Tuesday, March 18, 2003
POSTER SESSION I
7:00 p.m. Fitness Center

Outer Body Experiences

Swindle T. D. Reedy R. C. Masarik J.
Production Rates of Noble Gases in the Near-Surface Layers of Europa by Energetic Charged Particles and the Potential for Determining Exposure Ages **[#1466]**
We calculate production rates for light noble gas isotopes in Europa by GCR and trapped jovian energetic particles. The production rates are comparable to or greater than lunar ones, making *in situ* measurements of surface exposure ages plausible.

Bradak B. Kereszturi A.
Mud Volcanism as Model for Various Planetary Surface Processes **[#1304]**
In this work we review our current knowledge on the two basic kinds of mud volcanism on Earth and their possible application to planetary environments. Mud volcanic processes differ from magmatic volcanism but realize under such physical factors which are present in many planetary bodies.

Mitri G. Geissler P.
A Thermodynamical Model of the Icy Crust of Europa **[#1759]**
We study the evolution of an ice shell on Europa and the response of a solid shell to heat changes. The aim is to determine the time scales for heating a subsurface ocean, melting and refreezing the icy crust, and initiating convection.

Spaun N. A. Phillips C. B.
Analysis of Multispectral Galileo SSI Images of the Conamara Chaos Region, Europa **[#1260]**
We quantitatively analyze the corrected and calibrated multispectral images of Europa's Conamara Chaos region to determine whether the white and red-brown material units, and their subsequent geologic processing, are endogenic or exogenic in nature.

Billings S. E. Kattenhorn S. A.
Comparison Between Terrestrial Explosion Crater Morphology in Floating Ice and Europan Chaos **[#1955]**
Similarities between the morphology of explosion craters in terrestrial sea ice and chaos regions on Europa lead us to examine the possibility that some chaos may be the result of impact events into Europa's ice shell.

Kereszturi A.
Chaotic Terrains as Indicators of Crustal Thickness of Europa **[#1550]**
Based on the size distribution of rafts in the chaotic terrains of Europa we had found that the original ice thickness could be about 2 km.

Rodriguez Pascua M. A. Pérez López R. Prieto Ballesteros O. Kargel J. S.
Tectonic and Fractal Analysis of Conamara Chaos Area (Europa, Jupiter): Strike Slip and Compressional Features in an Expansive Satellite **[#1331]**
Two tectonic episodes are described in Conamara Chaos, both strike-slip regimes. Compressive structures due to horizontal movements have been recognized. Fractal analysis indicates that active faults are formed by re-activated and new-formed faults.

Collins G. C. Goodman J. C. Pierrehumbert R. T.
Can Hydrothermal Plumes Melt Through Europa's Ice Shell? **[#1430]**
Using an improved model to assess melting of Europa's ice shell, we find that total melt-through never occurs for reasonable values of sub-ice heat flux. Tens to hundreds of meters of ice always remain, making it difficult to form chaos terrain.

Patterson G. W. Head J. W.
Crustal Spreading on Europa: Inferring Tectonic History from Triple Junction Analysis **[#1262]**
Terrestrial techniques for triple junction analysis are applied to a set of junctions in the south polar region of Europa. Implications for relative spreading velocity, stability, and tectonic history are explored.

Fairén A. G. Ruiz J.
Seas Under Ice: Stability of Liquid-Water Oceans Within Icy Worlds **[#1139]**
Liquid water oceans within icy worlds may be a consequence of some factors affecting their thermal state, as stress-dependent ice viscosity, possible tidal straining, the effect of spherical geometry on small-size bodies, or surface insulating layers.

Prockter L. M. Pappalardo R. T.
Comparison of Ridges on Triton and Europa **[#1620]**
Ridges on both Triton and Europa exhibit an evolutionary sequence ranging from isolated troughs, through doublet ridges, to complex ridge swaths. Comparison of these ridges may provide insight into their formation on both satellites.

