

Monday, November 17, 2008

9:00 - 9:20

Conference Hall "WINDS" (11F)

Opening Ceremony

Chairperson : **Hiroyuki Yamamoto**, Japan

• **Welcome Address** : **Kenji Kato**, Japan

• **Logistics** : **Kazuhiro Aoki**, Japan

9:20 - 10:20

Conference Hall "WINDS" (11F)

Keynote Lecture - 1

Chairperson : **Ronald W. Harvey**, USA

Page

9:20 - 10:20	KN-1	<i>Joseph L. Kirschvink</i> Cyanobacteria, the first snowball Earth, and the rise of atmospheric oxygen	2
--------------	------	--	---

Monday, November 17, 2008

10:40 - 15:40

Room 1001-1 (10F)

Session 2 - Evolution of geochemical and microbiological systems

Co-convener : Ken Takai, Japan

Co-convener : Yuichiro Ueno, Japan

			Page
10:40 - 11:10	S2-01	<i>Giora Proskurowski</i> (Invited) (New) Thoughts on the geochemistry of methane and low-molecular weight hydrocarbon species in hydrothermal fluids	51
11:10 - 11:30	S2-02	<i>Ken Takai</i> A new high-temperature and -pressure cultivation technique will open a way to unknown deep subsurface microbial functions	52
11:30 - 11:50	S2-03	<i>Shinsuke Kawagucci</i> Stable isotope usage for quantitative estimation of H ₂ utilization metabolisms at hydrothermal ecosystem	53
11:50 - 12:10	S2-04	<i>Takazo Shibuya</i> Archean alkaline hydrothermal fluid and chert genesis	54
12:10 - 13:20	Lunch (70 min)		
13:20 - 13:40	S2-05	<i>Kosei E. Yamaguchi</i> Non-traditional stable isotope biogeochemistry of transition metals: A new tool for detecting biosignatures and constraining metabolism in modern subsurface environments and early Earth	55
13:40 - 14:00	S2-06	<i>Yuichiro Ueno</i> Stable sulfur and carbon isotope biogeochemistry of early Archean dresser hydrothermal system	56
14:00 - 14:20	S2-07	<i>Dupraz Sébastien</i> CO ₂ mobilization by endogenic microbial populations in a context of carbon geological sequestration	57
14:20 - 14:40	Coffee Break (20 min)		
14:40 - 15:00	S2-08	<i>Ian G. McKinley</i> Microbial catalysis of redox reactions in deep geological environments	58
15:00 - 15:20	S2-09	<i>Ean Warren</i> Aquifer temperature increases caused by microbial activity within subsurface oil bodies	59
15:20 - 15:40	S2-10	<i>Stefan Sievert</i> An integrated approach to study chemolithoautotrophic processes at deep-sea hydrothermal vents at 9°N, East Pacific Rise	60

Monday, November 17, 2008

16:00 - 18:00

Room 1001-1 (10F)

Session 3 - Search for life on Mars and other extreme environments

Co-convener : Takeshi Naganuma, Japan

Co-convener : Mahlon C. Kennicutt, USA

			Page
16:00 - 16:30	S3-01	<i>Mahlon C. Kennicutt</i> (Invited) Life in the ice: US Research on microbial ecology and diversity in frozen environments	69
16:30 - 17:00	S3-02	<i>Sergey Bulat</i> (Invited) Hidden life in extreme subglacial Lake Vostok, East Antarctica	70
17:00 - 17:20	S3-03	<i>Blaire Steven</i> Microbial diversity and activity in permafrost and ground ice from the Canadian High Arctic	71
17:20 - 17:40	S3-04	<i>Susana M. Direito</i> Search for life on Mars: Looking for optimal biomarker extraction and detection protocols	72
17:40 - 18:00	S3-05	<i>Vipul Chadha</i> Extremozymes belonging to glycosyl hydrolase family from <i>Halothermothrix orenii</i> (An extremophilic bacterium)	73

Monday, November 17, 2008

10:40 - 17:00

Room 1001-2 (10F)

Session 1A - Microbes in aquifer: nature, contamination and its biotechnological alteration (Organic compounds)

