



ALIFE 2018

# TIME SCHEDULE JULY 23-27

# 23 JUL.

## 9:00

### Miraikan Hall

9:00-9:30 \_ Opening  
Chair: Takashi Ikegami

## 9:30

### Miraikan Hall

9:30-10:30 \_ Keynote: David O'Reilly:  
Describing the Systems of Life  
Chair: Mizuki Oka

## 10:30

### Miraikan Hall

10:30-11:00 \_ Lightning session  
Chair: Mizuki Oka

10:30 \_ Past Visions of Artificial Futures: One Hundred and Fifty Years under the Spectre of Evolving Machines. Tim Taylor and Alan Dorin

10:40 \_ Cell-Mimicry Behaviors of Micrometer-Sized Oil Droplets in Aqueous Solution. Taisuke Banno, Taro Toyota and Kouichi Asakura

10:50 \_ Hallucination Machine: Simulating Altered Perceptual Phenomenology with a Deep-Dream Virtual Reality platform. Keisuke Suzuki, Warrick Roseboom, David Schwartzman and Anil Seth

## 11:00

11:00-11:30 \_ Coffee Break

## 11:30

### Miraikan Hall

11:30-12:45 \_ Session: Evolutionary Robotics I  
Chair: Julien Hubert

11:30 \_ Behavioral search drivers and the role of elitism in soft robotics. William La Cava and Jason Moore

11:55 \_ Stochastic Ontogenesis in Evolutionary Robotics. Adam Stanton

12:20 \_ Improving performance in distributed embodied evolution: Distributed Differential Embodied Evolution. Pedro Trueba and Abraham Prieto Garcia

### Venus & Mars

11:30-12:45 \_ Special Session: Hybrid Life I  
Chair: Manuel Baltieri, Keisuke Suzuki and Hiroyuki Iizuka

11:30 \_ The modularity of action and perception revisited using control theory and active inference. Manuel Baltieri and Christopher L. Buckley

11:55 \_ Precision without Precisions: Handling uncertainty with a single predictive model. Benjamin Cowley, John Thornton, Linda Main and Abdul Sattar

12:20 \_ Autonomous Regulation of Self and Non-Self by Stimulation Avoidance in Embodied Neural Networks. Atsushi Masumori, Lana Sinapayen, Norihiro Maruyama, Takeshi Mita, Douglas Bakkum, Urs Frey, Hirokazu Takahashi and Takashi Ikegami

### Mercury

11:30-12:45 \_ Special Session: ALIFE and Society I  
Chair: Alex Penn and J Mario Siqueiros

11:30 \_ Socio-technical evolution. Martin Rosenlyst, Henrik Siboni and Steen Rasmussen

11:40 \_ Major Transitions in Planetary Evolution. Hikaru Furukawa and Sara Walker

11:50 \_ ALife as a Tool for Cooperative Society Between People and Machines. Mizuki Oka, Dominique Chen, Ryuta Aoki and Takashi Ikegami

12:00 \_ Co-creating Enduring Institutions for Socio-Technical Systems: The Complementarity of Content-based and Value-based Modelling Approaches. Simon Powers, Aniko Ekárt and Peter Lewis

12:10 \_ The affective affordances of the web: a 4E approach. J. Mario Siqueiros-García, Laura Mojica and Susana Ramírez-Vizcaya

12:20 \_ Mutual synchronization and control between artificial chaotic system and human. Dobromir Dotov and Tom Froese

### Uranus

11:30-12:45 \_ Tutorial: Creative Prediction with Neural Networks (Organizers: Charles P. Martin, Kyrre Glette, Jim Tørresen)  
Session 1: *Introduction to predictive interaction, Generating creative sequences with Recurrent Neural Networks (RNNs)*

### Neptune

11:30-12:45 \_ Tutorial: Simulating Complex Systems with FLAME GPU (Organizers: Paul Richmond, Mozghan Kabiri Chimeh)  
Session 1: *General overview of the FLAME GPU methodology and the software framework*

