"Reading Terrestrial Planet Evolution in Isotopes and Element Measurements"

Workshop Program, October 22-26, 2018

Monday, October 22nd		**Seminar Room, 1st floor**
08:00-08:55	Registration ISSI, Hallerstrasse 6, 1st floor	
08:55-09:15	Welcome and Introduction: WS origin and objectives	Rudolf von Steiger (Director, ISSI)
09:15-09:20	Brief introduction to Europlanet	Manuel Scherf AAS, AT on behalf of Karoly Szego MTA, HU
09:20-09:30	Workshop objectives and expected outputs	Helmut Lammer, AAS, AT
Topic 1	**Formation of Terrestrial Planets**	**Chair: Thorsten Kleine**
09:30-10:00	Solar, chondritic and planetary/atmospheric abundance of elements/isotopes	Katharina Lodders-Fegley, Washington Univ., US
10:00-10:30	Young Sun & Sun in Time	Manuel Güdel, Univ. of Vienna, AT
10:30-11:00	*Coffee Break*	
11:00-11:30	Formation of protoplanets, Pebble accretion	Anders Johansen, Lund Univ., SE
11:30-12:00	Formation of Venus, Earth and Mars, influence of giant planets	Ramon Brasser, Tokyo Institute of Technology, JP
12:00-12:30	Origin of the Moon, including Isotopic constraints on its origin	Simon Lock, Harvard Univ., US
12:30-14:00	*Lunch*	
14:00-14:30	Comets vs. chondritic	Bernard Marty, CNRS, FR
14:30-15:00	Origin of planetary building blocks based on nucleosynthetic isotope anomalies	Christoph Burkhardt, Univ. Münster, DE
15:00-15:30	Chemical composition of late-accreted materials, volatile-rich versus volatile poor	Katherine Bermingham, Univ. of Maryland, US
15:30-16:00	General discussion	All
16:00-16:30	*Coffee Break*	
Topic 2	**Collisional erosion/delivery and fractionation of elements in planetary interiors**	**Chair: Hugh O'Neill**
16:30-17:00	Earth composition and implication of global geodynamics, connections between the bulk composition, geodynamics and habitability of Earth	Mark Jellinek, Univ. of British Columbia, US
17:00-17:30	Earth's volatile contents established by melting and vaporization, Magnesium isotope evidence that accretional vapour loss shapes planetary compositions	Paolo Sossi, IPGP, FR
17:30-18:00	The Earth-Moon system, the first Gyr, Isotope related evidence for magma ocean, small bodies, building blocks	Maud Boyet, CNRS, FR
18:00	*Welcome Reception at ISSI, Hallerstrasse 6, 1st floor*	

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Topic 2	**Collisional erosion/delivery and fractionation of elements in planetary interiors**	**Chair: Hugh O'Neill**
09:00-09:30	Atmosphere/Crustal/mantle erosion modelling and loss of elements	Thomas Maindl, Univ. of Vienna, AT
09:30-10:00	Accretion delivery of volatiles and atmospheric erosion	Zoe Leinhart, Univ. of Bristol, UK
10:00-10:30	Abundance of radioactive heat producing elements on Earth (planetary differentiation processes) K, U, Th, etc.	Craig O'Neill, Macquarie Univ., AU
10:30-11:00	*Coffee Break*	
11:00-11:30	Noble gas constraints on Earth formation and early evolution including magma oceans	Rita Parai, Washington Univ. US
11:30-12:00	Chemistry of steam atmospheres and of steam soluble elements during formation of the Earth and terrestrial planets	Bruce Fegley, Washington Univ. US
12:00-12:30	General discussion	All
12:30-14:00	*Lunch*	
Topic 3	**Atmospheric fractionation of isotopes and elements**	**Chair: Helmut Lammer**
14:00-14:30	Implication of gaseous H_2 envelopes around low mass (exo)planets (i.e., young terrestrial planets released from gas disk, boil-off phase, hydro-escape from primary atmospheres)	Luca Fossati, Austrian Academy of Sciences, AT
14:30-15:00	Reproduction of isotope and element fractionation of Solar System bodies by EUV-driven hydrodynamic drag (Venus, Earth, Mars)	Helmut Lammer, Austrian Academy of Sciences, AT
15:00-15:30	Mars atmospheric history derived from upper atmosphere noble gas measurements	Hiroyuki Kurokawa, Tokyo Institute of Technology, JP
15:30-16:00	*Coffee Break*	
16:00-16:30	Extreme C and S isotope fractionations in the atmosphere of a CO-world: A fresh insights into early Earth and Mars	Yuichiro Ueno, Tokyo Institute of Technology, JP
16:30-17:00	Nitrogen isotope variations in the Solar System (from space missions)	Evelyn Füri, CNRS, FR
17:00-17:30	Nitrogen isotope anomalies and isotope fractionation processes in Early Earth and Titan's atmospheres	Manuel Scherf, Austrian Academy of Sciences, AT
17:30-18:00	General discussion	All

