Strategies to Observe First Light & z≳6 QSO Hosts with JWST

Rogier Windhorst (ASU) — JWST Interdisciplinary Scientist

S. Cohen, R. Jansen (ASU), C. Conselice (UK), S. Driver, S. Wyithe (OZ), B. Frye (UofA), & H. Yan (U-MO)

+ ASU Grads: N. Hathi, H. Kim, M. Mechtley, R. Ryan, M. Rutkowski, B. Smith, & A. Straughn

Outline:

(1) Strategies to Observe First Light with JWST:

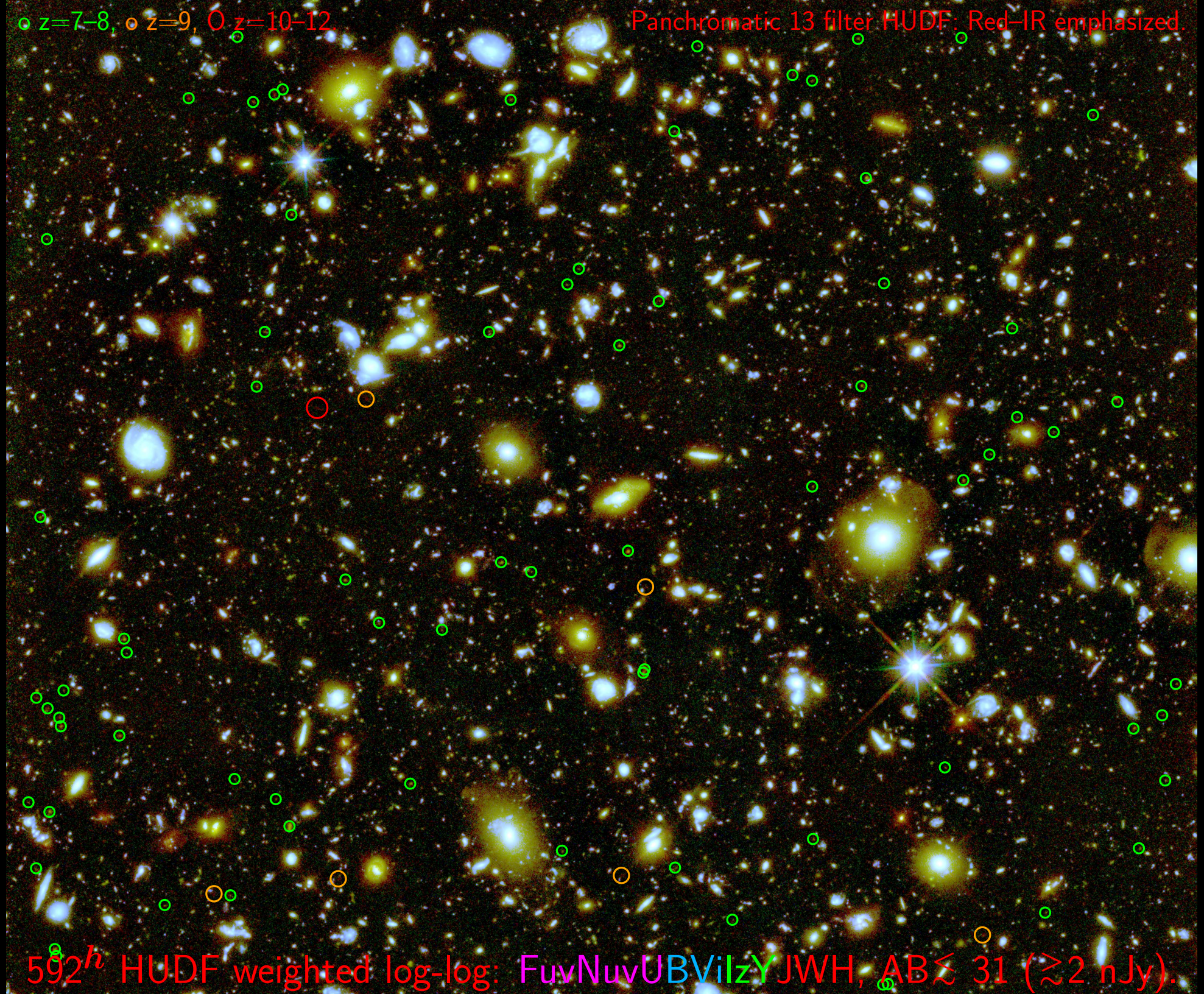
- How many random fields compared to the best lensing targets?

