mind the gap:

Synergies between resolved star and integrated light studies of galaxies

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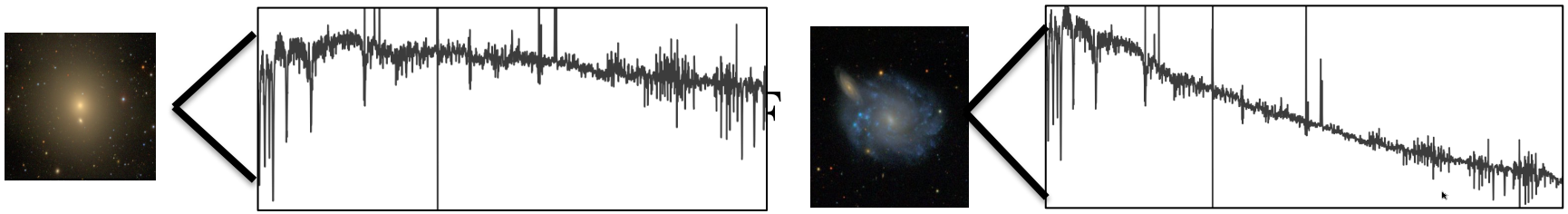
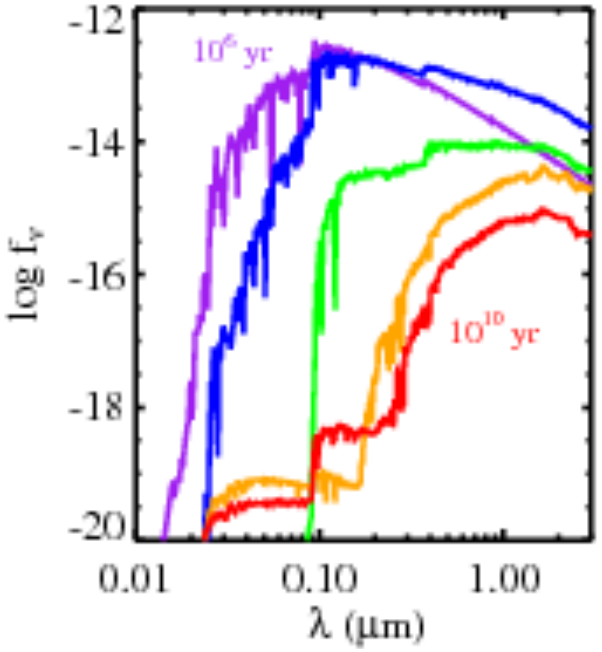
In collaboration with:
Julianne Dalcanton, Ben Williams, Dan Weisz, Ben Johnson, Charlie Conroy

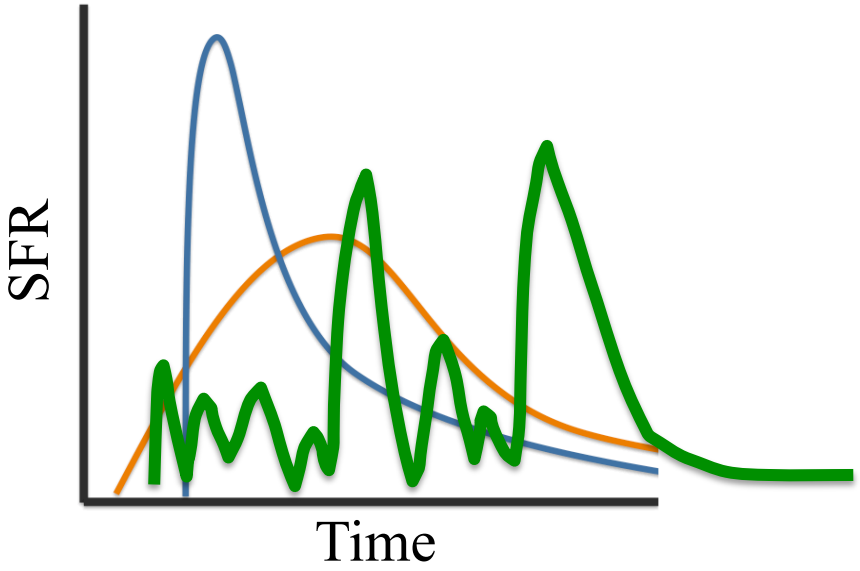
Population Synthesis: Light → Astrophysics



