Durham University

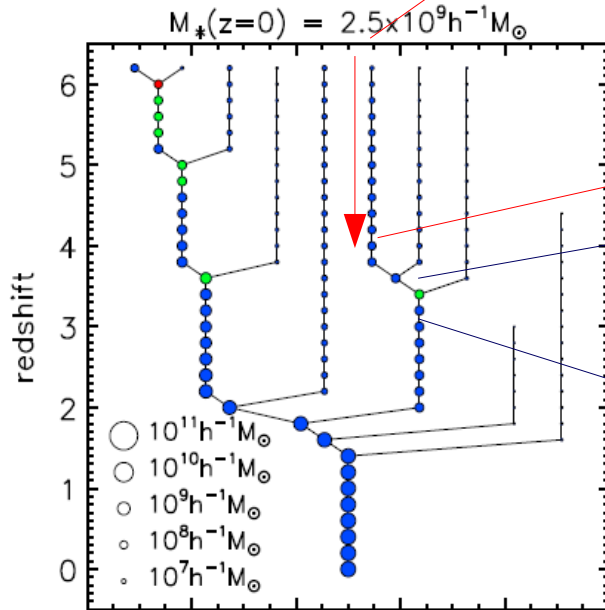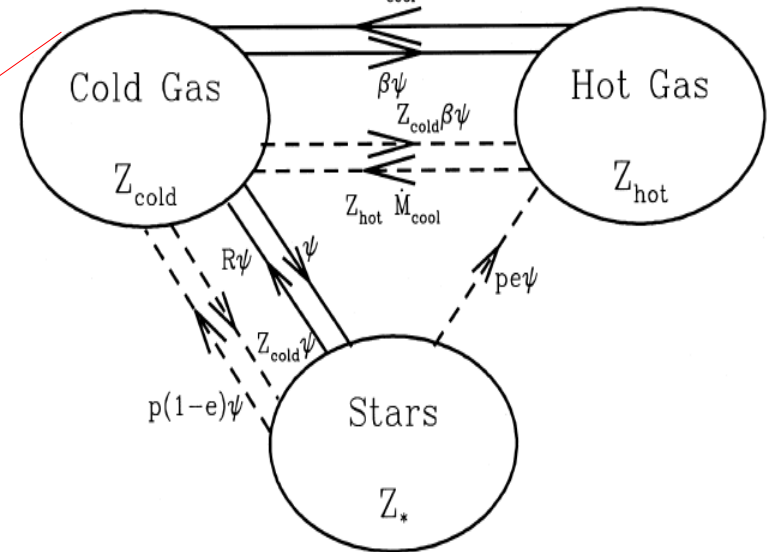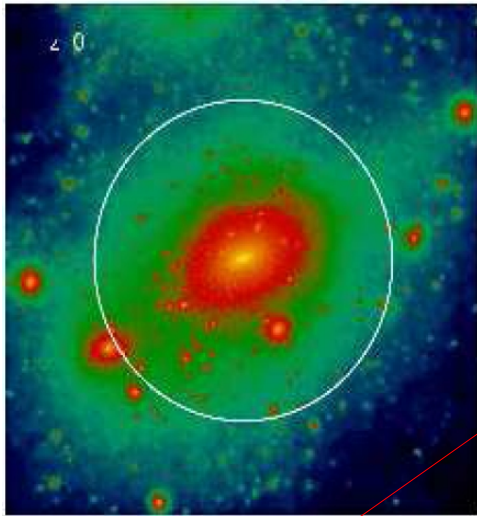ICC · Institute for Computational Cosmology

How can new surveys test the physics of galaxy formation?

Claudia Lagos, Carlton Baugh, Cedric Lacey,
Richard Bower, Andrew Benson, Violeta Gonzalez-Perez,
Alex Merson, Nikos Fanidakis...