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Wednesday, October 24th		**Seminar Room, 1st floor**
Topic 4	**Origin and Evolution of Nitrogen-dominated atmospheres and $\delta^{15}N$ through time**	**Chair: Bernard Marty**
09:00-09:30	Constraining the deep N cycle and associated fluxes (from an experimental & theoretical standpoint)	Sami Mikhail, Univ. of St Andrews, UK
09:30-10:00	Nitrogen cycles on terrestrial planets	Björn Mysen, Carnegie Institute, US
10:00-10:30	Constraining the deep N cycle and associated fluxes and N distribution and cycling in the crust	Ralf Halama, Keele Univ., UK
10:30-11:00	Atmospheric density and N_2 partial pressure over time, Nitrogen and Xe in the early Earth and Mars atmospheres	Sanjoy Som, NASA Ames Research Center, US
11:00-11:30	*Coffee Break*	
11:30-12:00	Early Earth N_2/CO_2 atmosphere/magnetosphere response to EUV flux of the young Sun and the role of the early Earth's paleomagnetosphere to atmosphere escape (polar etc.) during the Archean	Colin Johnstone, Univ. of Vienna, AT
12:00-12:30	Modelling planetary nitrogen atmospheres, pN2 over geologic timescales (Earth and Mars)	Mark Claire, Univ. of St Andrews, UK
12:30-13:00	Earth-like planets without plate tectonics	Nicolas Tosi, DLR, DE
13:00-13:30	First book discussion	Convenors & All
13:30-19:00	Free time to visit the attractions of Bern Also: All ISSI facilities are available for group discussions	
19:00	*Workshop Dinner at the Kornhauskeller (organized by ISSI)*	

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Thursday, October 25th		**Seminar Room, 1st floor**
Topic 4	**Origin and Evolution of Nitrogen-dominated atmospheres and $\delta^{15}N$ through time**	**Chair: Aubrey Zerkle**
09:00-09:30	Nitrogen cycling on the early Earth and exoplanets, d15N through time, N as a biomarker	Eva Stueeken, Univ. of St Andrews, UK
09:30-10:00	General discussion	All
Topic 5	**Biological influence on stable isotope fractionation**	**Chair: Aubrey Zerkle**
10:00-10:30	C, S, and H isotope fractionation in microbial lipids, Microbial and enzymatic fractionation of S isotopes	Alex Bradley, Washington Univ., US
10:30-11:00	*Coffee Break*	
11:00-11:30	Compound-specific C & N isotopes	Chris Junium, Syracuse Univ. US
11:30-12:00	Combining S & O isotopes in aqueous systems	Gilad Antler, Univ. of Cambridge, UK
12:00-12:30	Clumped isotopes and the global carbon cycle	Max Lloyd, Caltech, US
12:30-14:00	*Lunch*	
14:00-14:30	Modelling biological stable isotope fractionations	Harry McClelland, Weizmann Inst., IL
14:30-15:00	N and O isotope fractionation	Scott Wankel, WHOI, US
15:00-15:30	General discussion	All
15:30-16:00	*Coffee Break*	
16:00-17:00	Second book discussion	Convenors & All

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Friday, October 26th		**Seminar Room, 1st floor**
Topic 6	**Future missions and implications to habitability in general**	**Chair: Helmut Lammer**
09:00-09:30	The Earth-Moon system – remnants of Earth atmosphere (isotopes), orbit & surface: Investigating the Earth & lunar environment with orbiters	Iannis Dandouras, CNRS, FR
09:30-10:00	Chinese sample return missions	Yangting Lin, IGG/CAS, CN
10:00-10:30	Venus, Venera D (IKI, NASA), noble gases, nitrogen measurement's, stable isotopes, and elements on the surface	Mikhail Gerasimov, IKI, RU
10:30-11:00	Coffee Break	
11:00-11:30	Skype talk on Hayabusa 2	Shogo Tachibana, Hokkaido Univ., JP
11:30-12:00	Noble gas, atmosphere missions (Venus & Titan)	Christophe Sotin, NASA JPL, US
12:00-12:30	Exoplanet projects: Biomarkers, atmospheres, implications of life	Sarah Rugheimer, Univ. of Oxford, UK
12:30-13:30	Third book discussion: space Science Review special issue/ISSI book structure	Convenors & All
13:30	*End of the Workshop*	