## 12:45

12:45-14:15 \_ Lunch Break

## 14:15

### Miraikan Hall

14:15-15:15 \_ Keynote Hyejin Youn: Scaling in Physics, Biology, Cities and Beyond  
Chair: Olaf Witkowski

## 15:15

### Miraikan Hall

15:15-15:45 \_ Lightning session  
Chair: Olaf Witkowski

15:15 \_ Computation in artificial spin ice Johannes Jensen, Erik Folven and Gunnar Tufte

15:25 \_ How computational thought experiments can improve our understanding of the genetic architecture of common human diseases. Jason Moore, Randal Olson, Peter Schmitt, Yong Chen and Elisabetta Manduchi

15:35 \_ A reservoir computing approach for molecular computing. Wataru Yahiro, Nathanael Aubert-Kato and Masami Hagiya

## 15:45

15:45-16:15 \_ Coffee Break

## 16:15

### Miraikan Hall

16:15-17:30 \_ Session: Evolutionary Dynamics  
Chair: Emily Dolson

16:15 \_ Intrinsic Mortality Governs Evolvability. Frank Veenstra, Pablo González de Prado Salas, Josh Bongard, Kasper Støyt and Sebastian Risi

16:40 \_ The Complexity Ratchet: Stronger than selection, weaker than robustness. Vincent Liard, David Parsons, Jonathan Rouzaud-Cornabas and Guillaume Beslon

17:05 \_ Investigating Open-Ended Coevolution in Digital Organisms. Luis Zaman

### Venus & Mars

16:15-17:30 \_ Special Session: Hybrid Life II  
Chair: Manuel Baltieri, Keisuke Suzuki and Hiroyuki Iizuka

16:15 \_ Interfacing Synthetic Cells with Biological Cells: An Application of the Synthetic Method.

16:40 \_ Effect of Behavioral Complexity on Development of Spatial Recognition. Wataru Noguchi, Hiroyuki Iizuka and Masahito Yamamoto

17:05 \_ Evolving robot controllers for a bio-hybrid system. Pedro Mariano, Ziad Salem, Rob Mills, Stefan Schönwetter-Fuchs-Schistek, Luis Correia and Thomas Schmitt

### Mercury

16:15-17:30 \_ Special Session: ALIFE and Society II  
Chair: Alex Penn and J Mario Siqueiros

16:15 \_ "Open Space" Discussion on the future of ALIFE and Society beyond AI

### Uranus

16:15-17:30 \_ Tutorial: Creative Prediction with Neural Networks  
Session 2: *Interacting with RNNs, RNNs for continuous-valued data: Mixture Density Networks (MDNs)*

### Neptune

16:15-17:30 \_ Tutorial: Simulating Complex Systems with FLAME GPU  
Session 2: *Hands-on experience with FLAME GPU framework*

## 18:00

18:00-21:00 \_ Welcome Drinks

## TIME TABLE

	Miraikan-hall	Venus & Mars	Mercury	Uranus	Innovation-hall	Neptune	Jupiter	Saturn	Lobby 1	Studio	Lobby 2
08:30								WELCOME COFFEE	WELCOME COFFEE		
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# 24 JUL.

## 9:00

**Miraikan Hall**  
 9:00-10:00 \_ Keynote: Kenneth O. Stanley: Answering the Call of Open-Endedness  
 Chair: Reiji Suzuki

## 10:00

**Miraikan Hall**  
 10:00-10:30 \_ Lightning session  
 Chair: Reiji Suzuki

10:00 \_ Coevolutionary Neural Population Models. Nick Moran and Jordan Pollack

10:10 \_ Critical Learning vs. Evolution: Evolutionary Simulation of a Population of Ising-Embodied Neural Networks. Sina Khajehabdollahi and Olaf Witkowski

10:20 \_ Integrated Information and Autonomy in the Thermodynamic Limit. Miguel Aguilera and Ezequiel Di Paolo

