

# Second Mars atmosphere modelling and observations workshop

## Program

Last update : 22/02/06

- The time allocated to each presentation includes the questions, but some extra discussion time is allocated in the session.
- Notice that, in Spain, lunch is usually after 2pm and dinner after 9pm

Monday, February 27, 2006

**Registration: 9:30 – 10:00**

**Monday, session 1 10:00 – 11:30**

- **10:00 : Welcome and introduction (5')**

### ATMOSPHERIC DYNAMIC

#### ATMOSPHERIC CIRCULATION MODELLING: FROM GLOBAL SCALE TO SMALL SCALES (1)

- The GFDL Mars general circulation model : status and recent development (solicited)  
(*R. J. Wilson*) 15'
- LMD/AOPP General Circulation Model : status and recent development  
(*Forget et al.* ) 15'
- Development of a new global, scalable and generic general circulation model for studies of the Martian atmosphere (solicited) (*Mischna et al.* ) 15'
- The MAOAM Project: Review of the Recent Work (*Hartogh et al.* ) 10'
- A New General Circulation Model of the Martian Atmosphere: Description and First Results (solicited) (*Medvedev et al.* ) 15'
- High Resolution Simulations of the Martian Atmosphere with a General Circulation Model, *Part 1: Model Description* (*Takahashi et al.* ) 15'

**11:30 – 12:00 : Coffee break**

**Monday session 2 : 12:00 – 13:30**

#### ATMOSPHERIC CIRCULATION MODELLING: FROM GLOBAL SCALE TO SMALL SCALES (2)

- Description of the Global Mars Multiscale Model (GM3)  
(*Moudden et al.* ) 15'
- Boundary Layer/ Soil Model For Global Mars Multiscale Model (GM3)  
Akingunola and McConnell 10'
- Modelling the Martian Boundary Layer  
(*Weng et al.* ) 15'
- A New Large Eddy Simulation Model to Study the Convective Planetary Boundary Layer On Mars  
(*Tyler et al.* ) 15'
- General Circulation Models intercomparison  
(*Wilson et al.* ) 20'
- *Discussion* 13'

- *Poster Presentation* : Comparison of atmospheric temperatures obtained through Mars Global Surveyor Radio Science and the Global Mars Multiscale Model (*Rosso et al.*) 2'
- *Other poster in this session*: Winter Polar Warmings and the Meridional Transport on Mars Simulated with a GCM (*Medvedev, Hartogh and Kuroda*)
- *Other poster in this session*: The New Mars Climate Database (*Forget et al.*)
- *Paper given by abstract only*: Mars Limited Area Model: Status Report (*Sili et al.*)

**13:30 – 15:30 : Lunch break**

**Monday session 3 : 15:30 – 17:00**

#### **NEW OBSERVATIONS OF WINDS, TEMPERATURES and SURFACE PRESSURE (1)**

- Studies of the Local Circulation in the Martian Atmosphere from PFS data (*Grassi et al.*) 20'
- Radio-Sounding of the Neutral Martian Atmosphere with Mars Express: Overview Of the Observations (*Pätzold et al.*) 20'
- Mars Exploration Rovers Mini-Tes Observations of Boundary Layer Temperatures and Aerosol Optical Depth (*Smith et al.*) 20'
- Wind Measurements in Mars' Middle Atmosphere at Equinox and Solstice: IRAM Plateau de Bure Interferometric CO Observations (*Moreno et al.*) 15'
- Mesospheric Winds and Temperatures from JCMT Sub-Millimeter CO Line Observations during the 2003 and 2005 Mars Oppositions (*Clancy et al.*) 15'

