



INTERNATIONAL GLACIOLOGICAL SOCIETY

International Symposium on
Cryosphere and Biosphere



Kyoto Prefectural University
Kyoto, Japan
14–19 March 2018

Co-sponsored by:

- ❄ Japanese Society of Snow and Ice (JSSI)
- ❄ Japan Consortium for Arctic Environmental Research (JCAR)

FIRST CIRCULAR
November 2016

<http://www.igsoc.org/symposia/2018/kyoto>

The International Glaciological Society will hold an International Symposium on 'Cryosphere and Biosphere' in 2018. The symposium will be held at the heart of Kyoto, former imperial capital of Japan, from 14–19 March 2018.

THEME

The cryosphere is now acknowledged as a unique biome that, in spite of the cold and harsh conditions, is inhabited by a diverse range of micro- and macroorganisms. Since the organisms play important roles in the cycling of carbon, nutrients and other elements within and around the cryosphere, these processes have received significant research attention from biogeochemists and microbiologists. However, the presence and activity of microorganisms within the cryosphere also demands attention from glaciologists with interests in the physical and chemical properties of snow or ice. This is because melting and the crystallization of snow and ice are enhanced or even induced by the presence and activity of organisms. For example, supraglacial microbes can darken and increase melting on glaciers and ice sheets, while some species of bacteria can act as ice nucleators. Their influence upon the chemistry of ice and ice crystal interstices also has relevance to the interpretation of ice cores. However, biological processes on, within and under the ice are still insufficiently understood for us to incorporate their direct and indirect effects into current models of the Earth system. Furthermore, most organisms in the cryosphere are physiologically adapted to low temperatures and an improved understanding of these mechanisms has great potential for application to agriculture, food science, medical and material engineering. This symposium will therefore provide an opportunity for glaciologists and biologists to meet and discuss the various phenomena associated with life in the cold. The goals of this symposium are: (1) to provide a forum for presenting the current knowledge of life and ecosystems in the cryosphere; (2) to discuss the important gaps in our understanding of interactions between biological activity and physical/chemical phenomena in the cryosphere, from molecular to system level; and (3) to encourage participants to form a new scientific community, discussing the state and direction of glacial biology or bio-glaciology.

SUGGESTED TOPICS

We welcome all submissions for presentation under the broad topics of glaciology in the biosphere and/or biology in the cryosphere. The key focus areas are:

1. **Microbes and biogeochemistry in glaciers and ice sheets**, including algae and bacteria in supra-, en- and subglacial environments; darkening and melt enhancement of glaciers by biogenic impurities; biogeochemistry in subglacial aquatic environments; the nutrient cycle in glaciers; biogeography of glacial microbes; microbes on seasonal snow and lake ice
2. **The role of sea ice, icebergs and glacier calving fronts in marine ecosystems**, including the effects of sea ice and glacial melt water on marine biota; glacier fjord ecosystems; ecology of ice algae; changing polar marine ecosystems in global warming

3. **Permafrost and terrestrial biota**, including the ecology of tundra and forest in polar and alpine regions; vegetation and soil microbes in permafrost; the ecological succession of glacier forefields; microbes in seasonal snow and lake ice; the carbon cycle of the permafrost region
4. **Interaction between snow cover and forest**: snow cover in forested regions; forest ecology in snow-covered regions; living snow fences; avalanche protection forests
5. **Cryosphere ecosystems and climate change**: observations, data gathering and modelling of ecosystems across different time scales, including glacial–interglacial cycles and Snowball Earth events; projection of polar and alpine ecosystems in future global warming scenarios
6. **Biological ice nucleation**, including ecology of ice nucleation bacteria; global and local impact of biological ice nucleation; dynamics of bio-aerosol; ice crystallization or ice segregation in plant and fungi; ice nucleation activity in vertebrates and invertebrates
7. **Biomarkers and biogeochemistry in ice cores and frozen ground**, including analysis of microbes, pollen grains and other organic substances as a proxy of past environments; modifications of chemical compositions of soluble ions and air in ice by microbial activity; analytical technology of DNA and other biogenic substances for ice core study
8. **Physiology of cold adaptation and applications of biogenic material to low temperature technology**, including adaptation of organisms to low-temperature environments at the whole-organism, system or molecular level; anti-freeze and/or ice-binding proteins; cryopreservation of organisms; applications to food processing
9. **Emerging areas of cryosphere/biosphere research**

