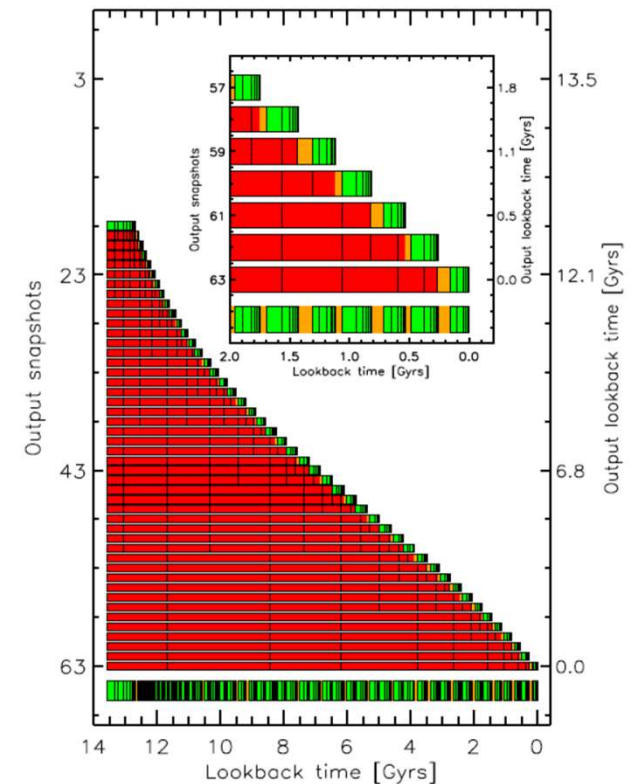
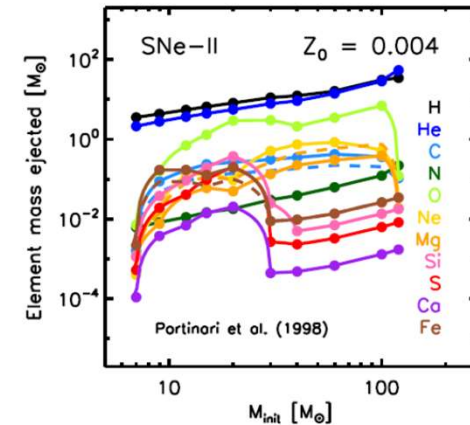


GCE in...

L - GALAXIES

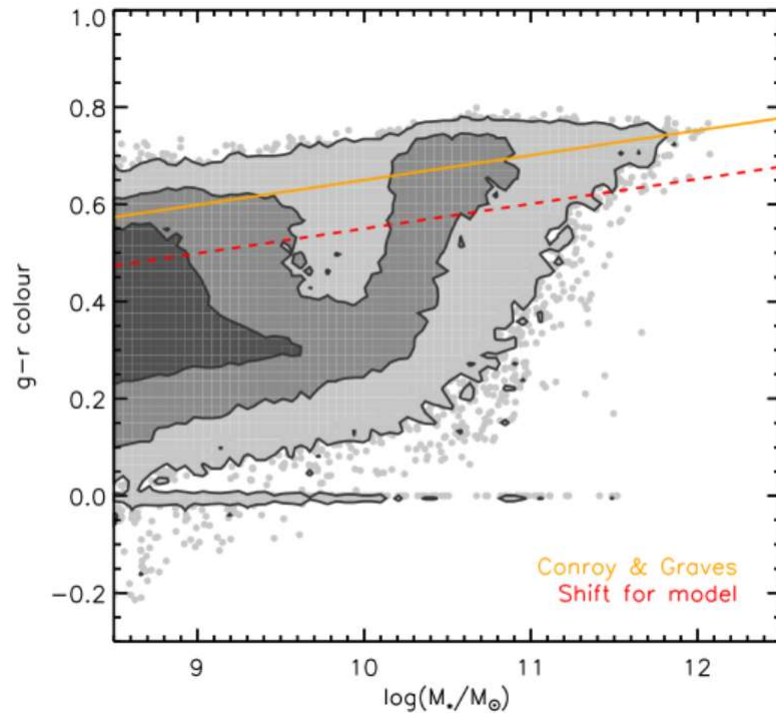
- Same implementation as in Yates+13:
 - Delayed enrichment from SNe-II, SNe-Ia, and AGB stars
 - Mass- and metallicity-dependent yields & stellar lifetimes (Portinari+98; Thielemann+03; Marigo+01)
 - Constant Chabrier+03 IMF
 - Power-law SN-Ia DTD (Maoz+12)
 - Store SF and metallicity histories
 - SN feedback occurs when stars die