Stempel M. M. Pappalardo R. T. Barr A. C. Wahr J.
Modeling Surface Stresses on Europa **[#1481]**
We outline a method of surface stress modeling, in this case applied to Europa. Comparison of lineament orientation through time can be made to the stress patterns predicted by the model. The model will be made available to the public sector.

McBee J. H. Hartmann D. Collins G. C.
Strain Across Ridges on Europa **[#1783]**
We have measured strain across some double ridges and complex ridge sets on Europa. Results show ridges with no strain, with slight extension, strike-slip motion, and some restraining bends showing compression.

Kattenhorn S. A.
Secondary Fracturing of Europa's Crust in Response to Combined Slip and Dilation Along Strike-Slip Faults **[#1977]**
Tail cracks at the ends of strike-slip faults on Europa indicate fault slip induces fracturing around faults. Comparison of crack geometries with linear elastic analytical models indicates that dilation must have accompanied the strike-slip motion.

DeRemer L. C. Pappalardo R. T.
Manifestations of Strike-Slip Faulting on Ganymede **[#2033]**
In Galileo high-resolution images of Ganymede's surface, we recognize ubiquitous evidence for strike-slip faulting, specifically: (1) en echelon structures, (2) strike-slip duplexes, and (3) offset pre-existing features.

Pappalardo R. T. Nimmo F. Giese B. Bader C. E. DeRemer L. C. Prockter L. M.
Furrow Topography and the Elastic Thickness of Ganymede's Dark Terrain Lithosphere **[#1511]**
We have estimated effective elastic thickness of dark terrain in Galileo Regio, Ganymede based on topographic profiles across furrows. We find effective elastic thicknesses ~0.4 km, similar to analyzed areas alongside bright grooved terrain.

Dalton J. B.
Spectral Properties of Hydrated Salts at Low Temperature: Implications for Europa Mission Spectrometer Design **[#2072]**
Spectral behavior of hydrated salt minerals at cryogenic temperatures has been examined to constrain Europa mission spectrometer design.

Jarvis K. S. Barker E. S. Vilas F. Owen T.
Shades of Grey: Iapetus' Secrets Aren't Just Black and White **[#1988]**
New leading side spectra of Iapetus match one of three previous data sets. Latitude-based variation caused by polar ice contribution may be the cause for some of the differences seen. Older data are being evaluated to see if they too display this variation.

Moore C. Zhang J. Goldstein D. B. Varghese P. L. Trafton L.
Modeling of Particulates and Condensates in Io's Pele-type Volcanic Plumes **[#2102]**
DSMC is used to model dust flow and condensate formation in Io's Pele-Type Plumes. It is found that particles up to 0.1 micron in diamter can reach the shock front.

Zhang J. Miki K. Goldstein D. B. Varghese P. L. Trafton L.
Modeling of Radiation Above Io's Surface from Pele-type Volcanic Plumes and Underground from the Conduit Wall **[#2123]**
We discuss modeling of radiation above Io's surface from Pele-type volcanic plumes and underground from the conduit wall.

Davies A. G. Matson D. L. Veeder G. J. Johnson T. V. Blaney D. L.
Lava Flows on Io: Modelling Cooling After Solidification **[#1460]**
Lava bodies cool faster after they have solidified. We have modeled post-solidification cooling of basaltic and ultramafic units of different thicknesses, and compare the results with Galileo observations of volcanism on Io.

Leone G. L. Wilson L.
Links Between Depths of Magma Reservoirs and Volcanic Eruption Rates on Io **[#1685]**
We review the volume eruption rates deduced for various volcanic events on Io, infer likely depths of magma reservoirs feeding the eruptions and show that the observed eruption rates can be sustained from sufficiently voluminous crustal reservoirs.

Hake M. D. Wilson L.
Emplacement of the Prometheus Compound Pahoehoe Lava Flow Field on Io **[#1328]**
The Prometheus lava flow on Io is a compound pahoehoe flow field. The morphologies of individual flow units and of the flow field as a whole are consistent with a total magma supply rate of ~200–400 $m^3 s^{-1}$ feeding ~30 local lava outbreaks at any one time with effusion rates of ~10 $m^3 s^{-1}$ each.