**17:00 – 17:30 : Tea break**

**Monday session 4 : 17:30 – 18:50**

#### **NEW OBSERVATIONS OF WINDS, TEMPERATURES AND SURFACE PRESSURE (2)**

- High Spectral Resolution Observations of CO<sub>2</sub> As a Probe For Mars Atmospheric Dynamics (*Sonnabend et al.*) 15'
- Remote Sensing of the Martian Atmosphere with Ground-Based Telescopes (*Bailey et al.*) 15'
- Altimetry Retrieval from the OMEGA Observations (*Melchiorri et al.*) 15'
- Mapping Surface Pressure Using OMEGA Observations (*Spiga et al.*) 15'
- *Discussion time* 15'
- *Poster Presentation* : Investigations of the Martian Neutral Atmosphere during the Polar Night and in the early Morning with the Mars Express Radio Science Experiment MaRS (*Tellmann et al.*) 2'
- *Poster Presentation* : Topographic and Atmospheric Pressure Mapping Using Near Infrared Imaging and Spectral Observations of Mars (*Chamberlain et al.*) 2'
- *Poster Presentation* : Derivation of Martian Meteorological Parameters Using Ground-Based Telescopes and Forward-Modelling (*Simpson et al.*) 2'
- *Other poster in this session*: Vstar - a New High-Spectral-Resolution Atmospheric Radiative Transfer Code For Mars and Other Planets (J. Bailey)

**Posters & wines: Monday 18:50– 20:30**

Tuesday, February 28, 2006

**Tuesday session 1 : 10:00 – 11:30**

**MARS ATMOSPHERE TRANSIENT EDDIES AND VARIABILITY**

- A Mesoscale Model Study of High Latitude Atmospheric Circulations and Transient Eddies in the northern Polar Summertime (*Tyler et al.*) 15'
- FFSM Studies of Transient Eddies in the MGS TES Temperature data (*J.R. Barnes*) 15'
- Baroclinic Waves in the Martian Atmosphere: Study Using the CCSR/NIES Martian GCM (*Kuroda and Takahashi*) 15'
- GCM Simulations of transient Eddies and Frontal Systems in the Martian Atmosphere (*Wilson, Hinson, and Smith*) 15'
- Atmospheric Predictability of the Martian Atmosphere: from Low-Dimensional Dynamics to Operational Forecasting? (*Read et al.*) 15'
- Discussion time 13'
  
- Poster Presentation :Effects of Condensation and Radiation on Eddies in the Martian Atmosphere (*J. S. Sabato*) 2'

**11:30 – 12:00 : Coffee break**

**Tuesday session 2 : 12:00 – 13:30**

**DATA ASSIMILATION**

- Data Assimilation for Mars: An overview of results from the Mars Global Surveyor period, proposals for future plans and requirements for open access to assimilation output. (*Lewis, L. Montabone, P. L. Read & P. Rogberg*) 20'
- Poster presentation: Climatology on Mars: Interannual variability of mean fields (*Rogberg et al.*) 2'
- Paper given by abstract only: Data Assimilation Developments for Martian Meteorology (*H. Houben*)

**DUST, WATER AND ICE IN THE MARTIAN ATMOSPHERE**

**GENERAL OBSERVATIONS**

- TES Atmospheric Temperature, aerosol optical depth, and water vapor observations 1999-2004 (*Smith et al.*) 20'
- Water Vapor, Water-Ice Clouds, and Dust in the North Polar Region (*Tamppari et al.*) 20'
- Sundry Atmospheric Observations with the Mars Exploration Rovers: Over- Flights, Refractive Indices, Clouds, and All That Jazz (*Wolff et al.*) 20'
- Discussion time 8'

**13:30 – 15:30 : Lunch break**

**Tuesday session 3 : 15:30 – 17:15**

**PROPERTIES OF ATMOSPHERIC DUST**

- OMEGA Spot Pointing Observations of Mars Aerosols (*Garcia-Comas et al.*) 20'

- OMEGA Limb Observations of the Martian Dust and Atmospheric Composition  
(*Fouchet et al.*) 20'
- Martian Atmosphere Limb Observations : Atmospheric Structure from PFS – Mars Express  
Measurements (*Formisano et al.*) 15'
- A Radiative Transfer Model Applied to the Analysis of Dust Suspended In the Martian Atmosphere  
(*Fonti et al.*) 15'
- Is the Scattered Radiation Inside the 2.7 Microns CO2 Band a Measurement of the Aerosols  
Dust Opacity? (*Rinaldi et al.*) 15'
- *Discussion time* 13'
- *Poster Presentation* : Constraining the Martian Dust Properties from the Marsexpress/Omega Data  
(*Määttänen et al.*) 2'

