

Preliminary Program
Origin of the Earth and Moon Conference
Steinbeck Forum, Monterey Conference Center
December 1–3, 1998

To view a particular abstract, click on the title of that presentation.

Tuesday, December 1, 1998

7:00 – 8:00 a.m. Registration and Continental Breakfast
Steinbeck Lobby, Monterey Conference Center

ACCRETION
8:00 a.m. Steinbeck Forum

Discussion Leaders: **Sean Solomon**
 George Wetherill

INVITED TALK (30 minutes) Canup R. M.* Agnor C.
Accretion of Terrestrial Planets and the Earth/Moon System

Humayun M.*
Chemical and Isotopic Constraints on the Origin of the Earth and Moon

Kortenkamp S. J.* Wetherill G. W.
Formation of the Earth in the Presence of Jupiter and Saturn

9:15 a.m. DISCUSSION

9:45 a.m. COFFEE BREAK

TIMING
10:15 a.m. Steinbeck Forum

Discussion Leaders: **Günter Lugmair**
 Gerald Wasserburg

INVITED TALK (30 minutes) Podosek F.*
The Age of the Earth and the Moon

Carlson R. W.* Tera F.
Lead-Lead Constraints on the Timescale of Early Planetary Differentiation

Walker R. J.* Morgan J. W. Brandon A. D.
Rhenium-Osmium-Isotopic Constraints on the Late Accretionary Histories of the Earth, Moon, and Mars

11:30 a.m. DISCUSSION

12:00 noon LUNCH

TIMING (continued)
1:00 p.m. Steinbeck Forum

Jacobsen S. B.* Yin Q. Z.
Extinct Nuclides and the Origin of the Earth and the Moon

Halliday A. N.*
Tungsten- and Lead-Isotopic Models and Recent Simulations of a Giant Impact Origin of the Moon

1:30 p.m. DISCUSSION

GIANT IMPACT
2:00 p.m. Steinbeck Forum

Discussion Leaders: Jay Melosh
S. Ross Taylor

INVITED TALK (30 minutes) Cameron A. G. W.* Canup R. M.
The Giant Impact and the Formation of the Moon

2:45 p.m. COFFEE BREAK

Pritchard M. E.* Stevenson D. J.
Geological, Geochemical, and Theoretical Considerations of the Initial Lunar Thermal Condition and Implications for the Origin of the Moon

Jones J. H.*
Tests of the Giant Impact Hypothesis

Grove T. L.* Bowring S. A.
Contrasting Early Evolutionary Histories of the Earth and Moon

4:30 p.m. DISCUSSION

5:00 – 6:30 p.m. RECEPTION IN THE STEINBECK LOBBY (hosted bar and hors d'oeuvres)

Wednesday, December 2, 1998.

7:30 a.m. CONTINENTAL BREAKFAST
Steinbeck Lobby

GIANT IMPACT (continued)
8:00 a.m. Steinbeck Forum

Ohtsuki K.* Ida S. Tanaka H.
Rotation Rate of the Proto-Earth by Planetesimal Accretion and Its Implication for Lunar Origin

Kokubo E.* Ida S. Makino J.
High-Resolution N-Body Simulation of Lunar Accretion from an Impact-generated Disk

Stewart G. R.* Canup R. M.
Can an Early-formed Moon Avoid Siderophile Contamination by Subsequent Impacts?

Abe Y.* Zahnle K. J. Hashimoto A.
Elemental Fractionation During Rapid Accretion of the Moon Triggered by a Giant Impact

9:00 a.m. DISCUSSION

9:45 a.m. COFFEE BREAK

MAGMA OCEANS
10:15 a.m. Steinbeck Forum

Discussion Leaders: Michael Drake
David Stevenson

INVITED TALK (30 minutes) Walter M. J.*
Segregation of Earth's Core in a Hadean Magma Ocean

Gessmann C. K.* Rubie D. C.
Silicon and Oxygen Solubilities in Liquid Metal as a Function of Pressure, Temperature, and Oxygen Fugacity

Hillgren V. J.* Boehler R.
The Light Element in the Core and Core-Mantle Interactions

11:30 a.m. DISCUSSION

12:00 noon LUNCH

MAGMA OCEANS (continued)
1:00 p.m. Steinbeck Forum

Holzheid A.* Palme H.
Early History of the Earth: Insights from Siderophile Elements in the Earth's Mantle

Li J.* Agee C. B. Fei Y.
Element Partitioning Constraints on Formation and Composition of the Earth's Core

