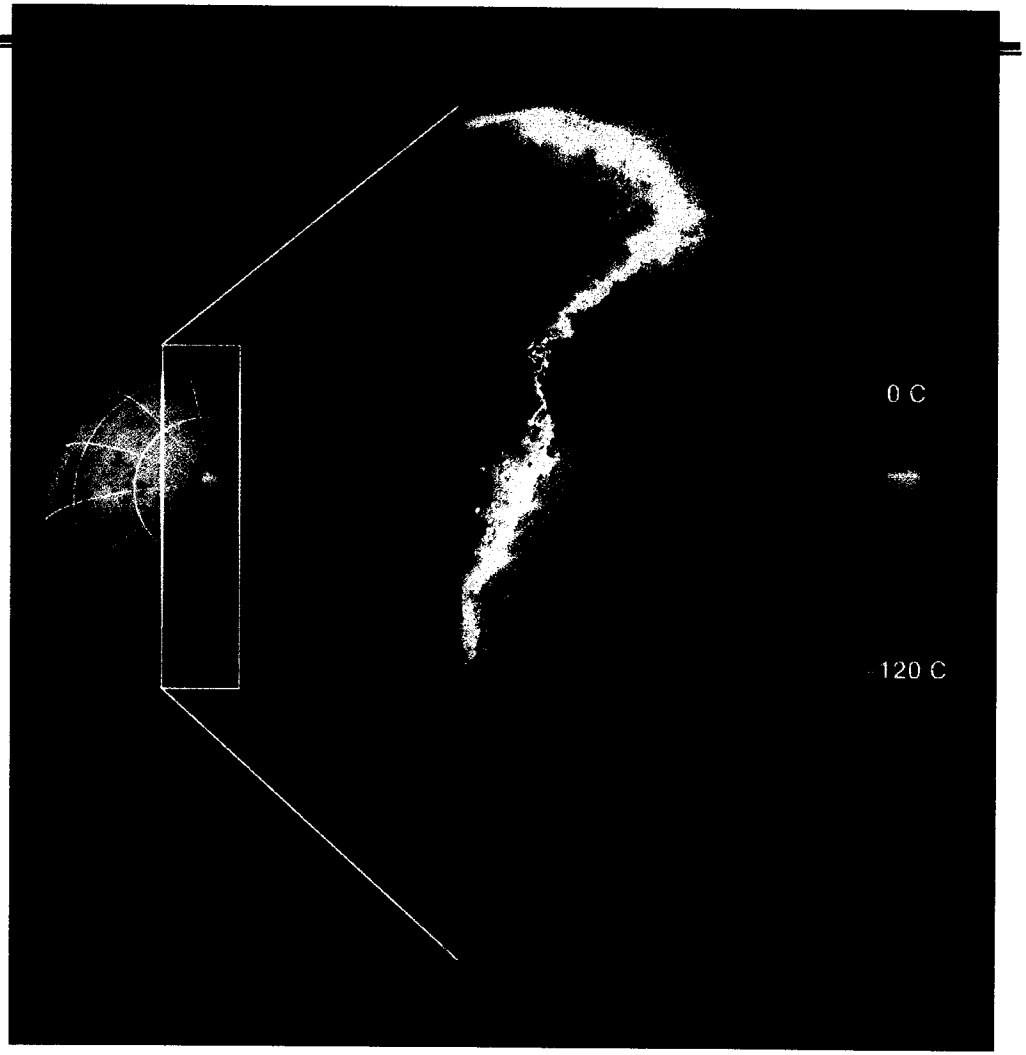
October 31, 2001
MARS ODYSSEY'S FIRST LOOK AT MARS IS ALL TREAT, NO TRICK

Martian southern hemisphere, south polar carbon dioxide ice cap at a temperature of about 120 °C (-184 ° F).

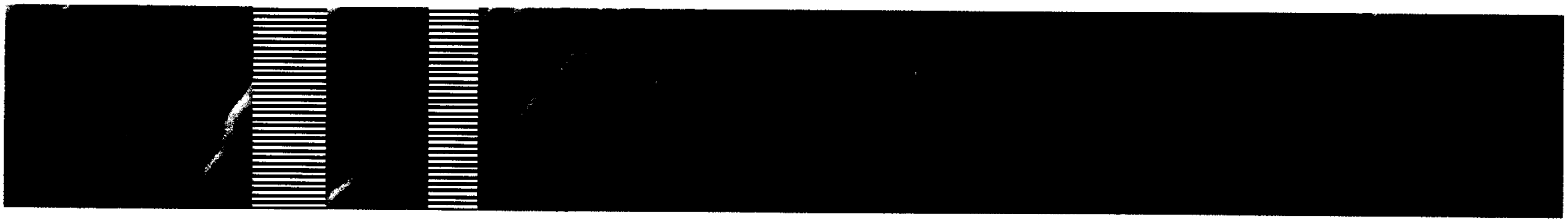
Image covers a length of more than 6,500 kilometers (3,900 miles) spanning the planet from limb to limb, with a resolution of approximately 7.7 km per pixel (4.6 miles per pixel), or picture element, at the point directly beneath the spacecraft.

The spacecraft was approximately 29,000 kilometers (about 17,500 miles) above the planet looking down toward the south pole of Mars when this image was acquired.