The galaxy formation model
(Cole et al., 2000; Baugh et al., 2006, Benson et al. 2010)

Merger trees + numerical treatment for the baryonic physics
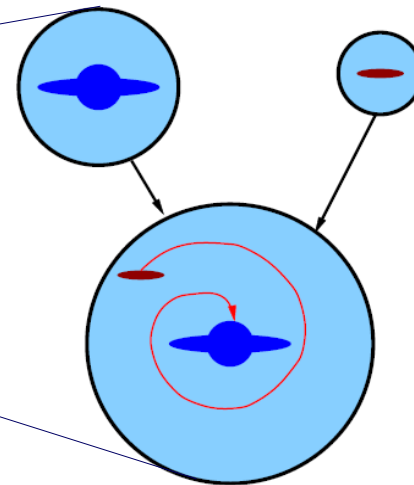
Gonzalez et al. (2011)

The predictive power of GALFORM: its multiwavelength nature

→ State-of-the-art dust treatment and SED construction (Lacey et al. 2011)

→ State-of-the-art star formation treatment (Lagos et al. 2011)

→ State-of-the art black hole growth treatment (Fanidakis et al. 2011a,b)

→ Most successful model to date on red galaxies (Bower et al., 2006; Gonzalez-Perez et al., 2010,2011)