- Main changes:
 - Percentage of stars that form as SN-Ia progenitors:
Before: $A' = 0.108\%$ Now: $A' = 0.154\%$
 - Fraction of SN ejecta directly enriching hot gas:
Before: $f_{SNII} = f_{SNI\alpha} = 0.0$ Now: $f_{SNII} = f_{SNI\alpha} = 0.3$
 - SN energy parameter:
Before: 2.5×10^{-51} erg Now: 5×10^{-51} erg

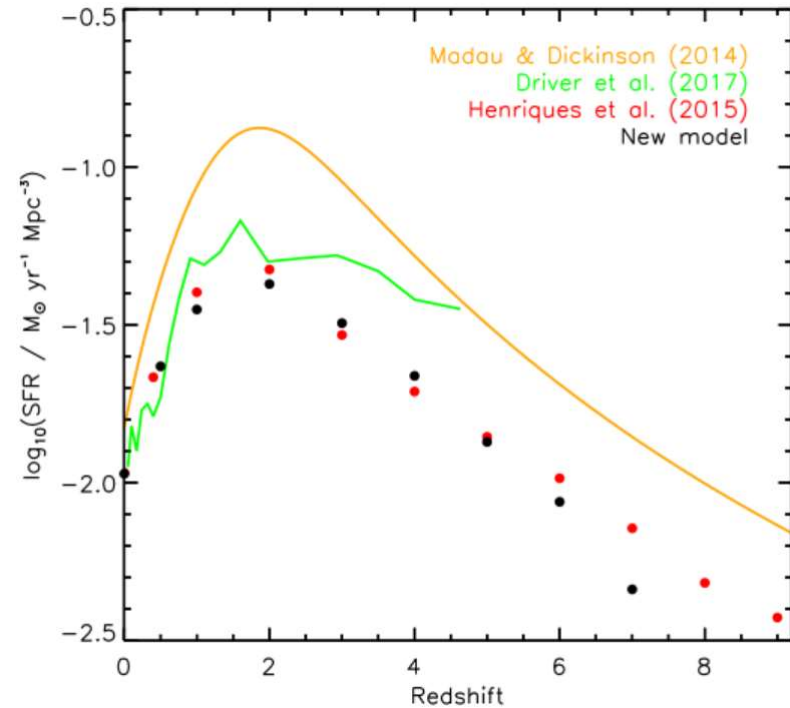


General galaxy properties

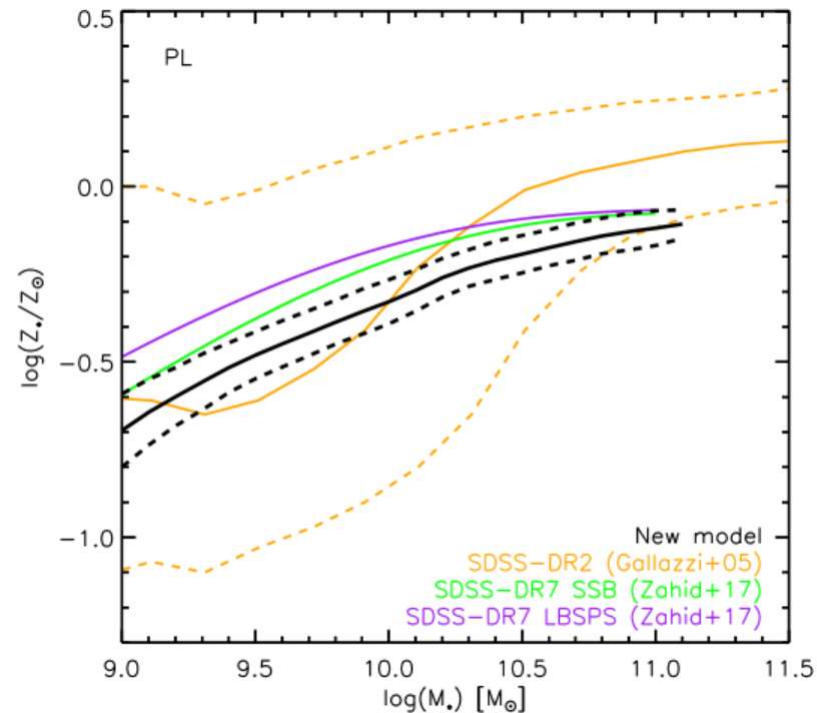
L - GALAXIES



- Galaxy colours are systematically bluer than in the Henriques+15 version of L-Galaxies