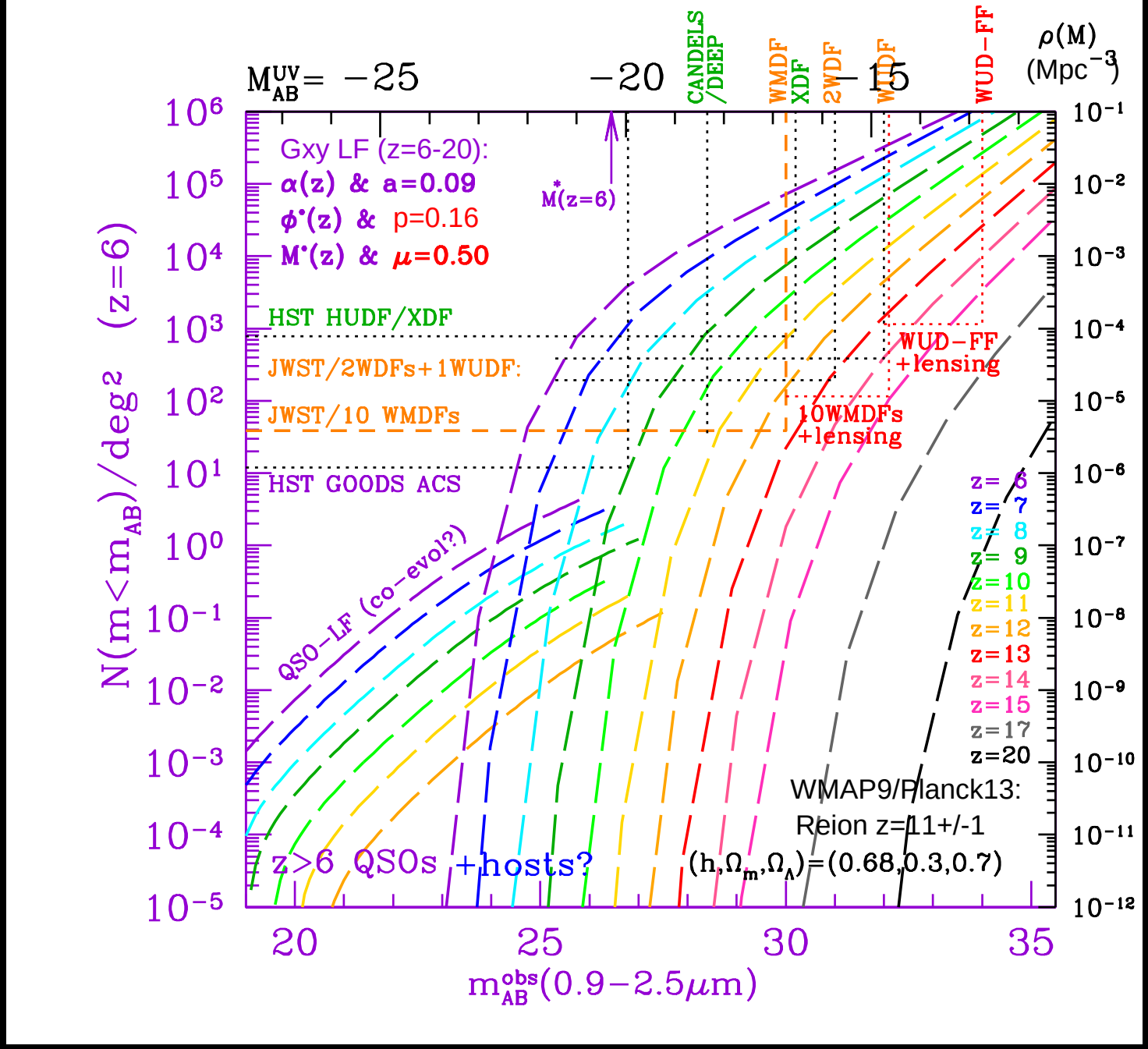
(2) High-z AGN & Hosts: PSF-subtraction, Coronagraphy & SED-fitting:

- How did Galaxy Assembly keep up with Supermassive Black-Hole Growth?

Talks at the JWST GTO Workshop, Aug. 7–8, STScI, Baltimore (MD). All 3 talks are on:

`http://www.asu.edu/clas/hst/www/jwst/jwsttalks/windhorst14_firstlight_AGNhosts.pdf`


z=7–8, z=9, z=10–12
Panchromatic 13 filter HUDF: Red–IR emphasized.
592^h HUDF weighted log-log: FuvNuvUBViIzYJWH, AB≲ 31 (≳2 nJy).