Tschauner O.* Rocholl A. Boehler R.
Metal-Silicate Partitioning of Moderately and Highly Siderophile Elements at Very High Pressures

Righter K.* Drake M. J.
Terrestrial and Lunar Magma Oceans: Water on the Early Earth and Core Formation in the Earth and Moon

2:00 p.m. DISCUSSION

2:45 p.m. COFFEE BREAK

Warren P. H.* Kallemeyn G. W. Kyte F. T.
Origin of Planetary Cores: Evidence for Mars-Earth Similarity in Distribution of Highly Siderophile Elements

Borg L. E.* Norman M. Nyquist L. E. Bogard D. Snyder G. Taylor L.
Evidence for a Light-Rare-Earth-Element-depleted Source for Some Ferroan Anorthosites

Hauri E. H.* Minarik W. G. Fei Y.
Isotopic Constraints on the Preservation of Primordial Heterogeneity in the Earth's Mantle

4:00 p.m. DISCUSSION

5:00 p.m. ADJOURN

Thursday, December 3, 1998

7:30 a.m. CONTINENTAL BREAKFAST
Steinbeck Lobby

OUTGASSING
8:00 a.m. Steinbeck Forum

Discussion Leaders: Keith O’Nions
Kevin Zahnle

INVITED TALK (30 minutes) Pepin R. O.*
Modeling the Formation of the Earth’s Atmosphere by Hydrodynamic Escape and Planetary Outgassing

Owen T.* Meier R. Bar-Nun A.
Sources of Terrestrial Volatiles: Constraints from D/H Noble Gases

Zahnle K. J.* Dones L.
Sources of Terrestrial Volatiles

9:15 a.m. DISCUSSION

9:45 a.m. COFFEE BREAK

Porcelli D.* Cassen P. Woolum D. Wasserburg G. J.
Acquisition and Early Losses of Rare Gases from the Deep Earth

Newman W. I.* Kaula W. M.
Differences of Venus from Earth Attributable to Origin Circumstances

Gerasimov M. V.* Dikov Yu. P. Yakovlev O. I. Wlotzka F.
Is There an Alternative for the Huge Impact-generated Atmosphere?

Okuchi T.* Abe Y. Iwamori H.
Hydrogen in the Core: An Evidence for the State of Lost Protoatmosphere

11:15 a.m. DISCUSSION

12:00 noon LUNCH

EARLY EARTH–MOON
1:00 p.m. Steinbeck Forum

Discussion Leaders: Don Anderson
Christopher Chyba

INVITED TALK (30 minutes) Stevenson D. J.*
Physical and Chemical Conditions for the Early Earth and Moon

Gaidos E. J.*
The Hadean Through a Glass Telescopically: Observations of Young Solar Analogs

Dones L.* Zahnle K. J.
The Population of Impactors After the Giant Impact

2:15 p.m. DISCUSSION

2:45 p.m. COFFEE BREAK

INVITED TALK (30 minutes) Shock E. L.*

Dynamic Mixing, Organic Synthesis, and Metabolic Potential Within the Early Earth

Zolotov M. Yu.* Shock E. L.

Volcanic Gases: Synthesis of Organic Compounds on the Present and Early Earth

4:15 pm. DISCUSSION

5:00 p.m. CONFERENCE ADJOURNS

POSTER PRESENTATIONS

Arrhenius G.

The New Moon

Borisov A. Walker R. J.

Osmium Solubility in Silicate Melts: New Efforts and New Results

Foing B. H. Racca G. SMART-1 Team

Science Exploration of the Moon with the European Space Agency SMART-1 Mission

Fortenfant S. Dingwell D. B. Rubie D. C. Hofmann A. Schiano P. Birck J. L. Gessman C. Tubrett M. Jenner G.

Experimental Investigation of Osmium Partitioning and Implications for Core Formation

Hartmann W. K.

Consequences of Early Intense Bombardment in the Earth-Moon System

Hood L. L.

Geophysical Constraints on the Existence and Size of a Lunar Metallic Core: A Reassessment Based on Initial Lunar Prospector Data

Jephcoat A. P.

Rare-Gas Solids and Planetary Interiors

Kaula W. M. Varadi F.

Terminal Phases of Earth and Venus Formation Dynamics

Kilburn M. R. Wood B. J.

The Effect of Oxygen Fugacity and Silicate Melt Composition on the Partitioning of Titanium, Vanadium, Chromium, and Manganese Between Liquid Metal and Silicate Melt

Koeberl C. Reimold W. U. McDonald I. Rosing M.