Co-convener : **Kenji Nanba**, Japan

Co-convener : **Tillmann Lueders**, Germany

			Page
10:40 - 11:10	S1-01	<i>Mike Manefield (Invited)</i> Extracellular respiration and the bioremediation of organochlorins in the subsurface	8
11:10 - 11:30	S1-02	<i>Frederick Colwell</i> Coupling biogeochemical process evaluation for conceptualizing trichloroethene co-metabolism	9
11:30 - 11:50	S1-03	<i>Ronald Harvey</i> Quantifying the chemotactic migration of a genetically engineered bacterium in a TCE-contaminated, sandy aquifer	10
11:50 - 12:10	S1-04	<i>Jennifer C. Underwood</i> Response of groundwater bacteria from Cape Cod, MA, U.S.A. to low concentrations of antimicrobials	11
12:10 - 13:20	Lunch (70 min)		
13:20 - 13:40	S1-05	<i>Tillmann Lueders</i> Unraveling the diversity and ecology of anaerobic BTEX degraders in aquifers by targeted structural and functional analyses	12
13:40 - 14:00	S1-06	<i>Draženka Selesi</i> Mechanistic insights into anaerobic biodegradation of naphthalene and benzene under sulfate-reducing conditions	13
14:00 - 14:20	S1-07	<i>Christian Griebl</i> The hidden spatial and temporal dynamics of biodegradation processes in a sandy tar oil-contaminated aquifer	14
14:20 - 14:40	Coffee Break (20 min)		
14:40 - 15:00	S1-08	<i>Natuschka M. Lee</i> The biodiversity of <i>Chloroflexi</i> -affiliated bacteria in the subsurface	15
15:00 - 15:20	S1-09	<i>Daniela B. Meisinger</i> Systematic evaluation of current molecular tools for characterizing the microbial diversity of chlorinated solvent contaminated aquifers	16
15:20 - 15:40	S1-10	<i>Kotaro Ise</i> Relationship between <i>Dehalococcoides</i> sp. and methanogenic archaea	17
15:40 - 16:00	Coffee Break (20 min)		
16:00 - 16:20	S1-11	<i>Owen Rubaba</i> Phenotypic and phylogenetic characterization of new <i>Agrobacterium</i> strains isolated from an anaerobic microbial consortium capable of reductive dechlorination	18

Monday, November 17, 2008

Continued

Room 1001-2 (10F)

			Page
16:20 - 16:40	S1-12	<i>Wilfred F. M. Röling</i> Control and regulation of biodegradation of groundwater pollutants in networks of interacting micro-organisms	19
16:40 - 17:00	S1-13	<i>Hans-Jørgen Albrechtsen</i> Microbial degradation of pesticides in subsurface: Scale matters	20

Tuesday, November 18, 2008

9:00 - 9:50

Room 1001-2 (10F)

Keynote Lecture -2

Chairperson : Danielle Fortin, Canada

9:00 - 9:50	KN-2	<i>James Lake</i> The phylogenetic underpinnings of subsurface microbiology	4
-------------	------	--	---

Tuesday, November 18, 2008

10:00 - 17:20

Room 1001-1 (10F)