Kirchoff M. R. McKinnon W. B.
Mountain Building on Io: Variable Volcanism and Thermal Stresses **[#2030]**
We investigate the effect of eruption rate variation on the development of thermal stresses in Io's crust, and their potential role in mountain building. Both a fixed and changing crustal thickness are considered.

Hargitai H. Karatson D.
Silicic Volcanism on Io? Evidence from Tohil Mons and Other Possible Volcanic Cones **[#1544]**
We now see more evidence that Io's Tohil Mons' genesis, at least in part, is also due to viscous silicic volcanic activity. Moreover, from other smaller conical mountains, we postulate that silicic magmas are not unique on present Io.

Howell R. R.
Mutual Event Observations of Hot Spots on Io **[#2098]**
Mutual events provide the highest resolution observations of Io's volcanic hot spots obtainable from Earth and the first observations from the 2002/2003 series have been obtained. Improvements to the satellite ephemerides also make possible a better analysis of data from previous series.

Radebaugh J. Phillips C. McEwen A. S. Milazzo M. Keszthelyi L. P.
Locations of Hotspots on Io from Galileo SSI Eclipse Images **[#2087]**
We correlate Galileo SSI images of Io in eclipse by Jupiter with high resolution basemaps of Io in order to determine the locations of all hotspots with respect to surface features.

Smythe W. D. Soderblom L. A. Lopes R. M. C.
Io's Thermal Regions and Non-SO_2 Spectral Features **[#2024]**
An unidentified 3.15 micron absorption mapped on Io's surface appears to occur generally, but not exclusively, at Io's equator and associated with white material. It does not appear to have a direct correlation with plume activity.

Rathbun J. A. Johnson S. T. Spencer J. R.
Loki, Io: An Update on Activity from Groundbased Data **[#1375]**
Loki Patera is a 200 km diameter horseshoe-shaped low albedo feature on Io. Rathbun et al., using infrared data from various sources, determined that Loki erupted periodically, with a 540 day period. Recent groundbased data are no longer consistent with the periodic behavior.

Perry J. E. Radebaugh J. Lopes R. McEwen A. S. Keszthelyi L.
Gish Bar Patera, Io: Geology and Volcanic Activity, 1996–2001 **[#1720]**
Geology of Gish Bar Patera and volcanic activity as seen by Galileo SSI and NIMS, as well as groundbased observations discussed.

Schenk P. M. Wilson R. R.
Tectonic and Regional Topography of Io: A New High **[#2097]**
New topographic maps of Io have been derived using improved stereo mapping and photoclinometry. These include the topographic measurements of mountains and regional topography.

Wilson R. R. Schenk P. M.
Volcanic Topography of Io: The Final Chapter **[#2069]**
New topographic maps of Io have been derived using improved stereo mapping and photoclinometry. These include the first topographic measurements of lava channels as well as new observations of shield volcanoes some of which are several kilometers high.

Schaefer L. Fegley B. Jr.
Volcanic Origin of Alkali Halides on Io **[#1804]**
We extend previous calculations of the equilibrium distribution of O, S, Na, K, and Cl in volcanic gases to include Li, Rb, Cs, F, Br, and I. We show the gas composition at 1760 K and a range of pressures, simulating conditions at the Pele hot spot.

Fegley B. Jr. Schaefer L. Kargel J. S.
Vapor Pressure, Vapor Composition and Fractional Vaporization of High Temperature Lavas on Io **[#1686]**
We use a thermodynamic equilibrium model to calculate vapor pressure and vapor composition of high temperature lavas. We consider vaporization of erupted lavas without any fractional vaporization as well as continuous fractional vaporization.

Kargel J. S. Fegley B. Jr. Schaefer L.
Ceramic Volcanism on Refractory Worlds: The Cases of Io and Chondrite CAIs **[#1964]**
Io may have a refractory composition and "ceramic volcanism" whose nature is controlled partly by thermal evaporation of metals and oxides. Silicate evaporation and ceramic volcanism is also a possible explanation of meteoritic CAIs.