SSP

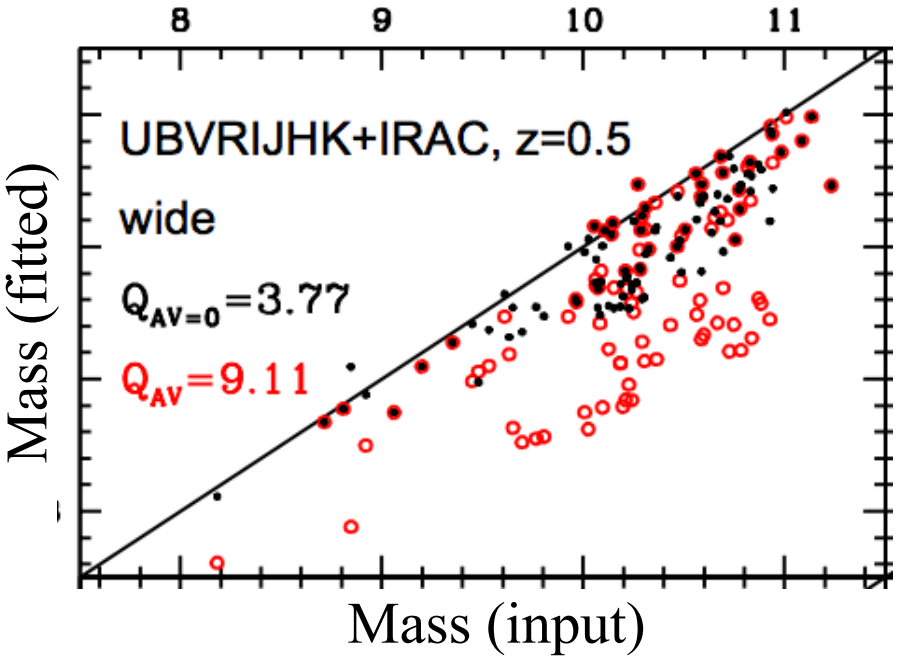


SFH

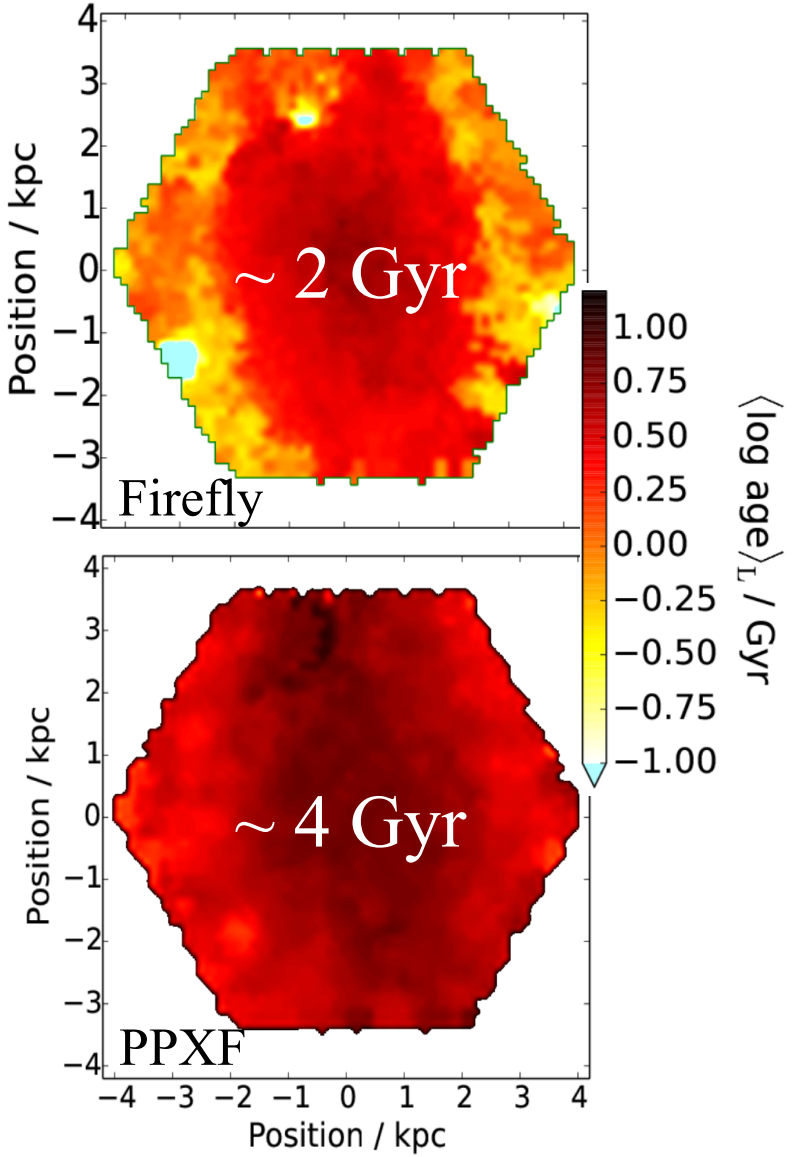


SFH choice biases derived parameters

M/L, <age>, stellar mass, SFR



Pforr et al. (2012)



Wilkinson et al. (2015)

