ISSI Workshop on
"ExoOceans: Space Exploration of the Outer Solar System Icy Moons Oceans"
18-22 June, 2018

PROGRAM

Monday, 18 June 2018

Introduction

09:00-09:30	Registration in ISSI, Hallerstrasse 6, 1st floor	
09:30-09:45	Welcome and Introduction: What we hope to accomplish	**R. Rodrigo & A. Coustenis**
09:45-10:30	Ocean Worlds of the Outer Solar System	**Kevin Hand**

10:30-11:00 Coffee break

1: Introduction: The conditions for life to emerge and evolve - definition of biosignatures
Conveners: Jan de Leeuw & François Raulin

11:00-11:30	Three routes to life on Earth and elsewhere	**Jan de Leeuw**
11:30-12:00	How green rust and mackinawite acted as the disequilibria converters at a submarine alkaline vent to enable life's emergence?	**Mike Russell**
12:00-12:30	Origin of life issues and general prebiotic chemistry	**Christopher House**

12:30-13:30 Lunch

2: Icy moons with core-ocean connection (Enceladus, Europa, Triton) – including models of tidal heating as the energy source
Convener(s): Kevin Hand & Frank Postberg

13:30-14:00	Organic material emitted by Enceladus	**Frank Postberg**
14:00-14:30	Role of tidal heating in powering hydrothermal activities in ocean worlds	**Gabriel Tobie**
14:30-15:00	Global Circulation and Local Convection in Icy World Oceans	**Jason Goodman**

15:00-15:30 Coffee Break

15:30-16:00	Some geochemical implications of elements leached into the oceans of icy worlds	**Christopher Glein**

16:00-17:00 General Discussion on Sessions 1 and 2

17:00 Welcome reception at ISSI

Tuesday, 19 June 2018

3: Comparative planetology of oceans in planetary bodies (Earth, icy moons of Jupiter and Saturn, Triton, etc)
Convener(s): Athena Coustenis & François Raulin

09:00-09:30	Ceres, the innermost ExoOcean World	**Maria C. de Sanctis**
09:30-10:00	Internal Structure of the Dwarf Planet Ceres	**Giuseppe Mitri**
10:00-10:30	Ceres as an astrobiology target	**Christopher House**
10:30-11:00	**Coffee break**	
11:00-11:30	Effects of Tidal-induced Ocean Dynamics for Icy Moons	**Bert Vermeersen**
11:30-12:00	Ocean on Mars?	**Tim Van Hoolst (on behalf of Véronique Dehant)**
12:00-13:00	**Lunch**	

4: Habitability of early Earth as another planet to study

Convener: Kevin Hand

13:00-13:30	Could Earth have an ExoOcean-Planet sister?	**Tilman Spohn**
13:30-14:00	Microbial diversity and adaptation to deep sea extreme conditions: energetic, and physico-chemical limits for life	**Mohamed Jebbar**
14:00-14:30	The early Earth and the emergence of life **(by skype)**	**Frances Westall**

5: Hydrothermal vents and terrestrial analogs:
5a: Geochemical processes in hydrothermal vents
5b: Hydrothermal systems and other analogue environments
Convener(s): Karen Olsson-Francis

14:30-15:00	Planetary protection for ocean worlds	**Gerhard Kminek**
15:00-15:30	**Coffee break**	
15:30-16:00	PPOSS Biology Roadmap	**Petra Rettberg**
16:00-16:30	Exploring the Deep-sea Anoxic Brines of the Red Sea: Challenges, Approaches, and Findings	**Andre Antunes**
16:30-17:00	Understanding the genomics of Bacillus strains from Spacecraft Clean Room Facilities and Microgravity Adapted Bacterial Strains, from a Planetary protection perspective related to ExoOceans	**Madhan Tirumalai**

17:00-18:00 General Discussion on Sessions 3, 4 and 5

Wednesday, 20 June 2018

6: Icy moons with ocean trapped between two ice layers (role of the High-Pressure ice layer)
6a: Ganymede, Callisto, and the ocean worlds (connection to exoplanets)
Convener(s): Alexander Hayes & Christophe Sotin

