

Exoplanet Science Measurements from Solar System Probes
18-19 May 2010
KITP, UCSB Campus, Santa Barbara

Workshop sponsors:
Keck Institute for Space Studies (KISS)
Kavli Institute for Theoretical Physics (KITP)

Purpose: This workshop will explore the potential for making measurements relevant to exoplanets, using hardware on current and future missions within the Solar System.

Background: NASA's Exoplanet Analysis Group (ExoPAG) has established a Science Analysis Group (SAG) to study this topic. The present workshop will be the SAG's first action. The workshop is invitation-only. The output of this workshop will be presented at the ExoPAG's next meeting on 24-25 June 2010, in Pasadena.

Agenda (Preliminary):

Tuesday, May 18

KITP Main Seminar Room (103)

- 9:00 am – Introduction to the Exoplanets-Solar System Spacecraft SAG – David Bennett
- 9:20 am – The EPOXI/EPOCh Mission and Its Observations of Earth – Nick Cowan
- 9:50 am – Exoplanet Transits from Solar System Spacecraft & EPOCh Transit Results – Jessie Christiansen
- 10:20 am – Exoplanet Transits and Spectra – Gautum Vasisht
- 10:50 am – Coffee Break
- 11:20 am – Microlensing Parallax Masses from Solar System Spacecraft – David Bennett
- 11:50 am – First Mass Measurement of a Cold Super-Earth from EPOXI Calibration Frames – Andy Becker
- 12:10 am – Discussion: Photometry of Unresolved Point Sources from Solar System Missions
 - Are there general requirements or problems?
- 12:30 pm – Lunch
- 1:30 pm – Outer Planet Program Analysis Group – Pat Beachamp
- 2:00 pm – Summary of “View from 5 AU” workshop and Cruise Phase Science with an IR Instrument – Jamie Bock
- 2:30 pm – Observations with Cassini/ISS – Robert West
- 3:00 pm – Exoplanetary Transit Observations with Cassini/VIMS – Christophe Sotin
- 3:30 pm – Coffee Break
- 4:00 pm – SAG Report Discussion
 - What do we need in the report?
 - Preliminary draft writing assignments
- 7:00 pm – Group Dinner (for those interested)

Wednesday, May 19 in KITP Main Seminar Room (103)

- 9:00 am – Summary of “Innovative Approaches to Exoplanet Spectra Workshop”, Nov., 2009, Caltech – Wes Traub
- 9:30 am – NASA HQ Efforts to on Astrophysics with Solar System Missions – Mario Perez (unconfirmed)
- 10:00 am – Astrophysics with New Horizons – Presentation by NH team to NASA HQ – David Bennett or Mario Perez
- 10:15 am – Exozodi and Debris Disks – Chas Beichman
- 10:45 am – Coffee Break
- 11:15 am – Debris Disks – Karl Stapelfeldt
- 11:45 am – Zodi Observations from > 1 AU – Bill Reach
- 12:15 pm – Lunch
- 1:30 pm – IR Instruments on Outer Planet missions – Kevin Hand
- 2:00 pm – Radio Science – Walid Majid
- 2:30 pm – Exoplanet/Astrophysics Instruments on Future Solar System Missions – Dan Coulter
- 3:00 pm – Coffee Break
- 3:30 pm –SAG Draft Report Writing

Potential topics:

- (1) Exoplanet Science Opportunities with Current Solar System Missions
 - a. Gravitational microlensing mass measurements from ≥ 0.1 AU from Earth.
 - b. Transit Observations
 - c. Remote Earth, Venus, Mars, outer planets observations (i.e. as an exoplanet for albedos, polarization)
 - d. Solar System zodi observations at radii other than 1 AU
- (2) Capabilities and Constraints of existing Solar System missions
 - a. EPOXI
 - b. Cassini
 - c. Dawn
 - d. Rosetta
 - e. New Horizons
 - f. Mars Missions
 - g. STEREO (CME & search for transits)
- (3) Opportunities for Future Missions
 - a. Encourage small instruments for exoplanet studies on future solar system missions
 - b. Encourage improved capabilities to enable exoplanet science (e.g. pointing stability, focus mechanism)
- (4) Political/Management issues
 - a. How to obtain approval for additional science for existing missions
 - b. How to propose for extended astrophysics mission for a solar system spacecraft
 - c. Get NASA HQ to encourage exoplanet science in solar system mission AOs
- (5) Related issues
 - a. Use a dark energy mission (eg Euclid) survey for microlensing events or transits
 - b. Observe microlensing events with a transit mission (eg PLATO)

- c. Use micro-satellites (cube-sats) for monitoring transits;
- d. Use suborbital balloons to study debris disks;
- e. Use the ISS as a platform to observe transits etc.

Logistics: We can pay travel costs for up to about \$1500 per person for 5-8 people, under KISS sponsorship. Reimbursement will be provided by KISS; details will be sent as needed. JPL people must find other means of support. KITP will furnish office space for visitors. People can stay for longer if desired. Participants in the ongoing (Jan.-May) workshop at KITP “The Theory and Observation of Exoplanets” will be invited to join our sessions; see <http://www.kitp.ucsb.edu/activities/dbdetails?acro=exoplanets10> for background.

Motel info: <http://www.kitp.ucsb.edu/visitor-info/lodging/short-term/off-campus/popular-hotels>
Be sure to talk to reservation person at hotel (not a national rep), and mention that you will be a KITP visitor, to get their special rate (\$103-119, Ramada) (\$108 Best Western).

Contact: David Bennett, for participation and potential travel support.

SOC Email and phone info:

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