

PRELIMINARY PROGRAM

Conference on the Geophysical Detection of Subsurface Water on Mars August 6–10, 2001

* *Denotes Speaker*

*To view a particular abstract, simply use the hand tool of your Acrobat Reader to
click on the title of that presentation.*

Monday, August 6, 2001
TERRESTRIAL BACKGROUND
8:30 a.m. Lecture Hall

Chair: S. Clifford

WELCOME, INTRODUCTIONS, AND REVIEW OF CONFERENCE AGENDA

Black P. B. * [INVITED]

Basic Concepts in Terrestrial Ground Freezing

Hallet B. * [INVITED]

Characteristics of the Continuous Permafrost Regions of Earth

Max M. D. * [INVITED]

Terrestrial Methane Hydrate

GENERAL DISCUSSION

10:30–10:45 a.m. BREAK

Monday, August 6, 2001
MARTIAN BACKGROUND
10:45 a.m. Lecture Hall

Chair: J. George

Clifford S. M.* [INVITED]

The Expected Nature, Distribution and State of Subsurface Volatiles on Mars

Greeley R.* [INVITED]

Mars Subsurface Science Issues: A MEPAG Perspective

GENERAL DISCUSSION

12:15–1:30 p.m. LUNCH

Monday, August 6, 2001
GEOMORPHIC EVIDENCE OF SUBSURFACE VOLATILES ON MARS
1:30 p.m. Lecture Hall

Chair: C. Stoker

Barlow N. G. *

Impact Craters as Indicators of Subsurface Volatile Reservoirs

Russell P. S. * Head J. W. III

The Elysium/Utopia Flows: Evidence for Release of Confined Groundwater in the Context of a Global Cryosphere-Hydrosphere System

Head J. W. * Kreslavsky M. A.

*Medusae Fossae Formation as Volatile-rich Sediments Deposited During High Obliquity:
An Hypothesis and Tests*

PANEL DISCUSSION
THE NATURE OF THE CRYOSPHERES OF THE EARTH AND MARS

Moderators: C. Stoker, S. Clifford, J. George

Panelists: M. Carr, B. Hallet, N. Hoffman

3:30–3:45 p.m. BREAK

Monday, August 6, 2001
MARS EXPLORATION: PLANS AND POSSIBILITIES
3:45 p.m. Lecture Hall

Chair: S. Clifford

Beaty D. * [INVITED]

Mars Subsurface Exploration: A Review of Recent Studies

MODERATED DISCUSSION

Moderators: D. Beaty, M. Carr, D. McCleese, S. Arcone

Monday, August 6, 2001
CONFERENCE RECEPTION AND POSTER SESSION
7:00 p.m. Great Room

Coleman N. M.

Geophysical Methods to Detect Ground Ice Produced by Recent Fluid Flows on Mars

Ozorovich Y. R. Linkin V. M. Fink J. Smythe W. D. Zoubkov B. V. Babkin F. V.

Possibilities of Using MARSES Instrument for Long-Term Monitoring and Subsurface Studies in Arctic and Arid Lands

Counil J. L. Ferri F. Lognonne Ph. Marsal O. Rocard F. Bonneville R.

The Netlander Mission: A Geophysical Network Aimed at Investigating Mars Atmosphere, Sub-Surface and Deep Interior

Mangold N.

Lobate Debris Aprons as Potential Targets for Ground Ice Detection Analogs to Terrestrial Rock Glaciers

Jean J.-S. Yang C.-H.

Future Explorations on Chemical Compositions of Seepage Water and Ground Ice on Mars Detected by Gamma-Ray Spectrometer, GC-MS, and Ion Chromatograph

Hamelin M. Trautner R.

Localization of Mars Sub-Surface Ice/Water by Means of a Mobile Ground Penetrating Radar in Combination with a Mutual Impedance Probe

Reineix A. Martinat B. Berthelie J. J. Ney R.

FDTD Method for the Theoretical Analysis of the NETLANDER GPR

Costard F. Forget F. Mangold N. Mercier D. Peulvast J. P.

Debris Flows on Mars: Comparison with Terrestrial Analogs

Pletser V. Lognonne P. Diament M. Ballu V. Dehant V. Lee P. Zubrin R.

Subsurface Water Detection on Mars by Active Seismology: Simulation at the Mars Society Arctic Research Station

Costard F. Berthelie J. J. Grandjean G. Heggy E. Mangold N. NEY R. Paillou Ph.

