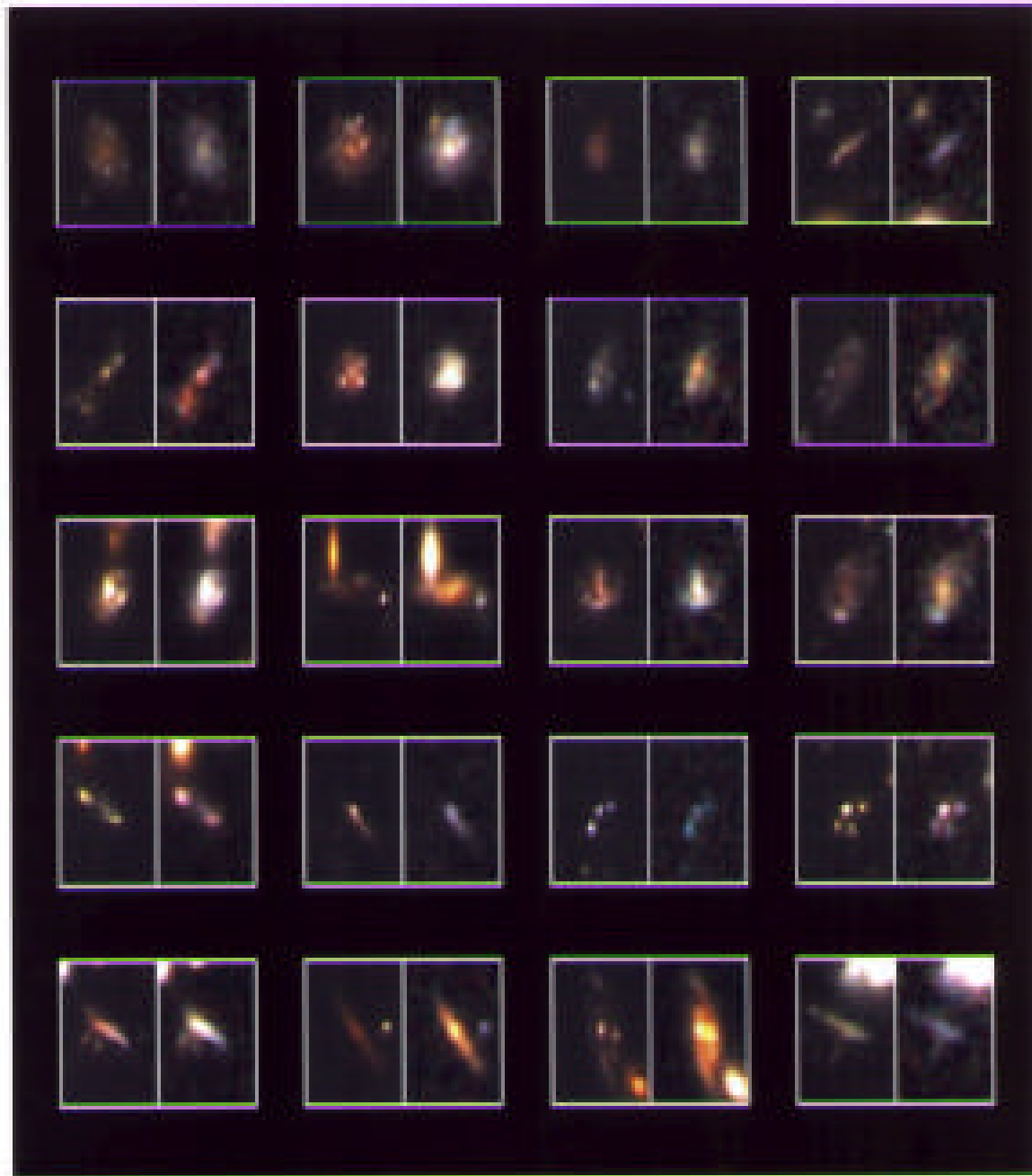


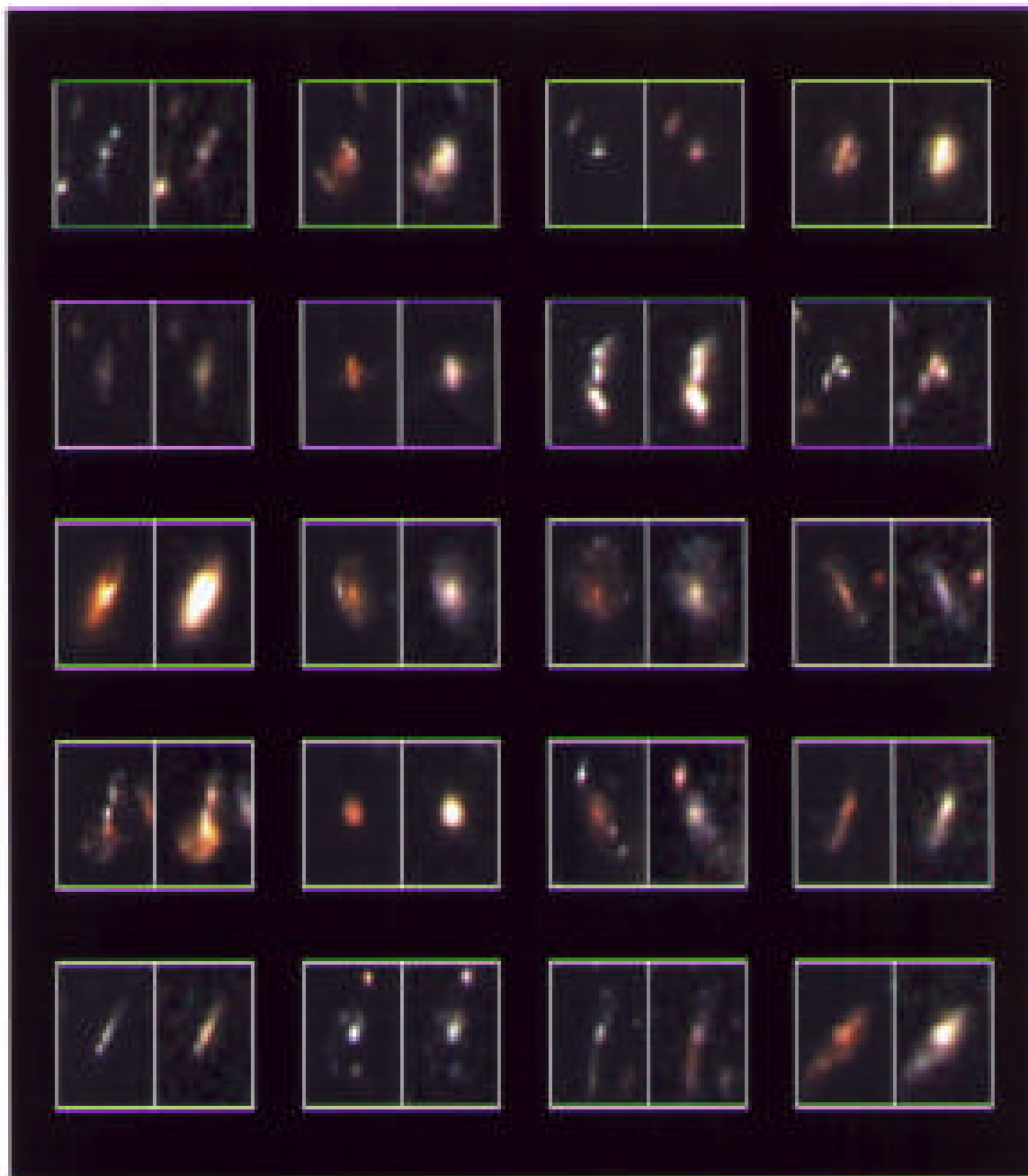
