Mars atmosphere modelling and observations workshop

program

- Notice that, in Spain, lunch is usually after 2pm and dinner after 9pm
- The time allocated to each presentation does NOT include question and discussions
- In each session, a total amount of time is allocated for questions and discussion. This flexible time will be managed by the (brilliant) session chairmen.

Monday, January 13, 2002

Monday, session 1 8:30 – 11:00 (Presentation: 93' ; questions and discussion : 42' ; registration 15')

- **8:30 – 8:45 : Registration**
- **8:45 : Welcome and introduction** *(5')*

ATMOSPHERIC DYNAMIC

OBSERVATIONS:

- TES and THEMIS instrument description and thermal structure observations
  (2 abstracts : 1) TES: *M. D. Smith, B. J. Conrath, J.C. Pearl and P.R. Christensen* ;
  2) THEMIS: *M. D. Smith, J. L. Bandfield, M. I. Richardson, and P. R. Christensen)* *25'*
- Planetary eddies in the Martian atmosphere: FFSM analysis of TES data
  (*J.R. Barnes*) *10'*
- Results from radio occultations with Mars Global Surveyor
  (*D. P. Hinson and R. J. Wilson*): *20'*
- The orbital (Ls) variation of thermal structure over the 60-80 km Mars atmospheric region
  (*R. T. Clancy, B. J. Sandor and G. Moriaty-Schieven*) *10'*
- Atmospheric wave structure derived from Mars Global Surveyor Horizon sensor data.
  (*T. Z. Martin and J. R. Murphy*) *10'*
- Mars surface boundary layer meteorology
  (S. E. Larsen, H. E. Jørgensen, J. Murphy, J. E. Tillman and J. T. Schoffield) *10'*
- *Poster presentation :* Forced and traveling waves in the Martian atmosphere from MGS TES nadir data (*D. Banfield, B. Conrath, R. J. Wilson and M. Smith*) *3'*

11:00 – 11:30 : Coffee break

Monday session 2 : 11:30 – 13:30 (Presentation: 80' ; questions and discussion : 40')

- The effect of the 2001 Martian global dust storm on middle atmosphere emissions due to the 10 μm non-LTE CO2 hot bands observed by MGS/TES (*W. C. Maguire et al.*): *10'*

GENERAL CIRCULATION MODELING

- The NASA/AMES Mars General Circulation Model: Model improvement and comparison with observations (*R. M. Haberle et al.*) *20'*

- General circulation simulated by the LMD-AOPP GCM: Update on model design and comparison with observations (*F. Forget et al.*) *20'*
- Recent advances in the development of a European Mars climate model at Oxford. (*P. L. Read et al.*) *10'*
- GCM simulation of thermal tides in the Mars atmosphere (*R. J. W ilson, D. Banfield, D. P. Hinson, and M. D. Smith*) *20'*

13:30 – 15:00 : Lunch break

Monday session 3 : 15:00 – 16:45 (Presentation: 72' ; questions and discussion : 33')

- Zonal mean circulation obtained by a newly developed Martian atmospheric General Circulation Model. (*Y. O. Takahashi et al.*) *10'*
- Interannual variability in Mars' atmosphere. (*A. F. C. Bridger and J. L. Hollingsworth*) *10'*
- Cyclogenesis and frontal waves on Mars (*J. L. Hollingsworth*) *10'*

DATA ASSIMILATION

- Data assimilation for the Martian atmosphere using MGS Thermal Emission Spectrometer observations (*S. R. Lewis et al.*) *10'*
- Assimilation of TES data from the Mars Global Surveyor scientific mapping phase. (*L. Montabone et al.*) *10'*
- Data assimilation of Mars Global Surveyor meteorology (*H. Houben*) *10'*

POSTER PRESENTATION

- *Poster presentation :* Towards an intermediate complexity Martian climate simulator. (*J. Segschneider et al.*) *3'*
- *Poster presentation :* The MAOAM project (*P. Hartogh et al.*) *3'*
- *Poster presentation :* Breeding vector and predictability in the Oxford Mars GCM (*C. E. Newman, P. L. Read and S. R. Lewis)* *3'*
- *Poster presentation :* Carnot thermodynamics of the Martian atmosphere (*R. D. Lorenz*) *3'*
- *Poster :* Migrating diurnal tides in the Martian atmosphere : numerical investigations (*Y. O. Takahashi, H. Fujiwara and H. Fukunishi*)
- *Poster* : Non-LTE model for infrared radiation in the Martian atmosphere *(A.. Kutepov, W.. Maguire, M.. Smith, J.. Pearl, B. Conrath, A. Feofilov and O. Gusev)*