Proposed Model of the Martian Subsurface for the GPR Experiment on Netlander

Pellenbarg R. E. Max M. D. Clifford S. M.

Methane and Carbon Dioxide Hydrates on Mars: Are There Sufficient Natural Resources on Mars to Sustain Human Habitation?

Kereszturi A.

Theoretical Assumptions on Subsurface Ice Melting on Mars

Cummer S. A. Farrell W. M.

Modeling the Complete Planetary Subsurface Radio Remote Sensing Problem

Knauth L. P. Burt D. M. Tyburczy J. A.

Highly Conductive Eutectic Brines Rather than Water Expected in the Martian Subsurface

Plaut J. J. Jordan R. Safaeinili A. Picardi G. Seu R. Orosei R.

Subsurface Sounding of Mars: The Effects of Surface Roughness

Aprea C. M. Alde D. M. Rutledge J. T.

Regional Imaging of the Subsurface of Mars Using Teleseismic Events

Banerdt W. B. Pike W. T.

A Miniaturized Seismometer for Subsurface Probing on Mars

Tuesday, August 7, 2001
TECHNIQUES IN TERRESTRIAL GEOPHYSICAL EXPLORATION
8:30 a.m. Lecture Hall

Chair: J. George

REVIEW OF DAY'S AGENDA

Olhoeft G. R. * [INVITED]

Subsurface Geophysical Detection Methods to Uniquely Locate Water

Grimm R.* Blohm M. [INVITED]

Practical Geophysical Exploration for Groundwater

Mosher C. * [INVITED]

Advanced Geophysical Techniques in the Search for Oil and Gas

10:30–10:45 a.m. BREAK

Tuesday, August 7, 2001
TECHNIQUES APPLIED TO THE TERRESTRIAL PERMAFROST
10:45 a.m. Lecture Hall

Chair: C. Stoker

Arcone S. * [INVITED]

Permafrost Investigations with Ground-Penetrating Radar in Northern and Interior Alaska, and in the Antarctic Dry Valleys

Hoekstra P. * [INVITED]

Electromagnetic Probing of Permafrost

12:15–1:30 p.m. LUNCH

Tuesday, August 7, 2001
TERRESTRIAL INVESTIGATIONS OF SOIL, PERMAFROST, AND ICE SHEETS
1:30 p.m. Lecture Hall

Chair: S. Clifford

Daniels J. * Blumberg D. G. Freiliker V. Vulfson L. D. Kotlyar A. L. Neta T. Ben-Asher J.
Sprintsin M. Ronen G. Linstky M.

Radar Penetration in Soils: The Potential for Sub-Surface Observation of Both Earth and Mars

Calvert H. T. * Dallimore S. R. Hunter J. A.

*Application of Geophysical Techniques for Mapping Ice-bearing Sediments, Mackenzie Delta,
Western Arctic, Canada*

Peters M. E. * Blankenship D. D. Morse D. L.

Imaging Subglacial Water Systems with Coherent Airborne Radar Sounding Techniques

Doebbler J. A. * Blankenship D. D. Morse D. L. Peters M. E.

A Model for the Dielectric Absorption of the Central West Antarctic Ice Sheet at Radar Sounding Frequencies

GENERAL DISCUSSION

3:30–3:45 p.m. BREAK

Tuesday, August 7, 2001
PLANNED ORBITAL GEOPHYSICAL INVESTIGATIONS I
3:45 p.m. Lecture Hall

Chair: S. Clifford

Jordan R. * Biccari D. Bombaci O. Gurnett D. Johnson W. T. K. Kirchner D. Picardi G. Plaut J.
Safaeinili A. Seu R. Zampolini E.

*The System and Implementation Aspects of the Mars Advanced Radar for Subsurface and Ionospheric
Sounding (MARSIS)*

Safaeinili A. * Biccari D. Bombaci O. Gurnett D. Johnson W. T. K. Jordan R. L. Orosei R. Picardi G.
Plaut J. Seu R. Zampolini E. Zelli C.

Radar Sounding of Mars: A Focus on MARSIS

Biccari D. * Picardi G. Seu R. Corradini A. Orosei R.

