



**CHAPMAN CONFERENCE**  
**EXPLORING VENUS AS A TERRESTRIAL PLANET**  
13–17 FEBRUARY 2006  
KEY LARGO, FLORIDA

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**SESSIONS**

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NOTE: All contributed talks will be posters. Posters will be up all week. Each poster will receive a five-minute introduction. The poster session chair will collect 1-2 transparency viewgraphs (no electronic presentations). This introduction will occur in the first part of the scheduled poster session.

**SUNDAY**

**Evening**

**ICEBREAKER RECEPTION (REGISTRATION TABLE OPEN FOR CHECK-IN)**

6:00 – 8:00pm

**MONDAY**

**Morning**

**INTRODUCTION**

LARRY W. ESPOSITO

8:45 – 9:00

**INTERIOR AND RESURFACING SESSION**

CHAIR—SUSANNE SMREKAR

**Tutorials**

9:00 – 9:30 James W. Head: *The Nature of the Surface of Venus and Implications for its Geological and Geodynamical Evolution*

9:30 – 10:00 Stephen J. Mackwell: *The Interior of Venus*

**Invited Speakers**

10:00 – 10:15 Misha A. Ivanov: *Regional to Global Comparative Stratigraphic Analyses and Implications for "Nondirectional" (Random) vs. "Directional" (Evolutionary) Models of the Geological History of Venus*

10:15 – 10:30 George E. McGill: *Venus Resurfacing: Directional or Non-directional?*

10:30 – 10:45 *Coffee Break*

10:45 – 11:00 Roger J. Phillips: *A Blast From the Past: What Have Impact Craters Told Us About the Resurfacing History of Venus?*

11:00 – 11:15 V. Slava Solomatov: *Magmatic Resurfacing of Venus*

11:15 – 11:30 Catherine L. Johnson: *Mantle Upwellings on Venus: Implications for Interior and Surface Evolution*

11:30 – 11:45 E. Mark Parmentier: *Why Does Venus Evolve Differently Than the Earth?*

11:45 – Noon Gerald Schubert: *Evidence for a Thick Venus Lithosphere*

Noon – 12:15 F. Scott Anderson: *Global Mapping of Crustal and Lithospheric Thickness on Venus*

**Lunch**

12:15 – 1:30 *Free – no organized lunch*

## Afternoon

### (CONTINUED FROM INTERIOR AND RESURFACING SESSION)

1:30 – 2:00 David J. Stevenson: *Evolution of Venus: Role of Initial Conditions, Internal dynamics, and Rotational State*

### GEOCHEMISTRY AND SURFACE-ATMOSPHERE INTERACTION SESSION

CHAIR—ALEXANDER T. BASILEVSKY

#### Invited Speakers

2:00 – 2:30 Alexander T. Basilevsky: *General Geochemistry of Venus*  
2:30 – 3:00 Linda T. Elkins-Tanton: *Volcanism and Volatile Recycling on Venus From Lithospheric Gravitational Instabilities*  
3:00 – 3:15 *Coffee Break*  
3:15 – 3:45 Mikhail Y. Zolotov: *Venus Atmosphere-Surface Chemical Interaction*  
3:45 – 4:15 George L. Hashimoto: *Near-Infrared Sounding of the Surface of Venus*