**17:15 – 17:45: Tea break**

**Tuesday session 4: 17:45 – 19:15**

#### IMPACT OF DUST ON THE MARTIAN CLIMATE AND DUST CYCLE MODELLING

- Results On Dust Storms and Stationary Waves In Three Mars Years of Data Assimilation  
(*Montabone, Lewis and Read*) 15'
- Synthesis of MGS Observations of the 2001 Global Dust Storm on Mars  
(*Noble et al.*) 15'
- The Martian Atmosphere During the 2001 Global Dust Storm: Observations with SWAS and  
Simulations with a General Circulation Model (*Kuroda, Medvedev and Hartogh*) 15'
- The Effects of Atmospheric Dust On the Seasonal Variation of Martian Surface Temperature  
(*Wilson et al.*) 15'
- High Resolution Simulations of the Martian Atmosphere with a General Circulation Model,  
*Part 2 : simulation of the dust cycle* (*Takahashi et al.*) 15'
- *Discussion time* 9'
- *Poster Presentation* : Simulations of the Martian Dust Cycle with a GFDL Mars GCM  
(*Basu, Wilson and Richardson*) 2'
- *Poster Presentation* : Calculations Derivation of the Forward Velocity of Martian Dust Devils  
and their Comparison with Wind Profiles from of a General Circulation Model (*Stanzel et al.*) 2'
- *Poster Presentation* : Pattern Recognition Algorithms For An Automated Search For Martian Dust Devils  
(*Stanzel et al.*) 2'

**19:15 End of session**

**Wednesday session 1 : 10:00 – 11:45**

**WATER VAPOR REMOTE SENSING FROM MARS EXPRESS**

- Atmospheric Water Vapour from the PFS/Mars Express Observations (*Tschimmel et al.*) 15'
- Water Vapor Retrieval In the Atmosphere of Mars: Results from the OMEGA Experiment Onboard Mars Express (*Maltagliati et al.*) 15'
- Water Vapour On Mars from Mars-Express PFS and OMEGA Measurements (*Fouchet et al.*) 15'
- Water In Mars Atmosphere: Comparison of Recent Data Sets (*Korablev et al.*) 15'
- Discussion time 15'

**CLOUDS OBSERVATIONS (1)**

- One Martian Year Observation of H<sub>2</sub>O Ice Clouds By OMEGA /Mars Express (*Gondet et al.*) 15'
- Martian Clouds Distribution Obtained from SPICAM Nadir UV Measurements: Preliminary Results (*Mateshvili et al.*) 15'

**11:45 – 12:15 : Coffee break**

**Wednesday session 2 : 12:15 – 13:30**

**CLOUDS OBSERVATIONS (2)**

- Seasonal Variation of the Structure of Martian Atmosphere from PFS Mars Express Data: Water Ice Clouds (*Zasova et al.*) 15'
- The Diurnal Variation and Radiative Influence of Martian Water Ice Clouds (*Wilson et al.*) 15'
- Stellar Occultations at UV Wavelengths By the SPICAM Instrument: Retrieval and Analysis of Martian Haze Profiles. (*Montmessin et al.*) 20'
- Mars Equatorial Mesospheric Clouds (*Clancy et al.*) 15'
- Discussion time 8'
- Poster Presentation : Ice Nucleation In the Martian Atmosphere (*Määttänen et al.*) 2'

**13:30 – 15:15 : Lunch break**

**Wednesday session 3 : 15:15 – 16:30**

**WATER AND ICE CYCLE MODELLING**

- Tracer Transport In the NASA-Ames GCM : Part 1 : Water Cycle (*Nelli et al.*) 15'
- Modeling Martian Water Cycle with Modified GM3 (*Akingunola and McConnell*) 15'
- Seasonal Cycle of the Martian Climate: Comparison of GCM Simulations with Spacecraft Data (*Rodin and Wilson*) 20'