IFU Surveys: New Regime

2” fiber at
z ~ 0.5

~1 kpc at
z = 0.04

Variations within individual galaxies of order systematic uncertainties

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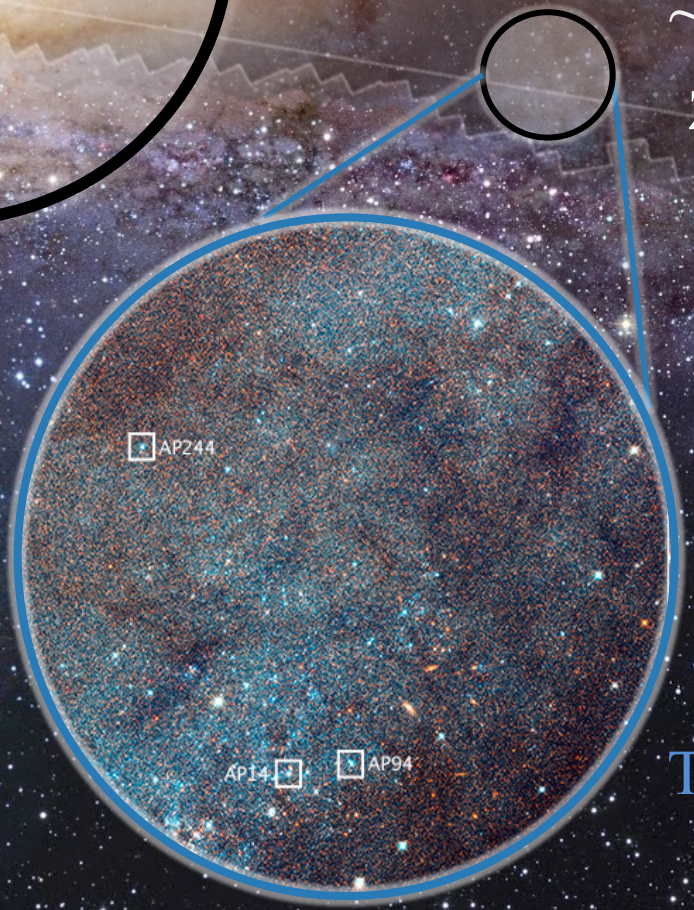

