

**Proceeding of International Astrobiology Workshop 2013**  
**国際アストロバイオロジーワークショップ2013(第6回日本アストロバイオロジーネットワーク年次研究会)**

Main Sponsor: Japan Astrobiology Network (JABN)  
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 主催: 日本アストロバイオロジーネットワーク  
 共催: 宇宙航空研究開発機構宇宙科学研究所 (JAXA/ISAS)

Dates: November 28–30, 2013

Document Number 資料番号	Symposium No. シンポジウムNo.	Title タイトル	Lead Author 筆頭著者
IS600008000		Proceeding of International Astrobiology Workshop 2013 国際アストロバイオロジーワークショップ2013(第6回日本アストロバイオロジーネットワーク年次研究会):講演 Day-1 Thursday, November 28, 2013 WELCOME AND INTRODUCTION Chair: Akihiko Yamagishi	
IS600008001	1W1	Opening Remarks by Japan Astrobiology Networks (President, JABN)	Yamagishi, Akihiko
IS600008002	1W2	Welcom Address by the Host Institution (Director General, JAXA/ISAS)	Tsuneta, Saku
IS600008003	1W3	Meeting Agenda and Logistics from the Local Organizing Committee	Yano, Hajime
Thursday, November 28, 2013 METEORITICS AND COSMOCHEMISTRY Chairs: Kensei Kobayashi, Motoo Ito			
IS600008004	1052	Aqueous Activity on Chondrite Parent Asteroids	Krot, Alexander N.
IS600008005	1042	Metamorphosed Clasts in the CV Carbonaceous Chondrite Breccias Mokoia and Yamato-86009: Evidence for Strong Thermal Metamorphism on the CV Parent Asteroid	Jogo, Kaori
IS600008006	1025	Deuterium-Hydrogen Exchange Between Organic Matter and Water: Implications for Chemical Evolution During Asteroidal Processing	Kebukawa, Yoko
IS600008007	1012	Comet Impacts as a Driving Force of Glycine Oligomerization	Mimura, Koichi
IS600008008	1016	Evolution of Interstellar Organics to Meteoritic and Cometary Organics: Approaches by Laboratory Simulations	Kobayashi, Kensei
IS600008009	1044	Ultra High Spatial Resolution Ion Imaging with a NanoSIMS Ion Microprobe: Applications to Astrobiology	Ito, Motoo
IS600008010	1049	Overview of Japan's MELOS1 Mars Mission: Mars Exploration for Life/Organism Search	Satoh, Takehiko
Thursday, November 28, 2013 SPECIAL LECTURES-1 Chair: Akihiko Yamagishi			
IS600008011	1043	Puzzles of Biochemistry of Extraterrestrial Life	Oshima, Tiro. O.
IS600008012	1064	From Origin of Life to Systematization to Astrobiology	Maruyama, Shigenori
Thursday, November 28, 2013 MOLECULAR CLOUDS AND PLANETARY FORMATION REGIONS Chairs: Masatoshi Ohishi, Aunaud Belloche			
IS600008013	1007	Complex Organic Molecules in the Interstellar Medium in the Era of ALMA	Belloche, Aunaud
IS600008014	1009	Discovery of Absorption Features of CH <sub>3</sub> NH <sub>2</sub> towards SgrB2(M)	Ohishi, Masatoshi
IS600008015	1023	Near-Infrared Circular Polarimetry: Implication for Astrobiology	Kwon, Jungmi
IS600008016	1048	AKARI Observations of Interstellar Polycyclic Aromatic Hydrocarbons	Ishihara, Daisuke
Thursday, November 28, 2013 EARLY EARTH, GEOCHEMISTRY, AND PLANETARY ENVIRONMENT Chairs: Yuichiro Ueno, Yasuhito Sekine			
IS600008017	1031	Formation and Early Evolution of Atmosphere and Ocean on the Earth	Genda, Hidenori
IS600008018	1056	The Faint Young Sun Problem – How to warm up Early Earth and Mars?	Tian, Feng
IS600008019	1063	Did Oceanic Biogenic Methane Cycling Regulate the Evolution of Early Earth Atmospheric Chemistry?	Thomazo, Christophe
IS600008020	1010	Unique Late Archean Atmosphere –Enhanced Volcanic and Biological Activities	Ueno, Yuichiro
IS600008021	1028	Enceladus' Hydrothermal Activity: Another Habitable World?	Sekine, Yasuhito
Day-2 Friday, November 29, 2013 WEBCAST PRESENTAION-1 Chair: Hajime Yano			
IS600008022	-	Planetary Protection for Astrobiology Missions (NASA-HQ): TBD	Conley, C.
Friday, November 29, 2013 SOLAR SYSTEM EXPLORATION AND EXPERIMENTS (SCIENCE, MISSION DESIGNS, INSTRUMENTS, AND ENABLING TECHNOLOGY) Chairs: Hitoshi Kuninaka, Masaki Fujimoto			
IS600008023	1026	Astrobiology Research on Board of the International Space Station as part of the European Space Exploration Initiative	Horneck, Gerda