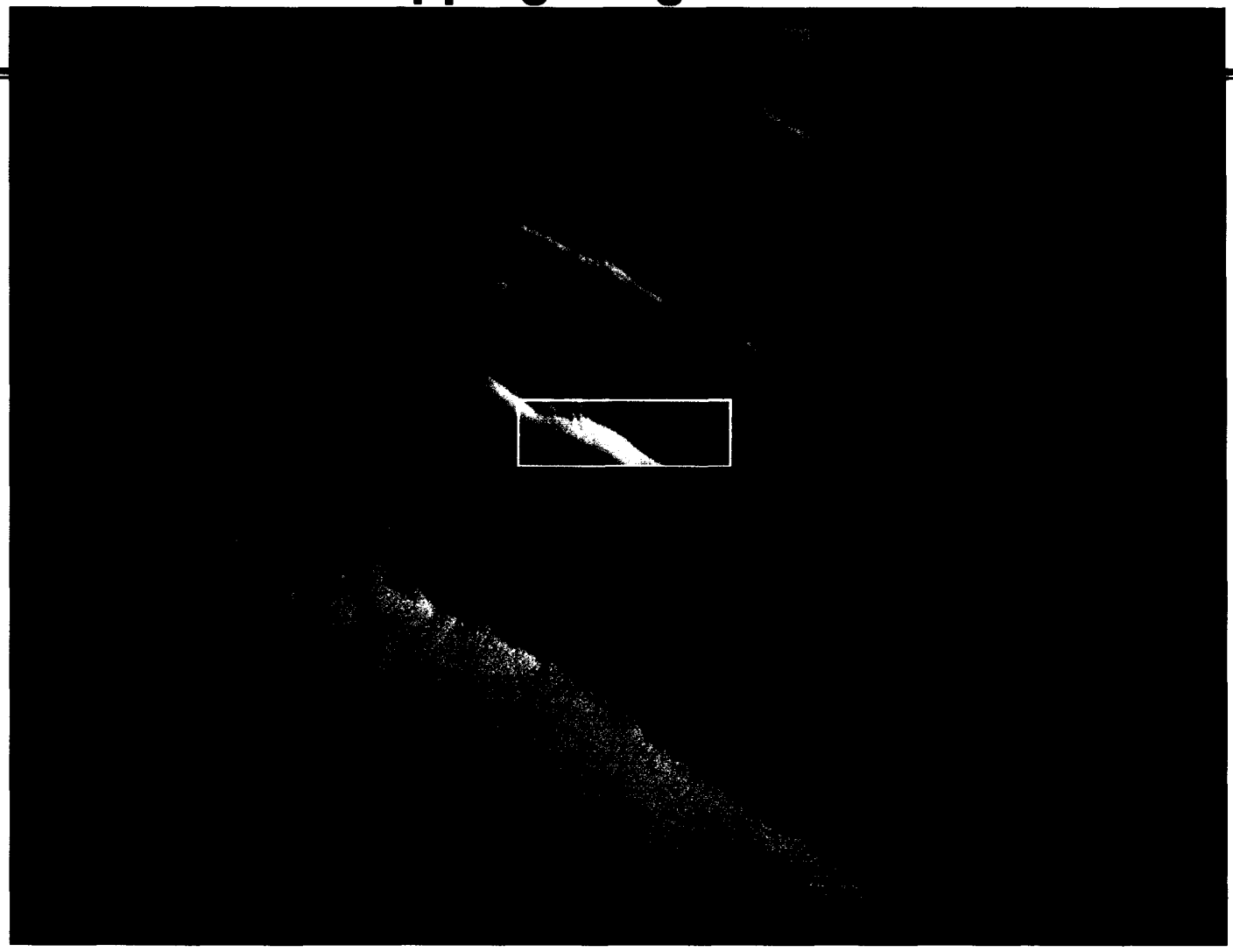


THEMIS First IR Image

32 km

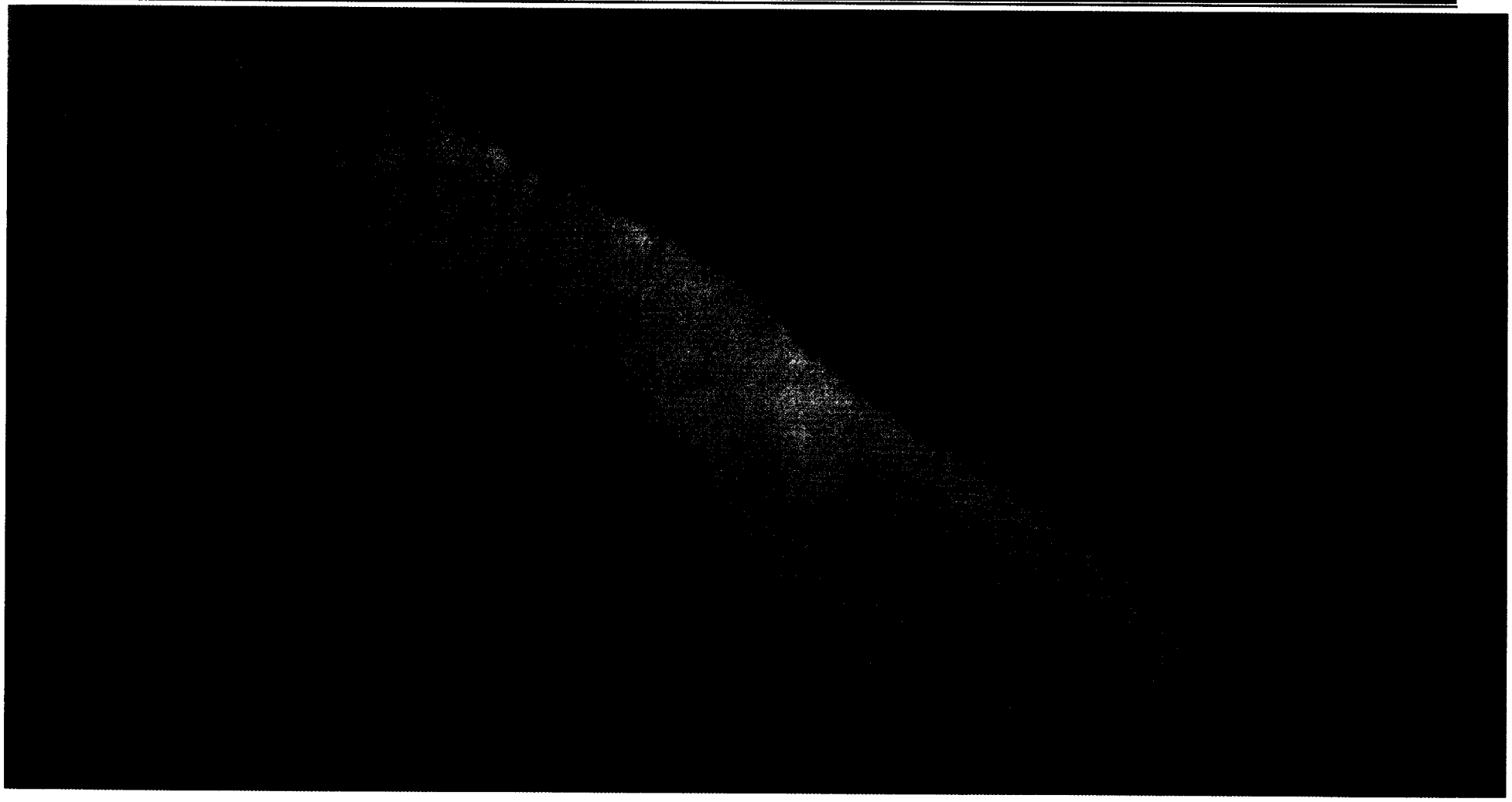


First THEMIS Mapping Image



Infrared (top) and visible (bottom) north of Olympus Mons. Width of visible image is 18 km