Session 7 - Subseafloor microbial life and biosphere

Convener : Fumio Inagaki, Japan

			Page
10:00 - 10:30	S7-01	<i>R. John Parkes (Invited)</i> Stimulated prokaryotic activity in the deep, hot biosphere	136
10:30 - 10:50	S7-02	<i>Daniel Prieur</i> Extending the sub-sea-floor biosphere	137
10:50 - 11:10	S7-03	<i>Bert Engelen</i> Enhanced microbial activities within the deep subseafloor biosphere induced by fluids from the oceanic crust	138
11:10 - 11:30	S7-04	<i>Mark A. Lever</i> Evidence for acetogenesis in deep subseafloor sediments	139
11:30 - 11:50	S7-05	<i>Hideyoshi Yoshioka</i> Microbial activities in deep marine sediments from a natural gas field offshore the Shimokita Peninsula, Japan	140
11:50 - 12:10	S7-06	<i>Fengping Wang</i> Stratified microbial communities involving in methane metabolism along the sediment core of Pearl River Estuarine, southern China	141
12:10 - 13:20	Lunch (70 min)		
13:20 - 13:40	S7-07	<i>Katrina Edwards (Invited)</i> Life in the crust of the ocean: exploring microbial activity and diversity on (and in) basalts	142
13:40 - 14:00	S7-08	<i>Anna H. Kaksonen</i> Distribution of microbial life in marine subsurface sediments of the seismogenic subduction zone	143
14:00 - 14:20	S7-09	<i>Axel Schippers</i> Nucleic acid based quantitative microbial community analysis in different marine and terrestrial sediments	144
14:20 - 14:40	Coffee Break (20 min)		
14:40 - 15:00	S7-10	<i>Yuki Morono</i> Enumeration of microbial cells in marine subsurface sediments using improved cell detachment protocol and automated microscopic imaging system	145
15:00 - 15:20	S7-11	<i>Kristina Rathsack</i> Novel microorganisms revealed from deep-sea cold oceanic crust basalts and sediment samples collected along the Mid-Atlantic-Ridge (4°48'S– 9°33'S)	146
15:20 - 15:40	S7-12	<i>Takeshi Kakegawa</i> Geochemical study of fossilized microbial mats in drilled holes at the Suiyo submarine hydrothermal field in Japan	147
15:40 - 16:00	Coffee Break (20 min)		

Tuesday, November 18, 2008

Continued

Room 1001-1 (10F)

			Page
16:00 - 16:20	S7-13	<i>Katsunori Yanagawa</i> Relationship between distribution of anarobic methanotrophs and methane flux: Evidence from a hydrate field in the Japan Sea	148
16:20 - 16:40	S7-14	<i>Joachim Reitner</i> Biosignatures, architecture and formation of methane derived microbialites at cold seeps from the Black Sea	149
16:40 - 17:00	S7-15	<i>Christoph Wrede</i> Correlative light/electron microscopy for the investigation of microbial mats from Black Sea cold seeps	150
17:00 - 17:20	S7-16	<i>Yoshinori Takano</i> <i>In-situ</i> tracer experiments for benthic archaea: carbon isotopic evidence of caldarchaeol and crenarchaeol in archaeal membrane lipids	151

Tuesday, November 18, 2008

10:00 - 12:20

Room 1001-2 (10F)

Session 5 - Meta-genomics and its future in geobiology

Co-convener : Satoshi Hanada, Japan

Co-convener : Takuro Nunoura, Japan

			Page
10:00 - 10:30	S5-01	<i>Victor Kunin (Invited)</i> Molecular convergence and genetic gradients in a microbial mat	101
10:30 - 11:00	S5-02	<i>Jennifer F. Biddle (Invited)</i> A genetic view of diversity beneath the seafloor	102
11:00 - 11:20	S5-03	<i>Hideto Takami</i> Metagenomic analysis of deep subsurface core samples collected in an offing of the Shimokita Peninsula on the northwest Honshu, Japan	103
11:20 - 11:40	S5-04	<i>Barbara J. Campbell</i> Adaptations to submarine hydrothermal environments exemplified by the genome of <i>Nautilia profundicola</i>	104
11:40 - 12:00	S5-05	<i>Takuro Nunoura</i> Metagenomic analysis of uncultivated thermophilic crenarchaeote from a subsurface gold mine	105
12:00 - 12:20	S5-06	<i>Kayo Arima</i> CAMERA: Building a "community cyberinfrastructure for advanced marine microbial ecology research and analysis"	106

Tuesday, November 18, 2008

13:20 - 17:10

Room 1001-2 (10F)