IS600008024	1040	Tanpopo: Astrobiology Exposure and Micrometeoroid Capture, a Sample Return Experiment to Test Quasi-Panspermia Hypothesis Onboard the ISS-Kibo Exposed Facility	Yano, Hajime
IS600008025	1050	Intact Capture, Aerogel, SOCCER, Stardust & LIFE	Tsou, Peter
IS600008026	1053	Hayabusa2 Asteroid Sample Return Mission	Kuninaka, Hitoshi
IS600008027	1054	A Strategy for Sample Retrieval and Possible Onboard Biosafety Controls: Perspectives	Takano, Yoshinori
IS600008028	1062	"Deep Habitat" in the Icy Moons: Structure and Evolution of the Internal Ocean	Kimura, Jun
IS600008029	-	Thermodynamic Constraints on Ocean Structure And Water-Rock Chemistry In Large Icy Worlds	Vance, Steve
<b>Friday, November 29, 2013</b> <b>SPECIAL LECTURES-2</b> <b>Chair: Ken Takai</b>			
IS600008030	1014	"Contact" with Extra-Terrestrial Life: An Astronomer's View	Kaifu, Norio
IS600008031	1011	Perspectives of ELSI Projects: The Origin of the Earth and the Origin of Life	Hirose, Kei
<b>Friday, November 29, 2013</b> <b>EXOPLANETARY SYSTEMS AND EXOPLANETS (THEORIES, MODELS, AND OBSERVATIONS)</b> <b>Chairs: Takao Nakagawa, Shigeru Ida</b>			
IS600008032	1065	Toward Detections and Characterization of Habitable Transiting Exoplanets	Narita, Norio
IS600008033	1037	Search for Habitable Planets Around Low-Mass Stars Using the InfraRed Doppler Instrument	Omiya, Masashi
IS600008034	1045	Brown Dwarfs Atmospheres Revealed by 2.5-5.0 $\mu$ m AKARI Spectra	Sorahana, Satoko
IS600008035	1047	Studies of Exoplanets with the SPICA Coronagraph Instrument (SCI)	Enya, Keigo
IS600008036	1055	Why Life? Origins of Life Elsewhere in the Universe	Hut, Piet
IS600008037	1020	Toward Characterization of Exoplanetary Surface Environment	Fujii, Yuka
IS600008038	1034	Polarimetric Signatures of the Earth Extracted from Earthshine Observations	Takahashi, Jun
IS600008039	1039	Conditions of Surface H <sub>2</sub> O of Snowball Planets with High-Pressure Ice	Ueta, Shoji
<b>Friday, November 29, 2013</b> <b>POSTER SESSION-CORE TIME</b>			
IS600008040	1003	Man Made Elements Periodic Table, Astronomical Periodic Table, Geographic Periodic Table-Dimitri Mendeleev Imitation in the 21st Century	Struck, J.-Tmothy
IS600008041	1030	Polarized Space Radiation and Biological Homochirality	Takahashi, Junichi
IS600008042	1046	Abiogenic and Biogenic Chiral Amino Acids for Further Enantiomer-Specific Isotope Analysis (ESIA)	Takano, Yoshinori
IS600008043	1013	The Possible Interplanetary Transfer of Microbes: Assessing the Viability of Deinococcus spp. Under the ISS Environmental Conditions for Performing Exposure Experiments of Microbes in the Tanpopo Mission	Kawaguchi, Yuko
IS600008044	1017	Fluorescent Dye Handling System for MELOS1 Life Detection Microscope	Nishizawa, Masataka
IS600008045	1018	Method for Biological Contamination Monitoring During Aerogel Cutting Process in Tanpopo Project Using Bioluminescent Bacteria Photobacterium Kishitanii	Kiyonaga, Yusuke
IS600008046	1019	Exposure Experiments of Organic Compounds on the JEM, ISS, in the Tanpopo Mission	Mita, Hajime
IS600008047	1033	Dried Colony in Cyanobacterium, Nostoc sp. HK-01 - Several high Space Environment Tolerances for "Tanpopo" Mission	Tomita-Yokotani, Kaori
IS600008048	1038	Silica Aerogel for Use in Cosmic Dust Collectors Utilized in the Tanpopo Mission	Tabata, Makoto
IS600008049	1008	Possibility of Electro-Ecosystem Around Deep-Sea Hydrothermal Vents	Yamamoto, Masahiro
IS600008050	1032	Interplanetary Migration of Eucaryotic Cell, Spore of Schizosaccharomyces Pombe	Hayashi, Nobuhiro
IS600008051	1041	Global Census of Microbial Life in Marine Subsurface Sediments	Hoshino, Tatsuhiko
IS600008052	1006	Evolution and Adaptation of the RNA Coupled with an Artificial Life-Like Self-Replication System to a Severe Translational Environment	Mizuuchi, Ryo
IS600008053	1021	Evolution of Intelligence in a Network of Chain Reactions	Karasawa, Shinji
IS600008054	1024	Molecular Phylogenetic Analyses of G1P Dehydrogenase and G3P Dehydrogenase Suggest the Late Origin of Archaea-Type Membrane	Yokobori, Shin-ichi
IS600008055	1066	Exploration of Jovian System by ESA-JUICE Mission: Participation of Japanese Teams	Saito, Yoshifumi
IS600008056	1067	Light Harvesting and Energy Transfer in Photosystem: Implication for Biosignatures	Komatsu, Yu
<b>Day-3</b> <b>Saturday, November 30, 2013</b> <b>WEBCAST PRESENTATION-2</b> <b>Chair: Hajime Yano</b>			
IS600008057	-	Astrobiology in US Space Program (NASA Ames)	McKay, Chiris