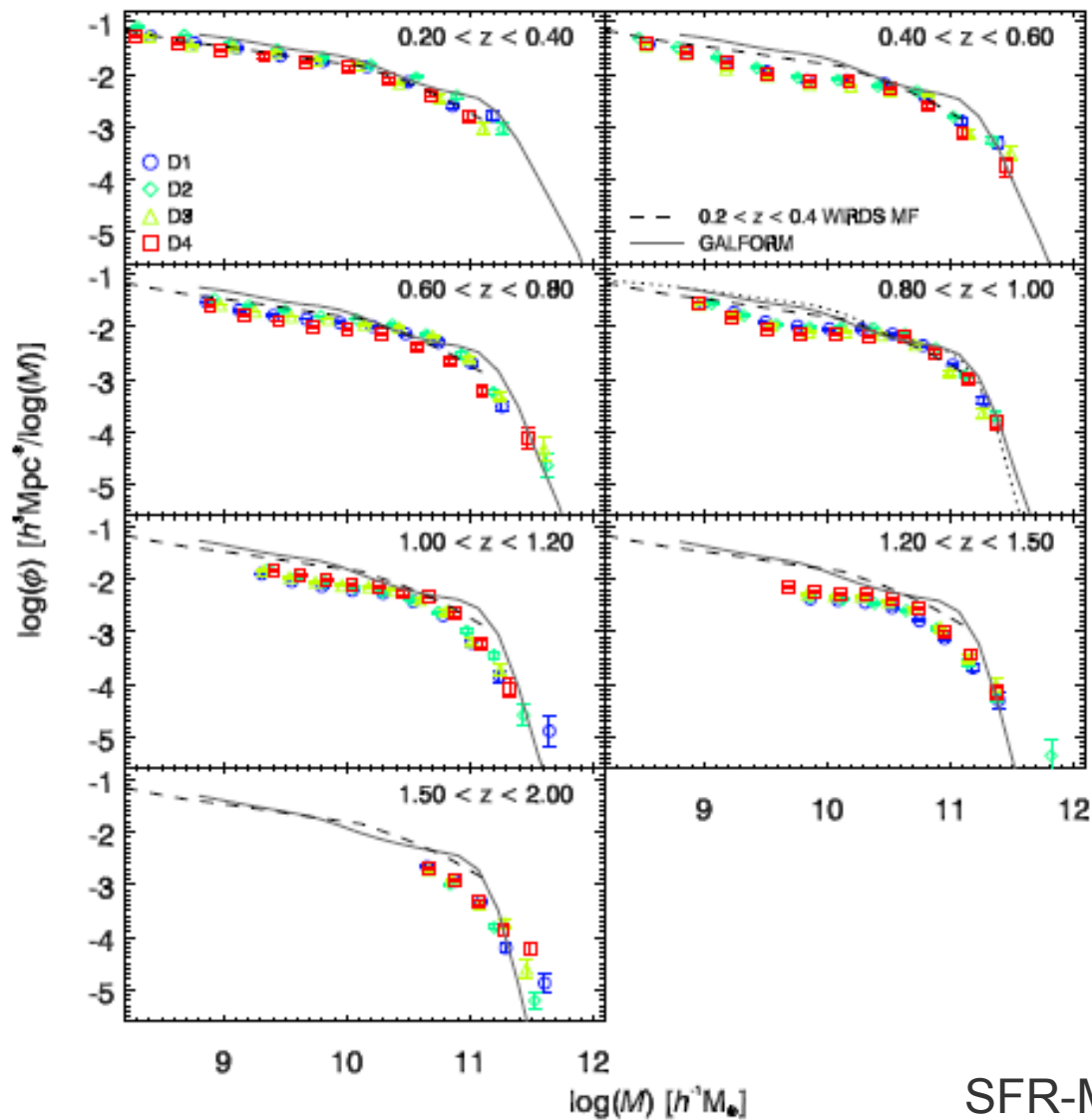
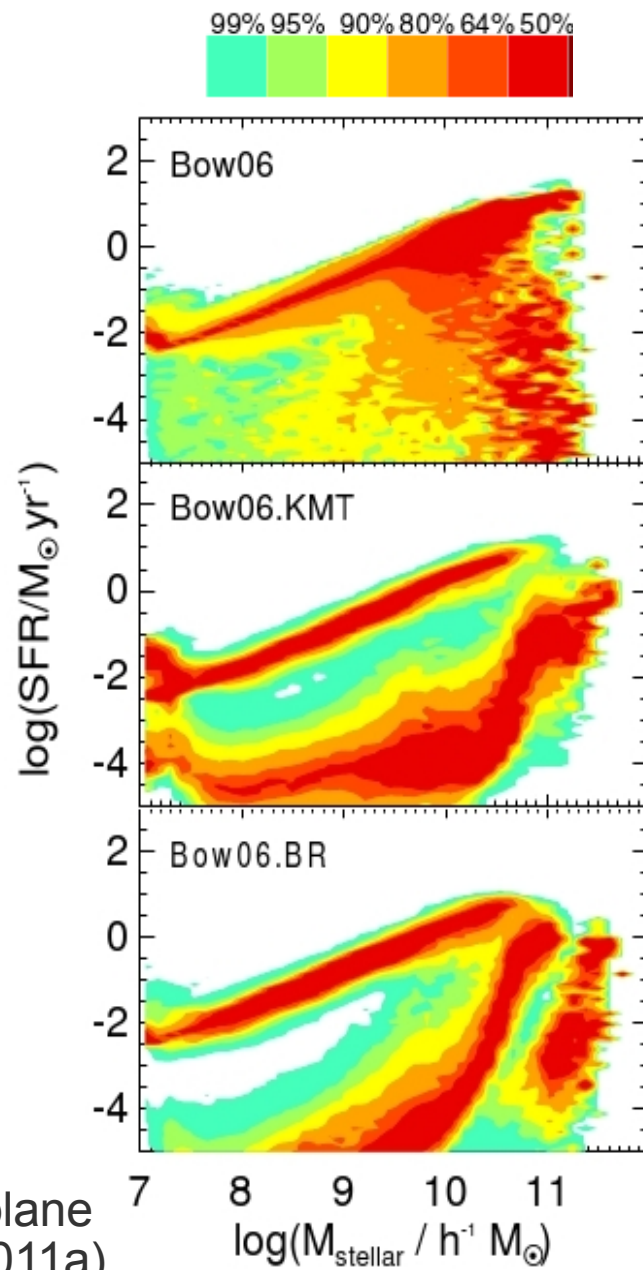**VST-ATLAS**
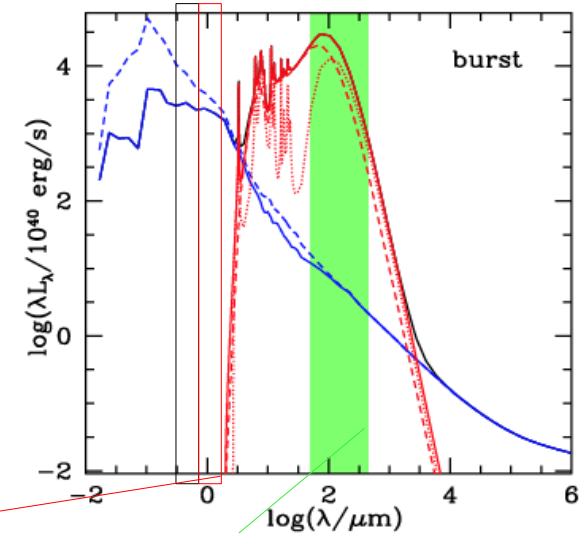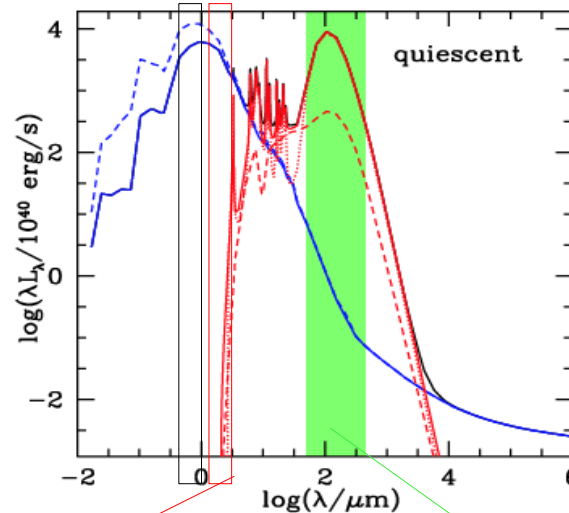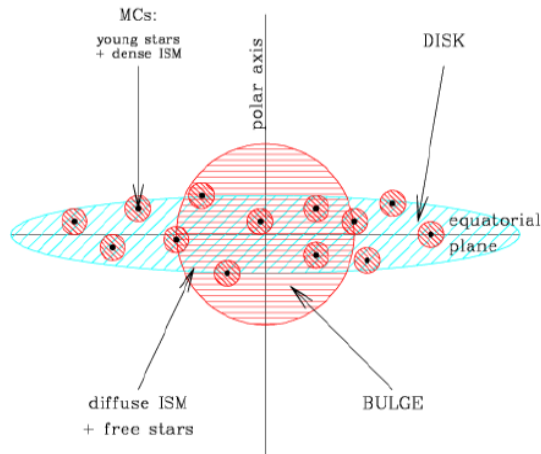
VIKING (VISTA KIDS)