## 10:30

10:30-11:00 \_ Coffee break

## 11:00

**Miraikan Hall**  
 11:00-12:00 \_ Poster pitch  
 Chair: Hiroki Sayama, Olaf Witkowski and Nathaniel Virgo

## 12:00

**Venus & Mars**  
 12:00-13:30 \_ ISAL student meeting

## 12:00

12:00-13:30 \_ Lunch break

## 13:30

**Miraikan Hall**  
 13:30-14:45 \_ Session: Neurons  
 Chair: Lana Sinapayen

13:30 \_ Navigating with distorted grid cells. Vegard Edvardson

13:55 \_ Behavioral Stability in the Face of Neuromodulation in Brain-Body-Environment Systems. Jason Yoder and Eduardo Izquierdo

14:20 \_ The Evolution of Training Parameters for Spiking Neural Networks with Hebbian Learning. Katarzyna Kozdon and Peter Bentley

**Venus & Mars**  
 13:30-14:45 \_ Special Session: Hybrid Life III  
 Chair: Manuel Baltieri, Keisuke Suzuki and Hiroyuki Iizuka

13:30 \_ An iterated learning approach to the origins of the standard genetic code can help to explain its sequence of amino acid assignments. Tom Froese, Jorge I. Campos and Nathaniel Virgo

13:55 \_ Panel Discussion

**Mercury**  
 13:30-14:45 \_ Session: Social Dynamics  
 Chair: Geoff Nitschke

13:30 \_ Zero-Determinant Strategies in Repeated Prisoner's Dilemma Games. Genki Ichinose and Naoki Masuda

13:55 \_ Multiplayer Ultimatum Games and Collective Fairness in Networked Communities. Fernando P. Santos, Jorge M. Pacheco, Ana Paiva and Francisco C. Santos

14:20 \_ Can justice be fair when it is blind? How social network structures can promote or prevent the evolution of despotism. Cedric Perret, Simon Powers, Jeremy Pitt and Emma Hart

## 14:45

14:45-15:15 \_ Coffee break

## 15:15

15:15-18:15 \_ Poster Session / Late Breaking Poster

	Miraikan-hall	Venus & Mars	Mercury	Uranus	Innovation-hall	Neptune	Jupiter	Saturn	Lobby 1	Studio	Lobby 2	
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# 25 JUL.

**9:00**

**Miraikan Hall**  
9:00-10:00 \_ Keynote: Rodney Brooks: The Philosophical Underpinnings of Work in Artificial Life  
Chair: Takashi Ikegami

**10:00**

10:00-10:30 \_ Coffee break

**10:30**

**Venus**  
10:30-12:00 \_ Workshop: ALife Roadmap Workshop 2018 (Organizers: Olaf Witkowski, Julien Hubert, Martin Biehl, Takashi Ikegami)  
*Session 1: Philosophy and Theory of Alife: Introduction (Witkowski, Hubert), Invited talk (Beer)*

**Mars**

10:30-12:00 \_ Workshop: PROTOCOGNITION 2018 (Organizers: Andrew Adamatzky, Yukio Gunji, Jordi Vallverdú)  
*Session 1: Introduction, Talks: Chemical Protocognition (Hanczyc); Protocognition not protocomputation (Egbert); Information processing in a growing organism (Stokes)*

**Mercury**

10:30-12:00 \_ Workshop: Developing Software Standards for the Artificial Life Community (Organizers: Clifford Bohm, Emily Dolson, Alexander Lalejini, Nitash CG, Charles Ofria)  
*Session 1: Introduction: An overview of the benefits and goals of data standards for Artificial Life (Bohm), Invited talks (Ofria (Avida), Rainford (Artificial Chemistries), TBD)*

**Uranus**

10:30-12:00 \_ Workshop: EVOSLACE: Workshop on the Emergence and Evolution of Social Learning, Communication, Language and Culture in Natural and Artificial Agents (Organizers: Reiji Suzuki, Michael Spranger, Julien Hubert, James Borg, Takashi Hashimoto, Hiroto Yonenoh, Jacqueline Heinerman, Chris Marriott, Peter Andras, Kazutoshi Sasahara, Takaya Arita, Takayuki Nagai, Yoshinobu Hagiwara, Tadahiro Taniguchi)  
*Session 1: Opening, Evolving linguistics and evolution of speech (Hashimoto, de Boer)*

