

**The 2nd ELSI International Symposium – 2014 March 24-26 – @Hitotsubashi Hall**  
**“Origin & Evolution of the Earth-Life System”**

Scientific Sessions:

Session 1: Origin of Life: Scenarios & Approach (Cleaves)

Session 2: Water in the Early Solar System (Genda & SG 1 members)

Session 3: Where Did Life Emerge? Deep Sea, Surface, or Mars? (Aono & SG2 members)

Session 4: Exploring the Hadean Earth (Usui & SG4 members)

Session 5: Early Evolution of Earth and Life before Oxygen (Kirschvink and SG3 members)

**Day 1 PM (Mon. 24th) Session 1 / Poster Session**

13:00 - 13:20 **Opening: Kei Hirose** (ELSI)

**Session 1:**

***“Origin of Life: Scenarios and Approach”***

(Chair: Jim Cleaves)

13:20 - 13:50 \***Christoph Adami** (Michigan State Univ.):  
Universal biosignatures for life detection

13:50 - 14:10 **Masashi Aono** (ELSI):  
Amoeba-inspired heuristic search dynamics for exploring the origins of life

14:10 - 14:40 \***Robert Pascal** (CNRS):  
Is it possible to build a scientific theory of the origin of life?

<20 min> break

15:00 - 15:30 \***Doron Lancet** (Weizmann Institute of Science):  
Compositional lipid assemblies: non-RNA scenario for life's early evolution

15:30 - 16:00 \***Yoshi Oono** (Univ. of Illinois):  
Let us go to the basics

16:00 - 16:20 **Kuruma & Kiga** (ELSI):  
Creation of possible living organisms to study an early life

16:20 - 16:50 **Poster Flash Talks** [30 min]

17:00 - 18:00 **Poster Session** [60 min] (w/ Drinks)

## Day 2 AM (Tue. 25th) Session 2

### Session 2:

### ***“Water in the early solar system”***

(Chair: Hidenori Genda)

09:00 - 09:15 **Hidenori Genda** (ELSI):

Overview: Origin of Earth's ocean

09:15 - 09:45 \***Alessandro Morbidelli** (Observatoire de la Cote d'Azur):

The Grand Tack scenario for the formation of terrestrial planets.

Implications on water delivery to the Earth and on the age of the Moon.

09:45 - 10:15 \***Michelle Hopkins** (Univ. of Colorado):

Early thermal events of the inner solar system from zircon geochronology, geochemistry, and thermometry of asteroidal meteorites and lunar rocks

<15 min> break

10:30 - 11:00 \***François Robert** (NMHN):

The origin of solar system water as recorded by its D/H ratio

11:00 - 11:20 **Shigeru Ida** (ELSI):

The rates of icy grains filtered by planetesimals and accreted by planets - A possible mechanism to control water fraction of the Earth

11:20 - 11:40 **Yann Alibert** (Univ. of Bern):

On the radius of habitable planets

11:40 - 13:00     **Lunch**

**Day 2 PM (Tue. 25th) Session 3 / Discussion / Poster Session / Banquet**

**Session 3:**

***Where did life emerge? Deep Sea, Surface, or Mars?***

(Chair: Masashi Aono)

13:00 - 13:15 **Jim Cleaves** (ELSI):

Overview: Where did life emerge?

13:15 - 13:45 \***Steven Benner** (FfAME):

Tar, water, and entropy. Three paradoxes obstructing emergence of an RNA World

13:45 - 14:05 **Joe Kirschvink** (ELSI/Caltech):

Was the requiem for life on Mars premature?

<10 min> break

14:15 - 14:45 \***Ken Takai** (ELSI/JAMSTEC):

Deep-sea hydrothermal vent as bottleneck of Hadean Monsters

14:45 - 15:05 \***Laurie Barge** (JPL):

Chemical disequilibrium, hydrothermal vents, and the origin of metabolism

<10 min> break

15:15 - 15:45 \***Armen Mulkidjanian** (Univ. of Osnabrück):

Early life on the anoxic geothermal fields of the primeval Earth

15:45 - 16:05 **Shigenori Maruyama** (ELSI):

Origin of life on the Hadean Continent

<10 min> break

16:15 - 17:00     **Discussion** (Deep Sea vs Surface vs Mars) [45 min]

17:00 - 18:00     **Poster Session** / Advisory Board Meeting

19:00-           **Banquet @JOSHUI-KAIKAN**

**Day 3 AM (Wed. 26th) Session 4 / Poster Session**

**Session 4:**

***“Exploring the Hadean Earth”***

(Chair: Tomohiro Usui & Kenji Kawai)

09:00 - 09:30 \***Bernard Marty** (CRPG Nancy):

Origin and Evolution of volatile on Earth

09:30 - 09:50 **Steeve Gréaux** (ELSI/Ehime Univ.):

Making Proto-planets from melting of chondrites at ultra-high pressures

09:50 - 10:20 \***Kevin Righter** (JSC):

Oxidation state in the early Earth: influence on H, C, S, O, N and other volatiles

10:20 - 10:40 **Nomura & Hirose** (ELSI):

Hydrogen in the core

<15 min> break

10:55 - 11:25 \***Rick Carlson** (CIW):

Early Earth differentiation and the creation of a recognizable world

11:25 - 11:55 \***Feng Tian** (Tsinghua Univ.):

Early evolution of rocky exoplanets in the habitable zones of M dwarfs

11:55 - 12:25 \***Steve Mojzsis** (Univ. of Colorado):

Rocks, water, impacts, life and the Hadean-Eoarchean transition on Earth

12:25 - 14:00 **Lunch / Poster Session**

## Day 3 PM (Wed. 26th) Session 5

### Session 5:

### ***“Early Evolution of Earth and Life before Oxygen”***

(Chaired by Joe Kirschvink)

14:00 - 14:30 \***Akihiko Yamagishi** (TUPLS):

Evolution of Commonote(s): History revealed by genetic engineering

14:30 - 15:00 \***Robert Hazen** (CIW):

Deep-time, data-driven discovery in mineralogy:  
Evidence for the co-evolution of life and minerals

15:00 - 15:20 **Yuichiro Ueno** (ELSI):

Redox evolution before oxygenic photosynthesis

15:20 - 15:50 \***Woody Fischer** (Caltech):

The history of the Mn cycle and the evolution of photosynthesis

<20 min> break

16:10 - 16:40 \***Paul Falkowski** (Rutgers Univ.):

Light to Life

16:40 - 17:10 \***Robert Blankenship** (Washington Univ.):

Early evolution of photosynthesis and the transition to an aerobic world

17:10 - 17:30 **Shinji Masuda** (ELSI):

Current status of laboratory experiments for artificial creation of oxygenic photosynthesis

17:30 - 17:50 **John Herlund** (ELSI):

ELSI-inspired model for the formation and evolution of Earth's interior

**Closing**