16:45 – 17:15 : Tea break

Monday session 4 : 17:15 – 19:15 (Presentation: 75' ; questions and discussion : 45')

GENERAL CIRCULATION MODEL INTERCOMPARISON

- Intercomparison: Lower atmosphere radiative transfer model (*H. Savijarvi*) *: 10'*

- GCM Intercomparison: zonal mean fields
  (*A. F. C. Bridger*) *10'*
- GCM Intercomparison: Stationary wave
  (*J. L. Hollinsworth*) *10'*
- GCM Intercomparison: Tides and travelling waves
  (*J. R. Wilson*): *10'*

COUPLING OF THE LOWER AND UPPER ATMOSPHERE: ANALYSIS OF MEASUREMENT ABOVE 90 KM

- Results obtained with the MGS and Mars Odyssey 2001 accelerometer experiments
  (*G. M. Keating et al.*) *15'*
- MGS accelerometer data analysis with the LMD GCM.
  (*M. Angelats i Coll et al.*) *10'*
- MGS accelerometer and radio science analysis using the coupled Ames-MGCM / Michigan TGCM
  (*S. W. Bougher)* No abstract *10'*

Posters & wines: Monday 19:15– 20:30

Tuesday, January 14, 2002

Tuesday session 1 :8:30 – 10:15 (Presentation: 70' ; questions and discussion : 35')

MESO-SCALE MODELLING

- Reflections on Mars global climate modeling from a mesoscale meteorologist
  (*S. C. R. Rafkin*) *20'*
- Development of the Oregon state university Mars MM5 and description of our initial results.
  (*D. Tyler and J. R. Barnes*) *15'*
- The Cornell/Caltech Mars MM5 mesoscale model
  (*A. D. Toigo and M. I. Richardson*) *15'*
- Two dimensional simulations of Martian mesoscale circulation phenomena: a review and future role
  (*T. Siili, H. Savijärvi, A. Määttänen and J. Kauhanen*) *10'*
- Intercomparison of mesoscale models
  (*D. Tyler*) *10'*
- *Poster*: Simulating the late-summer atmospheric circulation of the Martian north pole region.

  (*D. Tyler and J. R. Barnes*)
- *Poster:* Numerical modelling of Martian dust devils
  (*A. D. Toigo, M. I. Richardson, and P. J. Gierash*)

10:15 – 10:45 : Coffee break

Tuesday session 2 : 10:45 – 13:30 (Presentation: 125' ; questions and discussion : 40')

DUST, WATER AND ICE IN THE MARTIAN ATMOSPHERE

OBSERVATIONS

- Mars Orbiter Camera meteorological observations
  (*B. A. Cantor and M. Malin*) *25'*

- Mars Orbiter Camera climate observations
  (M. Malin and B. A. Cantor) *25'*
- TES observations of aerosol optical depth and water vapor abundance
  (*M. D. Smith, B. J. Conrath, J.C. Pearl and P.R. Christensen*) *30'*
- Variations in aerosol particle properties for Mars ice and dust clouds
  (2 abstracts: 1) *M. J. Wolff and R. T. Clancy;* 2) *R.T. Clancy and M. J. Wolff*) *20'*
- Clouds detected by the Mars Orbiter Laser Altimeter
  (*G. A. Neuman, M. T. Zuber and D. E. Smith*) *10'*

MODELS

- Dust cycles and storms in a Mars GCM
  (*C. E. Newman, P. L. Read, S. R. Lewis and F. Forget.*): *15'*

13:30 – 15:00 : Lunch break

Tuesday session 3 : 15:00 – 16:45 (Presentation: 72' ; questions and discussion : 33')

- Modelling the Martian water cycle
  (*M. I. Richardson*) *20'*
- Water-ice clouds in the LMDs Martian General Circulation Model
  (*F. Montmessin and F. Forget.)* *10'*
- GCM simulations of the Martian water cycle
  (*H. M. Böttger, S. R. Lewis, P. L. Read and F. Forget*) *10'*
- Simulation of the water cycle
  (*H. Houben,* no abstract*)* *7'*
- The incorporation of water ice cloud microphysics in a Mars General Circulation Model
  (*A. V. Rodin and R. J. Wilson.*) *10'*
- *Poster presentation:* Report on two topics: relationship between the dust and water cycles in the GCM; Dust devils at Pathfinder. (*S. M. Nelli and J. R. Murphy)* *3'*
- *Poster presentation*: Formation, evolution and estimated radiance of surface fogs in low and middle latitudes on Mars (*A. Inada, W.J. Markiewicz and T. Mukai*) *3'*
- *Poster presentation*: Sublimation of water from the North polar cap on Mars.
  (*C. S. Hvidberg and H. J. Zwally*) *3'*
- *Poster presentation*: Mountain glaciers on Mars? Characterization of western Tharsis Montes fan shaped deposits using MGS data. (*J. W. Head and D. R. Marchant*): *3'*
- *Poster presentation*: Atmospheric and hydrological cycles on Mars related to Tharsis superplume.
  (*J. M. Dohm et al.*) *3'*