**Innovation Hall**

10:30-12:00 \_ Workshop: OEE3: The Third Workshop on Open-Ended Evolution (Organizers: Mark Bedau, Alastair Channon, Tim Taylor, Norman Packard, Steen Rasmussen, Takashi Ikegami)  
*Session 1: Introduction (Bedau, Channon, Taylor), Talks (Pattee, Taylor, Bongard)*

**12:00**

12:00-13:30 \_ Lunch break

**13:30**

**Venus**  
13:30-15:00 \_ Workshop: ALife Roadmap Workshop 2018 *Session 2: Achievements of ALife: Invited talks (Bullock, Sayama)*

**Mars**

13:30-15:00 \_ Workshop: PROTOCOGNITION 2018 *Session 2: Talks: Ordinal preferential attachment (Haruna); Embodied protocognition (Balaz); Chinese room understands Chinese (Gunji)*

**Mercury**

13:30-15:00 \_ Workshop: Developing Software Standards for the Artificial Life Community *Session 2: Breakout groups, Group coalescence*

**Uranus**

13:30-15:00 \_ Workshop: EVOSLACE: Workshop on the Emergence and Evolution of Social Learning, Communication, Language and Culture in Natural and Artificial Agents *Session 2: Symbol emergence and cognitive models for robots (Taniguchi, Nagai)*

**Innovation Hall**

13:30-15:00 \_ Workshop: OEE3: The Third Workshop on Open-Ended Evolution *Session 2: Talks (Wiser, Moreno, Ikegami, Turney)*

**Neptune**

13:30-15:00 \_ ISAL Summer School (Organizers: Matthew Egbert, Charles Ofria)  
*Session 1: Evolutionary robotics (Bongard)*

**15:00**

15:00-15:30 \_ Coffee break  
15:00-15:30 \_ Posters / demos (OEE3)

**15:30**

**Venus**  
15:30-17:00 \_ Workshop: ALife Roadmap Workshop 2018 *Session 3: ALife, Outside ALife: Invited talks (Hut, Oka)*

**Mars**

15:30-17:00 \_ Workshop: Cognitive Development, Learning and Representation Co-construction in Human-Robots Systems and Ambient Intelligence Systems (Organizers: Amélie Cordier, Xavier Basset, Stéphane Doncieux, Amal El Fallah Seghrouchni, Frank Guerin, Salima Hassas, Bipin Indurkha, Leonardo Lana De Carvalho, Mathieu Lefort, Georgi Stojanov)  
*Session 1: Academic session: Invited talks from pioneering researchers in social robotics (Asada, Takashio)*

**Mercury**

15:30-17:00 \_ Workshop: The Synthetic Approach to Biology and the Cognitive Sciences (SA-BCS 2018) (Organizers: Luisa Damiano, Pasquale Stano)  
*Session 1: Introduction: The synthetic method (Damiano), Invited talks (Froese, Tani),*

**Discussion**

**Uranus**

15:30-17:00 \_ Workshop: EVOSLACE: Workshop on the Emergence and Evolution of Social Learning, Communication, Language and Culture in Natural and Artificial Agents *Session 3: Natural and artificial languages (Uno), Poster session (12 posters)*

**Innovation Hall**

15:30-17:00 \_ Workshop: OEE3: The Third Workshop on Open-Ended Evolution *Session 3: Talks (Ackley, Channon, Bedau, Adams)*

**Neptune**

15:30-17:00 \_ ISAL Summer School *Session 2: This is not a simulation: experimental evolution using evolving digital organisms (Pennock)*

**17:00**

17:00-17:30 \_ Coffee break  
17:00-17:30 \_ Posters / demos (OEE3)  
17:00-17:30 \_ Posters (EVOSLACE)

**17:30**

**Venus**  
17:30-19:00 \_ Workshop: ALife Roadmap Workshop 2018 *Session 4: Alife, Beyond Al: Invited talk (Ikegami)*

**Mars**

17:30-19:00 \_ Workshop: Cognitive Development, Learning and Representation Co-construction in Human-Robots Systems and Ambient Intelligence Systems *Session 2: From Academia to Industry: Presentation (Behaviors.ai, Hoomano in Japan, InnoPlay Lab), Panel: Social robots, Closure*

