Astrophysics
Design Reference Mission

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&
Co-Lead of the
In-Space Assembled Telescope Study
Recommendation #1:
NASA should lead a large strategic direct imaging mission capable of measuring the reflected-light spectra of temperate terrestrial planets orbiting Sun-like stars.
We now know that in our Galaxy...

Planets are common (> 1 per star)

Planets with sizes 0.5-2 times Earth are the most common

Earth-size planets in the Habitable Zone are common

...we’re ready for the search for life
Exo-Earth Model Predictions
As a function of telescope aperture size; coronagraph architecture

$\eta_{\text{Earth}} = 0.24$
Study Objective:

“When is it worth assembling space telescopes in space rather than building them on the Earth and deploying them autonomously from single launch vehicles?”
47 Invited Participants from government, industry, and academia with primary expertise in astrophysics

A 20-meter, filled-aperture, non-cryogenic, serviceable telescope operating at UV/V/NIR with coronagraph
Telescope Assembly and Infrastructure Face- to-Face Meeting
NASA Langley Research Center, Oct 2-4, 2018
60~ participants from 5 NASA centers, 14 companies, 4 gov’t agencies, 4 professors & graduate students
DRM: A 20-meter, filled-aperture, non-cryogenic, serviceable telescope with coronagraph operating at UV/V/NIR assembled at Cis-Lunar environment using supervised autonomy robotics for >30 year operations at SE-L2