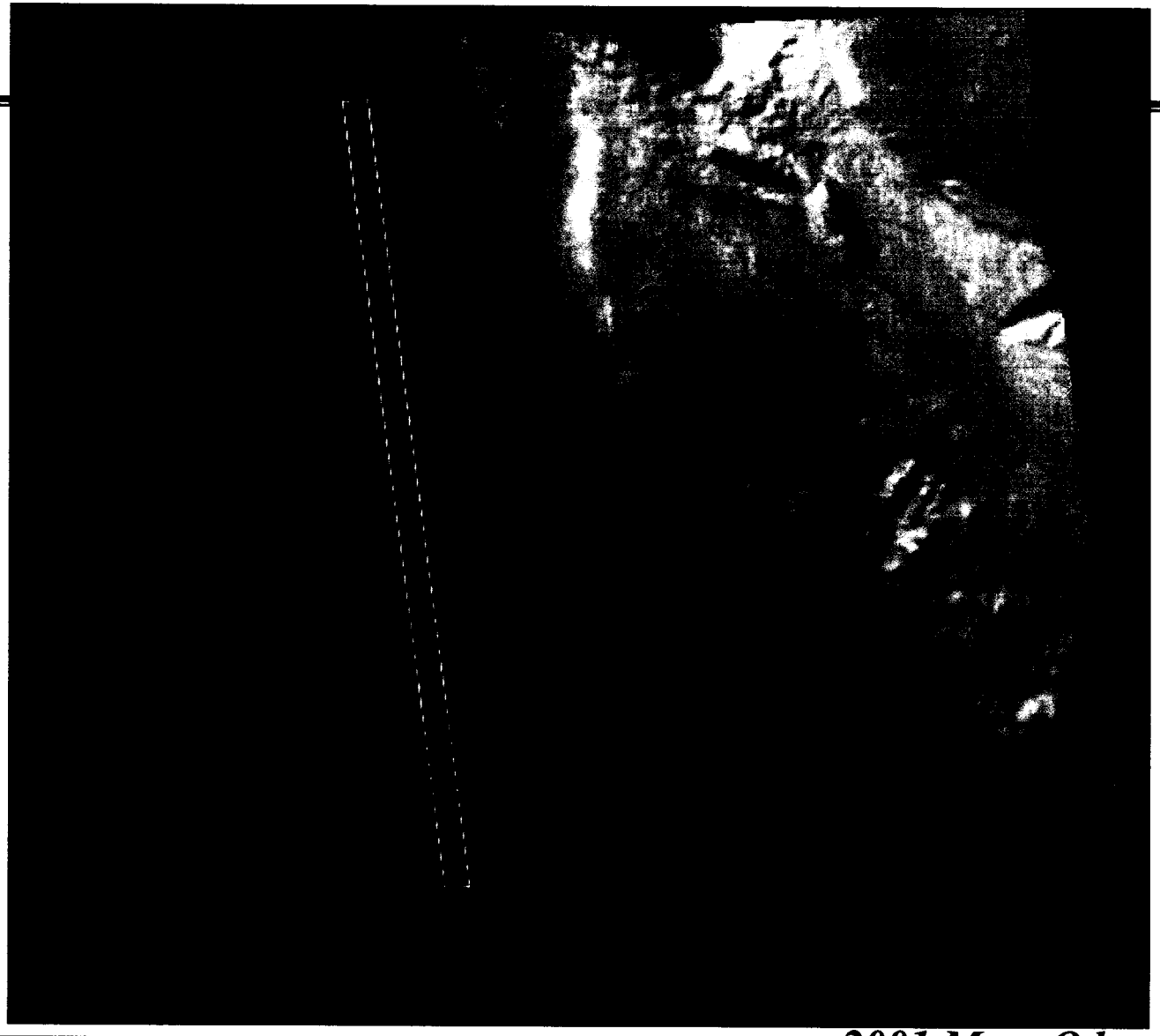
Acheron Fossae



THEMIS 819,1
Tiu Vallis

2001 Mars Odyssey

JPL ASU ARIZONA STATE UNIVERSITY UA JSC ИКИ Los Alamos NATIONAL LABORATORY



IASA/JPL/Malin
pace Science Systems
M2101509
'iu Vallis

2001 Mars Odyssey

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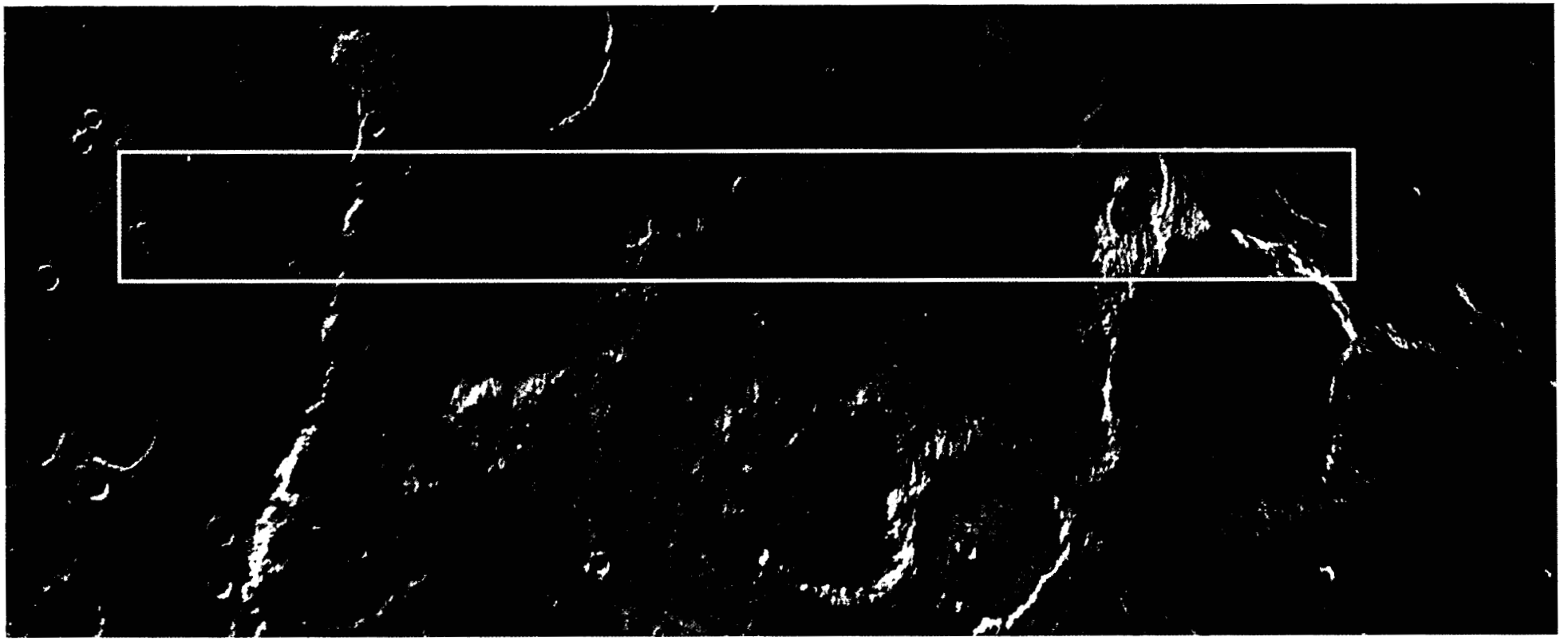
Space Science Systems
M2101509
Tiu Vallis

