



SCIENCE DEVELOPMENT CHALLENGES

1. Flagships have multiple interconnected science objectives.

Typically, have separate codes for each case. Many opportunities for inconsistencies.

Flowing hardware parameters back & forth during early trades is labor-intensive.

2. Hard to see sensitivity of science returns to hardware parameters

$$\begin{array}{l} \text{ExoEarth} \\ \text{Yield} \end{array} \propto D^{1.97} (IWA)^{-0.98} (\eta_{Earth})^{0.96} (SNR)^{-0.76} A^{0.65} T^{0.35} \\ (PSF)^{-0.33} (Time)^{0.32} \Delta\lambda^{0.30} x^{-0.17} \xi^{-0.10} \quad \text{Stark et al. (2015)}$$

Instrumental, astrophysical, & observational parameters

Quantitative understanding of the integrated science trade space & hardware implications is key for early architecture trades. We need the correlations and the derivatives, not the priorities.