The Mars High Resolution Advanced Radar for 2005 Space Mission

MODERATED DISCUSSION

Moderators: D. Beaty, M. Carr, D. McCleese, S. Arcone

6:30–9:00 p.m. CONFERENCE DINNER: VILLA CAPRI, CLEAR LAKE

MODERATED DISCUSSION (Continued)

Moderators: D. Beaty, M. Carr, D. McCleese, S. Arcone

Wednesday, August 8, 2001

AMBIGUITIES AND COMPLICATIONS IN THE INTERPRETATION OF GEOPHYSICAL DATA
8:30 a.m. Lecture Hall

Chair: C. Stoker

REVIEW OF DAY'S AGENDA

Leuschen C. J. * Gogineni S. P. Clifford S. M. Raney R. K. [INVITED]
Design of a Ground-Penetrating Radar for Mars: Simulations and Experiments

Orosei R. * Bianchi R. Coradini A. Espinasse S. Federico C. Ferriccioni A.
Characterization of the Martian Surface Scattering at Decametric Wavelengths

Heggy E. * Paillou Ph. Ruffié G. Malézieux J.-M. Costard F. Grandjean G.
On Sounding Radar Performances for Martian Subsurface Water Detection

Pettinelli E. * Della Monica G. Bella F. Losito G. Di Maio R. Vannaroni G. Storini M. Orsini S. Cerulli-Irelli R.
High and Low Frequency Electrical Measurements of Martian Soil Simulants

Shchuko O. B. Kartashov D. V. * Orosei R. Picardi G.
Martian Underground Water Detection: Thermal Model and Simulations of Radar Pulse Propagation

GENERAL DISCUSSION

10:30–10:45 a.m. BREAK

Wednesday, August 8, 2001
MARS GEOPHYSICAL EXPLORATION STRATEGY
10:45 a.m. Lecture Hall

Chair: S. Clifford

Clifford S. M. * George J. A. Stoker C. R. Briggs G. Beaty D. W.
A Proposal for an Integrated Geophysical Strategy to "Follow the Water" on Mars

DEEP-SOUNDING ORBITAL RADAR, GLOBAL RECONNAISSANCE CONCEPTS

Gogineni P. * [INVITED]
Orbital Radar Sounding of Mars: Technical Challenges and Solutions

GENERAL DISCUSSION

12:15–1:30 p.m. LUNCH

Wednesday, August 8, 2001
SAR ORBITAL SOUNDERS
1:30 p.m. Lecture Hall

Chair: J. George

Campbell B. A. * Campbell D. B. Grant J. A. Hensley S. Maxwell T. A. Plaut J. J. Rosen P.
Shepard M. K. Simpson R.

Orbital Imaging Radar and the Search for Water on Mars

Paillou Ph. * Thompson T. W. Plaut J. J. Rosen P. A. Hensley S. Elachi Ch. Massonnet D. Achache J.

MEEM: An Orbital Synthetic Aperture Radar for Mars Exploration

Kofman W. * Herique A. Costard F.

The P-band Radar to Study Polar Caps, the Shallow Sub-Surface and Paleo-Channels on Mars

GENERAL DISCUSSION

PANEL DISCUSSION
MARS ORBITAL SOUNDING: A VIABLE METHOD
OF GLOBAL RECONNAISSANCE FOR SUBSURFACE WATER?

Moderators: D. Beaty, M. Carr, D. McCleese

Panelists: G. Olhoeft, S. Arcone, P. Gogineni, C. Leuschen, K. Raney, C. Mosher

3:30–3:45 p.m. BREAK

Wednesday, August 8, 2001
PANEL DISCUSSION
MARS ORBITAL SOUNDING: A VIABLE METHOD
OF GLOBAL RECONNAISSANCE FOR SUBSURFACE WATER? (Continued)
3:45 p.m. Lecture Hall

Moderators: D. Beaty, M. Carr, D. McCleese

Panelists: G. Olhoeft, S. Arcone, P. Gogineni, C. Leuschen, K. Raney, C. Mosher

PLANNED ORBITAL GEOPHYSICAL INVESTIGATIONS II

Chair: J. George

Squyres S.* [INVITED]

The Gamma-Ray/Neutron Spectrometer Onboard the 2001 Mars Orbiter

6:30–9:00 p.m. CONFERENCE DINNER: CADILLAC BAR AND GRILL, KEMAH BOARDWALK
Featured Speaker: A. Frolov
On the Nature and Geophysical Investigation of the Continuous Permafrost of Siberia

Thursday, August 9, 2001
NETLANDERS
8:30 a.m. Lecture Hall

Chair: S. Clifford

REVIEW OF DAY'S AGENDA

Costard F. Lognonne Ph. * Banerdt B.

