

# Online Workshop 2021 on Sustainable Development

Academics from the University of Tokyo, Karolinska Institutet, KTH – Royal Institute of Technology and Stockholm University will share research findings and discuss possibilities for collaboration in the **fourth** interdisciplinary workshop within the framework of the strategic partnership between the University of Tokyo and the Stockholm Trio.

**Monday 27 September: 08.00 – 12.00 CET+ / 15.00 – 19.00 JST**

**Tuesday 28 September: 08.00 – 12.00 CET +1 / 15.00 – 19.00 JST**

Where: **Zoom video meeting**

*Welcome address:*

Professor Astrid Söderbergh Widding, President,  
Stockholm University

Professor Teruo Fujii, President, The University of  
Tokyo

**Introduction (plenary): How can  
Universities make an impact on Society,  
relating to SDGs and Covid-19?**

*Key note Speakers:*

Johan Küylenstierna, Adjunct Professor and  
Honorary Doctor at Stockholm University, Chair of  
the Swedish Climate Policy Council

Hiroko Akiyama, Professor Emeritus, The  
University of Tokyo

## Parallel thematic workshops

### Theme 1: The Brain and Society

The session will address the information handling processing of the brain, from molecular mechanisms to how the brain functions in interactions with other humans or even robots. We will bring together

neuroscientists, psychologists, engineers and medical doctors to discuss how the brain handles and stores information in the normal and diseased brain, with a focus on diseases such as Alzheimer and Schizophrenia.

### Theme 2: Biomaterials

#### 2.1 Nanocellulose and lignocellulosic materials

Nanocellulose and lignocellulosic materials feature an attractive combination of properties and a possibility for chemical modifications that offers a possibility to use these renewable biomaterials for high-performance and multi-functional materials. This workshop will give examples of recent research and applications of nanocellulose and lignocellulosic materials in Sweden and Japan, and offers presentations from both young and more senior researchers and a panel discussion about the future developments and challenges. The workshop will focus on the themes of research using large facilities; new developments; and applications and commercialization.

#### 2.2 Biomaterials for bioengineering

Biomedical engineering has emerged as a central discipline for meeting healthcare needs, through the



development of innovative technologies. The development of Covid-19 vaccines in record time is a clear example of the significant role of biomedical engineering. In this workshop, we present cutting-edge research trends in biomedical engineering in Sweden and Japan, with the purpose of promoting further advancement and cooperation in the field. The themes include bio-sensing and organ-on-chip devices, cell and tissue engineering approaches and strategies toward next-generation therapeutics. The workshop aims to provide a unique opportunity for researchers and students to discuss their recent achievements and encourage potential avenues for collaboration.

### Theme 3: Education for Sustainable Development and Healthy Ageing

This workshop deals with two partly different, but at the same time related topics: - education for sustainable development and education and healthy ageing. It will focus on education for sustainable development on September 27 and on education and healthy ageing on September 28. Education for sustainable development will be presented and discussed based on earlier cooperation between the University of Tokyo and Stockholm Trio (KI, KTH and SU). The purpose of the workshop will be to share information and explore possibilities between the universities on how to further develop cooperation related to education and research about education for sustainable development. Research on education and healthy ageing will be presented and discussed. The purpose of the workshop will be to share information and explore possibilities between the universities on how to further develop cooperation related to research on education and healthy ageing as well as how healthy ageing can be seen in the perspective of education for sustainable development.

### Theme 4: Multiscale and Multiphysics Phenomena

#### 4.1: Large-scale Computation in Life Science with the Memorial of Prof. Fujitani

The recent progress of high-performance computing enables us to conduct largescale simulations in the field of life science with medical applications such as drug design, cardiovascular disease prediction and treatment, genome analysis etc.

The session is dedicated to the memory of Professor Hideaki Fujitani, who was one of the coordinators on the Japanese side, for the workshops between UTokyo and Stockholm Trio. Prof. Fujitani made a great contribution in the field of computational drug design using molecular dynamic simulations. In this session, we have presentations related to the large-scale computations from molecular scales phenomena to macroscopic behaviours.

#### 4.2: Interfacial Thermo-Fluid Mechanics

In the physics of everyday life, the behaviour of liquids on hot or cold surfaces is one of the easiest to observe and yet one of the most surprising. Beyond the apparent banality of condensation appearing on a cold drink, or Leidenfrost drops that a distracted cook may witness, there is rich and complex physics arising from liquid and heat transport at the solid interface. In this theme "Interfacial Thermo-Fluid Mechanics", we will explore via simulations and experiments how fluid behaviour at a solid interface can be modified by wetting, surface structure, temperature, or thermal properties. Discussing how to manipulate the wetting properties of such interfaces and how to apply it for industry fields from thermal management to anti-frosting, we will find a new and a continued opportunity for collaboration between Japan and Sweden.



## Theme 5: Hybrid Infrastructure for Urban Sustainability

Climate change, urbanization, and demographic transition impose new challenges for urban infrastructure and planning, requiring new solutions for the urban infrastructure landscape, including nature-based solutions and decentralized and localized hybrid infrastructure. Transforming our urban environment for a more sustainable one must be a priority in order to accommodate ageing populations, protect human health, provide adequate services and prevent damages from growing calamities (heat waves, wildfires and floods). Integrating living systems with built systems, i.e. hybrid green-blue-grey infrastructure, may provide new opportunities for resilience to climate change and extreme events, partly through enhancing multifunctionality of infrastructure, while also providing opportunities for initiating more inclusive participatory co-design processes.

[Register for workshop](#)