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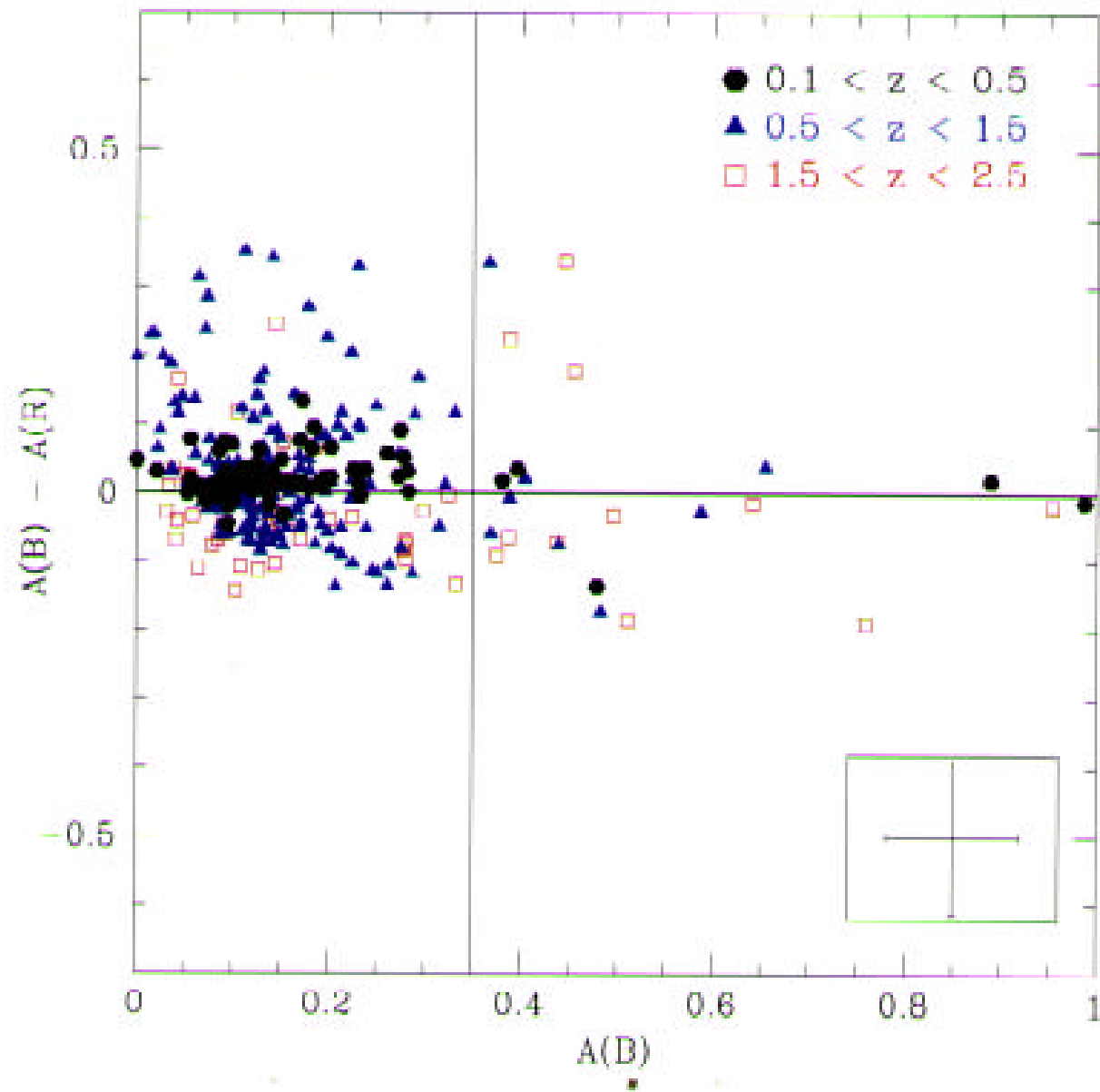


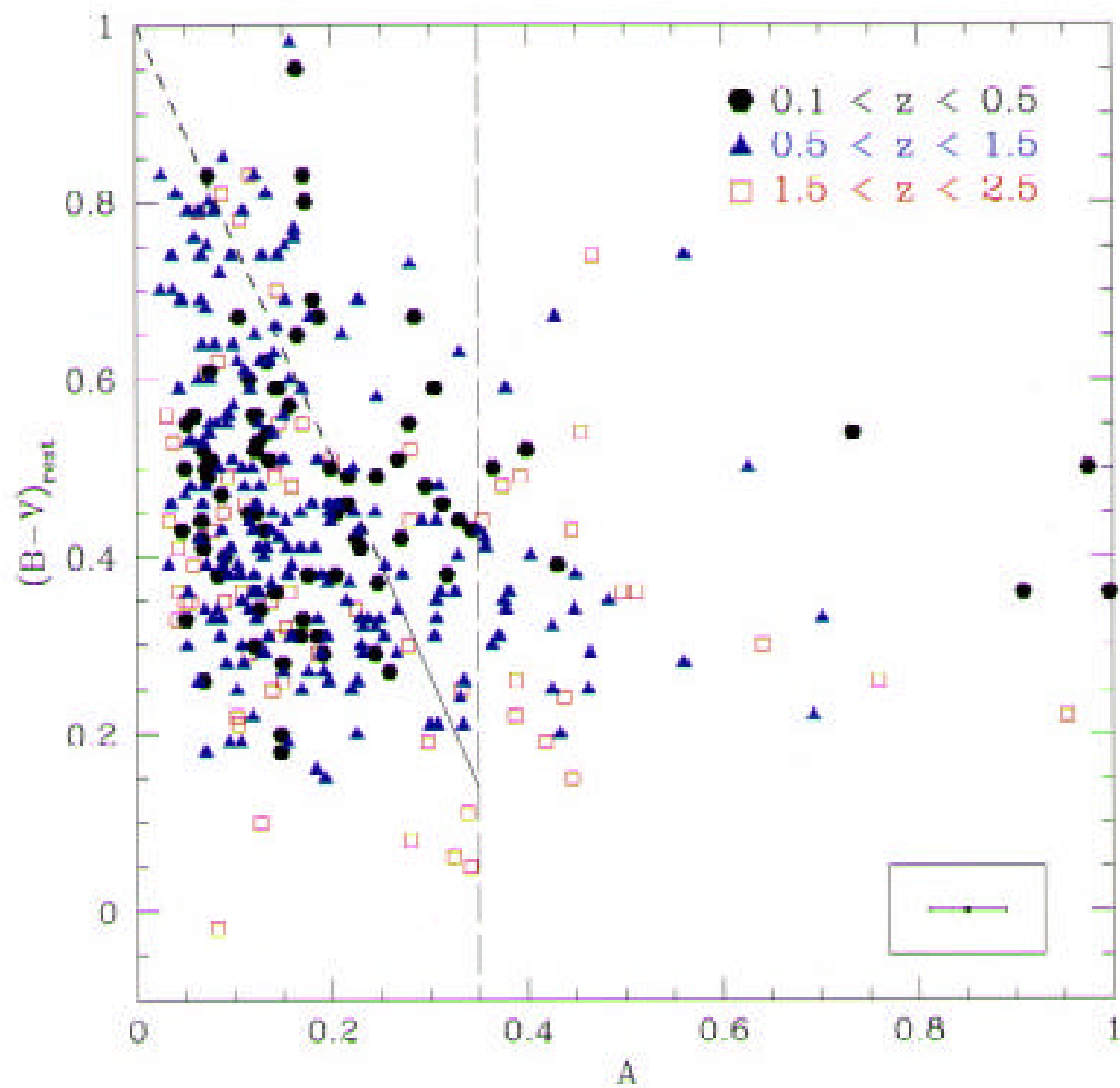
