

**PRELIMINARY PROGRAM**  
**The First International Conference on Mars Polar Science and Exploration**  
**October 18–22, 1998**

**Click on a title to view the abstract for that presentation.**

**Sunday evening, October 18, 1998**

REGISTRATION (5:00–7:30 p.m.)

**KEYNOTE SESSION**  
**7:30 p.m.**

**Chair: S. Clifford**

Carr M.\*

*Water on Mars*

Björnsson H.\*

*Glaciology of Iceland: Ice, Fire and Water, Processes, and Landforms*

**Monday morning, October 19, 1998**

REGISTRATION and BREAKFAST (7:30–8:30 a.m.)

**SUMMARY OF OUR CURRENT UNDERSTANDING OF THE  
MARTIAN POLAR REGIONS**  
**8:30 a.m.**

**Chair: J. Rice**

Clifford S.\*

*Welcome, Introductions, and Review of Conference Agenda*

Herkenhoff K. E.\*

*Geology, Composition, Age, and Stratigraphy of the Polar Layered Deposits on Mars*

Haberle R.\*

*Seasonal and Climatic Evolution*

Fisher D. A.\*

*Past Glaciological and Hydrological Studies*

BREAK (10:15–10:30 a.m.)

Malin M.\*

*Early MGS Results: MOC*

Smith D. E.\* Zuber M. T.

*An Overview of Observations of Mars' North Polar Region from the MGS Laser Altimeter*

TBA\*

*Early MGS Results: TES*

GENERAL DISCUSSION (30 minutes)

LUNCH BREAK (12:30–1:30 p.m.)

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\* Denotes speaker

**Monday afternoon, October 19, 1998**

**OVERVIEW OF PLANNED INVESTIGATIONS  
1:30 p.m.**

**Chair: J. Rice**

McCleese D.\*

*Surveyor '98 (Orbiter)*

Paige D. A.\* Boynton W. V. Crisp D. DeJong E. Harri A. M. Hansen C. J. Keller H. U. Leshin L. A.  
Smith P. H. Zurek R. W.

*Mars Volatiles and Climate Surveyor (MVACS) Integrated Payload for the Mars Polar Lander Mission*

Smrekar S. E.\* Gavit S. A.

*Deep Space 2: The Mars Microprobe Project and Beyond*

Plaut J. J.\*

*The Mars Express Subsurface Sounding Radar: Water and Ice Detection in the Polar Regions*

BREAK (3:30–3:45 p.m.)

**MODERATED DISCUSSION ON GEOLOGY, COMPOSITION, AGE,  
AND STRATIGRAPHY  
3:45 p.m.**

**Moderator: P. Thomas**

Clifford S.\*

*Introduction to Key Issues and Needed Observations*

Thomas P.\*

*Introductory Remarks*

PANEL DISCUSSION (45 minutes)

Panelists:

Cutts J.  
Herkenhoff K.  
Howard A.  
Rice J.  
Tanaka K.

GENERAL DISCUSSION (45 minutes)

DINNER BREAK (6:00–7:00 p.m.)

**Monday evening, October 19, 1998**

**RECEPTION AND POSTER PRESENTATIONS  
7:30–9:30 p.m.**

Anguita F. Babin R. Benito G. Collado A. Gomez D. Rice J. W.

*Chasma Australe, Mars: Structural Framework for a Catastrophic Outflow Origin*

Bass D. S. Paige D. A.

*Separating the Role of Regolith Adsorption Versus Polar Cap Development and Retreat in the North Polar Region of Mars*

- Bills B. G.  
*Climate-Rotation Feedback on Mars*
- Boynton W. V. Lorenz R. D. Bailey S. H. Williams M. S. Hamara D. K.  
*The Thermal and Evolved Gas Analyzer (TEGA) on the 1998 Mars Polar Lander*
- Cantor B. A. James P. B.  
*Review of the 1990–1997 Hubble Space Telescope Observations of the Martian Polar Caps*
- Delory G. T. Luhmann J. G. Curtis D. W. Friedman L. D. Primbsch J. H. Mozer F. S.  
*Development of an Audio Microphone for the Mars Surveyor 98 Lander*
- Doran P. T. Fritsen C. H.  
*Deeply Frozen Lakes in a Terrestrial Periglacial Environment*
- Ford A. L. J. Khatwa A.  
*Martian Glacial Lineations: Sedimentology, Remote Sensing, and Geographical Information Systems Unravel the Past*
- Forget F.  
*Formation of the CO<sub>2</sub> Ice Seasonal Polar Caps*
- Foster J. Chang A. Hall D. Tait A. Klein A.  
*35-GHz Measurements of CO<sub>2</sub> Crystals*
- Garvin J. B. Sakimoto S. E. H. Frawley J. J. Matias A.  
*Martian Polar Region Impact Craters: Geometric Properties from Mars Orbiter Laser Altimeter (MOLA) Observations*
- Greve R.  
*Dynamic/Thermodynamic Simulations of the North Polar Ice Cap of Mars*
- Hansen G. B.  
*Radiative Properties of the Seasonal CO<sub>2</sub> Polar Caps on Mars*
- Hansen G. B. Kirkland L. E. Calvin W. M. Kieffer H. H. Herr K. C. Forney P. B.  
*Examination of the Most Diagnostic Spectral Regions from Visible Through Infrared for Polar Studies of Mars*
- Harri A. M. Polkko J. Siili T. Crisp D.  
*In Situ Atmospheric Pressure Measurements in the Martian Southern Polar Region: Mars Volatiles and Climate Surveyor Meteorology Package on the Mars Polar Lander*
- Howard A. D.  
*The Role of Eolian Processes in Forming Martian Polar Topography*
- Kapitsa A. P. Loukashov A. A. Marchenko A. G.  
*A Comparison of the Permanent Polar Caps of Earth and Mars*
- Kapitsa A. P. Loukashov A. A. Marchenko A. G.  
*Origins and Morphology of Similar Landforms in Terrestrial and Martian Polar Regions*
- Kargel J. S.  
*Possible Composition of Martian Polar Caps and Controls on Ice-Cap Behavior*
- Kieffer H. H. Titus T. N. Mullins K. F.  
*Thermal Emission Spectrometer Observations of the South and North Polar Regions During the First Phase of Aerobraking Orbits*