**Session 1B - Microbes in aquifer: nature, contamination and its biotechnological alteration
(Metal)**

Co-convener : Yohey Suzuki, Japan

Co-convener : Rainer U. Meckenstock, Germany

Page

13:20 - 13:50	S1-14	<i>Jonathan R. Lloyd (Invited)</i> Putting subsurface microorganisms to work; mechanisms, environmental impact and biotechnological application of metal-reducing bacteria	21
13:50 - 14:10	S1-15	<i>Yoshio Takahashi</i> Binding sites of metal ions at bacterial cell surfaces studied by distribution patterns of rare earth elements and EXAFS	22
14:10 - 14:30	S1-16	<i>Danielle Fortin</i> Biogenic iron oxides (BIOS) and Sr cycling in a wetland environment	23
14:30 - 14:50	Coffee Break (20 min)		
14:50 - 15:10	S1-17	<i>Rainer U. Meckenstock</i> Size matters: nano-sized iron oxides strongly enhance microbial iron reduction	24
15:10 - 15:30	S1-18	<i>Jens Aamand</i> Microbial oxidation of pyrite with nitrate as electron acceptor in a Danish anaerobic groundwater aquifer	25
15:30 - 15:50	S1-19	<i>Richard L. Smith</i> Characterization of denitrification-coupled Fe(II) oxidation in nitrate-impacted groundwater using combined field and laboratory studies	26
15:50 - 16:10	Coffee Break (20 min)		
16:10 - 16:30	S1-20	<i>Yohey Suzuki</i> Biogeochemical profiles in deep sedimentary rocks in an inland fore-arc basin, Central Japan	27
16:30 - 16:50	S1-21	<i>Mio Takeuchi</i> Methanogenesis in ancient marine sediments of Holocene in the Kanto Plain, Japan	28
16:50 - 17:10	S1-22	<i>Peter Schillig</i> The effects of microbial activity on the hydrogeology of a biostimulated aquifer	29

Thursday, November 20, 2008

9:30 - 12:00

Room 1001-1 (10F)

Session 11 - Biomat and other topics related to subsurface microbiology

Co-convener : Mio Takeuchi, Japan

Co-convener : Annette Summers Engel, USA

			Page
9:30 - 9:50	S11-01	<i>Yuichi Suwa</i> Anammox activity in groundwater, soil and sediment	212
9:50 - 10:10	S11-02	<i>Nagappa Ramaiah</i> Archaeal phylogeny, DGGE profiles and signatures of AMO activity in the surface sediments of ecologically analogous tropical estuaries	213
10:10 - 10:40	S11-03	<i>Masayuki Ohmori</i> (Invited) The molecular mechanisms of desiccation tolerance in cyanobacteria and application of terrestrial cyanobacteria to improve devastated soil	214
10:40 - 11:00	Coffee Break (20 min)		
11:00 - 11:20	S11-04	<i>Christina Heller</i> Localization of a Ni-based enzyme in microbial mats and cold-seep carbonates with geo- and biochemical methods	215
11:20 - 11:40	S11-05	<i>Lise Øvreås</i> Microbial population structure in low temperature iron hydroxide deposits at the 71°N hydrothermal vent field the Arctic-Ocean Ridge	216
11:40 - 12:00	S11-06	<i>Tomohiko Kuwabara</i> Is <i>Thermosiphon globiformans</i> multicellular?	217

Thursday, November 20, 2008

13:20 - 15:50

Room 1001-1 (10F)

Session 10 - Soil: top of subsurface system

Convener : Kiwamu Minamisawa, Japan

			Page
13:20 - 13:40	S10-01	<i>Kazuyuki Inubushi</i> Hydrogen and methane production mechanism in direct iron mixing method in VOC-contaminated subsurface soil	194
13:40 - 14:00	S10-02	<i>Arvind Mohanram</i> Transport of <i>Cryptosporidium parvum</i> through variably and permanently charged soils	195
14:00 - 14:20	S10-03	<i>Alam Syed Sartaj</i> Plant growth promoting fungus <i>Penicillium</i> sp. EU0013 to control Fusarium wilt diseases	196
14:20 - 14:40	Coffee Break (20 min)		
14:40 - 15:00	S10-04	<i>Hiroyuki Ohta</i> Microbial iron cycle accompanied by nitrogen fixation in volcanic ash deposits of Miyake-jima Island, Japan	197
15:00 - 15:20	S10-05	<i>Yoko Masue-Slowey</i> Development of arsenic and iron biogeochemical gradients upon anaerobiosis at soil aggregate scale	198
15:20 - 15:50	S10-06	<i>Kiwamu Minamisawa (Invited)</i> Geochemical aspects of soil bacteria deduced from their genome: thiosulfate oxidation and C1 metabolism of <i>Bradyrhizbium japonicum</i>	199