Changing scale of application

Irregular dust geometry

Star formation: Temporal stochasticity, spatial clustering

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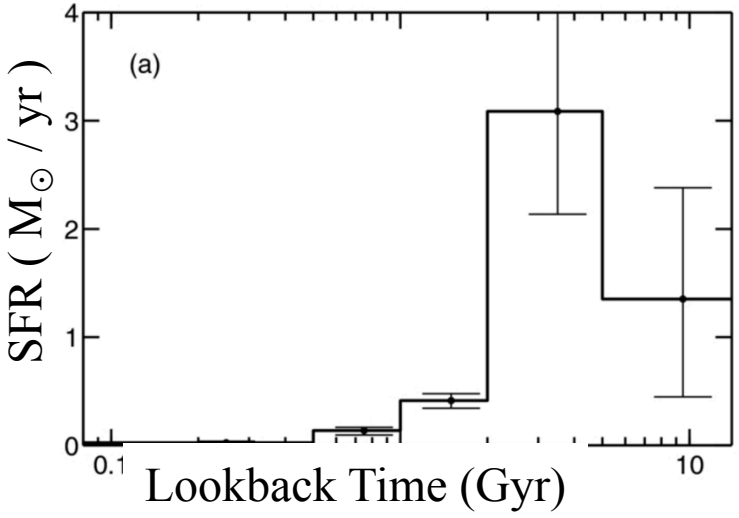
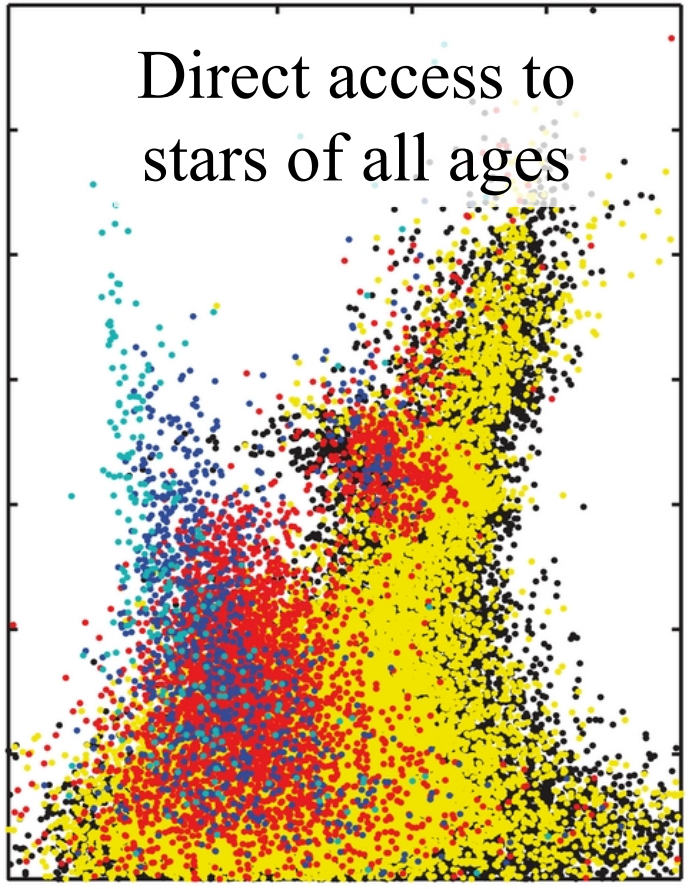
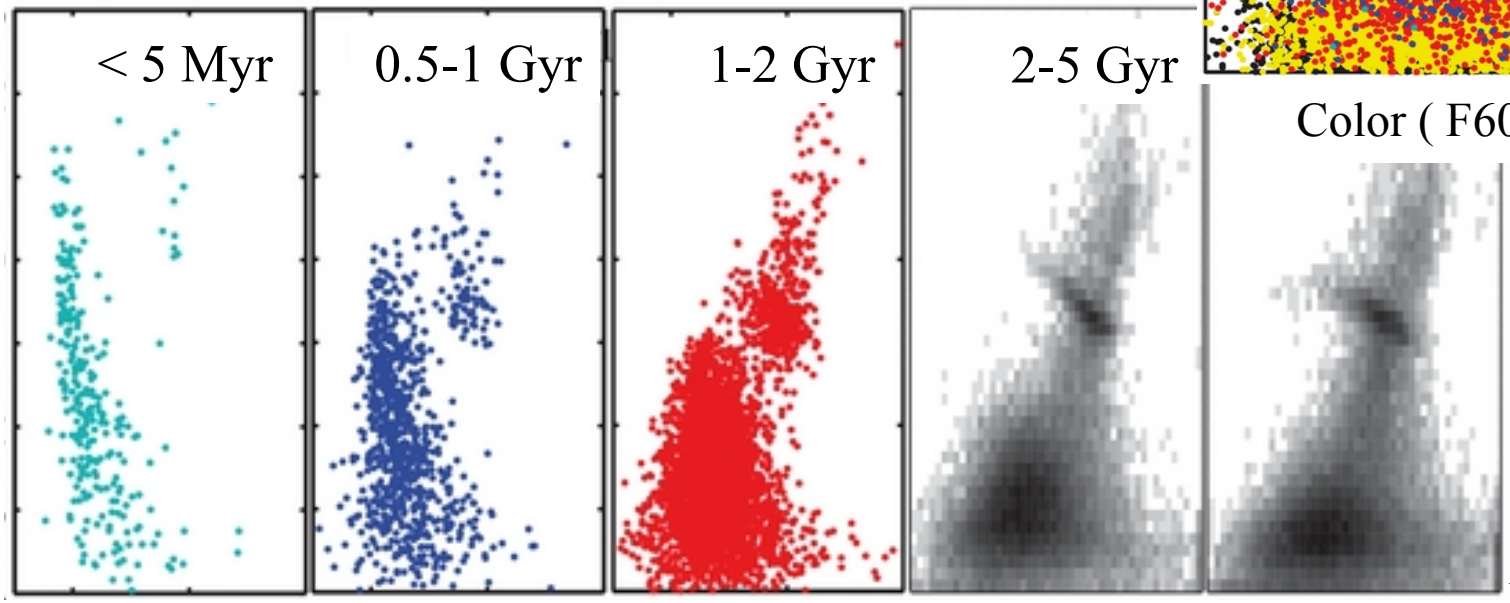
Resolved Stars:
"gold standard" SFHs