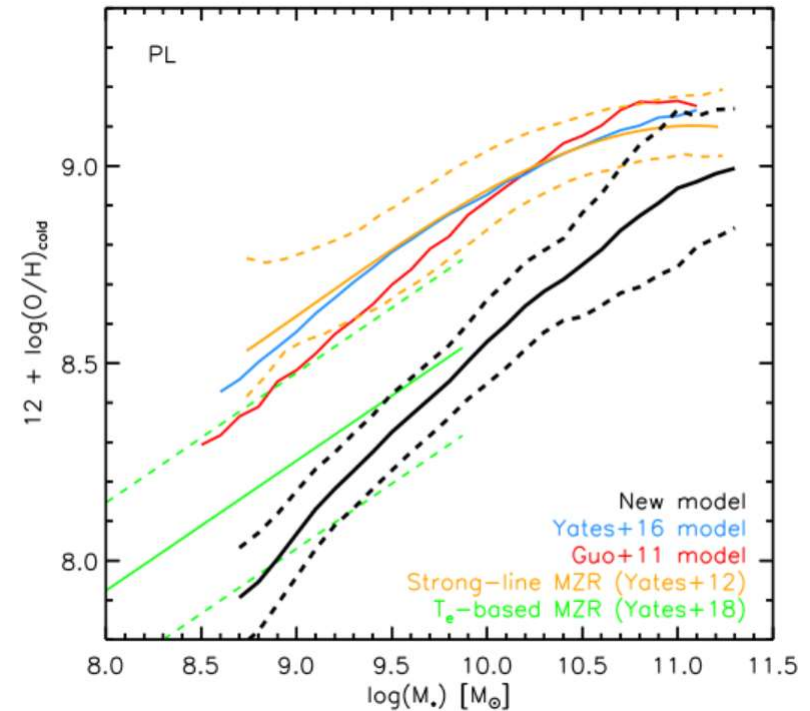
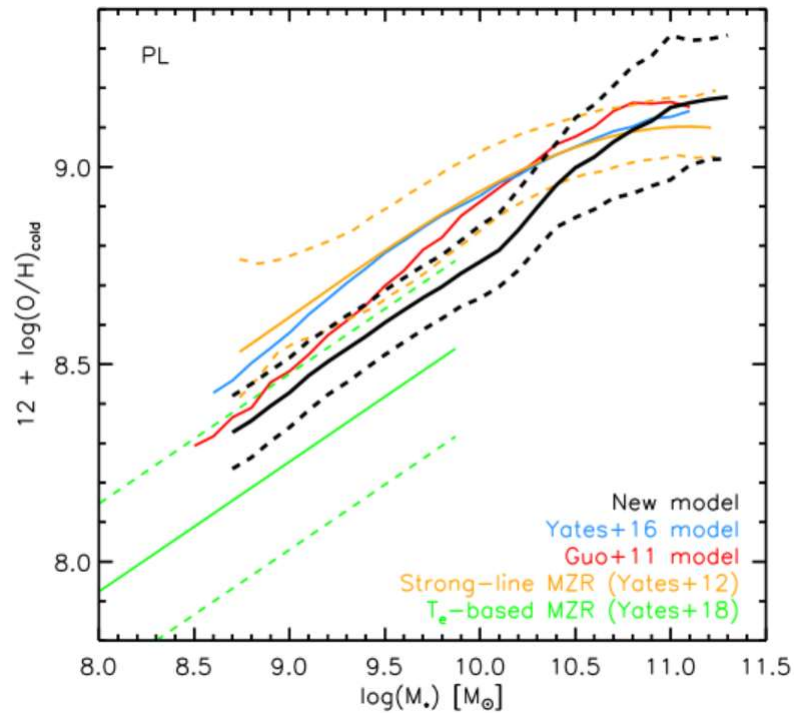
- Star formation is a little lower at high redshifts



- $MZ_{\star}R$ has similar slope to recent measurements for SDSS galaxies (Zahid+17)
 - Normalisation is a little low (perhaps expected, given bluer colours)
- However, model Z_{\star} is mass weighted, whereas observed Z_{\star} is V-band-luminosity weighted