16:45 – 17:15 : Tea break

Tuesday session 4 : 17:15 – 19:00 (Presentation: 69' ; questions and discussion : 36')

- Intercomparison: GCM/dust transport models
  (*C. Newman*) *10'*
- Intercomparison: water vapour cycle simulation (TBC)
  (*M. Richardson*) *10'*
- Intercomparison: water cloud simulation
  (*A. Colaprete*) *10'*

ATMOSPHERIC PHOTOCHEMISTRY AND UV IN THE LOWER ATMOSPHERE

- High resolution spectroscopic observations of Mars : recent results
  (*V. Krasnopolsky*) *10'*
- Photochemistry of the Martian atmosphere
  (*R.T Clancy et al.*) No abstract *10'*
- Coupling a photo chemical model and the LMD GCM
  (*F. Lefevre, S. Lebonnois and F. Forget*) *10'*
- *Poster presentation*: Modelling the annual cycle of carbon monoxide in the Martian atmosphere
  (*M. M. Joshi, R. M. Haberle and R. T. Clancy*) *3'*
- *Poster presentation*: Ultraviolet radiation on the surface of Mars and a UV spectrometer on Mars
  (*D. C. Catling et al.*) *3'*
- *Poster presentation*: Martian Modelling for the design of UV sensors for Mars surface
  (*C. Muller, D. Gillotay and D. Moreau)* *3'*
- *Poster* : A stringent upper limit of the H_2O_2 abundance in the Martian atmosphere
  (*T. Encrenaz et al.*)

19:00 End of session

20:00 Busses leaves to the workshop dinner

Wednesday, January 15, 2002

Wednesday session 1 : 8:30 – 10:30 (Presentation: 80' ; questions and discussion : 40')

CO2 CYCLE AND POLAR PROCESSES

- CO_2 cycle: Two martian years of polar IR observations
  (*T. N. Titus et al.*) *20'*
- Effects of atmospheric dust on the recession of the seasonal south polar cap.
  (*P. B. James et al.*) *10'*
- Martian polar clouds
  (*P. G. Ford and G. H. Pettengill*): *10'*
- Numerical simulation of the winter wave clouds observed by Mars Global Surveyor Mars Orbiter Altimeter (*G. Tobie, F. Forget and F. Lott*) *10'*
- A comparison of Mars GCM carbon dioxide cloud simulations with observations
  (*A. Colaprete and R. M. Haberle*) *10'*
- Seasonal changes in the masses of the polar ice caps of Mars derived from Mars Global surveyor gravity (*D. E. Smith and M. T. Zuber*): *10'*
- Estimation of temporal changes in the mean global atmospheric pressure on Mars from MGS Doppler tracking (*M. T. Zuber and D. E. Smith*) *10'*

10:30 – 11:00 : Coffee break

Wednesday session 2 : 11:00 – 13:30 (Presentation: 103' ; questions and discussion : 47')

THERMOSPHERE AND IONOSPHERE

- The NCAR Mars Thermospheric General Circulation Model: a review
  (*S. W. Bougher, S. Engel and P. Withers*) *20'*
- Mars' upper atmosphere and ionosphere at low, medium, and high solar activities
  (*W. Krasnopolsky*) *10'*
- Theoretical 1D model of the energetics, composition and vertical transport of the Martian upper atmosphere
  (*M. Lopez-Valverde, F. Gonzalez-Galindo, M. Angelats-i-Coll, F. Forget, F. Hourdin)* *10'*
- Fast parameterizations of UV heating and photochemistry for GCM models of the Martian atmosphere (*F. Gonzalez-Galindo and M. A. Lopez-Valverde*) *10'*
- Towards a global model of the martian atmosphere-thermosphere
  (*M. Angelats-i-coll et al.*) *10'*
- The current status of the UCL Mars thermospheric model
  (*T. Moffat and A. D. Aylward*) *10'*
- A new Mars ionosphere/airglow model between 60 and 500 km altitude.
  (*O. Witasse et al.)* *10'*
- Intercomparison : Upper atmosphere radiative transfert model
  (*M. Lopez Valverde*) *10'*
- Intercomparison : Mars 3D Thermosphere Models
  (*M. Angelats I Coll*) *10'*
- *Poster presentation* : Development of a surface-to-exosphere Mars atmosphere model.
  (*G. Crowley et al.*) 3'

