Exoplanet Exploration Program
Welcome / Overview

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The Exoplanet Exploration Program
NASA Astrophysics Division, Science Mission Directorate

**Exploring** How the Universe Works

**Discovering** and Characterizing Exoplanets

**Searching** for Signs of Life in the Galaxy

Space Missions and Mission Studies

- Kepler
- AFTA
- Probe-Scale: External Occulter (Starshade)
- Coronagraph

Public Engagement

Supporting Research & Technology

Key Sustaining Research

- Keck Single Aperture Imaging and RV
- Large Binocular Telescope Interferometer

Technology Development

- High Contrast Imaging
- Deployable Star Shades

Archives, Tools & Professional Education

- NASA Exoplanet Science Institute
Exoplanet Exploration: A Decade Horizon
NASA-sponsored efforts

Program defines **Success** as three compelling, viable mission concept reports by 1/31/15 with CATE by 2/28/15
WFIRST/AFTA: Coronagraph Architectures Selected for Further Development

- SDT Report (April 2013) described science possible with 2.4m telescope including
  - Dark energy, infrared survey, microlensing
  - Exoplanet direct imaging via coronagraph
- AFTA Coronagraph Working Group formed
- Architectures selected for continued study and technology investment:
  - Primary: Occulting Mask Coronagraph (OMC), single optical design incorporating both Hybrid Lyot (HL) and Shaped Pupil (SP) masks
  - Backup: Phase Induced Amplitude Apodization Complex Mask Coronagraph (PIAA-CMC)
  - More about this: http://exep.jpl.nasa.gov
- Technology plan for potential FY17 new mission start
Probe-Scale Missions

• Two probe-scale ($1B) mission concepts under development by Science and Technology Definition Teams (STDTs)
  – Exo-S (Starshade, or External Occulter) Sara Seager, MIT, chair
  – Exo-C (Coronagraph) Karl Stapelfeldt, GSFC, chair

• Purposes: Alternatives for FY17 new mission start, motivate technology investments, potential candidates for 2020 Decadal
Kepler
Data processing for primary mission continues
Approved to submit 2-wheel mission concept (K2) to Senior Review

LBTI
Closed loop fringe tracking and sequence demonstrated

Public Outreach
Eyes on Exoplanets visualization – in discussions with National Air and Space Museum for display

NExScI
Sagan workshop approved for July 2014 “Imaging Planets and Disks”

Keck Single Aperture
2014A Keck Observing season allocated
OSIRIS instrument data in Keck Observatory Archive

Technology
Coronagraph mask tests continue in High Contrast Imaging Testbeds
Starshade: successful deployment from furled configuration

Program
ExoTAC membership updated; Alan Boss (chair)
ExoPAG active; Scott Gaudi (chair)
Looking Forward: Selected Program Milestones

This week
1/8       WFIRST/AFTA Evening session
1/9-10    WFIRST/AFTA Science Definition Team meeting

Kepler   
1/28      Submit two-wheel concept to Senior Review

LBTI     
2/6-14    Next commissioning run

NExScI   
Mid-Feb Sagan workshop registration opens

Probe Missions
3/3       Mid-term report and briefing to CAA

Technology
1/21      TDEM-13 Pre-Proposal Telecon
3/31      TDEM-13 proposals due

WFIRST/AFTA
224th AAS Meeting – AFTA science conference

You are invited to keep up with latest news at http://exep.jpl.nasa.gov and via New Worlds quarterly newsletter:
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