Cold Gas: MZ_gR

L - GALAXIES



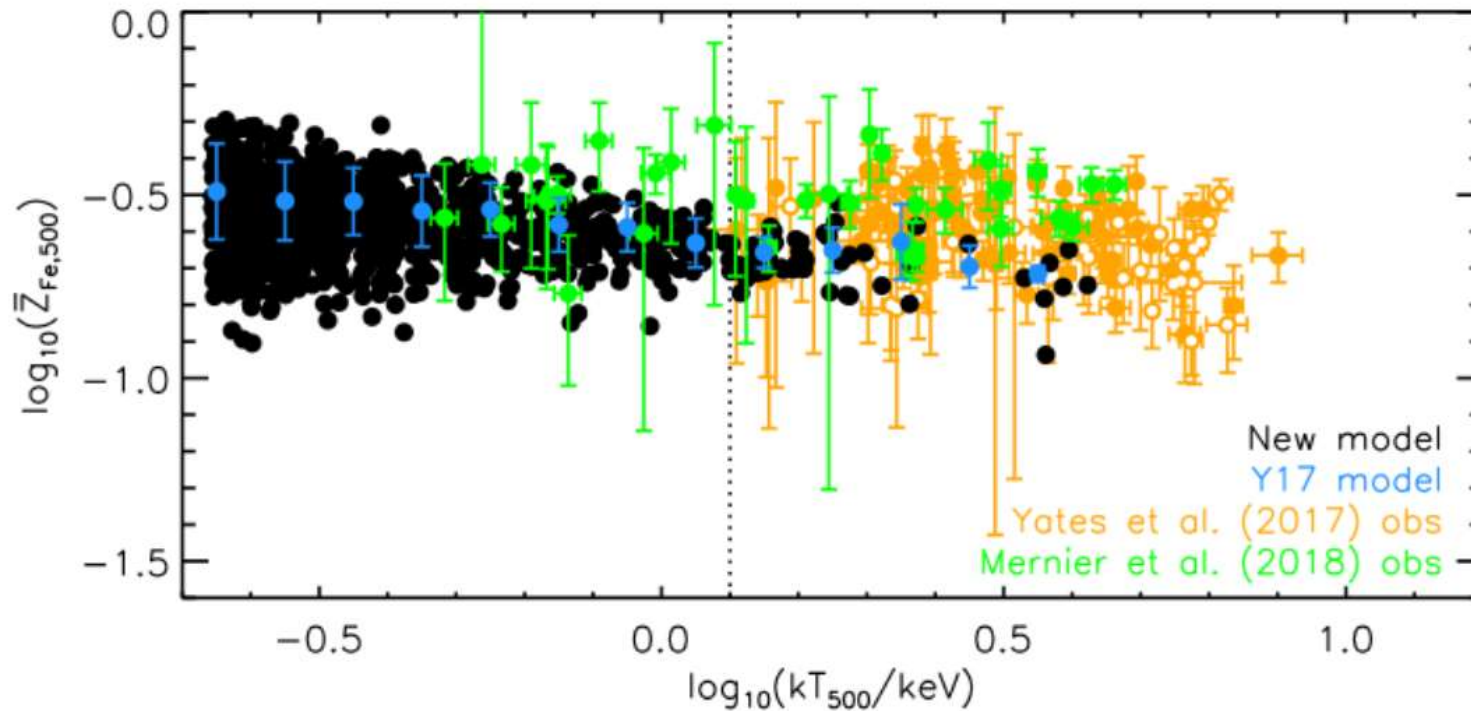
- SFR-weighted MZ_gR is closer to (my favourite) observed MZ_gR from strong-lines (orange)

- Mass-weighted MZ_gR is closer to (my favourite) observed MZ_gR from electron temperatures (green)

NB: Normalisation of the observed MZ_gR varies by up to ~ 0.6 dex.
Difficult to use as a constraint

Hot gas: $TZ_{\text{Fe}}R$

L - GALAXIES



- Iron abundance in model groups & clusters is in reasonable agreement with observations
- Improvements in X-ray spectral fitting and radial Fe gradient measurements for groups have brought observations in to line with models (Mernier+17,18)

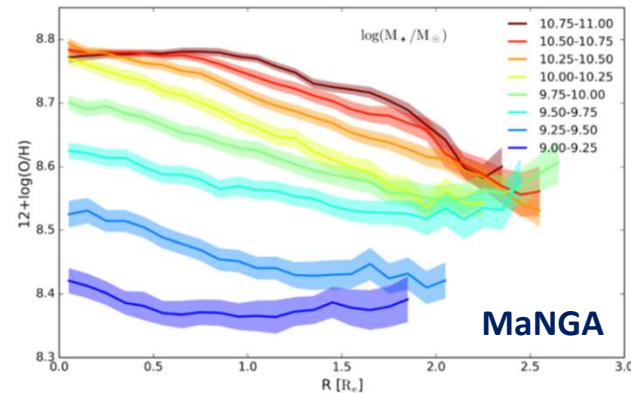
Follow-up paper on GCE

L - GALAXIES



- Main model paper (Henriques+):

- Present key redshift O scaling relations (MZ_R , MZ_gR , $TZ_{Fe}R$)
- Present Z_* and Z_g radial gradients in star-forming galaxies in stellar mass bins



- Follow-up GCE paper (Yates+):

- Evolution of the MZ_gR relation
- Evolution of metallicity gradients in galaxies. Dependencies on SFH and merger history, etc
- Chemical composition in low-redshift ETGs
- Chemical composition in the MW stellar disc (compare to APOGEE, AMBRE, GAIA-ESO, etc)
- Consider changes to the GCE set-up: ISM-density dependent direct ejection, constrain A' and f_{SN} using MCMC, etc...