## **MODELLING CLIMATE CHANGE INDUCED BY MARS ORBITAL VARIATIONS**

- **Review** : Geological Evidence for Hesperian-Amazonian Climate Change on Mars: North Polar Layering, South Polar Basal Melting and Circumpolar Lakes, Mid-Latitude Plateau Icefields and Debris-Covered Glaciers, and Tropical Mountain Glaciers. (Solicited)  
(*James W. Head III*) 25'

**16:30 – 16:45 : SHORT Tea break**

**Wednesday session 4 : 16:45 – 18:00**

- Climate simulation of recent climate changes on Mars (Solicited)  
(*Mischna et al.*) 15'
- Modelling Mars past water cycle : glacier, ice mantling, gullies and polar caps  
(*Forget et al.*) 15'
- Mars Atmosphere and Ice Sheet Modelling  
(*Stenzel et al.*) 15'
- Modelling the Evolution of North Polar Cap of Mars For Recent Past Climate  
(*Mahajan et al.*) 15'
- *Discussion time* 15'

**18:00 End of session**

**19:15 : WORKSHOP DINNER in the Carmen de los Chapiteles, Granada**

Thursday, March 2, 2006

**Thursday session 1 : 10:00 – 11:30**

**CO2 CYCLE AND POLAR PROCESSES**

- Use of Mars Odyssey GRS Results to Constrain the Exchangeable Mass of Martian CO2  
(*Boynton et al.*) 20'
- The Masses of Mars' Seasonal Polar Caps and Changes In the Gravity Field. (Solicited)  
(*Smith and Zuber*) 20'
- *Poster presentation* : Martian Global Scale CO2 Exchange from orbital tracking data  
(*O. Karatekin, T. Van Hoolst and V. Dehant*) 2'
- Meridional Mixing In Mars North Polar Region  
(*Sprague et al.* ) 20'
- Vertical Mixing In the Mars Polar Atmosphere  
(*D. Hunten*) 15'
- *Discussion time* 13'

**11:30 – 12:00 : Coffee break**

**Thursday session 2 : 12:00 – 13:30**

- Tracer Transport In the Nasa-Ames GCM : *Part 2 : Non-Condensable Gas*  
(*Nelli et al.* ) 15'
- Modelling the Non-Condensable gas enrichment in the polar night  
(*F.Forget*) 15'
- Observations By OMEGA /Mars Express of CO2 and H2O Frosts In the Seasonal Caps  
During a Full Martian Year (01/2004 - 11/2005) (*Langevin et al.* ) 25'
- Spatial Variability and Composition of the Seasonal North Polar Cap of Mars  
(*Giuranna et al.* ) 20'
- *Discussion time* 15'

**13:30 – 15:30 : Lunch break**

**Thursday session 3 : 15:30 – 17:10**

**ATMOSPHERIC COMPOSITION, PHOTOCHEMISTRY, AND RADIATION ENVIRONMENT**

- Ground-Based High-Resolution Ir Spectroscopy of Mars: H2O and H2O2 Mapping,  
Search for CH4, and Determination of CO2 Isotopic Ratios (*Encrenaz et al.*) 20'
- Ground-Based Direct Access to Martian Ozone through Infrared Heterodyne Spectroscopy  
(*Fast et al.*) 15'
- Ozone Retrieval On Mars from SPICAM/Mex UV/IR Nadir Measurements  
(*Perrier et al.*) 20'
- Vertical Distribution of Ozone, As Measured By SPICAM On Mars-Express  
(*Lebonnois et al.*) 20'

- Preliminary Study of UV Radiation On Mars from SPICAM Results and Its Relation to Surface Habitability (*Depiesse et al.*) 15'
- Discussion time 8'
- Poster presentation :A New Coupled 3D-Model of the Dynamics and Chemistry of the Martian Atmosphere and Some Problems of the Chemical Modeling (*Sonnemann et al.*) 2'
- Other Poster: Millimeter Observations of Mars with the IRAM 30-m Antenna: Constraints on CO, T(P), and Zonal Winds (*Encrenaz et al.*)