Thursday, November 20, 2008

9:30 - 12:10

Room 1001-2 (10F)

Session 9 - Technology for subsurface sciences

Co-convener : Hiroyuki Yamamoto, Japan

Co-convener : Patricia A. Sobecky, USA

			Page
9:30 - 10:00	S9-01	Masanori Kyo (Invited) Technologies on in-situ long term monitoring of the earth's interior	181
10:00 - 10:30	S9-02	Teruo Fujii (Invited) Microfluidic in situ biological and chemical sensing	182
10:30 - 10:50	S9-03	Hiroyuki Kimura Culture-independent estimation of growth temperature of archaea in subsurface habitats based on G+C content in 16S rRNA gene sequences	183
10:50 - 11:10	Coffee Break (20 min)		
11:10 - 11:30	S9-04	Yutaka Yawata Development of novel microscopy technique and culture technique for studying biofilm under various extreme conditions and biofilms of uncharacterized microorganisms	184
11:30 - 11:50	S9-05	Bénédicte Ménez Imaging interactions between microbes and carbonates by combining Raman and X-ray absorption spectroscopies	185
11:50 - 12:10	S9-06	Patricia A. Sobecky Uranium immobilization by the activities of microbial phosphates	186

Thursday, November 20, 2008

13:20 - 18:00

Room 1001-2 (10F)

Session 6 - Geological radioactive waste disposal and subsurface microbiology

Co-convener : Karsten Pedersen, Sweden

Co-convener : Sakae Fukunaga, Japan

Co-convener : Kazuhiro Aoki, Japan

			Page
13:20 - 13:40	S6-01	<i>Loïc Esnault</i> Reactivity of ferric-reducing bacteria in clayey environment in presence of iron metal	109
13:40 - 14:00	S6-02	<i>Toshihiko Ohnuki</i> Microbial impacts on the migration of long-lived radionuclides	110
14:00 - 14:20	S6-03	<i>Tamara. N. Nazina</i> Microorganisms of the deep repository for liquid radioactive wastes and their influence on radionuclides	111
14:20 - 14:40	Coffee Break (20 min)		
14:40 - 15:00	S6-04	<i>Nadia-Valérie Quéric</i> Biogeochemistry and biodiversity of chemolithotrophic microorganisms in the tunnel of Äspö (Sweden)	112
15:00 - 15:30	S6-05	<i>Karsten Pedersen (Invited)</i> The effect from hydrogen and acetate on <i>in situ</i> growth and diversity of attached and unattached microorganisms in Äspö hard rock laboratory groundwater at 450 m Depth	113
15:30 - 15:50	S6-06	<i>Laurent Urios</i> Microbial diversity of Toarcian argillite from Tournemire, France	114
15:50 - 16:10	Coffee Break (20 min)		
16:10 - 16:30	S6-07	<i>Simcha Stroes-Gascoyne</i> Microbial analyses of the porewater chemistry experiment at the Mont Terri (MT) Underground Rock Laboratory (URL), Switzerland	115
16:30 - 16:50	S6-08	<i>Claire Sergeant</i> Microbial analysis of water from the opalinus clay formation at Mont Terri (MT) Underground Rock Laboratory (URL)	116
16:50 - 17:10	S6-09	<i>Toru Nagaoka</i> Field-scale tracer test of carbon-14 organic compounds in a pumice tuff aquifer: Evidence for microbially enhanced migration	117
17:10 - 17:30	S6-10	<i>Shuji Ajima</i> A Study of microbially mediated sulphate reducing processes by means of laboratory experiments and numerical models	118
17:30 - 18:00	Discussion		

Friday, November 21, 2008

9:00 - 11:50

Room 1001-1 (10F)