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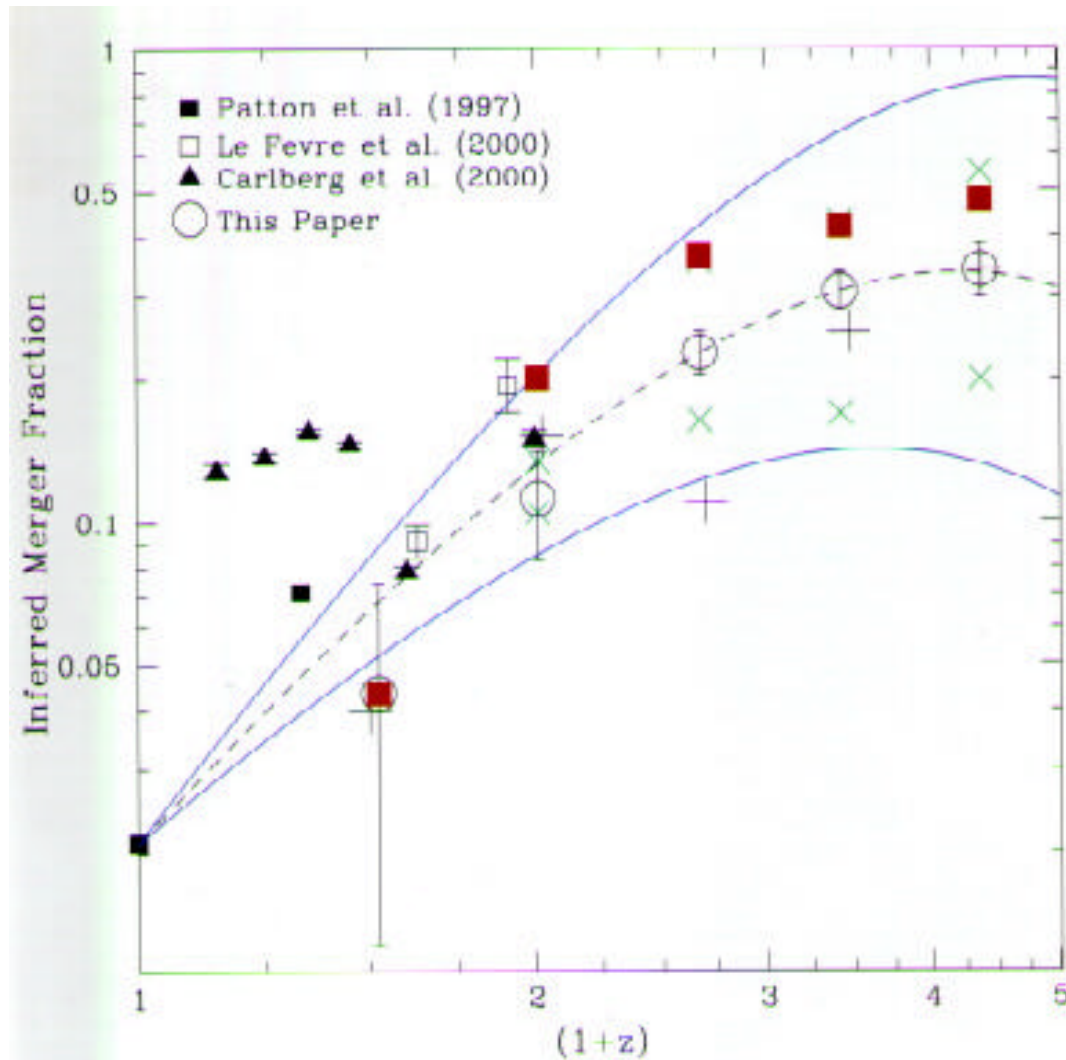












Conselice, Bershady & Dickinson  
(2001)