

KAVLI INSTITUTE FOR THEORETICAL PHYSICS
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KITP Conference: Physics of Exoplanets: From Earth-sized to Mini-Neptunes
 Feb 23-27, 2015 Main Seminar Room, Kohn Hall, UCSB
Coordinators: Eric Ford, Louise Kellogg, Geoff Marcy, Burkhard Militzer

Monday, February 23, 2015

Overview on Kepler Observations and IR Observations of Planets, Chair: Geoff Marcy (UCB)

8:45am Lars Bildsten (KITP Director) Welcome
 8:50am Introduction
 9:00am Natalie Batalha (NASA Ames) The Kepler Legacy: Warm Exoplanet Populations
 9:45am Andrew Howard (Univ. Hawaii) Demographics and Properties of Earths and Super-Earth
 10:30am **Morning Break**
 11:00am David Charbonneau (Harvard) Results from the HARPS-N Campaign to Characterize the
 Transition from Terrestrial Exoplanets to Neptune-like Worlds
 11:45am Leslie Rogers (Caltech) Glimpsing the Transition Between Rocky and Gaseous Planet
 Populations
 12:30pm **Lunch Break**

High pressure physics, Chair: Burkhard Militzer (UC Berkeley)

2:00pm Jon Eggert (LLNL) Structure of Crystalline Matter under Super-Earth Conditions
 2:45pm Sarah Stewart (UC Davis) Growing Planets by Giant Impacts: A Diversity of Outcomes
 3:30pm **Afternoon Break**
 4:00pm Agnes Dewaele (CEA, France) New Chemistry of the Constituents of the Earth above 1
 Megabar
 4:45pm Razvan Caracas (CNRS, Lyon) Magmas in Terrestrial Planets
 5:30pm **SHUTTLE TO BWSCI**

Tuesday, February 24, 2015

Observational Constraints on Theory, Chair: Eric Ford (Penn State)

9:00am Heather Knutson (Caltech) Exoplanet Atmospheres in the Super-Earth Era
 9:45am Eric Gaidos (Univ. Hawaii) What are Little Worlds Made Of? The Compositions of Earth- to
 Neptune-size Planets
 10:30am **Morning Break**

Observational Constraints on Theory, Chair: Jack Lissauer (NASA Ames)

11:00am Adam Burrows (Princeton) Evolutionary Models for Super-Earths and Mini-Neptunes
 11:45am Michael Jura (UCLA) Extrasolar Cosmochemistry
 12:30pm **Lunch Break**

High Pressure Physics and Interiors, Chair: Sarah Stewart (UC Davis)

2:00pm Dario Alfe (UCL) Transport Properties of Iron Mixtures at Planetary Core
 Conditions
 2:45pm Sebastien Hamel (LLNL) First-Principles Calculations of the High-Pressure Melt Line of
 Silicon Dioxide and Strength of Superionic Water
 3:30pm **Afternoon Break**

- 4:00pm Gilbert Collins (LLNL) Melting, Transport, and Chemistry Data for Deep Exoplanet Conditions
- 4:45pm Jonathan Fortney (UC Davis) Modeling the Thermal Evolution and Atmospheres of Sub-Neptunes in the "Data Era"
- 5:30pm **RECEPTION & POSTER SESSION**
- 6:00pm **SPECIAL EVENTS DINNER**
- 8:00pm **SHUTTLE TO BWSCI**

Wednesday, February 25, 2015

Atmospheres and volatiles, Chair: Sean Raymond (Bordeaux)

- 9:00am Oded Aharonson (Weizmann) Forming Planetary Moons by Multiple Impacts
- 9:45am Renyu Hu (Caltech) Equilibrium and Disequilibrium Chemistry in Evolved Exoplanet Atmospheres
- 10:30am **Morning Break**
- 11:00am Edwin Kite (Univ. Chicago) Surface-Interior Exchange on Rocky and Icy Planets
- 11:45am Sushil Atreya (Univ. Michigan) The Atmospheres of the Terrestrial Worlds: Earth, Venus, Mars, and Titan
- 12:30pm **Lunch Break**
- 2:00pm **FREE AFTERNOON -- SHUTTLE AVAILABLE TO BWSCI**

Las Cumbres Observatory Global Telescope Network

Thursday, February 26, 2015

Characterizing Small Planets via TTVs, Chair: Hilke Schlichting (MIT)

- 9:00am Daniel Fabrycky (Chicago) Small-Planet Densities and System Architectures through Photodynamic Variations
- 9:45am Eric Agol (Univ. Washington) Measuring Planet Masses with Synodic Chopping
- 10:30am **Morning Break**
- 11:00am Rebekah Dawson (UCB) TTV Planets: Farm to Table
- 11:45am Sourav Chatterjee (NWU) Inside-Out Planet Formation and Its Implications
- 12:30pm **Lunch Break**

Planetary remote sensing and interiors: Lessons from Earth, Chair: Louise Kellogg (UC Davis)

- 2:00pm Scott King (Virginia Tech) Mercury, Venus, Mars, Oh My!
- 2:45pm Anne Davaille (U Paris-Sud) Convective Patterns in "Soft" Planets: from Plumes to Plate Tectonics
- 3:30pm **Afternoon Break**
- 4:00pm Barbara Romanowicz (UCB) Plumes in the Earth's Deep Mantle: Insights from Seismic Waveform Tomography
- 4:45pm Isabelle Panet (IPGP) Satellite Gravity: a Probe on Earth's System Dynamics
- 5:30pm **RECEPTION & POSTER SESSION**
- 6:00pm **SPECIAL EVENTS DINNER**
- 8:00pm **SHUTTLE TO BWSCI**

Friday, February 27, 2015**Planet Formation Theory, Chair: Daniel Fabrycky (Chicago)**

- 9:00am Sean Raymond (Bordeaux) Formation of the Observed Systems of Hot Super-Earths and Mini-Neptunes
- 9:45am Hilke Schlichting (MIT) Terrestrial Planet Formation: A Blueprint for the Formation of Close-in Super-Earths and Mini-Neptunes?
- 10:30am **Morning Break**
- 11:00am Ruth Murray-Clay (UCSB) Predictions for the Compositions of Small Planets as a Function of System Architecture
- 11:45am Eugene Chiang (UC Berkeley) How Super-Earths Acquire Their Atmospheres
- 12:30pm **Lunch Break**

Planetary dynamos and Outlook, Chair: Eugene Chiang (UC Berkeley)

- 2:00pm Gary Glatzmaier (UCSC) Exoplanet Dynamo Simulations
- 2:45pm Bruce Buffett (UC Berkeley) Magnetic Fields as a Probe of the Internal Dynamics of Terrestrial Planets
- 3:30pm **Afternoon Break**
- 4:00pm Jonathan Aurnou (UCLA) Laboratory Insights Into Planetary Core Flows & Dynamo Action
- 4:45pm Dave Stevenson (Caltech) The Way Forward
- 5:30pm **SHUTTLE TO BWSCI *ALSO AVAILABLE TO SB AIRPORT AND SB AIRBUS, GOLETA LOCATION. (SEE REGISTRATION DESK TO SIGN UP)**