09:00-09:30	The silicate core of the large icy moons	**Christophe Sotin**
09:30-10:00	Dynamics of HP ice layers	**Klara Kalousova**
10:00-10:30	Deep Ocean in large icy moons	**Steve Vance**
10:30-11:00	**Coffee break**	
11:00-11:30	Current status of induction studies to probe subsurface oceans within the Galilean satellites	**Joachim Saur**
11:30-12:00	Geodesy constraints on the deep oceans of ExoOcean worlds	**Tim Van Hoolst**
12:00-12:30	Lessons learned from Antarctic Deep Subglacial Lake Access **Paper deferred from Session 5**	**David Pearce**
12:30-13:30	**Lunch**	
13:30-14:50	***Early career researchers' presentations***	
13:30-13:50	Experimental study of aqueous systems at high pressure : how high pressure ices and equilibriums with fluids constrain extraterrestrial deep ocean habitability?	**Baptiste Journaux**
13:50-14:10	An origins simulator - Could natural pH gradients have powered the origin of life?	**Eloi Camprubí Casas**
14:10-14:30	Top-down freezing in a Fe-FeS core and Ganymede's present-day magnetic field	**Tina Rückriemen-Bez**
14:30-14:50	Biological methane production under putative Enceladus-like conditions	**Ruth-Sophie Taubner**
14:50	Free time for networking at ISSI (all ISSI facilities are available for small group discussions) Also: Time to visit the attractions of Bern	
19:30	Workshop dinner: Restaurant Kornhauskeller, Bern, Organized by ISSI	

Thursday, 21 June2018

6b: Titan (hydrocarbon liquid on surface and organic chemistry)
Convener(s): Athena Coustenis & Christophe Sotin

09:00-09:30	Titan's organic chemistry	**Athena Coustenis**
09:30-10:00	Titan Astrobiology. Complex organic chemistry, lakes and internal ocean: from observations and laboratory simulations to speculations	**François Raulin**
10:00-10:30	**Coffee break**	
10:30-11:00	Titan's lakes and seas: physical properties and chemistry	**Alexander Hayes**
11:00-11:30	Models of oceanic circulation in Titan's seas	**Ozgur Karatekin**
11:30-11:45	**General Discussion on Session 6b**	

7: Biosignatures in Exo-Oceans **CANCELLED**
Convener(s): Barbara Cavalazzi

8: Experimental and simulation efforts
Convener(s): Karen Olsson-Francis & Gabriel Tobie

11:45-12:15	Analogue sites and simulation experiments	**Karen Olsson-Francis**
12:15-13:15	**Lunch**	
13:15-13:45	GANOVEX, BIOMEX and BioSigN – exploring icy worlds through Field, lab and space studies	**Jean-Pierre de Vera**
13:45-14:15	What makes chemical diversity of ExoOceans?: accretion and water-rock reactions	**Yasuhito Sekine**
14:15-14:45	Numerical modeling of ocean dynamics in icy satellites	**Krista Soderlund**
14:45-15:15	Modeling the interior evolution of water-rich bodies: from icy moons to mini-Neptunes	**Lena Noack**
15:15-15:30	**General Discussion on Session 8**	
15:30-16:00	**Coffee break**	

Splinter sessions for book organization

16:00-16:30	General outline of ISSI book, organization, followed by splinter groups for book' review papers ISSI facilities, rooms available	**Rafael Rodrigo** **Athena Coustenis**
16:30-18:00	**Splinter groups, authors** **Book plans, actions and schedule**	**Led by Conveners**
18:00-19:00	**General Discussion**	

Friday, 22 June 2018

9: Key technologies and instruments for exploration and biosignatures detection (including energy sources)
Convener(s): Patricia Cabezas & Nicolas Walter

09:30-10:00	Melting probe technology and approaches to penetrate and investigate planetary ice layers	**Stephan Ulamec**
10:00-10:30	**Coffee break**	
10:30-11:00	IceMole – A Subsurface Ice Probe for Clean Access to ExoOceans	**Bernd Dachwald**
11:00-12:00	**Reports from splinter groups, authors**	**Led by Coordinators**
	Book plans, actions, schedule	
12:00-12:30	**Final Discussion. Book coordinators and schedule**	
12:30	Close of Workshop	