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## Poster Session

### SURFACE AND RELATED

CHAIR—SUSANNE SMREKAR

#### 5-Minute Poster Introductions

4:15 – 6:20

M01	A. T. Basilevsky	<i>Impact Craters as a Tool to Estimate Ages and Durations of Geologic Events on Venus</i>
M02	Z. R. Bowles	<i>Comparison of Shield Field Formation on Venus</i>
M03	V. J. Bray	<i>Meander Characteristics of Venusian Canali: Presentation of Results and Implications for Channel Origin</i>
M04	L. M. Carter	<i>Mapping the Topography of Maxwell Montes Using Ground-Based Radar Interferometry</i>
M05	B. C. Clark	<i>Elemental Analysis via XRF at the Surface of Venus: Options for Data of MER-Quality or Higher</i>
M06	A. J. Dombard	<i>Coronae on Venus as Products of Magmatic Loading of the Crust over Transient Plume Heads: Consequences for Surface Deformation and Volcanism</i>
M07	M. J. Drake	<i>Venus and Earth Really are Bulk Compositional Twins</i>
M09	R. R. Ghent	<i>Venusian structural geology and tectonics: Where are we, where can we go next, and how do we get there?</i>
M10	O. Grasset	<i>Gravity Signal of Convection Patterns Obtained in a 3D Spherical Shell: Application to Venus</i>
M11	V. L. Hansen	<i>Spatially Isolated Time-Transgressive Equilibrium Resurfacing: The SPITTER hypothesis, an alternative to catastrophic resurfacing of Venus</i>
M12	J. W. Head	<i>Venus Volcanism: Landforms, Geological Units, Major Eruption Styles and Implications for Evolution</i>
M13	J. Helbert	<i>Observing the surface of Venus with VIRTIS on Venus Express</i>
M14	M. A. Ivanov	<i>Mapping of Global Geotraverses: Global Stratigraphic Correlations and Testing Models of the Geological Evolution of Venus</i>
M15	M. A. Kreslavsky	<i>Surficial Deposits on Venus: New Results from Magellan Microwave Remote Sensing Data</i>
M16	J. J. Leitner	<i>A Review of Venusian Surface Heat Flow Estimates</i>
M17	A. Lenardic	<i>Climate Change and the Mode of Mantle Convection on Venus</i>
M18	J. L. Margot	<i>Earth-based Radar Measurements of Venus Length of day Variations</i>
M19	S. Oshigami	<i>Cross-sectional Profiles of Baltis Vallis Channel on Venus: Reconstruction From Magellan SAR Brightness Data</i>
M20	N.O. Renno	<i>Multiple equilibria in radiative-convective atmospheres</i>
M21	C. M. I. Robin	<i>Implications of Transient Convection for Venusian geodynamics</i>
M22	D. T. Sandwell	<i>Plate Driving Forces on Venus: Swell Push Versus Slab Pull</i>

M23	T. G. Slanger	<i>Plans for Ground-based Measurements of Atomic and Molecular Oxygen Emissions at Venus During the ESA Venus Express Mission</i>
M24	S. E. Smrekar	<i>Rifts and the Role of Mantle Upwelling in a Stagnant Lid Regime: The Example of Parga Chasma</i>
M25	F. Tian	<i>Hydrogen Escape from Atmosphere of Early Venus</i>
<b>Poster Viewing</b>		
6:20 – 7:20		

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## Evening

*Free*

## TUESDAY

### Morning

#### ATMOSPHERE, CHEMISTRY AND CLOUDS SESSION

CHAIR—VICTORIA MEADOWS

##### Tutorial

8:45 – 9:30 Fredric W. Taylor: *Venus: the Atmosphere, Chemistry, and Clouds*

##### Invited Speakers

9:30 – 9:55 Bruno Bezdard: *Composition of the Lower Atmosphere of Venus*

9:55 – 10:20 Yuk L Yung: *Photochemistry above and within the Clouds*

10:20 – 10:35 *Coffee Break*

10:35 – 11:00 Vladimir A, Krasnopolsky: *Chemical Composition of Venus Clouds and Some Related Problems*

11:00 – 11:25 Takeshi Imamura: *Microphysics and Dynamics of Venusian Clouds*

##### Tutorial (PART OF THE AFTERNOON'S "ATMOSPHERIC DYNAMICS SESSION)

11:25 – 12:10 Anthony D. DelGenio: *The Venus Dynamical Regime*

### Lunch

12:10 – 1:30 *Free – no organized lunch*

### Afternoon

#### ATMOSPHERIC DYNAMICS SESSION

CHAIR—GERALD SCHUBERT

##### Invited Speakers

1:30 – 2:00 Sanjay S. Limaye: *Venus Atmospheric Circulation*

2:00 – 2:30 Timothy E. Dowling: *Handling the Topography of Venus with a Hybrid Sigma-Theta Coordinate GCM*

2:30 – 3:00 Christopher Lee: *Producing and Understanding the Super-rotation in a Simple Venus GCM*

3:00 – 3:15 *Coffee Break*

3:15 – 3:45 Masaaki Takahashi: *Recent Development of CCSR/NIES AGCM for Venus Atmospheric Sciences*

3:45 – 4:15 Mark A. Bullock: *Venus Climate Evolution*

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### Poster Session

#### ATMOSPHERES AND RELATED

CHAIR—SANJAY S. LIMAYE

##### 5-Minute Poster Introductions

4:15 – 6:25

T01 D. R. Adams *Exploring the Super Rotation of the Venusian Atmosphere: A Balloon Probe Mission Study*

T02 R. W. Carlson *Infrared Observations of the Deep Atmosphere and Surface of Venus: The Far-Wing Continuum Opacity of Carbon Dioxide*