PROGRAMME

A mixture of oral and poster sessions, interlaced with ample free time, forms the general framework of the symposium, which is intended to facilitate exchange of scientific information between participants in an informal manner. Additional activities include the customary icebreaker, a symposium banquet and a selection of activities for the Saturday afternoon mid-symposium break.

ABSTRACT AND PAPER PUBLICATION

Participants wishing to present a paper (either oral or poster) at the Symposium will be required to submit an abstract by 1 November 2017. A collection of submitted abstracts will be provided for all participants at the Symposium. The Council of the International Glaciological Society has decided to publish a thematic issue of the *Annals of Glaciology* on topics consistent with the Symposium themes. Participants are encouraged to submit manuscripts for this *Annals* volume.

SYMPOSIUM ORGANIZATION

Magnús Már Magnússon (International Glaciological Society)

SCIENCE STEERING AND EDITORIAL COMMITTEE

Co-chairs: Alex Anesio, Andrew J Hodson and Martyn Tranter

Scientific Editors: Further editors will be announced as they are appointed.

LOCAL ORGANIZING COMMITTEE

Nozomu Takeuchi (Chair), Shiro Kohshima, Kumiko Azuma, Tetsuo Ohata, Shin Sugiyama, Kazunari Ushida, Teruo Aoki, Yuji Kodama, Jumpei Kubota, Kazuo Takeda, Kenji Kawamura, Koichi Watanabe, Konosuke Sugiura, Naoko Nagatsuka, Rigen Shimada, Sumito Matoba, Keisuke Suzuki, Koji Fujita, Tsutomu Uchida, Jun Uetake, Satoru Yamaguchi, Yukihiko Onuma, Akane Tsushima, Takahiro Segawa

VENUE

The symposium will be held at the Kyoto Prefectural University in Kyoto city. Kyoto is located in the western (Kansai) area of Japan and is connected by railways, including the Shinkansen, the high-speed railway line that connects Japan's major metropolitan areas such as Tokyo and Osaka. The nearest international airport is Kansai Airport. The university is accessible in 15 minutes by subway from Kyoto railway station. It is surrounded by cultural facilities such as the Botanical Garden, the Prefectural Museum for Historical and Literary Research Materials and Kyoto Concert Hall. The quiet environment near the Kamo River and Mount Hiei offers a comfortable atmosphere for the symposium.

LOCATION

Kyoto is often called 'Japan's heartland', and it is said that no one understands the real Japan without knowing Kyoto. The city has more than 1200 years of history. For 1100 years it was the imperial capital of Japan. A place nurtured by time, Kyoto is also changing into a modern city, where great ideas are born and culture continues to develop. The visitor can't help but be touched by the wonder of this special city. You will enjoy its natural scenery, temples, shrines, towns, homes, people and food. March is one of the best seasons in Kyoto, with beautiful weather and an average daily temperature range of 4–13°C. The cherry blossom may be in full bloom soon after the symposium.

FURTHER INFORMATION

Please register your interest online if you wish to attend the symposium at <http://www.igsoc.org/symposia/2018/kyoto>.

The Second Circular will give further information about accommodation, the general scientific programme, additional activities, preparation of abstracts and final papers. Members of the International Glaciological Society will automatically receive one, as will all those who have pre-registered. Information will also be updated on the IGS conference website, <http://www.igsoc.org/symposia/2018/kyoto/> as it becomes available. A local website will open later in 2016.