Direct access to stars of all ages

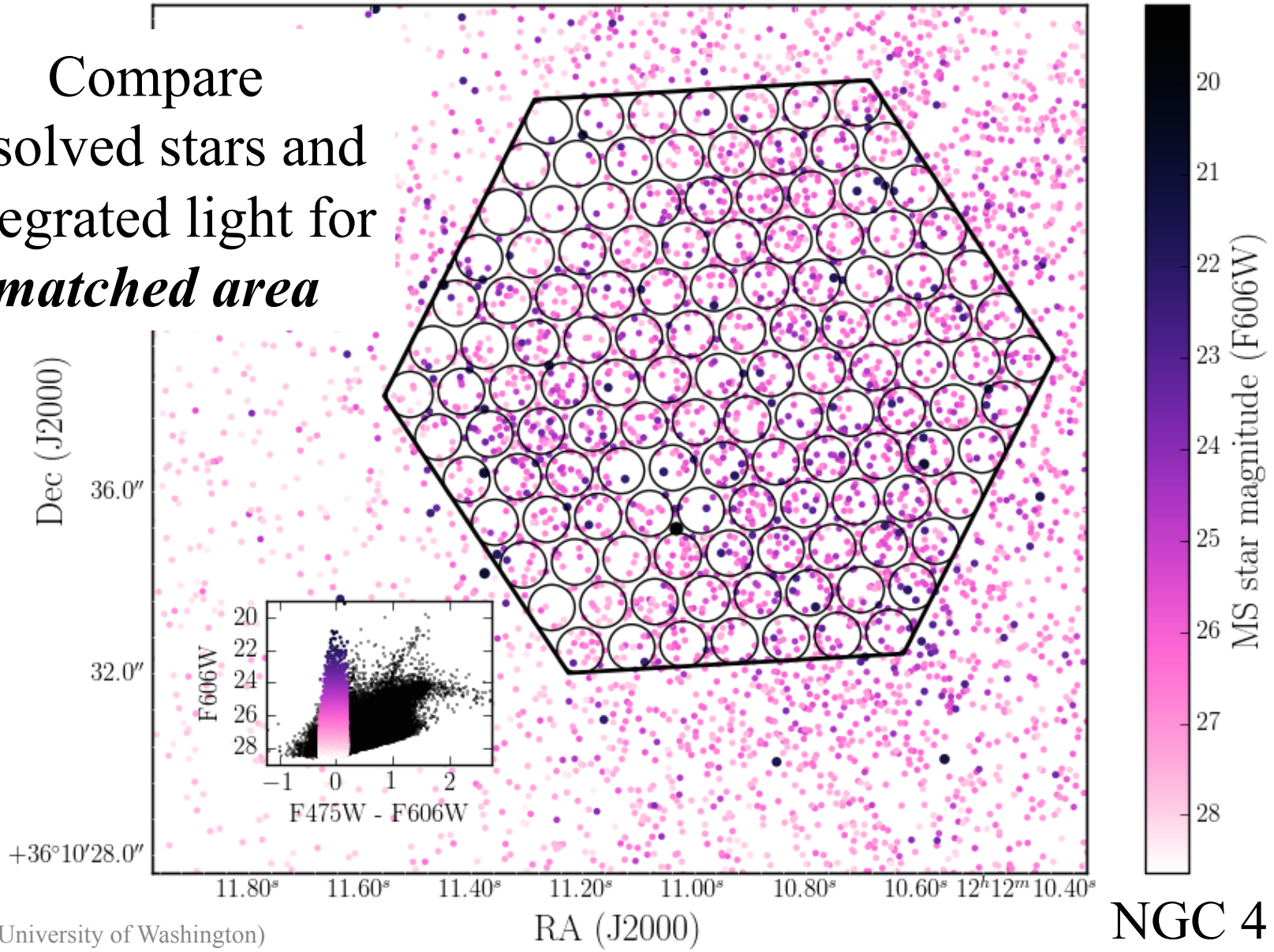




Monachesi et al (2014)

Empirical Calibration: HST + MaNGA

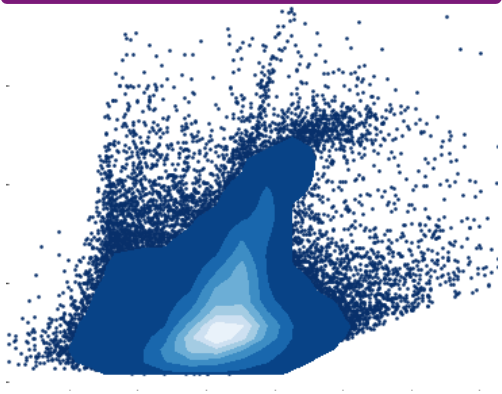
Compare resolved stars and integrated light for ***matched area***