Session 8 - Petroleum and gas hydrate

Co-convener : Kazuya Watanabe, Japan

Co-convener : Frederick Colwell, USA

			Page
9:00 - 9:30	S8-01	<i>Kazuya Watanabe</i> (Invited) Microbiology of underground petroleum storage cavities	165
9:30 - 9:50	S8-02	<i>Sabrina Berendis</i> Microbial communities involved in the natural attenuation of BTEX in a deep gas storage aquifer	166
9:50 - 10:10	S8-03	<i>Natalya M. Shestakova</i> Phylogenetic diversity and activity of microorganisms in the high-temperature petroleum reservoir	167
10:10 - 10:30	S8-04	<i>Vinh D. Pham</i> Microbial community structure analyses of a low-temperature Alaskan North Slope oil field	168
10:30 - 10:50	Coffee Break (20 min)		
10:50 - 11:10	S8-05	<i>Mikhail Chudetsky</i> Geofluids, underground biosphere and oils enriched with isoprenoid hydrocarbons	169
11:10 - 11:30	S8-06	<i>Aleksandr Grigoryan</i> Nitrate reducing bacteria: keystone microorganisms for bioremediation of souring in oilfields	170
11:30 - 11:50	S8-07	<i>Kazuhiro Fujiwara</i> Developing microbial restoration of methane deposit with subsurface CO ₂ sequestration into depleted oil fields	171

Friday, November 21, 2008

9:00 - 14:40

Room 1001-2 (10F)

Session 4 - Interaction between surface and subsurface in terrestrial and marine systems

Co-convener : Hiroshi Kitazato, Japan

Co-convener : Kazuhiro Kogure, Japan

Co-convener : Nobuhito Ohte, Japan

			Page
9:00 - 9:30	S4-01	Ronnie N. Glud (Invited) Carbon and nitrogen cycling in ocean margin sediments: a case study from Sagami Bay, Japan	76
9:30 - 9:50	S4-02	Kazumasa Oguri Oxygen distributions, fluctuations, and bioirrigation processes in deep sea sediment: a case of Sagami bay sea floor	77
9:50 - 10:10	S4-03	Hidetaka Nomaki Benthic activities and organic carbon consumption at the sediment-water interface revealed by <i>in situ</i> ¹³ C-tracer experiments	78
10:10 - 10:40	S4-04	Jung-Ho Hyun (Invited) Sulfate reduction coupled to water column productivity in the Ulleung Basin, East Sea/Sea of Japan	79
10:40 - 11:00	Coffee Break (20 min)		
11:00 - 11:20	S4-05	Minoru Wada Microbial activity and accumulation of organic matter in the burrow of the mud shrimp, <i>Upogebia major</i> (Crustacea: Thalassinidea)	80
11:20 - 11:40	S4-06	Janez Mulec Amoebae in carbonate precipitating habitats of karst caves and a new vahlkampfiid amoeba, <i>Allovahlkampfia spelaea</i> gen. nov., sp. nov.	81
11:40 - 12:00	S4-07	Annette Summers Engel Chromophoric dissolved organic carbon from cave and karst waters	82
12:00 - 12:20	S4-08	Nobu Ohte In situ isotope signals of nitrate show how the gross nitrification is high in the surface soils in a humid temperate forest	83
12:20 - 13:30	Lunch (70 min)		
13:30 - 13:50	S4-09	Keisuke Koba Characterization of N ₂ O in a temperate forested ecosystem by stable isotopes techniques	84
13:50 - 14:10	S4-10	Rota Wagai Soil microbial community structure in a forested mountain in the tropics: altitude, rock, and soil depth as distal controllers	85
14:10 - 14:40	S4-11	Teri Balsler (Invited) Microbial determinants of soil carbon response to climate warming	86

Friday, November 21, 2008

15:10 - 16:10

Room 1001-2 (10F)

Closing Lecture

Chairperson : Hans-Jørgen Albrechtsen, Denmark

			Page
15:10 - 16:10	CL-1	<i>William C. Ghiorse</i> Thirty years of subsurface microbiology: Where are we now?	6

16:10 - 17:00

Room 1001-2 (10F)

Closing Ceremony

Chairpersons : Frederick Colwell, USA, **Kenji Kato**, Japan

- **Closing Address**
 - **Presentation of Poster Awards**
 - **Invitation to 8th ISSM - 2011**
-