The Late Heavy Bombardment on the Earth? A Shock Petrographic and Geochemical Survey of Some of the World's Oldest Rocks

Konrad W. Spohn T.

The Influence of Lunar Mantle Convection on Partial Melting and the Cooling of a Small Core

Lee D-C. Halliday A. N.

Tungsten Isotopes and the Origins of Enstatite Chondrites and the Earth

- Lissauer J. J. Rivera E. Duncan M. J. Levison H. F.
The Dynamical Evolution of the Earth-Moon Progenitors: I. Motivation and Methodology
- Malcuit R. J. Winters R. R.
A Prograde Gravitational Capture Model for the Origin of the Earth-Moon System: Is It Compatible with the Rock Records of Earth and Moon?
- Mohapatra R. K. Murty S. V. S.
Nitrogen in the Earth's Mantle: Inferences from a Comprehensive Study of the Mantle-derived Materials
- Mojzsis S. J.
Clues to the Hadean Environment in the Chemistry of Ancient (4270 – 3900 Ma) Terrestrial Zircons
- Morishima R. Watanabe S.
Coaccretional Evolution of a Planet-Satellite System
- Newsom H. E. Shearer C. K.
Tungsten-Hafnium-Isotopic Abundances and the Early Origin of the Earth
- Norman M. D.
Volatile- and Siderophile-Element Depletion by Impact Processing of Chondritic Planetesimals
- Pechernikova G. V. Vityazev A. V.
Exchange of Material During Formation of the Earth and Moon
- Pickett B. K. Durisen R. H. Stewart G. R.
Three-Dimensional Hydrodynamic Simulations of the Postimpact Proto-Earth
- Pierazzo E. Melosh H. J.
Hydrocode Modeling of Oblique Impacts: The Fate of the Projectile
- Poe B. T. Reid J. E. Rubie D. C.
Effects of High Pressure on the Rheological Properties of Magma Oceans
- Potts L. V. von Frese R. R. B. Merry C. J.
Lunar Mass Differentiation from Spectrally Correlated Gravity and Topographic Data
- Rivera E. Lissauer J. J. Duncan M. J. Levison H. F.
The Dynamical Evolution of the Earth-Moon Progenitors: II. Results and Interpretation
- Rushmer T.
Core Formation Under Dynamic Conditions: An Experimental Study
- Shearer C. K. Newsom H. E.
The Origin of Mantle Reservoirs for Mare Basalts and Implications for the Thermal and Chemical Evolution of the Lunar Magma Ocean
- Smith D. E. Zuber M. T.
Inferences About the Early Moon from Gravity and Topography
- Stern S. A.
The Detectability of Moon-forming Impacts in Young, Nearby Planetary Systems
- Taylor G. J. Spudis P. D. Lucey P. G. Hawke B. R.
Bulk Composition of the Moon

- Taylor S. R.
Is the Composition of the Moon Consistent with the Giant Impact Hypothesis?
- Teterev A. V.
A Model of Interaction of a Vaporous Jet and High-Velocity Condensed Fragments at the Giant Impact
- Toda Y. Abe Y.
Crustal Asymmetry of the Moon: Necessary Consequence of Random Impacts
- Togashi S. Kita N. T. Morishita Y.
Transition Metal Trac-Element Analysis of Plagioclase for Application to Lunar Rocks
- Tronnes R. G.
Melting Relations and Mineral-Melt Partitioning of an FeO-rich, Bulk Earth Model Composition at 15–27 GPa
- Vityazev A. V. Pechernikova G. V.
The Heating, Degassing, Melting, and Differentiation in an Early History of the Earth
- Vityazev A. V. Bashkurov A. G. Pechernikova G. V. V. T. D. Li
Neutrinography of Earth and Moon and Mikheyev-Smirnov-Wolfenstein Effect
- Ward W. R.
Earth Interactions with an Impact-generated Disk
- Weisberg O. Hager B.
Global Lunar Contraction with Subdued Surface Topography
- Yanagisawa M.
Luminous Cloud in High-Velocity Impact Experiment
- Zhong S. Parmentier E. M. Zuber M. T.
Early Lunar Evolution and the Spatial Distribution of Mare Basalts
- Zuber M. T. Zhong S.
Topographic Relaxation in a Spherical, Viscoelastic Planet: Implications for Long Wavelength Topography and Compensation of Lunar Basins

PRESENTED BY TITLE ONLY

- Marakushev A. A.
Endogenic Activity of the Earth and Moon
- Warren P. H.
Bulk Moon Compositional Systematics: Inherited from Earth? Not So Simple!