**Mercury**

17:30-19:00 \_ Workshop: The Synthetic Approach to Biology and the Cognitive Sciences (SA-BCS 2018) *Session 2: Selected talks (Valotta; Kojima and Ikegami), Invited Talk (Dumouchel), Discussion*

**Uranus**

17:30-19:00 \_ Workshop: EVOSLACE: Workshop on the Emergence and Evolution of Social Learning, Communication, Language and Culture in Natural and Artificial Agents *Session 4: Experimental and modeling approaches to cultural and biological evolution (Takezawa, Arita), Closing*

**Innovation Hall**

17:30-19:00 \_ Workshop: OEE3: The Third Workshop on Open-Ended Evolution *Session 4: Talks (Sayama, Rasmussen), general discussion*

**Neptune**

17:30-19:00 \_ ISAL Summer School *Session 3: Biological bits: A brief guide to the ideas and artefacts of computational artificial life (Dorin)*

**19:30**

19:30-22:00 \_ Banquet

	Miraikan-hall	Venus	Mars	Mercury	Uranus	Innovation-hall	Neptune	Jupiter	Saturn	Lobby 1	Studio	Lobby 2
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16:00		WORKSHOP ALife Roadmap Workshop	WORKSHOP Cognitive Development, Learning and Representation Co-construction	WORKSHOP The Synthetic Approach to Biology and the Cognitive Sciences (SA-BCS 2018):	WORKSHOP EVOSLACE	WORKSHOP OEE3: The Third Workshop on Open-Ended Evolution	SUMMER SCHOOL					
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# 26 JUL.

## 9:00

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**Miraikan Hall**  
9:00-10:00 \_ Keynote: Elena Antonova:  
Varela's Legacy for ALIFE: from Enactive  
to Enlightened AI  
Chair: Hiro Iizuka

## 10:00

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**Miraikan Hall**  
10:00-10:30 \_ Lightning session  
Chair: Hiro Iizuka

10:00 \_ The Surprising Creativity of Digital  
Evolution. Joel Lehman, Jeff Clune and  
Dusan Misevic

10:10 \_ Neuronal Variation as a Cognitive  
Evolutionary Adaptation. Jory Schossau  
and Arend Hintze

10:20 \_ Seeking Open-Ended Evolution  
in Swarm Chemistry II: Analyzing Long-  
Term Dynamics via Automated Object  
Harvesting. Hiroki Sayama

## 10:30

10:30-11:00 \_ Coffee break

## 11:00

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**Miraikan Hall**  
11:00-12:15 \_ Session: Biology  
Chair: Martin Hanczyc

11:00 \_ Toward a Synthetic Acoustic  
Ecology: Sonically Situated, Evolutionary  
Agent Based Models of the Acoustic  
Niche Hypothesis.

11:25 \_ Viva in Silico: A position-  
based dynamics model for microcolony  
morphology simulation. Christoph Bader,  
Sunanda Sharma, Rachel Soo Hoo Smith,  
Jean Disset and Neri Oxman

12:50 \_ Multi-objective Strategies  
for Exploring Form and Function in  
Crustaceans. Claudia Szabo, Jayden  
Barnes and Pablo Munguia

## Venus & Mars

11:00-12:15 \_ Session: Neural Controllers  
Chair: Takaya Arita

11:00 \_ Systematic self-exploration  
of behaviors for robots in a dynamical  
systems framework. Cristina Pinneri and  
Georg Martius

11:25 \_ Analysing the Relative Importance  
of Robot Brains and Bodies. Milan  
Jelisavcic, Diederik M. Roijers and A.E.  
Eiben

11:50 \_ Modular Neural Control for Bio-  
Inspired Walking and Ball Rolling of a  
Dung Beetle-Like Robot. Binggwong  
Leung, Mathias Thor and Poramate  
Manoonpong

## Mercury

11:00-12:15 \_ Session: Agency Studies  
Chair: Tom Froese

11:00 \_ Investigations of an Adaptive and  
Autonomous Sensorimotor Individual.