13:30 – 15:00 : Lunch break

Wednesday session 3 : 15:00 – 17:15 (Presentation: 94' ; questions and discussion : 41')

FUTURE OBSERVATIONS

MARS EXPRESS (2003)

- The Planetary Fourier Spectrometer (PFS) onboard the European Mars Express mission
  (*V. Formisano et al.*) *15'*
- *Poster presentation*: PFS: evaluation of atmospheric sounding capabilities
  (*D. Grassi et al.*) *3'*
- *Poster presentation*: PFS measurements and statistics between orbit 17 and 116 of Mars Express mission. (*A. Maturilli, V. Formisano and D. Grassi*) *3'*
- *Poster presentation:* Validation of Mars General Circulation Models using spectrally resolved data from PFS (*C. Fiorenza et al.)* *3'*
- SPICAM on Mars Express: The atmosphere of Mars from top to bottom
  (*J.-L. Bertaux, S. Guibert, O. Korablev, and the SPICAM team*) *10'*
- The Mars Express Orbiter radio science experiment
  (*D. Hinson, M. Paetzold et al.*) No abstract *7'*
- *Poster presentation :* Optical depth retrievals with the HRSC on Mars Express
  (*N. M. Hoekzema, W. J. Markiewicz and H. U. Keller*) *3'*
- *Poster presentation :* Pressure measurements from 2.0 microns CO2 band by remote sensing : reanalysis of Phobos/ISM and preparation of Mars Express/Omega observations
  (Melchiorri et al) *3'*

- *Poster presentation :* Observation of pressure variations in the Martian atmosphere. Potential applications to Omega/Mars Express *(A. Gendrin, S. Erard, R. Melchiorri and P. Drossart)*

MARS EXPLORATION ROVER (2003)

- Atmospheric Science with Mars Exploration Rover 2003
  (*M. Wolff et al.*) No abstract *7'*

MARS RECONNAISSANCE ORBITER (2005)

- Atmospheric science on the Mars Reconnaissance Orbiter
  (*R. Zurek*) *10'*
- Objectives of the Mars Climate Sounder on the Mars Reconnaissance Orbiter
  (*D. McCleese et al.*) *15'*

OTHER POSTERS

- *Poster presentation:* DynAMO, an imaging interferometer for satellite observations of wind and temperature on Mars (*W. E. Ward et al.)* *3'*
- *Poster presentation :* Sounding mars by Schumann resonances and electromagnetic transparence
  (*J. A. Morente et al*.) *3'*
- *Poster presentation:* Evaluation of geodetic measurement in the determination of Martian global-scale seasonal CO2 change (*O. Karatekin et al*.) *3'*
- *Poster presentation:* Optimal orbits for Mars atmosphere remote sensing
  (*M. Capderou and F. Forget*) *3'*
- *Poster presentation:* Observing Mars with large ground-based telescopes using adaptive optics
  (*J. Bailey and D. Crisp*) *3'*

17:15 – 17:45 : Tea break

Wednesday session 4 : 17:45 – 19:30 (Presentation: 73' ; questions and discussions : 32')

PROJECT BEYOND 2005

- Netlander ATMIS: overview: objectives and current instrument status
  (*A. M. Harri et al*.) *6'*
- Netlander ATMIS wind and temperature instruments
  (*D. Crisp et al.*) *6'*
- The Pascal Mars Scout mission
  (*R. M. Haberle and the Pascal team.*) *10'*
- The optical depth sensor (ODS) on Netlander and Pascal missions
  P. Rannou et al. *6'*
- MAMBO : the Mars Atmosphere Microwave Brightness Observer
  (*F. Forget and the MAMBO team*) *10'*
- DYNAMO: A Mars upper atmosphere package for investigating solar wind interaction and escape processes, and mapping magnetic fields (*Chassefiere et al.)* *10'*

REFERENCE ATMOSPHERE AND DATABASE

- Mars Global Reference atmospheric model (Mars-GRAM) and database for mission design
  (*C. G. Justus, A. Duvall and D. L. Johnson*.) *10'*
- The Mars Climate Database.
  (*S. J. Bingham et al*.) *10'*

- Mars International Reference Atmosphere (no abstract)
  (*G. M. Keating*) *5'*

Wednesday 19:30 : End of workshop