T03	R. T. Clancy	<i>Extreme Variability in Global Circulation at the Venus Mesopause: Sub-millimeter Doppler Wind, Temperature, and CONightside Mapping Observations in 2001, 2002, 2004, and 2006</i>
T04	E. Dubinin	<i>Plasma Environment at Mars (ASPERA-3 Observations). Lessons to VENUS</i>
T05	J. L. Fox	<i>The Near Terminator Ionosphere of Venus: How Chapman-esque? A Comparison to Mars</i>
T06	R. Gil	<i>Automatic determination of planetary cloud motions</i>
T07	P. Hartogh	<i>Sub-mm Wave Sounding of the Venus Atmosphere</i>
T08	J. L. Hollingsworth	<i>A Simple-Physics Global Circulation Model for Venus: Sensitivity Assessments of Atmospheric Super-rotation</i>
T09	R. Jarvinen	<i>Venus-Solar Wind Interaction: Response of the Global QNH Model Solution to the Upstream Conditions</i>
T10	M. Kanao	<i>The relationship between the Venus plasma cloud and the motional electric field induced by the solar wind</i>
T11	J. G. Luhmann	<i>Solar Activity Effects at Venus as Seen on PVO</i>
T12	E. Marcq	<i>Near-IR Study of the Lower Atmosphere of Venus: Latitudinal Variations of CO, H<sub>2</sub>O and OCS Vertical Profiles</i>
T13	K. McGouldrick	<i>Exploring the Effects of Gravity Waves on the Venus Condensational Cloud with a Microphysical Model Including Radiative-Dynamic Feedback</i>
T14	F. P. Mills	<i>Oxygen in the Venus Atmosphere</i>
T15	J. Peralta	<i>A Re-Analysis of Galileo Venus Images</i>
T16	H. G. Roe	<i>A high-resolution search for peroxychloroformyl (ClCOO<sub>2</sub>)</i>
T17	M. Roos-Serote	<i>Venus cloud particle phase function in the 2.5 - 5.2 micron range</i>
T18	H. Sagawa	<i>Interferometric Observation of the Venusian Atmosphere with Nobeyama Millimeter Array</i>
T19	B. J. Sandor	<i>Venus Water Vapor and Sulfur Compounds above the Clouds: Measurements and Analysis from Ongoing Ground-Based Microwave Observations</i>
T20	M. Sundaram	<i>Heterogeneous Chemistry in the Venusian Middle Atmosphere</i>
T21	D. Tamura	<i>Ground-based Observation of Cloud Patterns on Venus Dayside</i>
T22	H.Y. Wei	<i>Hydromagnetic Waves Upstream from the Venus Bow Shock</i>
T23	T Widemann	<i>Wind Measurements in Venus' Lower Mesosphere From CO<sub>2</sub> Visible Observations</i>
T24	M. Yamamoto	<i>Development of GCM for the Venus middle atmosphere</i>
T25	L. Zasova	<i>Structure of Venus atmosphere and its clouds</i>
T26	M.A.H. Smith	<i>Spectroscopic Parameters for Remote Sensing of Venus: A Review of the HITRAN Database</i>

### Poster Viewing

6:25 – 7:25

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## Evening

### BANQUET

7:30 – 10:00

#### Introduction

Larry W. Esposito

#### After-Dinner Talk

Andrew F. Nagy: *Pioneer Venus, the past and future of Venus exploration*

## WEDNESDAY

## Morning

### AERONOMY, IONOSPHERE AND SOLAR WIND INTERACTIONS SESSION

CHAIR—JANET G. LUHMANN

#### Tutorial

8:45 – 9:30

Christopher T. Russell: *Solar Wind Interaction with Venus: A Tutorial*

### Invited Speakers

- 9:30 – 9:55 Stephen W. Bougher: *Venus Upper Atmosphere Circulation Models and Coupling from Above and Below*
- 9:55 – 10:20 A. Ian F. Stewart: *Venus' Ultraviolet Airglow*
- 10:20 – 10:35 *Coffee Break*
- 10:35 – 11:00 Thomas E. Cravens: *The Ionosphere of Venus*
- 11:00 – 11:25 Richard E. Hartle: *Atmospheric Escape Processes on Venus*
- 11:25 – 11:50 Robert J. Strangeway: *Update on Venus lightning from observations on PVO and Galileo*

### Lunch, Afternoon and Evening

*Free – no sessions*

## THURSDAY

### Morning

#### VENUS EXPRESS AND VCO SESSION

CHAIR—HÅKAN SVEDHEM/DMITRI TITOV

#### Tutorials

- 8:45 – 9:00 Håkan Svedhem: *The Venus Express science goals and mission scenario*
- 9:00 – 9:15 Dmitri Titov: *Planning of the Venus Express science observations*