11:25 \_ From Physics to Pattern:  
Uncovering Pattern Formation in Tissue  
Electrophysiology. Micah Brodsky and  
Michael Levin

11:50 \_ An Artificial Life perspective on  
traditional Pacific wave navigation. Inman  
Harvey

## Uranus

11:00-12:15 \_ Tutorial: Introduction to  
Artificial Gene Regulatory Networks  
(Organizers: Sylvain Cussat-Blanc,  
Wolfgang Banzhaf) *Session 1:  
Introduction to Artificial Gene Regulatory  
Networks: from biology to models*

## Neptune

11:00-12:15 \_ Tutorial: Avida-ED: A  
Tool for Artificial Life in the Classroom  
(Organizers: Michael Wiser, Robert  
Pennock) *Session 1: Background and  
user controls*

## 12:15

12:15-13:45 \_ Lunch break

## 13:45

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**Miraikan Hall**  
13:45-14:45 \_ Keynote: Hiroshi Ishiguro:  
Studies of Interactive Humanoids  
Chair: Takashi Ikegami

## 14:45

14:45-15:15 \_ Coffee break

## 15:15

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**Miraikan Hall**  
15:15-16:30 \_ Session: Artificial Chemistry  
Chair: Keisuke Suzuki

15:15 \_ Modular combinations of Artificial  
Chemistries. Penelope Faulkner Rainford,  
Angelika Sebald and Susan Stepney

15:40 \_ Evolving Reactive Agents with  
SignalGP. Alexander Lalejini and Charles  
Ofria

16:05 \_ The fittest, the common, and  
the dullest: Selection dynamics of exact  
autocatalytic replicators. Ben Shirt-Ediss,  
Natalio Krasnogor and Harold Fellermann

## Venus & Mars

15:15-16:30 \_ Special Session:  
Morphogenetic Engineering  
Chair: Rene Doursat, Hiroki Sayama

15:15 \_ Holonic Cellular Automata:  
Modelling Multi-level Self-organisation of  
Structure and Behaviour. Ada Diaconescu,  
Sven Tomforde and Christian Müller-  
Schloer

15:40 \_ The Self-Assembling Brain:  
Contributions to Morphogenetic  
Engineering from a Self-Organizing  
Neural Network in the Insect Brain. Robin  
Hiesinger

16:05 \_ Modeling Cell Migration in a  
Simulated Bioelectrical Signaling Network  
for Anatomical Regeneration. Giordano  
Ferreira, Matthias Scheutz and Michael  
Levin

## Mercury

15:15-16:30 \_ Session: Evolution and  
Networks  
Chair: Miguel Aguilera

15:15 \_ Topological resilience in non-  
normal networked systems. Malbor  
Asllani and Timoteo Carletti

15:40 \_ Exploring Exploration  
Catastrophes in Various Network Models.  
Geoff Nitschke and David Shorten

16:05 \_ Multi-modeling the morphogenesis  
of transportation networks. Juste  
Raimbault

## Uranus

15:15-16:30 \_ Tutorial: Introduction to  
Artificial Gene Regulatory Networks  
*Session 2: Applications of Artificial Gene  
Regulatory Networks in Artificial Life*

## Neptune

15:15-16:30 \_ Tutorial: Avida-ED: A Tool  
for Artificial Life in the Classroom  
*Session 2: Introductory exercises and  
integration into curricula*

	Miraikan-hall	Venus & Mars	Mercury	Uranus	Innovation-hall	Neptune	Jupiter	Saturn	Lobby 1	Studio	Lobby 2
08:30								WELCOME COFFEE	WELCOME COFFEE		
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09:15	KEYNOTE Elena Antonova				SATELLITE ROOM						
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11:30	SESSION Biology	SESSION Neural Controllers	SESSION Agency Studies	TUTORIAL Introduction to Artificial Gene Regulatory Networks	SATELLITE ROOM	TUTORIAL Avida-ED: A Tool for Artificial Life in the Classroom					
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14:45								COFFEE BREAK	COFFEE BREAK		
15:00											
15:15											
15:30	SESSION Artificial Chemistry	SESSION Morphogenetic Engineering	SESSION Evolution and Networks	TUTORIAL Introduction to Artificial Gene Regulatory Networks	SATELLITE ROOM	TUTORIAL Avida-ED: A Tool for Artificial Life in the Classroom					
15:45											
16:00											
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# 27 JUL.