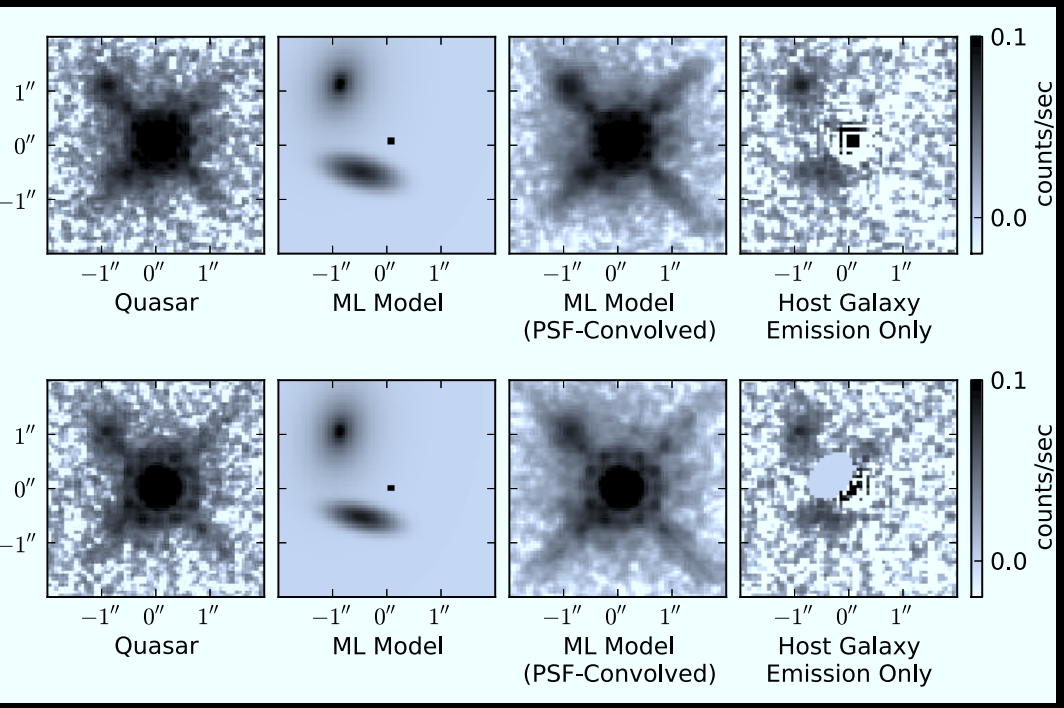


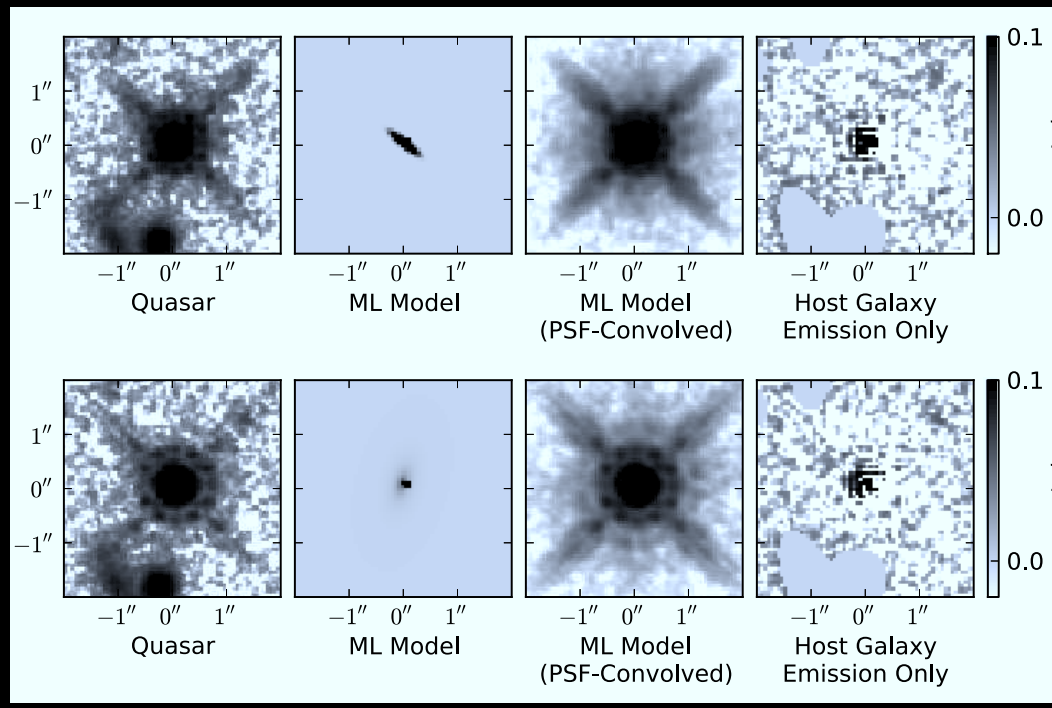
Schechter LF ($z\lesssim6\lesssim20$) with best-fit $\alpha(z)$, Φ^* (z), M^* (z) & μ=0.50.

Area/Sensitivity for: HUDF/XDF, **10 WMDFs**, 2 WDFs, & 1 WUDF.

- May need lensing targets for WMDF–WUDFF to see $z\simeq14$–16 objects.

JWST imaging of z≳6 QSO Host Galaxies (dusty mergers?)





- Markov Chain Monte Carlo posterior model of observed PSF-star + Sersic light-profile. Gemini AO images to pre-select PSF stars (Mechtley^{+} 2014).
- First WFC3 detection out of four z≃6 QSOs [2 more to be observed].
- One z≃6 QSO host galaxy: Giant merger morphology + tidal structure?
- Same J+H structure! Blue UV-SED colors: (J–H)≃0.19, constrains dust.
  - IRAS starburst-like SED from rest-frame UV–far-IR, A_{FUV}∼1 mag.
- M_{AB}^{host}(z≃6)≲–23.0 mag, i.e., ∼2 mag brighter than L*(z≃6).

JWST (+Coronagraphs?) can do this ≳10× fainter: will do 2 in GTO time.