**Saturday, November 30, 2013**  
**PANEL DISCUSSION: "ASTROBIOLOGY VS. SPACE EXPERIMENTS AND EXPLORATION"**  
**Moderator: Hajime Yano (ISAS/JAXA)**  
**Panel Members:**  
 Gerda HORNECK (European Astrobiology Network Association)  
 Hitoshi KUNINAKA (JAXA/JSPEC, JSPEC Space Exploration Committee)  
 Chris McKAY (NASA Ames Research Center via TV Conference System)  
 Ken TAKAI (JAMSTEC)  
 Akihiko YAMAGISHI (Japan Astrobiology Network)  
 Hiroshi YAMAKAWA (Kyoto University, ISAS Space Engineering Committee)

**Saturday, November 30, 2013**  
**LIFE IN EXTREME ENVIRONMENT (1/2)**  
**Chairs: Ken Takai, Daiki Horikawa**

IS6000008058	1051	Can Terrestrial Microbes Grow on Mars?	Nicholson, Wayne L.
IS6000008059	1035	Astrobiological Research on Tardigrades: Implications for Extraterrestrial Life Forms	Horikawa, Daiki D.
IS6000008060	1005	Interaction of the Sleeping Chironomid with Microorganisms: "Uchi-Soto" in the World of Anhydrobiosis	Gusev, Oleg
IS6000008061	1029	Energetics of Amino Acid Synthesis and Polymerization as a Function of Temperature and pH	Kitadai, Norio

**Saturday, November 30, 2013**  
**LIFE IN EXTREME ENVIRONMENT (2/2)**  
**Chairs: Ken Takai, Daiki Horikawa**

IS6000008062	1022	Limits of Life in the Deep Subseafloor Biosphere: New Insights from IODP Expedition 337	Inagaki, Fumio
IS6000008063	1027	Technological Challenges for the Advanced Study of Deep Subseafloor Life	Morono, Yuki
IS6000008064	1004	Microbial Community Development in Deep-Sea Hydrothermal Vents in the Earth, and the Enceladus	Takai, Ken

**Saturday, November 30, 2013**  
**RNA AND MOLECULAR BIOLOGY**  
**Chairs: Daisuke Kiga, Yutetsu Kuruma**

IS6000008065	1057	The PURE System for Artificial Cells	Ueda, Takuya
IS6000008066	1060	Darwinian Evolution in a Translation-Coupled RNA Replication System within a Cell-Like Compartment	Ichihashi, Norikazu
IS6000008067	1061	Variation of Genetic Alphabets of Nucleobases	Kimoto, Michiko
IS6000008068	1036	Bioimaging by X-Ray Laser Diffraction at SACLA	Bessho, Yoshitaka
IS6000008069	1059	RNA and the Nature of the Last Common Ancestor	Bracho, Arturo Becerra
IS6000008070	1015	Experimentally Testing the Hypothesis of a Limited Amino Acid Repertoire in Primitive Proteins	Akanuma, Satoshi
IS6000008071	1058	Simplification of the Genetic Code: Restricted Diversity of Genetically Encoded Amino Acids	Amikura, Kazuaki

**Saturday, November 30, 2013**  
**FINDINGS AND CLOSING REMARKS**  
**Chair: Ken Takai**

IS6000008072		Workshop Findings	Yano, Hajime
IS6000008073		Closing Remarks	Takai, Ken