- Lepper K. McKeever S. W. S.  
*Luminescence Dating: A Tool for Martian Eolian Geochronology*
- Markiewicz W. J. Kossacki K. J. Keller H. U.  
*Small-Scale Trench in the Martian Soil: Conditions for Condensation of Atmospheric Volatiles at the Mars Polar Lander Site*
- Muhleman D. O. Ivanov A. B.  
*Evolution of the Mars Northern Ice Cap and the Results from the Mars Orbiter Laser Altimeter (MOLA)*
- Neumann K. Lyons W. B. Des Marais D. J.  
*Carbon-Isotopic Dynamics of Streams, Taylor Valley, Antarctica: Biological Effects*
- Nolin A. W.  
*Mapping the Martian Polar Ice Caps: Applications of Terrestrial Optical Remote Sensing Methods*
- Pankine A. A. Ingersoll A. P.  
*Martian Dusty Atmosphere as a Lorenz System*
- Pathare A. V. Paige D. A.  
*Recent Liquid Water in the Polar Regions of Mars*
- Schenk P. Moore J. Stoker C.  
*Topography of the South Polar Cap and Layered Deposits of Mars: Viking Stereogrammetry at Regional and Local Scales*
- Schneebeli M. Johnson J. B.  
*Measuring Snow Structure and Resistance with a High-Resolution Penetrometer*
- Siili T.  
*Downslope Windstorms in the Martian Polar Regions: A Sensitivity Study*
- Skidmore M. L. Foght J. M. Sharp M. J.  
*Microbial Experiments on Basal Ice from John Evans Glacier, Eastern Ellesmere Island, Northwest Territories, Canada*
- Tanaka K. L. Leonard G. J.  
*Martian Paleopolar Deposits: Evidence for a Stable Pole and Periods of Climate Change*
- Thorsteinsson Th. Kipfstuhl J. Nixdorf U. Oerter H. Miller H. Fritsche D. Jung-Rothenhaeusler F. Mayer C. Schwager M. Wilhelms F. Steinhage D. Goektas F.  
*Terrestrial Ice Sheets: Studies of Climate History, Internal Structure, Surface, and Bedrock*
- Waddington E. D. Clow G. D. Winebrenner D. P.  
*Densification of Surface Deposits on Terrestrial and Martian Ice Sheets*
- Wilson A. T.  
*Mass Balance of Martian Ice Caps: Is There Another Type of Polar Glacier?*
- Wilson A. T.  
*Where Do We Look for Life in the Polar Regions of Mars?*
- Wohlleben T. M. H.  
*The Initiation and Maintenance of an Ice Sheet at the Martian South Pole*
- Zuber M. T. Lim L. Zwally H. J.  
*The Role of Viscous Deformation in the Morphology of the Martian North Polar Cap*

**PAPER PRESENTED BY TITLE ONLY**

Moersch J. E. Lorenz R. D.

*Subsurface Structure in the Martian Polar Layered Deposits: The Deep Space-2 Impact Accelerometry Experiment*

**Tuesday morning, October 20, 1998**

BREAKFAST (7:30–8:30 a.m.)

**MODERATED DISCUSSION ON PAST AND PRESENT CLIMATE  
8:30 a.m.**

**Moderator: J. Barnes**

Fisher D.\*

*Review of Day's Agenda*

Barnes J.\*

*Introductory Remarks*

PANEL DISCUSSION (45 minutes)

Panelists:

Bills B.  
Haberle R.  
James P.  
Waddington E.  
Zent A.

GENERAL DISCUSSION (40 minutes)

BREAK (10:15–10:30 a.m.)