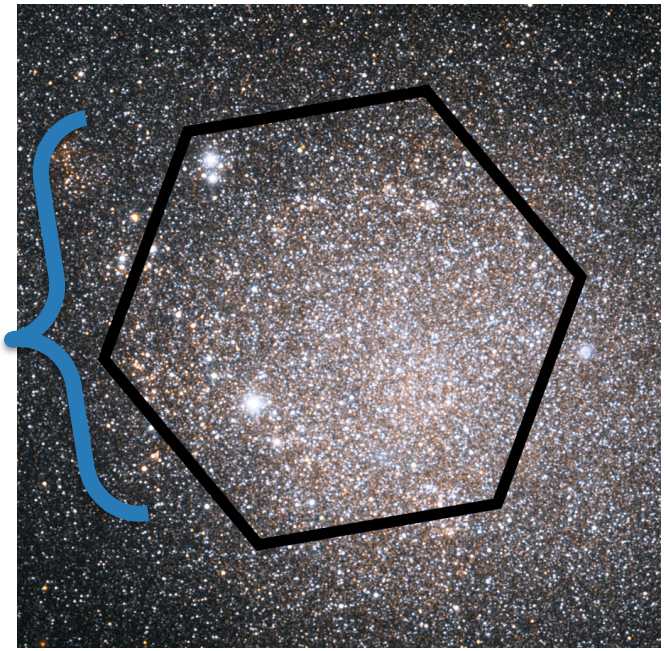


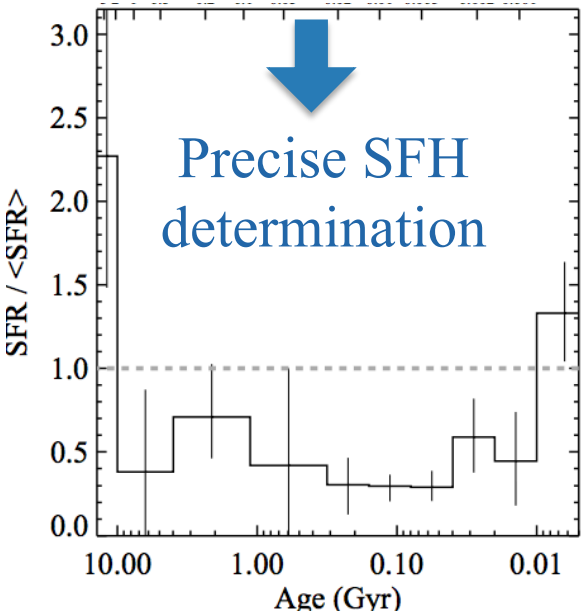
NGC 4163

Aperture-Matched Comparison of Light

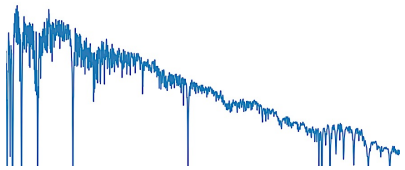
Resolved Stars







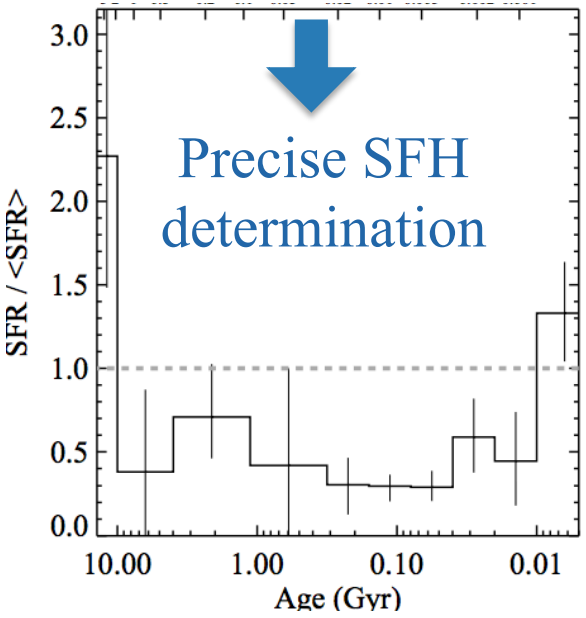
Precise SFH determination



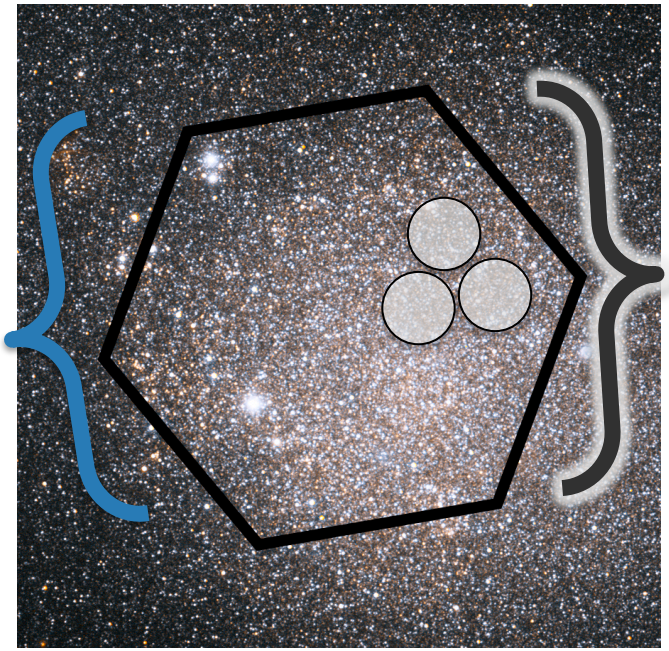
SFH-reconstructed