## 9:00

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**Miraikan Hall**  
9:00-10:00 \_ Keynote: Inman Harvey: Artificial Life Beyond AI: Neats, Scruffies and Holograms  
Chair: Nathaniel Virgo

## 10:00

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**Miraikan Hall**  
10:00-10:30 \_ Lightning session  
Chair: Nathaniel Virgo

10:00 \_ On the origin of gliders. Randall Beer

10:10 \_ Quantifying the tape of life: Ancestry-based metrics provide insights and intuition about evolutionary dynamics. Emily Dolson, Alexander Lalejini, Steven Jorgensen and Charles Ofria

10:20 \_ Digital protocells with dynamic size, position, and topology. Dave Ackley

## 10:30

10:30-11:00 \_ Coffee break

## 11:00

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**Miraikan Hall**  
11:00-12:15 \_ Session: Evolutionary Robotics II  
Chair: Nathanael Aubert-Kato

11:00 \_ Effects of Selection Preferences on Evolved Robot Morphologies and Behaviors. Karine Miras, Evert Haasdijk, Kyrre Glette and A.E. Eiben

11:25 \_ Locomotion as a Result of Displacement of Resources. Payam Zahadat and Thomas Schmickl

11:50 \_ Neural Network Quine. Oscar Chang and Hod Lipson

## Venus & Mars

11:00-12:15 \_ Session: Information Theory / Information Flow  
Chair: Martin Biehl

11:00 \_ Information integration in a globally coupled chaotic system. Hiroki Mori and Masafumi Oizumi

11:25 \_ Quantifying Information Modification in Cellular Automata using Pointwise Partial Information Decomposition. Conor Finn and Joseph Lizier

11:50 \_ The structure of evolved representations across different substrates for artificial intelligence. Arend Hintze, Douglas Kirkpatrick and Christoph Adami

## Innovation hall

11:00-12:15 \_ Special workshop: Earth, Life and Artificial Life, sponsored by ELSI (Organizers: Nathaniel Virgo, Alexandra Penn, Matthew Egbert, Stuart Bartlett, Takashi Ikegami)  
*Session 1: ALIFE and the origins of life (Mamajanov, McGlynn, Froese, Bose)*

## 12:15

12:15-12:45 \_ Closing  
Chair: Takashi Ikegami

## 12:45

12:45-14:15 \_ Lunch break

## 14:15

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**Innovation hall**  
14:15-15:30 \_ Special workshop: Earth, Life and Artificial Life, sponsored by ELSI  
*Session 2: Building one system to understand another (Hom, Rasmussen, Penn, Egbert)*

## 15:30

15:30-16:00 \_ Coffee break

## 16:00

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**Innovation hall**  
16:00-17:15 \_ Special workshop: Earth, Life and Artificial Life, sponsored by ELSI  
*Session 3: The post-AI future of ALIFE (Ikegami)*

	Miraikan-hall	Venus & Mars	Mercury	Uranus	Innovation-hall	Neptune	Jupiter	Saturn	Lobby 1	Studio	Lobby 2
08:30											
08:45								WELCOME COFFEE	WELCOME COFFEE		
09:00	KEYNOTE Inman Harvey				SATELLITE ROOM						
09:15											
09:30											
09:45											
10:00	LIGHTNING										
10:15											
10:30								COFFEE BREAK	COFFEE BREAK		
10:45											
11:00	SESSION Evolutionary Robotics II	SESSION Information Theory / Information Flow			SPECIAL WORKSHOP: Earth, Life and Artificial Life, sponsored by ELSI						
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12:00											
12:15	CLOSING									ART EXHIBITION 2	ART EXHIBITION 2
12:30											
12:45											PARTNER EXHIBITION
13:00											
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13:30								LUNCH	LUNCH		
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