

International interdisciplinary workshop
"Accretion and Early Differentiation of the Terrestrial Planets"
Le Saint-Paul Hotel (formerly Maison du Séminaire), Nice
May 26-30, 2014).

Program

Monday May 26

19.30-21.30 – Welcome cocktail

Tuesday May 27

8.55 – Welcome by D. Rubie

Origins (Chair: M. Wieczorek)

9.00-9.30 – Chambers: (invited) Planetary accretion - from dust to protoplanets

9.30-9.45 – Lambrechts: The Jupiter levee: connecting pebble accretion in the outer disc to terrestrial planet formation

9.45-10.15 – Levison: (invited) The Formation of terrestrial planets from the direct accretion of pebbles

10.15-10.30 – Ogiwara: Formation and dynamical evolution of close-in terrestrial planets

10.30-11.00 - *Coffee break*

11.00-11.30 – Walsh: (invited) Formation of the terrestrial planets with LIPAD - including dynamics, accretion and fragmentation

11.30-11.45 – Jacobson: Planet formation within the Grand Tack model

11.45-12.00 – Rubie: Chemical constraints on the Grand Tack accretion model

12.00-12.15 - Discussion

12.15-14.15 - *Lunch break*

Planetesimals and protoplanet precursors (Chair: G. Libourel)

14.15-14.45 – Young: (invited) Oxygen isotopes and the oxidation states of the terrestrial planets

14.45-15.15 – Chaussidon: (invited) Oxygen and Magnesium isotopic constraints on the presence of planetary fragments in meteoritic chondrules

15.15-15.30 – Metzler: How fast did some chondrites accrete?

15.30-15.45 – Guillot: Filtering of grains in the protosolar disk as a prerequisite to planet formation

15.45-16.15 – Ciesla: (invited) The distribution of volatiles in primitive Solar System bodies

16.15-16.45 - *Coffee break*

16.45-17.15 – Bourdon: (invited) Volatile element depletion in early-formed planetesimals

17.15-17.30 – Quitte: Metal-rich chondrites : insights into the first steps of metal segregation

17.30-17.45 – Kruijer: Protracted core formation in protoplanets inferred from Hf-W chronometry of iron meteorites

17.45-18.00 – Rushmer: Deforming chondrules as natural analogs for dynamic metal segregation: Analyses from 3D synchrotron imaging

18.00-18.15 – Discussion

Wednesday, May 28

Collisions and giant impacts (Chair: P. Michel)

9.00-9.30 – Jutzi: (invited) Consequences of global-scale collisions

9.30-9.45 – Davison: Impact processing of heterogeneous meteorite parent bodies in the early solar system

9.45-10.00 – Sarid: Mercury, the impactor: Fate of projectiles emerging from hit-and-run events in the inner Solar System.

10.00-10.30 – Leinhardt: (invited) The origin of Earth's non-chondritic composition?

10.30-11.00 - *Coffee break*

11.00-11.15 – Monteux: Consequences of giant impacts in early Mars: core merging and martian dynamo evolution

11.15-11.45 – Melosh: (invited) Dispersion and chemical equilibration of planetesimal cores in accretionary collisions

11.45-12.15 – Golabek: (invited) Towards coupled giant impact and long term interior evolution models

12.15-12.30 – Discussion

12.30-14.30 - *Lunch break*

Consequences of the Moon-forming collision on Earth (Chair: D. O'Brien)

14.30-15.00 – Marty: (invited) Origin and early evolution of the terrestrial atmosphere: implications for the age of the Moon, the rate of continental crust growth, and the evolution of the young Sun

15.00-15.15 – Nakajima: The initial state of Earth's mantle after the Moon-forming impact

15.15-15.30 – Lock: Was the atmosphere lost during the Moon-forming event?

15.30-16.00 – Stewart: (invited) Atmospheric blow-off and melting during the giant impact stage of planet formation

16.00-16.15 – Tucker: Terrestrial volatile abundances reflect different fates during giant impacts

16.15-18.30 - *Coffee break & Poster session*

18.45: *Buses leave for social event at Nice Observatory*

Thursday, May 29

Moon formation and evolution (Chair: A. Crida)

9.00-9.30 – Canup: (invited) Implications of the Moon-forming impact for late stage terrestrial accretion

9.30-10.00 – Kleine: (invited) Tungsten isotopes and the origin of the Moon

10.00-10.30 – Bottke: (invited) The evolution of giant impact ejecta and the age of the Moon.