**17:10 – 17:40 : Tea break**

**Thursday session 4 : 17:40 – 19:30**

- Ozone In Martian Atmosphere from the 1.27  $\mu\text{m}$  O<sub>2</sub> Emission: OMEGA/Mars Express Measurements (*Zasova et al.*) 15'
- Towards a Quantitative Understanding of Martian Ozone (*Lefevre et al.*) 20'
- 3D Chemistry on Mars Using the Global Multiscale Model (*Moudden et al.*) 15'
- Photo-Electrochemistry of Mars, and Prospects For Measurements On the Mars Science Laboratory (*Atreya and Mahaffy*) 20'
- CO<sub>2</sub> Isotopes on Martian Atmosphere from Planetary Fourier Spectrometer (PFS-Mex) Data (*Cottini et al.*) 15'
- The Effects of Atmospheric Variations On the High Energy Radiation Environment at the Surface of Mars (*Keating et al.*) 15'
- Discussion time 10'

**19:30 End of session**

**22:00 : Andalusi Evening. Tetería, Bajo Albaycin. Granada**



Friday, March 3, 2006

**Friday session 1 : 10:00 – 11:30**

**MARS UPPER ATMOSPHERE: OBSERVATION AND MODELLING**

- Limb Observations of Infrared Fluorescence of CO<sub>2</sub> from OMEGA /Mars Express  
(*Drossart et al.*) 20'
- PFS-MEX Observations of non LTE emission at 4 - 5 microns  
(*Formisano et al.*) 15'
- Modelling Non-LTE radiative processes on Mars (*Lopez et al.*) 15'
- New Technique For Calculating the Non-LTE Infrared Radiative Cooling/Heating Rates  
In the Martian GCM (*Feofilov et al.*) 15'
- Mars Ionosphere Sounding By Marsis Subsurface Signals Analysis  
(*Picardi et al.*) 15'
- Discussion time 10'

**11:30 – 12:00 : Coffee break**

**Friday session 2 : 12:00 – 13:30**

- Mars atmosphere density and temperatures between 60 and 130 km observed  
by Mars Express SPICAM stellar occultation (*Forget et al.*) 15'
- Solar Flux Variability and Mars' Thermosphere Densities Derived from Orbital Tracking Data  
(*Bruinsma, Forbes and Lemoine.*) 15'
- 1-D and 3-D Modeling of the Martian Upper Atmosphere  
(*Lopez-Valverde et al.*) 15'
- Interannual Variability of the Mars Thermosphere: New Simulations and Comparisons with  
Recent Mars Datasets (*Bougher et al.*) 20'
- Thermal Structure of the Martian Thermosphere: LMD-IAA GCM and MTGCM Intercomparisons  
(*Gonzalez-Galindo et al.*) 20'
- Discussion time 5'

**13:30 – 15:30 : Lunch break**

**Friday session 3 : 15:30 – 16:45**

**FUTURE OBSERVATIONS**

- The Mars Climate Sounder on Mars Reconnaissance Orbiter (MRO) (Solicited)  
(*Taylor, Read, Mcleese et al.*) 15'
- Atmospheric Science with MRO/CRISM: Fun, Fun, Fun. (Solicited)  
(*Wolff et al.*) 15'
- Mars Weather and Ozone Column Mapping with MRO/MARCI (Solicited)  
(*Clancy et al.*) 15'
- The Phoenix Lander and climate Science on the surface in 2008 (Solicited)  
(*Tamparri et al.*) 15'

- *Discussion* 15'
- *Paper given by abstract only* :Virtual Sensor Technology For Mars Exploration  
(H. Houben)

**16:45 – 17:15 : Tea break**

**Friday session 4 : 17:15 – 18:15**

- The Rover Environmental Monitoring Station (REMS) of the Mars Science Laboratory (MSL,NASA/JPL 2009) (Solicited) (*Vázquez and Gómez-Elvira*) 15'
- The Medusa (Martian Environmental Dust Systematic Analyser) Experiment For the Monitoring of Dust and Water Vapour In the Lower Atmosphere of Mars (*Esposito et al.*) 15'
- Atmospheric Chemistry Explorer for Mars, Ace-M. (*Bernath et al.* ) 15'
- Metnet Atmospheric Science Network For Mars (*Harri et al.* ) 15'

**Friday 18:15 : End of workshop**