

Titan Through Time

*Unlocking Titan's
Past, Present and Future*

NASA Goddard Space Flight Center

April 3th - 5th, 2012

Order of Scientific Presentations

Tuesday, April 3th

08:00-09:00 Badging and Registration

Session 1.1: Titan's Interior

Chair: Ralph Lorenz

09:00-09:15 *Workshop Welcome* - Conor Nixon;

Goddard Welcome - Anne L. Kinney

09:15-09:30 - Local arrangements

09:30-10:00- **Review** - *Titan's internal structure and evolution* – Francis Nimmo

10:00-10:15 *Thermal and compositional evolution of a three-layer Titan* – Michael Bland et al.

10:15-10:30 *The dynamic tidal response of a subsurface ocean on Titan and the associated dissipative heat generated* – Robert Tyler

10:30-11:00 **Coffee Break**

Session 1.2: History and Evolution

Chair: Francis Nimmo

11:00-11:30 **Review** - *Origin of Titan's Atmosphere* – Yasuhito Sekine

11:30-11:45 *The influence of photochemical fractionation on the evolution of the nitrogen isotope ratios – detailed analysis of current photochemical loss rates* – Kathleen Mandt

- 11:45-12:00 *Crater topography on Titan: Implications for landscape evolution* – Catherine Neish
- 12:00-12:15 *Titan's Impact Cratering Record: Erosion of Ganymede (and other) Craters on a Wet Icy Landscape* – Paul Schenk
- 12:15-12:30 *Titan's Timescales: Constraints on the Age of the Methane-Supported Atmosphere* – Conor Nixon
- 12:30-14:00 **Lunch**

Session 1.3: Surface Topology and Processes

Chair: Jason Barnes

- 14:00-14:30 **Review** - *Titan's Surface Diversity and Ongoing Processes-A Review* – Laurence Soderblom
- 14:30-14:45 *Progressive Poleward Migration of Fluvial Processes on Titan* – Jeffrey Moore et al.
- 14:45-15:00 *Do Titan's river channels carve into ice bedrock or loose regolith?* – Geoffrey Collins et al.
- 15:00-15:15 *Temperate Lakes Discovered on Titan* – Graham Vixie
- 15:15-15:30 *Is Titan's shape caused by its meteorology and carbon cycle?* – M. Mathieu Choukroun et al.
- 15:30-16:30 **Posters and Refreshments**
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Session 1.4: Titan Posters I

A Near-Infrared and Thermal Imager for Mapping Titan's Surface Features – Shahid Aslam et al.

Global Patterns of Tectonism on Titan from Mountain Chains and Virgae – Casey Cook et al.

Celebrating one year of atmospheric evolution on Titan since Voyager with Cassini/CIRS – Athena Coustenis et al.

Models of a partially hydrated Titan interior with a clathrate crust – Jonathan Lunine et al.

Short period librations in a three-layer Titan – Nicolas Rambaux et al.

Cassini Titan Flybys: The Next Year (April 2012 through April 2013) – Trina Ray

Seasonal variations in Titan's stratosphere observed with Cassini/CIRS: temperature, trace molecular gas and aerosol mixing ratio profiles – Sandrine Vinatier

Session 1.5: Atmosphere / Surface Interactions

Chair: Jonathan Mitchell

16:30-16:45 *Insolation Distribution in Titan's Lower Atmosphere* – Juan Lora et al.

16:45-17:00 *Evolution of Titan's equinoctial weather patterns and accompanying surface changes and implications thereof* – Elizabeth Turtle et al.

17:00-17:15 *VIMS Near-Infrared Imaging and Spectra of Precipitation-Associated Surface Changes* – Jason Barnes et al.

17:15-17:30 *Spectral changes associated with rain on Titan: observations by VIMS*
– Bonnie Buratti

Public Event: Goddard Visitor Center

19:00 Titan in History and Popular Culture - Ralph Lorenz

Wednesday, April 4th

Session 2.1: Lower / Middle Atmosphere - Physical

Chair: Darrel Strobel

09:00-09:15 Local arrangements

09:15-09:45 **Review** - *Titan Meteorology* - Jonathan Mitchell

09:45-10:00 *Titan's methane cycle in the Titan WRF general circulation model* – Claire Newman et al.

10:00-10:15 *A new look at Titan's zonal winds from Cassini radio occultations* – Mike Flasar et al.

10:15-10:30 *Temporal Variations of Titan's Stratospheric Structure from Cassini CIRS Observations* – Richard Achterberg

10:30-11:00 Coffee Break

Session 2.2: Middle Atmosphere - Composition

Chair: Elizabeth Turtle

11:00-11:15 *Titan's post-equinox circulation revealed using chemical tracers* – Nicholas Teanby et al.

