

# 1st QST International Symposium "Quantum Life Science"

Tokyo Bay Makuhari

25-26 July 2017

Day 1 25-Jul-17

9:00 - 10:00	<b>REGISTRATION</b>
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## Joint Session / Hall A

10:00 - 10:05 ( 5 )	<b>Opening Remarks</b>	Toshio Hirano	QST
10:05 - 10:10 ( 5 )	<b>Greetings 1</b>	TBD	Ministry of Education, Culture, Sports, Science and Technology, Japan
10:10 - 10:15 ( 5 )	<b>Greetings 2</b>	Aiko Shimajiri	Cabinet Office, Government of Japan
10:15 - 10:25 ( 10 )	<b>Greetings 3</b>	Claudie Haigneré	European Space Agency
10:25 - 10:35 ( 10 )	<b>Greetings 4 (video message)</b>	Hélène Langevin-Joliot	A nuclear physicist, the granddaughter of Marie and Pierre
10:35 - 11:40 ( 65 )	<b>Keynote Lecture: Quantum Biology</b>	Johnjoe McFadden	University of Surrey, UK

11:40 - 13:00 ( 80 )	<b>Lunch</b>
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## Quantum Life Science - Overview / Hall A

13:00 - 13:30 ( 30 )	Bridging Quantum Science and Biology	Alexandra Olaya-Castro	University College London, UK
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## Quantum Life Science - Session 1: Hot topics of quantum biology / Hall A

13:30 - 14:00 ( 30 )	A Quantum Sensor to Detect the Geomagnetic Field in Animals	Thorsten Ritz	University of California, USA
14:00 - 14:30 ( 30 )	Quantum dynamical aspects in biophysical and material systems	Akihito Ishizaki	National Institutes of Natural Sciences, Japan
14:30 - 14:45 ( 15 )	<b>Break</b>		
14:45 - 15:15 ( 30 )	Vibronic Enhancement of Algae Light Harvesting	Jacob C. Dean	Princeton University, USA
15:15 - 15:45 ( 30 )	Proton Tunneling in Proteins	Paul M. Champion	Northeastern University, USA
15:45 - 16:15 ( 30 )	Quantum Biology of Reactive Oxygen Species and its Impact in Cellular Bioenergetics	Carlos F. Martino	Florida Institute of Technology, USA

16:15 - 16:30 ( 15 )	<b>Break</b>
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## Quantum Life Science - Session 2: Photosignal and DNA repair / Hall A

16:30 - 17:00 ( 30 )	A Unified Electron-Transfer Mechanism of DNA Repair by all Photolyase	Dongping Zhong	The Ohio State University, USA
17:00 - 17:30 ( 30 )	Modular Structure of a Plant Photoreceptor, Phytochrome A	Akira Nagatani	Kyoto University, Japan
17:30 - 18:00 ( 30 )	Circadian regulation of metabolism for the prevention and treatment of metabolic diseases	Satchidananda Panda	Salk Institute for Biological Studies, USA

## Joint Reception with Poster Presentations / Reception Room

18:10 - 20:40 ( 150 )	<b>Reception with poster presentations</b>
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## Day 2 26-Jul-17

### Quantum Life Science - Session 3: Charge transfer in biomolecules and damage induction / Hall A

9:30 - 10:00 ( 30 )	Charge and energy transfer dynamics in biological systems	Shigenori Tanaka	Kobe University, Japan
10:00 - 10:30 ( 30 )	Mechanisms of Radiation Damage to DNA	Michael D. Sevilla	Oakland University, USA
10:30 - 11:00 ( 30 )	Excess Electron Transfer in DNA	Tetsuro Majima	Osaka University, Japan

### Quantum Life Science - Session 4: Physical process of radiation damage to DNA and its biological consequences (1) / Hall A

11:00 - 11:30 ( 30 )	Biological Consequences of Radiation-induced Clustered DNA Damage: a Danger in Hiding	Peter O'Neill	University of Oxford, UK
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### Joint Session / Hall A

11:30 - 12:00 ( 30 )	<b>Report of Mentoring Workshop / Conclusion</b>	C. Haigneré and S. Kakinuma	
12:00 - 12:05 ( 5 )	<b>Closing Remarks for Mentoring Workshop</b>	William D. Magwood, IV	OECD/NEA
12:05 - 12:15 ( 10 )	<b>Congress Photo</b>		
12:15 - 13:30 ( 75 )	<b>Lunch</b>		

### Quantum Life Science - Session 4: Physical process of radiation damage to DNA and its biological consequences (2) / Hall A

13:30 - 14:00 ( 30 )	Fragmentation of Doubly-Ionized Deoxyribose. <i>Ab Initio</i> Molecular Dynamics Simulations	Marie-Anne Hervé du Penhoat	Pierre-and-Marie Curie Univ., France
14:00 - 14:30 ( 30 )	High Brilliance Synchrotron Radiation as a Tool for Studies of Radiation Damage to DNA and resulting cellular responses	Akinari Yokoya	QST

### Quantum Life Science - Session 5: Quantum imaging nano-technology for biology / Hall A

14:30 - 15:00 ( 30 )	Quantum Metrology using Entangled Photons	Shigeki Takeuchi	Kyoto University, Japan
15:00 - 15:30 ( 30 )	Nanobiodevices for Single DNA Analysis and Quantum Dot <i>in vivo</i> Imaging of iPS Cells for Regenerative Medicine	Yoshinobu Baba	Nagoya University, Japan
15:30 - 15:45 ( 15 )	<b>Break</b>		

### Quantum Life Science - Session 6: Nano-circumstances and nano-sensing in a cell / Hall A

15:45 - 16:15 ( 30 )	Nanoscale Temperature Sensing in Cells with Nitrogen-Vacancy Centers in Fluorescent Nanodiamonds	Huan-Cheng Chang	Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan
16:15 - 16:45 ( 30 )	Imaging and Manipulation of Temperature in Living Cells: Uncovering Unique Intracellular Microenvironments	Kohki Okabe	The University of Tokyo, Japan
16:45 - 17:15 ( 30 )	Quantum Sensing Based on Color Center in Silicon Carbide for Biological Applications	Takeshi Oshima	QST

### Quantum Life Science - Conclusion / Hall A

17:15 - 17:55 ( 40 )	<b>Discussion</b>	All	
17:55 - 18:00 ( 5 )	<b>Closing Remarks</b>	Yoshiya Shimada	QST

## Day 3 27-Jul-17

### Quantum Life Science - Excursion: facility tour at the National Institute of Radiological Sciences (NIRS), QST

9:30 - 10:00 ( 30 )	<b>Travel to NIRS by bus</b>		
10:00 - 10:30 ( 30 )	<b>Introduction</b>		
10:30 - 12:30 ( 120 )	<b>Facilities of Molecular Imaging / Radiation Safety / Radiation Emergency Medicine</b>		
12:30 - 13:30 ( 60 )	<b>Lunch</b>		
13:30 - 14:30 ( 60 )	<b>Facility of Heavy Particle Beam Therapy</b>		
14:30 - 15:00 ( 30 )	<b>Return to Tokyo Bay Makuhari Hall by bus</b>		