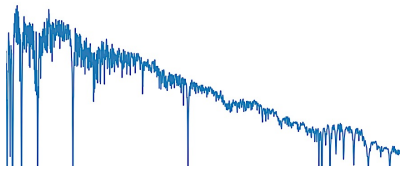
Aperture-Matched Comparison of Light

Resolved Stars



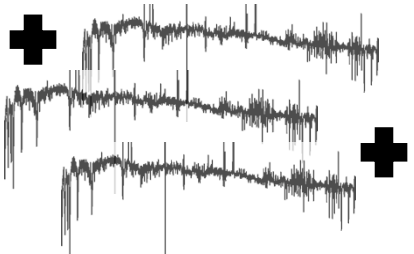
Precise SFH determination



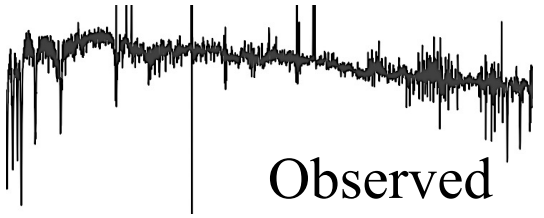


SFH-reconstructed

Integrated Light

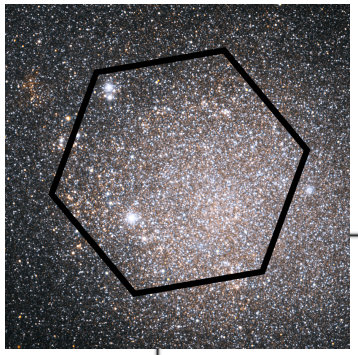


Sum MaNGA spectra over matched area