Martian Volatile-Rich Reservoirs: A Review of the Netlander Payload Contribution

Berthelier J. J. * Ney R. NETLANDER/GPR Team

The GPR Experiment on Netlander: Objectives, Description of the Instrument and Simulated Performances

Ciarletti V. * Berthelier J. J. Ney R. Reinex A. Martinat B.

The GPR Experiment on NETLANDER: Preliminary Results on the Determination of the Propagation Vector of Reflected Waves

Lognonné Ph. * Banerdt B. Giardini D. Costard F. NL-SEIS Team

An Idea for an Active Seismic Experiment on Mars in 2008

10:30–10:45 a.m. BREAK

Thursday, August 9, 2001
ALTERNATIVE PLATFORMS
10:45 a.m. Lecture Hall

Chair: J. George

Stoker C. *

Rovers, Airplanes, & Balloons: Capabilities & Limitations

Brownlow L. W. Dorn G. A. Mosher T. J. *

A Proposal for Detailed Mapping of Martian Aquifers Using Penetrators

Grant J. A. * Campbell B. A. Schutz A. E.

A Rover Deployed Ground Penetrating Radar on Mars

GENERAL DISCUSSION

12:15–1:30 p.m. LUNCH

Thursday, August 9, 2001
ALTERNATIVE INVESTIGATIONS
1:30 p.m. Lecture Hall

Chair: C. Stoker

Grimm R. E. * [INVITED]

Low-Frequency Electromagnetic Exploration for Groundwater on Mars

Connerney J. E. P. * Acuna M. H.

Detection of Sub-Surface Water on Mars by Controlled and Natural Source Electromagnetic Induction

Trautner R. Grard R. * Hamelin M.

Localisation and Characterisation of Subsurface Ice and Water Deposits by Means of Mutual Impedance (MI) Instruments

Smith P. H. *

Mars Oasis Detector

Kiefer W. S. *

Water or Ice: Heat Flux Measurements as a Contribution to the Search for Water on Mars

3:30–3:45 p.m. BREAK

Thursday, August 9, 2001
PANEL DISCUSSION
SURFACE AND AIRBORNE GEOPHYSICAL
INVESTIGATIONS IN THE SEARCH FOR SUBSURFACE WATER ON MARS
3:45 p.m. Lecture Hall

Moderators: D. Beaty, M. Carr, D. McCleese, S. Arcone
Panelists: C. Stoker, R. Grimm, P. Hoekstra, R. Grard, N. Coleman

6:30–9:00 p.m. CONFERENCE DINNER: LANDRY'S SEAFOOD, KEMAH BOARDWALK

PANEL DISCUSSION
COLLATERAL SCIENCE OPPORTUNITIES OFFERED BY THE GEOPHYSICAL EXPLORATION
FOR SUBSURFACE WATER ON MARS

Moderators: D. Beaty, M. Carr, D. McCleese, S. Arcone
Panelists: B. Banerdt, Ph. Lognonné, C. Mosher, G. Olhoeft

Friday, August 10, 2001
ACCESSING VOLATILE TARGETS: DRILLING ON MARS
8:30 a.m. Lecture Hall

Chair: J. George

Briggs G.* [INVITED]

The Scientific Goals and Technical Challenges of Drilling on Mars

Coradini A. * Angrilli F. De Sanctis M. C. Espinasse S. Flamini E. Orosei R. Re E.

An Integrated Technological Proposal for Drilling and In-Situ Science for the 2007 Mars Lander Mission

Mandell H. * [INVITED]

A Proposal for Going Deep and Early

GENERAL DISCUSSION

10:30–10:45 p.m. BREAK

Friday, August 10, 2001
SUMMARY PANEL DISCUSSION
DEFINING THE BEST STRATEGY TO “FOLLOW THE WATER” ON MARS
10:45 a.m. Lecture Hall

Moderators: S. Clifford, C. Stoker, J. George

Panelists: D. Beaty, M. Carr, D. McCleese, S. Arcone, J. Garvin, C. Mosher

CLOSING REMARKS

12:30 p.m. CONFERENCE ADJOURNS

PRINT-ONLY PRESENTATIONS

Hoffman N.

Quantities and Sources of Liquid Carbon Dioxide in the Subsurface of Modern and Ancient Mars

Hoffman N.

Modern Geothermal Gradients on Mars and Implications for Subsurface Liquids

Garry J. R. C.

The Measured Permittivity of CO₂ Ice Grown Under Martian Polar Conditions