10.30-11.00 - *Coffee break*

11.00-11.15 – Charnoz: Evolution of the protolunar disk from the impact to the assembling of the Moon

11.15-11.30 – Pahlevan: Excitation of the lunar inclination via three-body interactions

11.30-12.00 - Muenker: (invited) The evolution of the Earth-Moon system constrained from refractory and volatile trace elements

12.00-12.15 – Discussion

12.15-14.15 - *Lunch break*

Physical aspects of Core formation (Chair: J. Siebert)

14.15-14.45 – Tackley: (invited) Influence of formation and early differentiation processes on long-term evolution of terrestrial planet

14.45-15.15 – Deguen: (invited) Turbulent metal-silicate mixing, fragmentation, and equilibration in magma oceans

15.15-15.30 – Landeau: Laboratory experiments on metal fragmentation in a magma ocean

15.30-15.45 – Wacheul (Monteux): Fluid dynamics experiments on the breakup of liquid metal diapirs

15.45-16.00 – de Vries: Melting during planetary formation

16.00-16.30 - *Coffee break*

Chemical aspects of core formation (Chair: B. Wood)

16.30-17.00 – Van Westrenen: (invited) Trace element constraints on core formation in the Moon and Mars

17.00-17.15 - Savage: Copper isotopes and the role of sulphides during Earth's differentiation

17.15-17.30 – Fischer: Metal-silicate partitioning of Co, Ni, V, Cr, Si, and O up to 100 GPa and 5500 K

17.30-17.45 – Vogel: The Dependence of siderophile element partitioning on pressure, temperature, fO_2 and Si- and S-contents.

17.45-18.00 – Piet: Accreting the Earth and Forming its Core: Experimental and Theoretical Constraints

18.00-18.15 – Laurenz: Metal-silicate partitioning of highly siderophile elements in S-bearing systems- Implications for the formation of Earth's core

18.15-18.30 – Genske: Experimental investigation of Cr isotope fractionation during core formation

18.30-18.45 – Dwyer: The influence of multi-modal collisional outcomes on bulk composition and Hf/W isotopic systematics

18.45-19.00 - Discussion

Friday, May 30

Earth composition (Chair: M. Moreira)

9.00-9.30 – Fitoussi: (invited) Mars: A major ingredient to the Earth's recipe

9.30-9.45 – Andraut: Early cosmochemical fractionation through collisional erosion, a solution to the enstatite chondrite Earth model

9.45-10.15 – Stevenson: (invited) State of the core

10.15-10.30 – Blanchard: Light elements in the core: Constraints from Gallium metal-silicate partitioning experiments

10.30-11.00 - *Coffee break*

11.00-11.15 – Campbell: Sulfur contents of planetary and protoplanetary cores

11.15-11.30 – Caracas: Constraints on the inner core composition from mineral physics.

11.30-12.00 – Ballhaus (invited): Effect of core merging on the sulfur, selenium, and tellurium contents of the Earth's mantle

12.00-14.00 - *Lunch break*

Late Accretion/Veneer (Chair: C. Dale)

14.00-14.30 – Halliday: (invited) The origin of Earth's volatiles : not a Late Veneer !

14.30-14.45 - Marchi: The bombardment of the Earth during the Hadean and early Archean eras: A new look at the late accretion

14.45-15.15 – Raymond: (invited) Dynamical and collisional constraints on a stochastic late veneer on the terrestrial planets

15.15-15.30 - Andrews-Hanna: Geophysical constraints on the accretion, early thermal evolution and bombardment history of the Moon and Mars

15.30-15.45 – Morbidelli: Late accreted mass: How much material?

15.45-16.00 – Nimmo: Mantle heterogeneity and the late veneer

16.00-16.30 - *Coffee break*

16.30-16.45 – Becker: Terrestrial and lunar constraints on the composition of the late veneer: primitive, but slightly different from chondrites?

16.45-17.00 - Fischer-Gödde: Origin of the late veneer inferred from Ru isotope systematics

17.00-17.15 – Foing: Accretion and early evolution: what should future lunar missions tell us?

17.15-18.00 – General conclusions and farewell.

Posters

Cartier: Redox control on Nb/Ta fractionation during planetary accretion

Delbo: Search for the metallic cores of differentiated planetesimals in the asteroid main belt

Elfers: In search for the Earth's building blocks: Hf and W composition of chondrite leachates and residues

Kremser: Investigation of Ga and Cd isotope fractionation during evaporation and re-condensation

Lourenco: Early evolution and dynamics of Earth from a molten initial stage

Matthes: Pd-Ag evidence for rapid cooling of iron meteorite parent bodies

Miyajima (Fisher): Quantitative chemical analysis of carbon and oxygen in molten Fe-rich alloy by analytical transmission electron microscopy

Myhill: Melting of a partially oxidised upper mantle: an oxygen filter for the Earth?

O'Rourke: Magnesium exsolution in Earth's Core?

Peters: Studying late accretion and planetary differentiation using the ^{184}Os - ^{180}W decay system

Petitgirard: P-V equation of state of deep Earth's mantle-like glasses

Pfeifer: High-precision tantalum isotope measurements of meteorites by MC-ICPMS.

Posner: Si and Cr diffusion in liquid iron: kinetic implications for the chemical evolution of planetesimal cores

Pringle: Silicon isotopes in achondrites and clues to planetary differentiation

Salmon: Accretion of the Moon from the protolunar disk: canonical Vs non-canonical

Samuel: The early evolution of Mars' mantle and crust

Seclaman: Minor elements in silicate melts from ab initio calculations

Siebert: Sulfur isotopes fractionation between metal and silicate at high pressure and high temperature

Sossi: Iron isotopes on Mars linked to the formation of the terrestrial planets

Suer: The metal/silicate partition coefficients of highly siderophile elements during core formation

Wang: New constraints on the abundances of siderophile volatile elements in Earth's mantle