#### Invited Speakers

- 9:15 – 9:30 Stas Barabash: *Plasma Measurements Onboard Venus Express*
- 9:30 – 9:45 Christopher T. Russell, on behalf of Tielong Zhang: *Magnetic Field Investigation of the Venus Plasma Environment: Expected New Results*
- 9:45 – 10:00 Jean-Loup Bertaux: *SPICAV Occultation Spectrometers for Venus Express*
- 10:00 – 10:15 Davide Grassi, on behalf of Vittorio Formisano: *The Planetary Fourier Spectrometer (PFS) Onboard the European Venus Express Mission*
- 10:15 – 10:30 Pierre Drossart: *The Observation Plan of VIRTIS on ESA/Venus Express Mission*
- 10:30 – 10:45 *Coffee Break*
- 10:45 – 11:00 Wojtek J. Markiewicz: *Venus Monitoring Camera for Venus Express*
- 11:00 – 11:15 Bernd Haesler: *The Venus Express Radio Science Experiment VeRa*

#### Open Discussion

CHAIR—ESPOSITO

- 11:15 – 12:15 *Feedback on science plans*

### Lunch

- 12:15 – 1:30 *Free – no organized lunch*

### Afternoon

#### FUTURE PLANS SESSION (INCLUDES VCO, LESSONS LEARNED, FUTURE TECHNOLOGY, NEEDS, VEXAG, FUTURE US MISSION POSTERS.)

CHAIR—KEVIN H. BAINES

#### Invited Speakers

- 1:30 – 1:55 R. Stephen Saunders: *Future Exploration of Venus: Some NASA Perspectives*
- 1:55 – 2:20 Sushil K. Atreya: *Venus Exploration Analysis Group (VEXAG/NASA)*
- 2:20 – 2:45 James A. Cutts: *Technology Perspectives in the Future Exploration of Venus*
- 2:45 – 3:10 Ethiraj Venkatapathy: *Enabling In-situ Science: The Engineering of Thermal Protection System for Future Venus Entry Missions*
- 3:10 – 3:25 *Coffee Break*
- 3:25 – 3:50 Takeshi Imamura: *PLANET-C: Venus Climate Orbiter Mission from Japan*
- 3:50 – 4:15 Victoria S. Meadows: *Preparing for a New Era of Comparative Planetology: Venus, Earth and Mars and the Search for Extrasolar Terrestrial*
- 4:15 – 4:40 David H. Grinspoon: *Astrobiology and Venus Exploration*

#### General Discussion

CHAIR—DMITRI TITOV

- 4:40 – 5:00 *Open and controversial issues*

## Closing Remarks

5:00 – 5:10 Larry W. Esposito

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## Poster Session

### STRATEGY FOR VENUS EXPLORATION

CHAIR—KEVIN H. BAINES

#### 5-Minute Poster Introductions

5:10 – 6:25

H01	K. H. Baines	<i>To the Depths of Venus with Venus Express</i>
H02	D. Banfield	<i>Venus Polarization Nephelometer</i>
H03	J. M. Canales-Romero	<i>An Architecture Program for the Robotic Exploration of Venus</i>
H04	A. F. Chicarro	<i>Observing Mars and Venus with the Mars and Venus Express Twin Missions</i>
H05	G. Chin	<i>Solar Gravity Perturbation Effects in the Evolution of Venus Orbits</i>
H06	S. C. Solomon	<i>The MESSENGER Venus Flybys: Opportunities for Scientific Observations of Venus</i>
H07	N. R. Izenberg	<i>Plans for Imaging and Spectrometry During MESSENGER's Venus 2 Flyby</i>
H08	A. A. Pankine	<i>Guided Balloons for Venus Exploration</i>
H09	M. B. Simakov	<i>Exobiology of Venus</i>
H10	L. W. Esposito	<i>Surface and Atmosphere Geochemical Explorer (SAGE)</i>
H11	M. Takagi	<i>Thermal Tides and Atmospheric Superrotation of Venus</i>
H12	Y. Takahashi	<i>Lightning Observation in Venus by PLANET-C</i>
H13	C. F. Wilson	<i>A ten-gramme sensor payload for Venus micro descent probes: part of ESA's Venus Microsat Explorer technology reference mission</i>
H14	J. Yoshida	<i>Venusian Visible Nightglow Observation by PLANET-C</i>
H15	L.V. Zasova	<i>Venera D - future Russian mission</i>

#### Poster Viewing

6:25 – 7:25

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## Evening

Free

## FRIDAY

## Morning

*Program committee wrap-up*

8:45 – Noon