Herschel (Peder's talk)
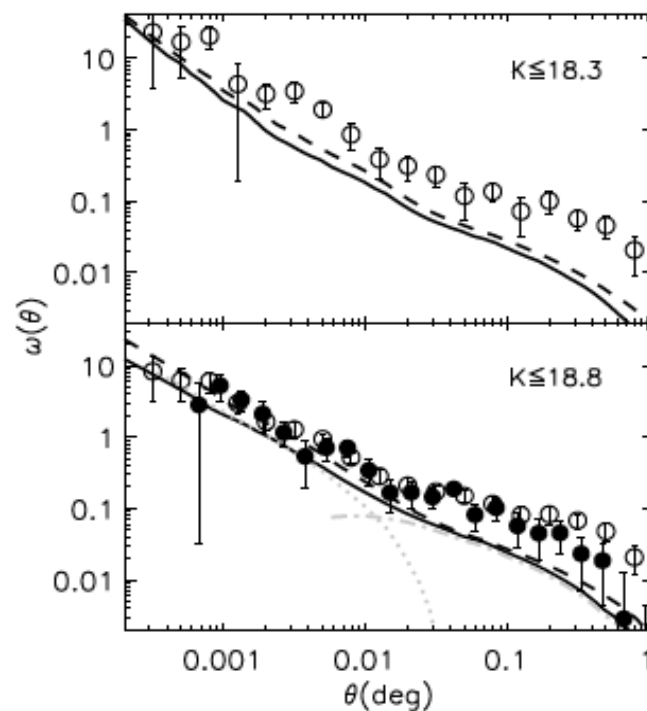
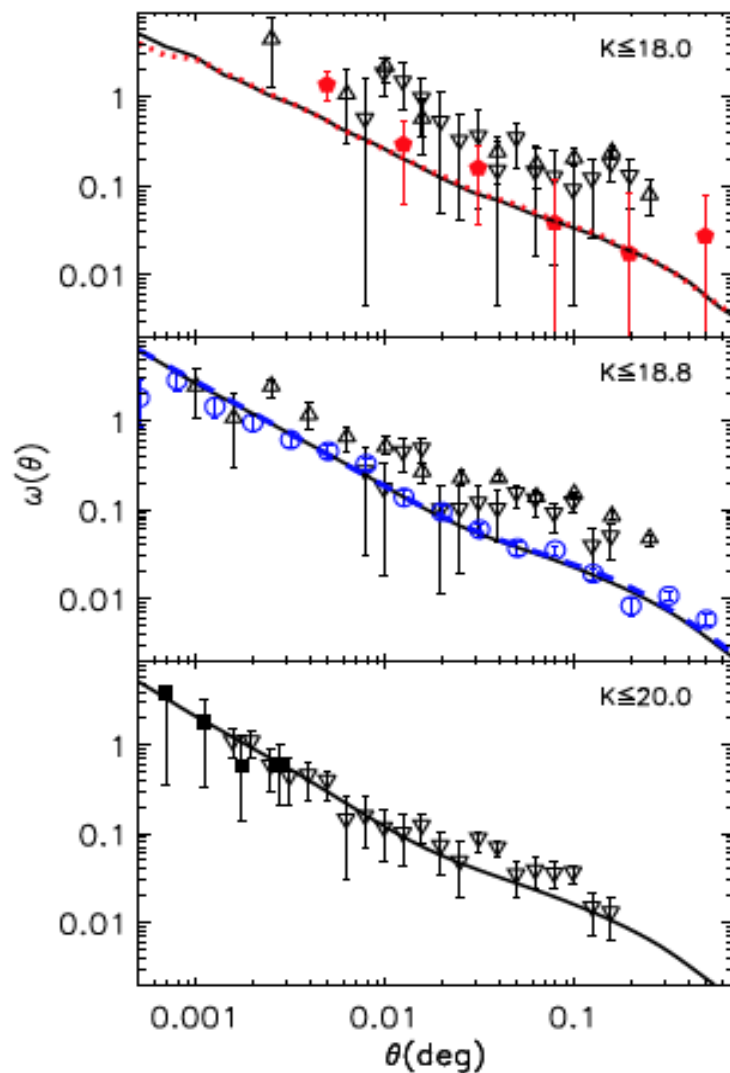Stellar mass functions (Bielby et al. 2011)