**MODERATED DISCUSSION ON GLACIOLOGY AND HYDROLOGY  
10:30 a.m.**

**Moderators: S. Clifford  
J. Rice**

Durham W. B.\*

*Factors Affecting the Rheologic Properties of Martian Polar Ice*

PANEL DISCUSSION (45 minutes)

Panelists:

Dahl-Jensen D.  
Durham W.  
Fisher D.  
Kargel J.  
Nye J.  
Reeh N.  
Thorsteinsson T.  
Waddington E.

GENERAL DISCUSSION (55 minutes)

LUNCH BREAK (12:30–1:30 p.m.)

**Tuesday afternoon, October 20, 1998**

**EXPLORATION TECHNOLOGIES AND PLATFORMS I  
1:30 p.m.**

**Chairs:**        **D. Fisher**  
                  **D. Crisp**

Cutts J.\*  
    *Balloons/Aerobots*

Stoker C.\*  
    *Rovers for Mars Polar Exploration*

Blake E. W.\*  
    *Geophysical Sounding*

Kuivinen K.\*    Hansen L.  
    *Melters/Borers*

AFTERNOON BREAK (3:30–6:00 p.m.)

DINNER (6:00–7:00 p.m.)

**Tuesday evening, October 20, 1998**

**MODERATED DISCUSSION ON EXOBIOLOGY  
7:30 p.m.**

**Moderators:**    **D. Wynn-Williams**  
                  **K. Neelson**

Neelson K.\*  
    *Search for Martian Life*

Wynn-Williams D. D.\*    Edwards H. G. M.  
    *Potential Earth Analogs*

BREAK (8:30–8:45 p.m.)

PANEL DISCUSSION (45 minutes)

Panelists:  
    Edwards H.  
    Farmer J.  
    Harvey R.

GENERAL DISCUSSION (30 minutes)

## **Wednesday morning, October 21, 1998**

BREAKFAST (7:30–8:30 a.m.)

### **KEY QUESTIONS AND NEEDED OBSERVATIONS: CRITIQUE AND REALITY CHECK BY PANEL OF DISTINGUISHED AND OPINIONATED GREYBEARDS 8:30 a.m.**

**Moderators: R. Haberle  
P. Thomas**

Clifford S.\*  
*Review of Day's Agenda*

PANEL DISCUSSION (1 hour, 40 minutes)

Terrestrial Panelists:  
Björnsson H.  
Harrison W.  
Nye J.  
Thorsteinsson T  
Waddington W.

Planetary Panelists:  
Carr M.  
Fanale F.  
Kieffer H.  
Ingersoll A.  
Malin M.

BREAK (10:15–10:30 a.m.)

GENERAL DISCUSSION (2 hours)

LUNCH BREAK (12:30–1:30 p.m.)

## **Wednesday afternoon, October 21, 1998**

### **EXPLORATION TECHNOLOGIES AND PLATFORMS II: PANEL DISCUSSION 1:30 p.m.**

**Moderators: D. Fisher  
D. Crisp**

PANEL DISCUSSION (1 hour)

Panelists:  
Blake E.  
Blankenship D.  
Clow G.  
Cutts J.  
Grard R.  
Harrison W.  
Kuivinen K.  
Stoker C.  
Zwally J.

GENERAL DISCUSSION (1 hour)

BREAK (3:30–3:45 p.m.)

**Wednesday afternoon, October 21, 1998**

**FUTURE EXPLORATION  
3:45 p.m.**

**Chair: S. Clifford**

McCleese D.\*  
*Post '98 Surveyor, Micromission, and Discovery Opportunities*

Paige D.\*  
*Putting Together the Team and Hardware*

TBA\*  
*The Human Exploration of Mars*

GENERAL DISCUSSION (15 minutes)

BARBECUE DINNER at the Lakeside Pavilion (6:00–9:00 p.m.)

**Thursday morning, October 22, 1998**

BREAKFAST (7:30–8:30 a.m.)

**SUMMARY PANEL DISCUSSION: A PROPOSED ROAD MAP FOR  
MARS POLAR SCIENCE AND EXPLORATION  
8:30 a.m.**

**Moderators: H. Kieffer  
D. Fisher**

Rice J.\*  
*Review of Day's Agenda*

PANEL DISCUSSION (1 hour, 40 minutes)

Terrestrial Panelists:

Dahl-Jensen D.  
Gotto-Azuma K.  
Nye J.  
Reeh N.  
Thompson E.  
Waddington E.  
Wynn-Williams D.

Planetary Panelists:

Briggs G.  
Carr M.  
Cutts J.  
Grard R.  
McCleese D.  
Nealson K.  
Paige D.  
Smith D.

SUMMARY GENERAL DISCUSSION (1 hour, 30 minutes)

Clifford S.\*

*Announcement of Mars Polar Science and Exploration Research Group*

TBA\*

*Introduction of Organizing Committee for 2nd International Conference*

CONFERENCE ADJOURNS (12:30 p.m.)

LUNCH (12:30–1:30 p.m.)

**BUSES LOAD FOR AIRPORT (2:00 p.m.)**