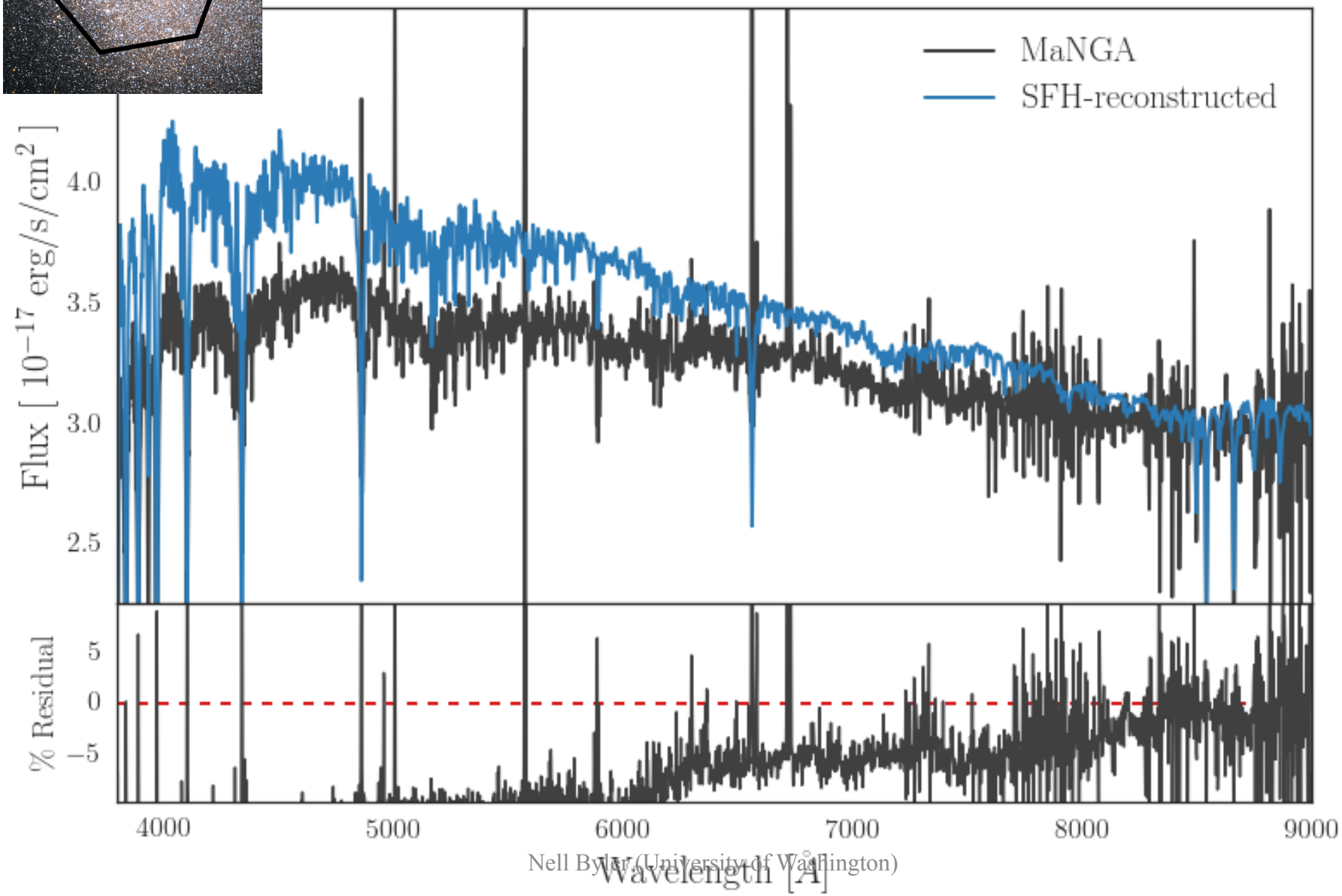


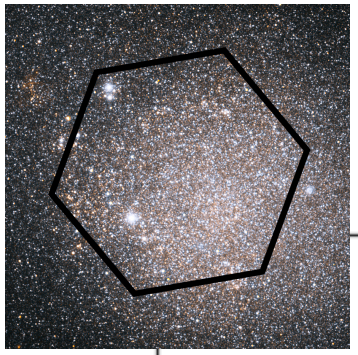
Observed

Directly measure contribution of stars to total light



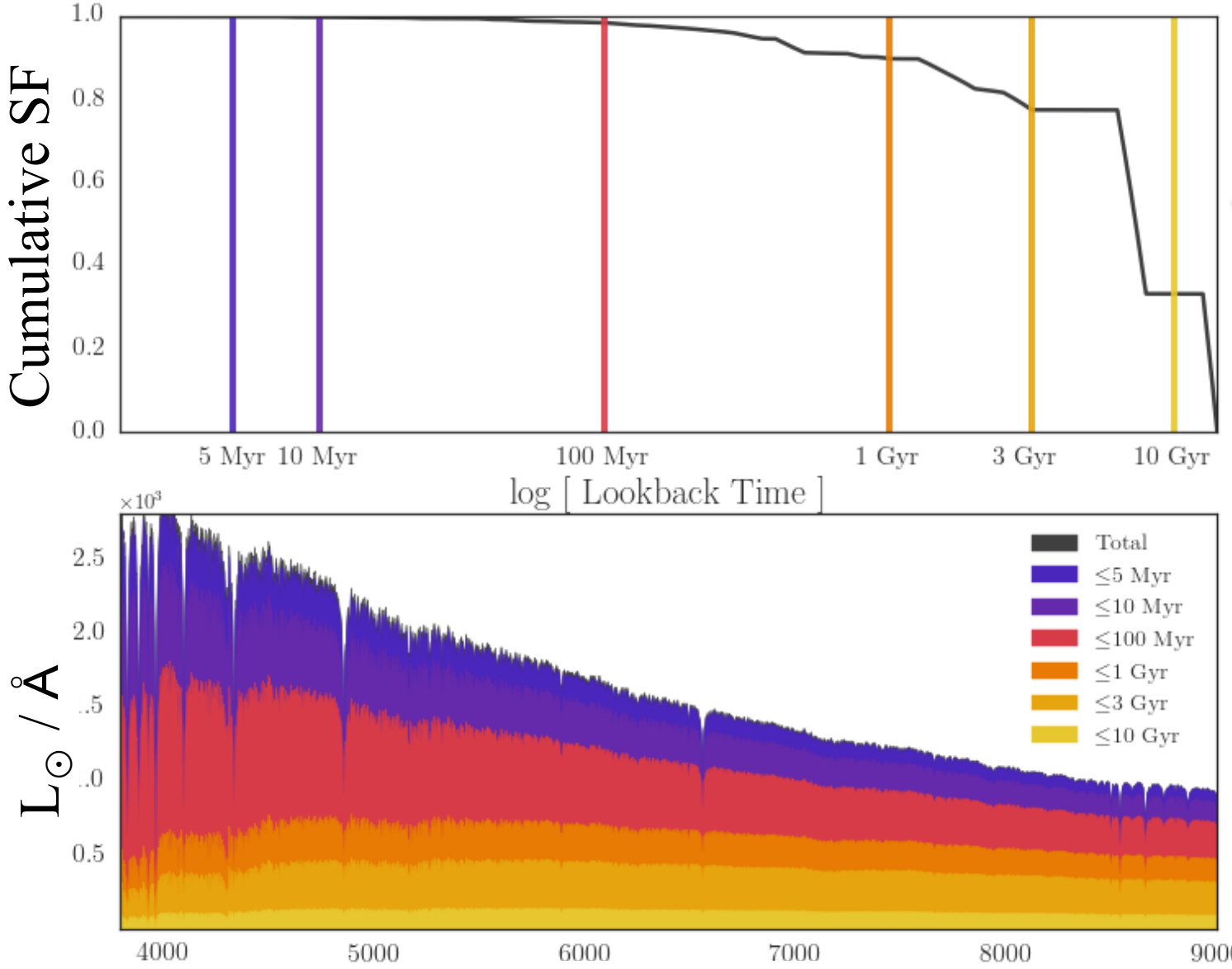
Aperture-Matched Comparison





Aperture-Matched Comparison

Assess sensitivity of mass-weighted properties



Empirical calibration: Test your code here!