SFR-Mstellar plane
(Lagos et al. 2011a)

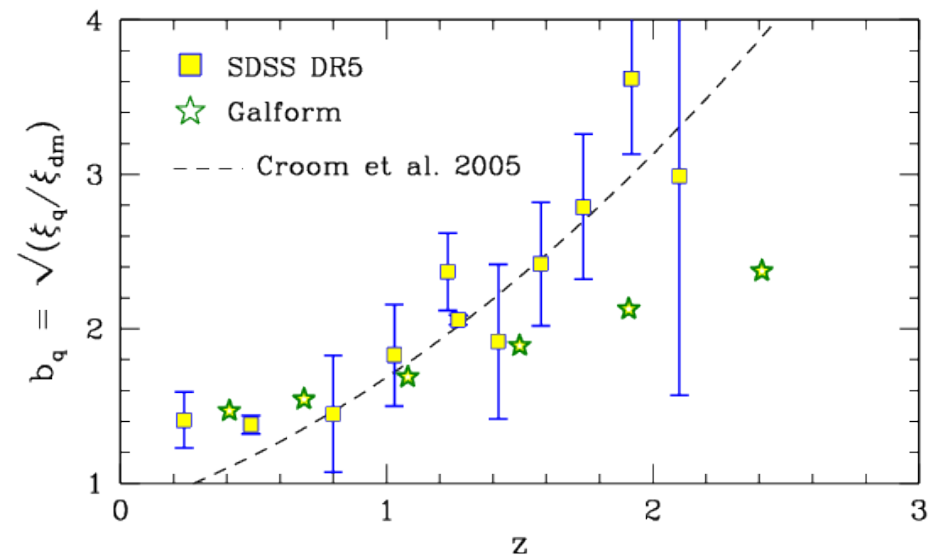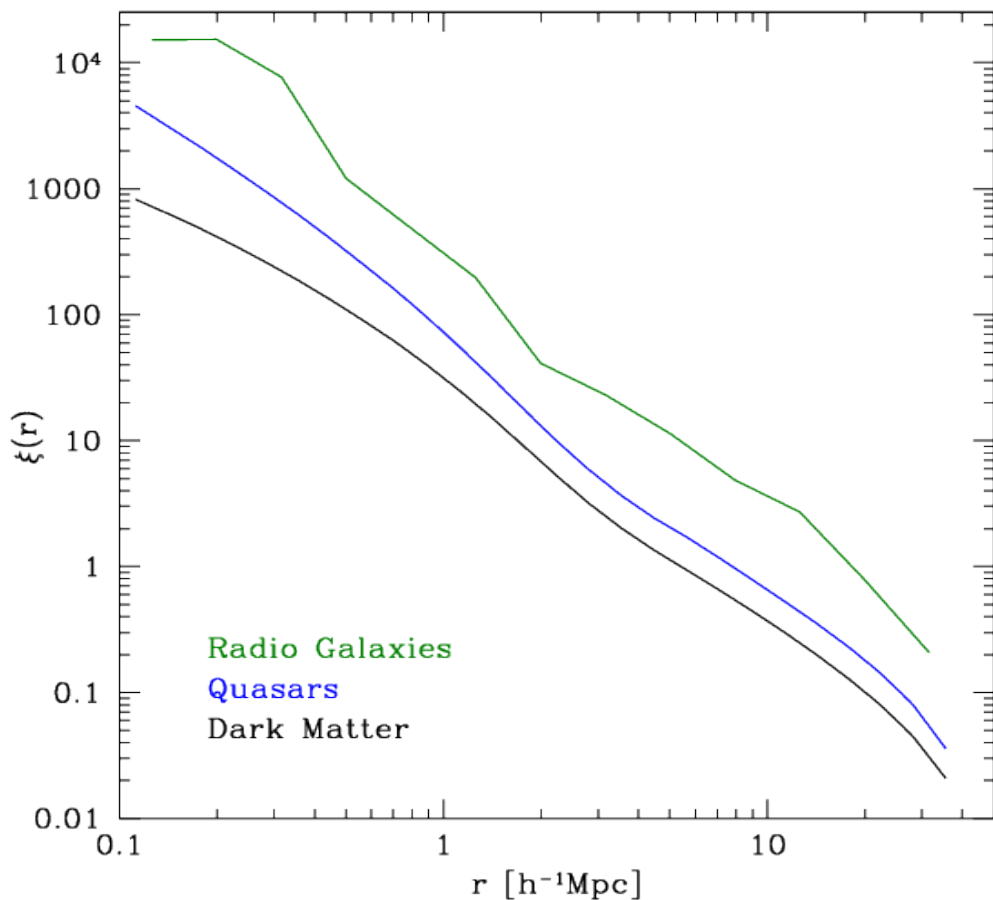# Aside science cases VST ATLAS+ KIDS+VIKING on galaxy evolution

LRGs and colour-selected EROs clustering (Gonzalez-Perez et al. 2011)

QSOs clustering Fanidakis et al. (2012, in prep.)

Conclusions

→ Galaxy formation models are very successful at explaining available observations of galaxies: luminosity functions, colours, metallicities, gas contents, multi-wavelength data, etc. However...

→ VST ATLAS + KIDS + VIKING: constraints on galaxy formation model predictions:

- Stellar mass functions
- SFR-Mstellar relations: passive/normal/starburst galaxies
- LRGs/EROs: clustering, mass functions, etc.
- QSOs: clustering, luminosity functions.