2001 Mars Odyssey

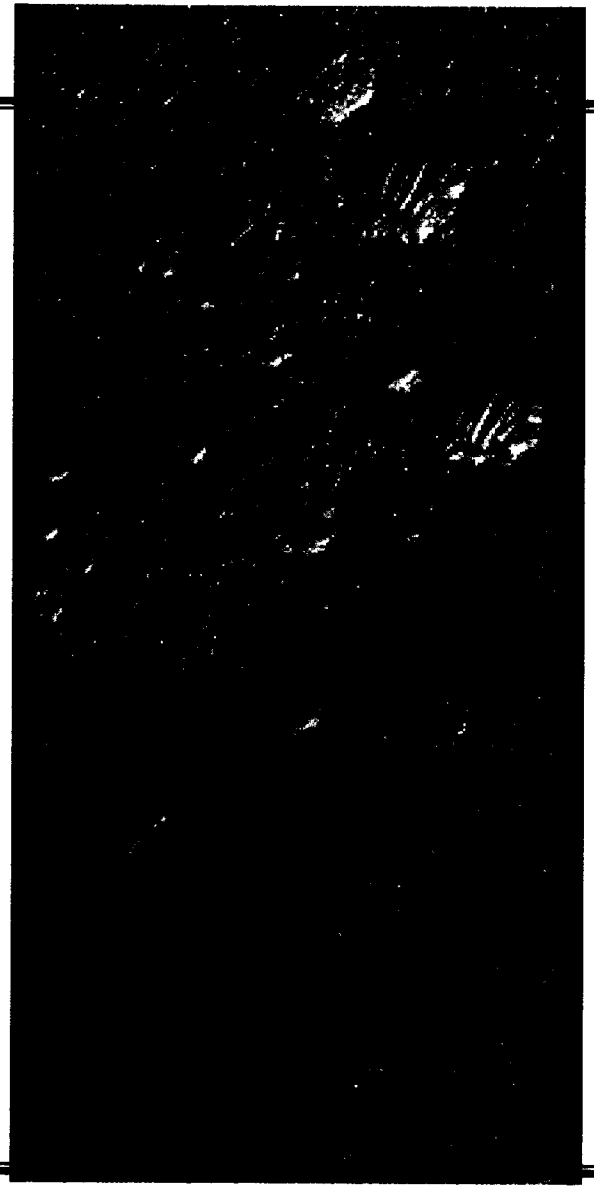
Terra Sirenum



THEMIS 817-2

THEMIS image 817,2
Centered at ~-35, 140W
Terra Sirenum

North part of THEMIS image
817,2
Floor of crater Koval'sky



Area in crater Koval'sky

NASA/JPL/Malin Space Science Systems
1700572

2001 Mars Odyssey

JPL ASU Arizona State University UA JSC IKI Los Alamos National Laboratory

Terra Sirenum

THEMIS Data Collection Strategy

- Mineral mapping (daytime IR) during clearest periods and warmest time of day
  - ~50% of total mission data
- Nighttime temperature mapping throughout the year
  - ~15% of total mission data
- Visible imaging during late afternoon periods when shadows are better and IR data of lower quality
  - ~30% of total mission data
- Color imaging for targets of opportunity
  - ~5% of total mission data

Baseline Observing Strategy

Mission Phase	Fraction of Data	# of images	% of Mars
Science (919 days)			
Daytime IR	54%	14,800 (32x300 km)	104%
Nighttime IR	12%	17,200 (32x300 km)	121%
Panchromatic VIS	30%	54,000 (18x58 km)	39%
Multi-spectral VIS	4%	1,200 (18x9 km)	1%
Science plus Relay (1375 days)			
Daytime IR	47%	15,700	111%
Nighttime IR	15%	21,300	149%
Panchromatic VIS	35%	76,600	56%
Multi-spectral VIS	3%	1,400	1%

Initial Observing Strategy

Ls = 320°

Local time ~3:15 PM (best it will ever be)

Mission Phase	Fraction of Data	# of images/day
First Science		
Daytime IR	75%	24 (32x300 km)
Nighttime IR	10%	17 (32x300 km)
Panchromatic VIS	5%	11 (18x58 km)
Multi-spectral VIS	15%	6 (18x9 km)

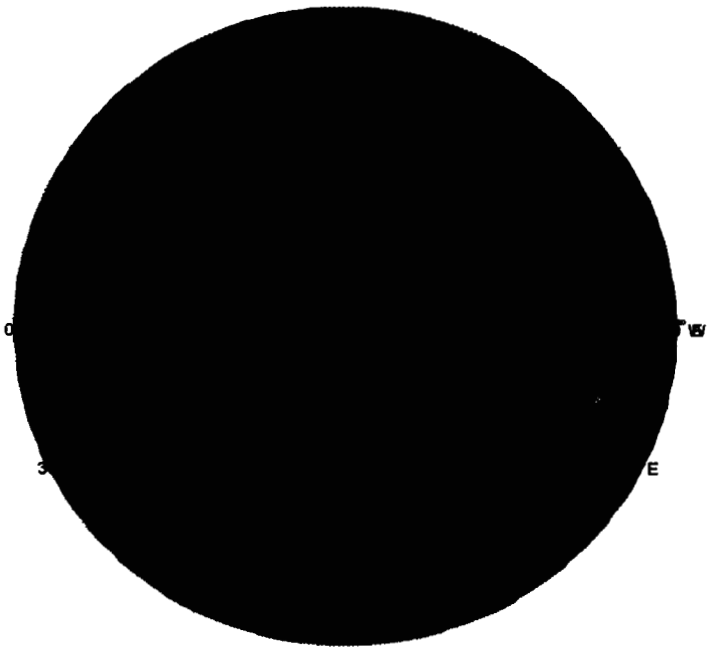
Initial Targets - 1st two weeks

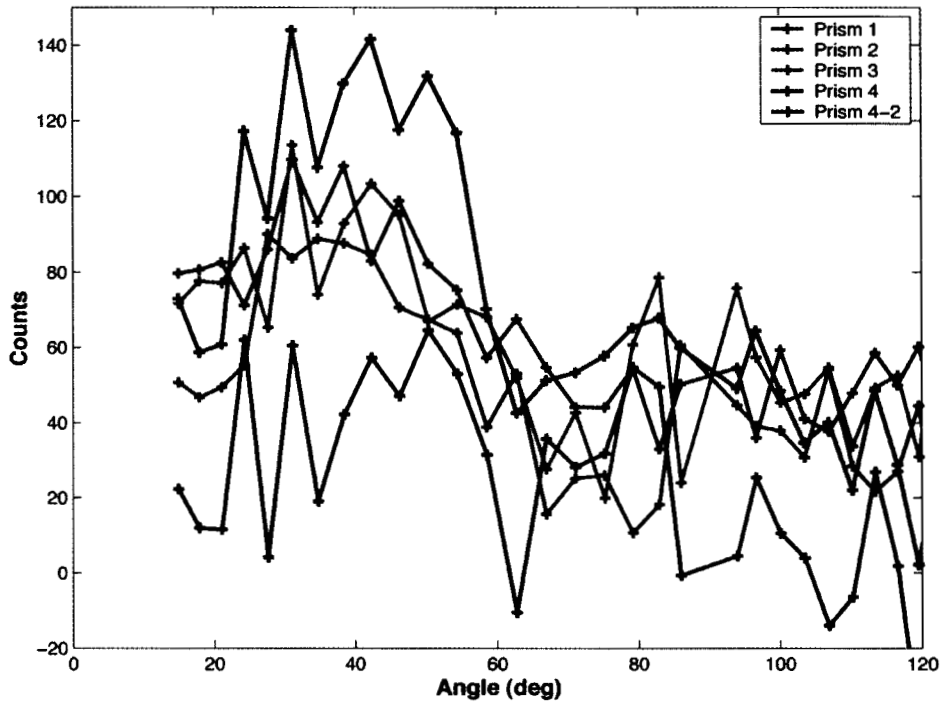
- MER Landing Sites. day/night IR; 5-color VIS whenever possible
  - Meridiani
  - Melas
  - Isidis
  - Eos
  - Gusev Crater
- Viking 1, 2, & Pathfinder Sites. Day/night IR; 5-color VIS; whenever possible
- Valles Marineris layered deposits. Day/night IR; 5-color VIS; 6 observations
- Southern hemisphere young gullies. Day/night IR; 5-color VIS; 6 observations
- Putative shorelines. Day/night IR; 5-color VIS; 6 observations
- Polar caps. Day/night IR; 5-color VIS; 6 observations
- Geometric calibration sites. Day/night IR; 5-color VIS; 4 / day
- IR drift calibration sequences. Day/night IR; 3 / day; Equatorial, polar, night
- General interest. Outflow channels, S. H. dunes, Arsia, Pavonis, Ascraeus, Olympus, Elysium Mons, polar dunes, Elysium flows. Day/night IR; 5-color VIS; 1 / orbit