11:15-11:30 *Titan's stratospheric condensibles at high northern latitudes during northern winter* – Carrie Anderson et al.

11:30-11:45 *Ice layers in Titan's stratosphere* – Erika Barth

11:45-12:00 *Water vapor on Titan: the stratospheric vertical profile from Cassini/CIRS infrared spectra* – Valeria Cottini et al.

12:00-12:15 *Observations of H₂O in Titan's atmosphere with Herschel* – Raphael Moreno et al.

12:15-12:30 *Photochemical modeling of H₂O in Titan's atmosphere constrained by Herschel Observations* – Luisa Lara et al.

12:30-14:00 **Lunch**

Session 2.3: Middle / Upper Atmosphere - Composition

Chair: Claire Newman

14:00-14:30 **Review** – *Titan's chemical complexity* – Veronique Vuitton

14:30-14:45 *On the absence of significant aerosol chemistry below Titan's stratopause at 300 km* – Robert Samuelson et al.

14:45-15:00 *Forward Modeling of the 2003 November 14 Titan Occultation: New Retrievals of Temperature, Density and Opacity Profiles from about 350 to 500 km* – Eliot Young et al.

15:00-15:15 *Non-LTE diagnostics of CIRS observations of Titan's mesosphere* – Alexander Kutepov

15:15-15:30 *Compositional Variations from UVIS Observations of Titan's Dayglow and Comparisons with in situ INMS Observations* – Michael Stevens et al.

15:30-16:30 **Posters and Refreshments**

Session 2.4: Titan Posters II

Experiments on Titan's lakes and surface interactions at JPL and preparation for future in-situ missions – Mathieu Choukroun et al.

Analysis of High-Resolution Mid-Infrared Laboratory Allene Spectra and the Interpretation of Titan's Infrared Spectra – Tilak Hewagama et al.

The solubility of ^{40}Ar in liquid hydrocarbons: implications for Titan's geological evolution – Robert Hodyss et al.

Nitrogen Chemistry in Titan's Upper Atmosphere – Joshua Kammer et al.

Update from the Analysis of High Resolution Propane Spectra and the Interpretation of Titan's Infrared Spectra – Valerie Klavans et al.

Tholin sensitivity to atmospheric methane abundance and the implications for multiple stable states of Titan's climate system – Erik Larson et al.

Radiolysis of frozen methane by heavy ions at different temperatures – Christian Fernando Mejía Guaman et al.

Influence of Benzene on the Optical Properties of Titan Haze Laboratory Analogs in the Mid-Visible – Yeonjoo Heidi Yoon et al.

Session 2.5: Upper Atmosphere

Chair: Michael Flasar

16:30-17:00 **Review** – *Titan's Upper Atmosphere: The Great Escape?* – Darrell Strobel

17:00-17:15 *Energetic particle energy deposition in Titan's upper atmosphere* – Joseph Westlake et al.

17:15-17:30 *Ionization processes in the atmosphere of Titan: from electron precipitation along magnetic field lines to high-Z cosmic rays ionization* – Guillaume Gronoff et al.

19:00 - Workshop Dinner

The Chart House, Annapolis

Thursday, April 5th

Session 3.1: Laboratory Simulations

Chair: Veronique Vuitton

09:00-09:15 Local Arrangements

09:15-09:30 *Titan Influence of methane concentration on the optical indices of Titan's aerosols analogues* – Ahmed Mahjoub et al.

09:30-09:45 *Comparison of Nitrogen Incorporation in Tholins Produced by FUV Irradiation and Spark Discharge* – Sarah Hörst et al.

09:45-10:00 *The Titan Haze Simulation experiment: laboratory simulation of Titan's atmospheric chemistry at low temperature* – Ella Sciamma-O'Brien

10:00-10:15 *Chemical and Optical Properties of Titan Aerosol Analogs Produced from Aromatic Precursors* – Melissa Trainer et al.

10:15-10:30 **Review** - *Mission Paradigms and Planetary Exploration: Titan's place in the NASA Mission Portfolio* – Curt Niebur

10:30-11:00 **Coffee Break**

Session 3.2: Future Exploration

Chair: Conor Nixon

11:00-11:15 *Descent and Surface Wind Expectations for Titan North Polar Summer Exploration* – Ralph Lorenz et al.

11:15-11:30 *Formation and Growth of Wind-Driven Waves on Titan's Hydrocarbon Seas* – Ralph Lorenz et al.

11:30 11:45 *Composition of a Cryogenic Sea Studied by the Titan Mare Explorer* – Paul Mahaffy et al.

11:45-12:15 **Review** - *Future Titan Missions* – Hunter Waite et al.

12:15-12:30 **Closing Remarks** - Conor Nixon