Initial Targets (con't)

- **Team Member Science**
  - Volcanic type localities. Day/night IR; 5-color VIS; 2 / week
  - Basalt outliers in northern hemisphere. Day/night IR; 5-color VIS; 2 / week
  - Olivine sites. Day/night IR; 5-color VIS; 2 / week
  - Thermal inertia units (1 per "Kieffer unit). Day/night IR; 5-color VIS; 2 / day
  - Aeolus Quadrangle sites. Day/night IR; 5-color VIS; 2 / week
  - Exobiology sites. Day/night IR; 5-color VIS; 2 / week
  - "Cyrptic regions". Day/night IR; 5-color VIS; 2 / week

Neutron Spectrometer

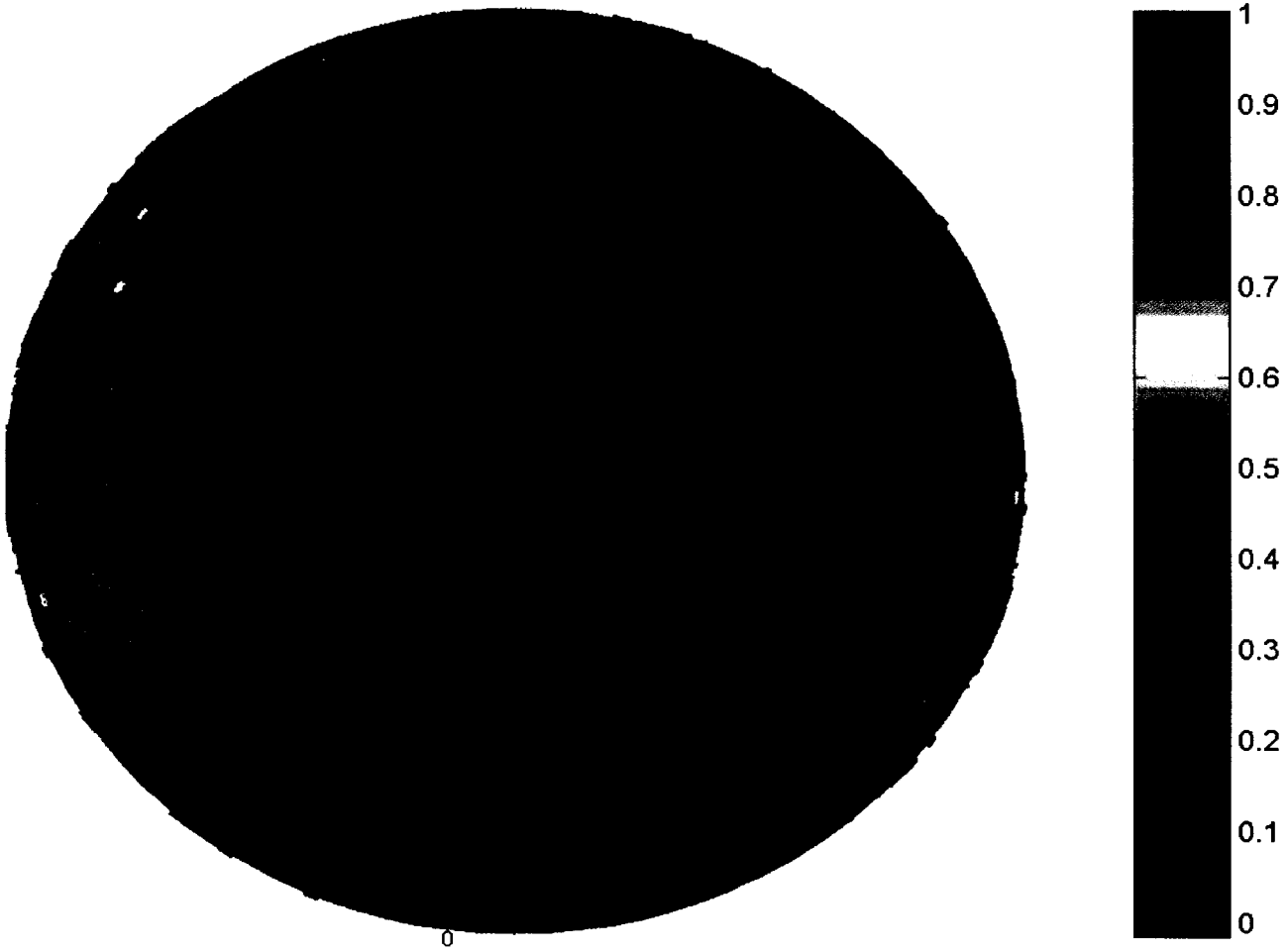


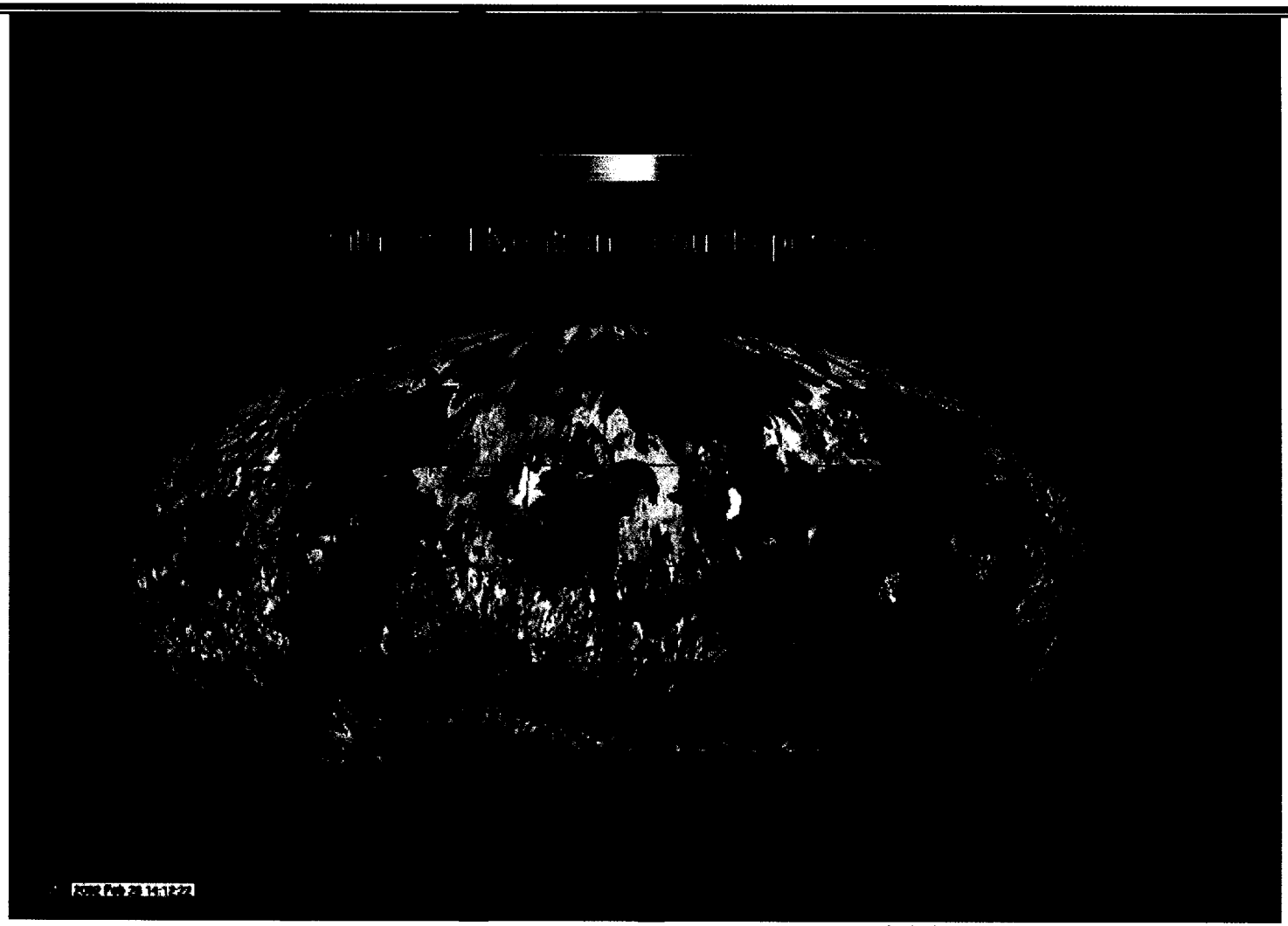


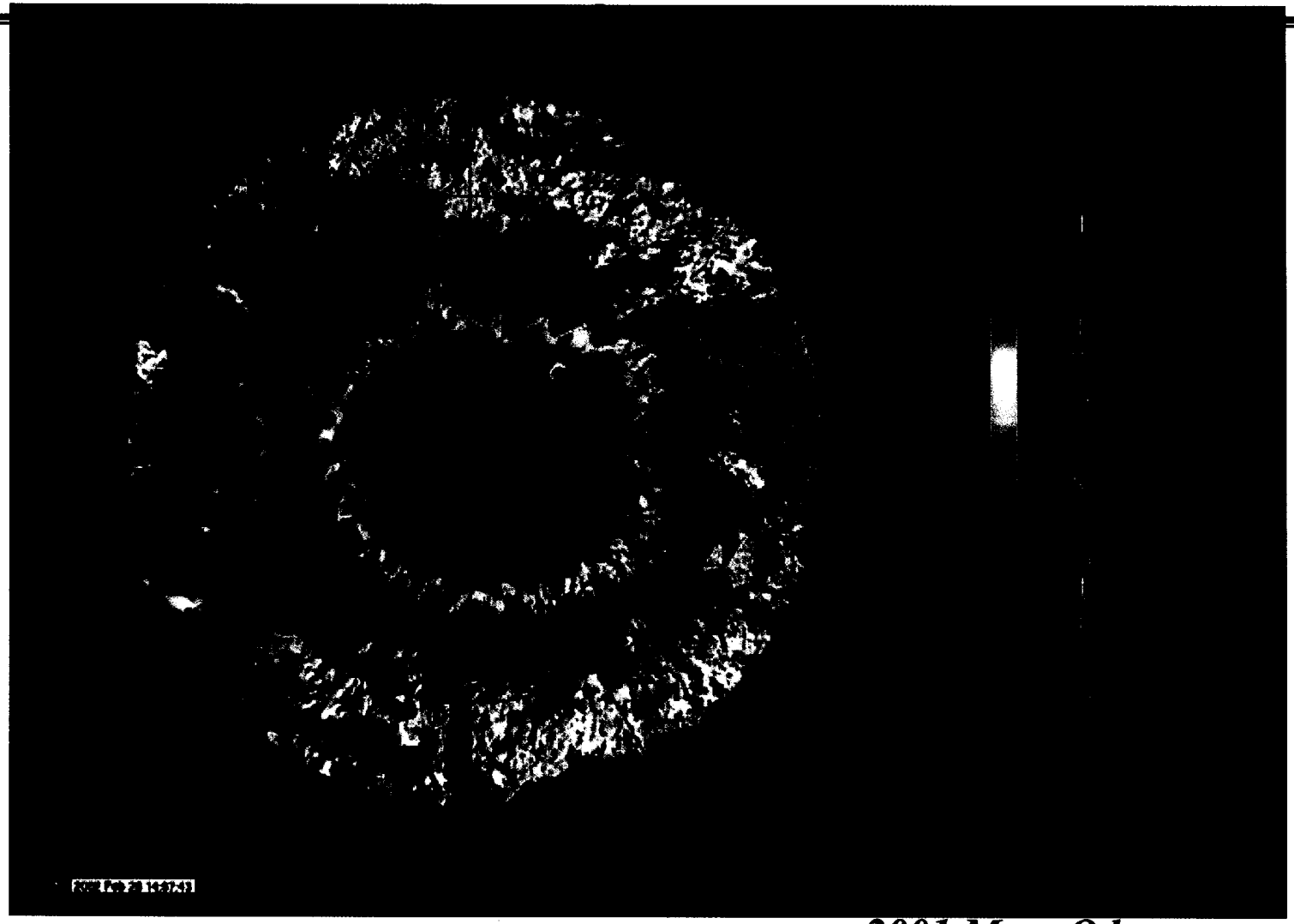
Fourth periapsis pass of Mars Odyssey at altitude less than 1000 km. At right is an overplot of the latitude dependence of the counts per 57.6 s integration period registered by each of the prism faces.

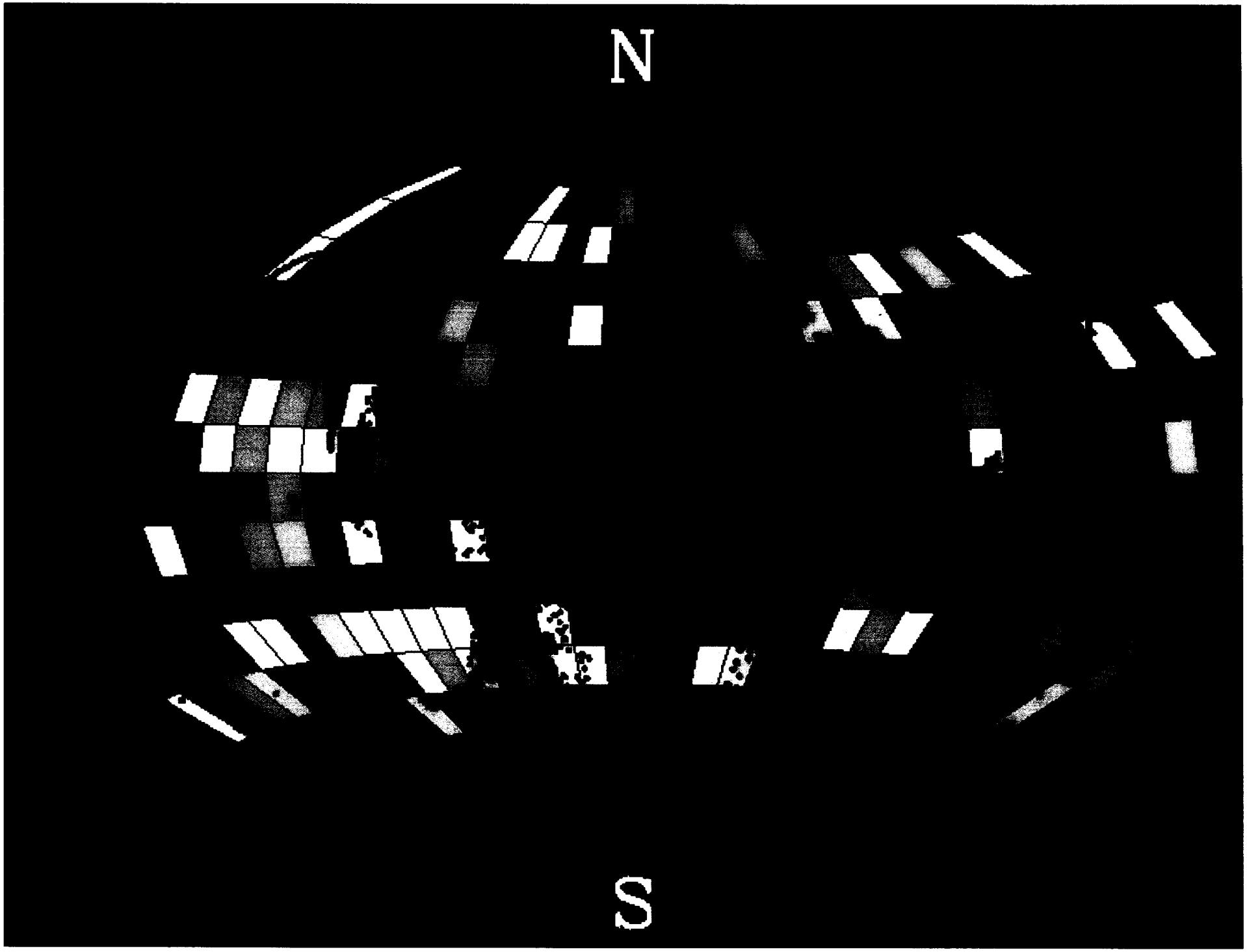
William Feldman, LANL

NS – Epithermal Neutrons








N
S

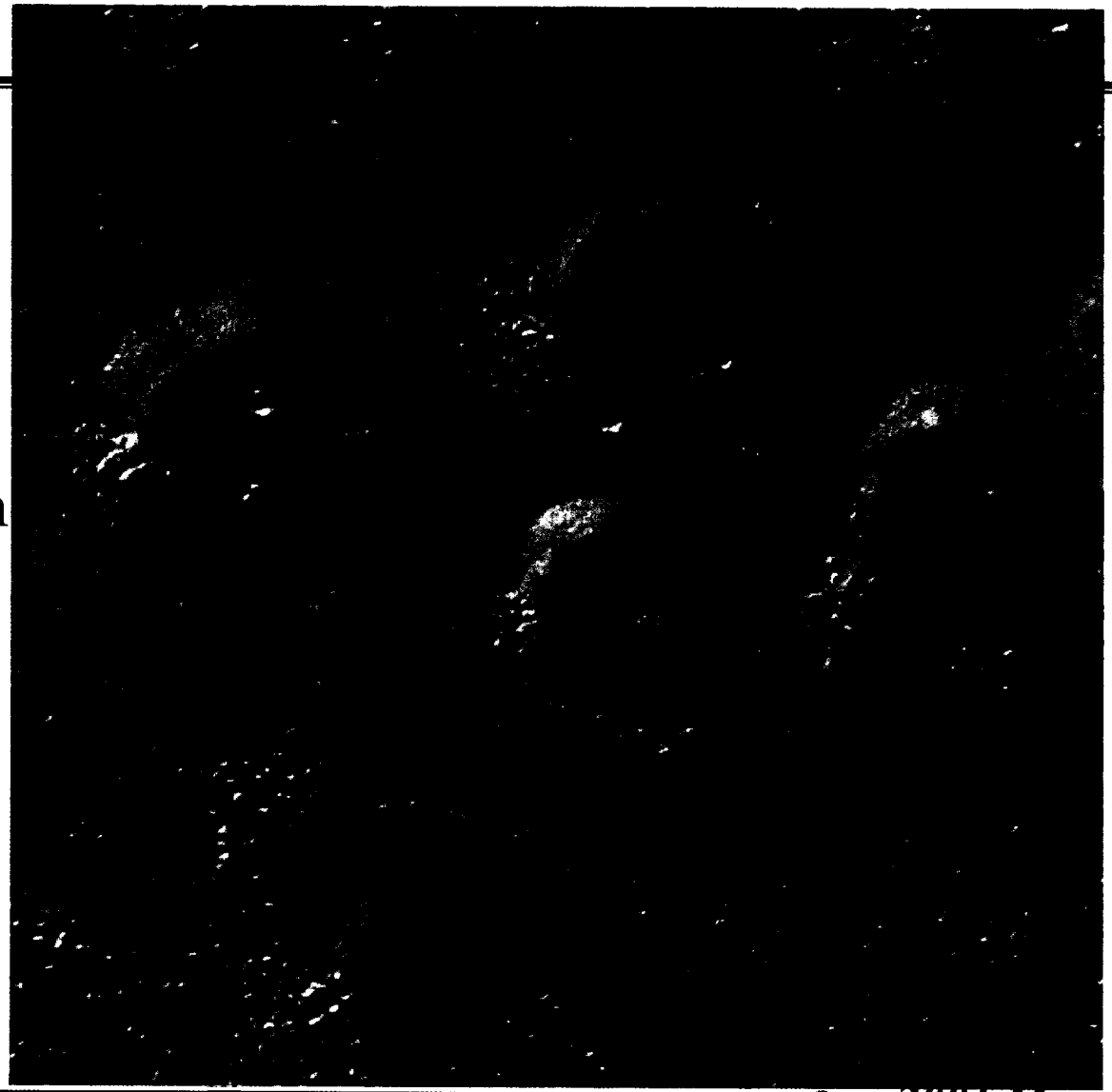
Ground Ice Terrane

Mustard et al.,
Nature, 2001

MGS MOC
FHA01450
MSSS/JPL

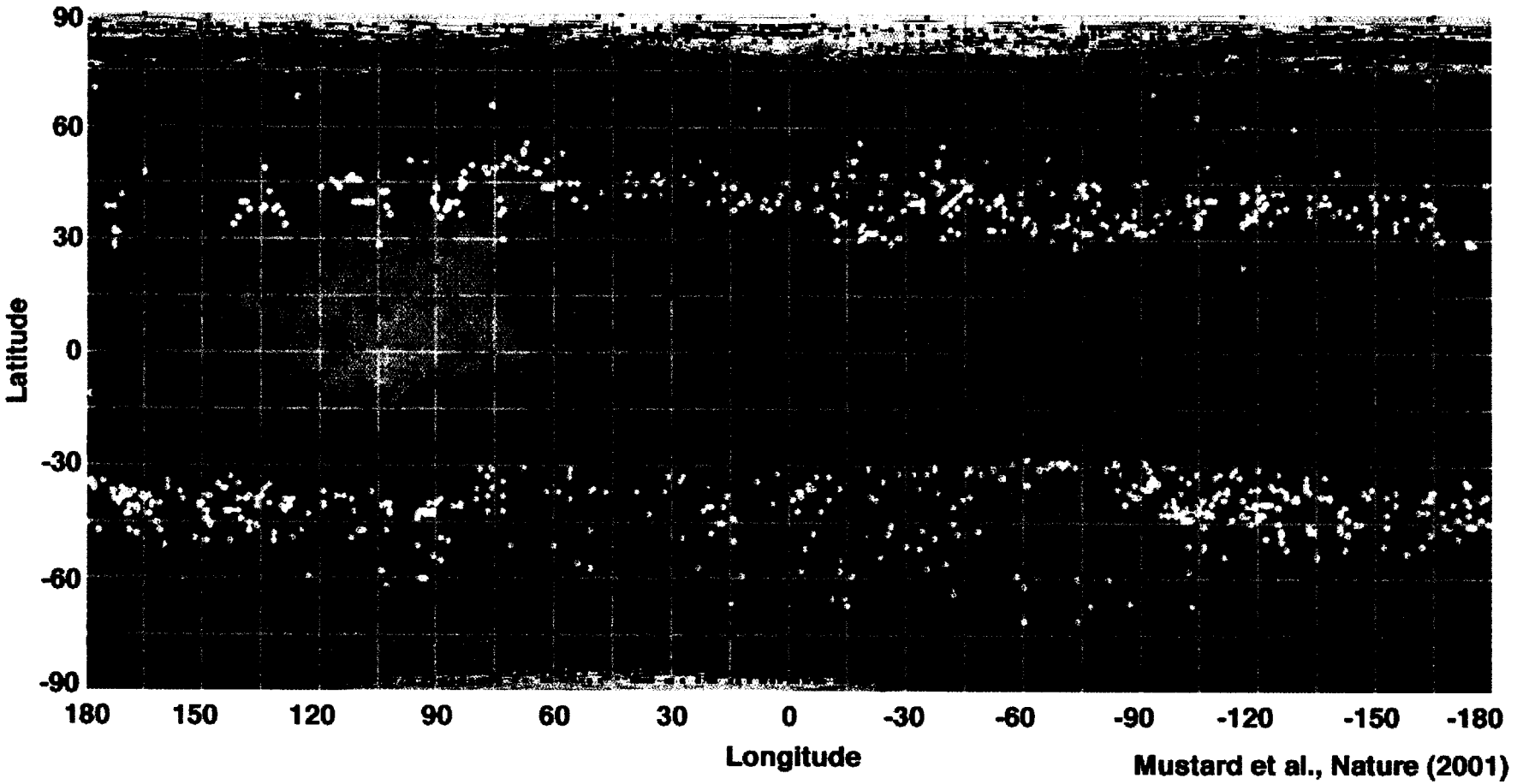
Ground Ice Terrane

2 km



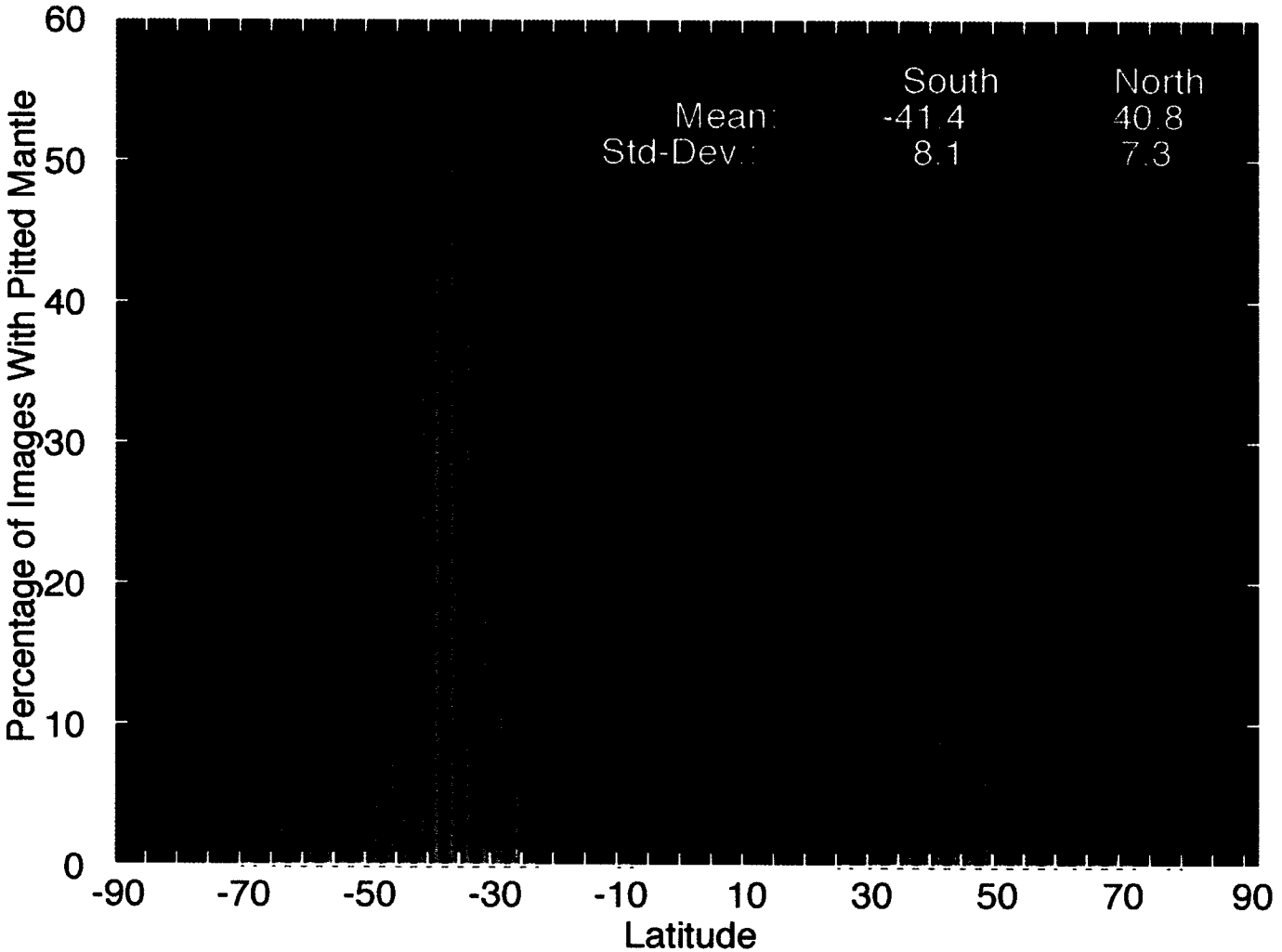
MGS MOC
FHA01450
MSSS/JPL

MOC Images



Mustard et al., Nature (2001)

"Karst" Distribution



Mustard et al., Nature (2001)