



The Heat Transfer Society of Japan, Kansai Branch

## 4th International Seminar on Heat Transfer and Fluid Flow

早春の京都で、熱を語り、未来を描く。日欧研究者が集う国際セミナー

Exploring Heat and the Future– Connecting European and Japanese Researchers in Early Spring Kyoto

The Kansai Branch International Exchange Committee of the Heat Transfer Society of Japan will hold the following international seminar. At the seminar, we are honored to have a keynote lecture by Prof. Wilko Rohlf s of RWTH Aachen University, as well as invited lectures by Dr. Daniel Kroniger of Kawasaki Heavy Industries, Ltd. and Prof. Anna Sciazko of the Institute of Industrial Science, The University of Tokyo. We understand that you may have a busy schedule, but we would be most grateful if you could join us.

日本伝熱学会関西支部国際交流委員会は、以下の国際セミナーを開催いたします。本セミナーでは、ドイツ・アーヘン工科大学の Wilko Rohlf s 先生による基調講演のほか、川崎重工業株式会社の ダニエル・クロニガー博士、東京大学生産技術研究所の アンナ・シチョンシコ先生にご講演いただきます。会場は、南禅寺の塔頭跡から移設された歴史的建造物「和楽庵」で、早春の京都の趣ある環境の中で開催いたします。ご多忙の折とは存じますが、ぜひご参加賜りますようお願い申し上げます。

**Date:** March 27, 2026

**日時:** 2026年3月27日(金)

**Venue:** Waraku-an, Kyoto Institute of Technology  
Matsugasaki, Sakyo-ku, Kyoto, 606-8585 JAPAN  
和楽庵, 京都工芸繊維大学, 京都市左京区松ヶ崎

**申込:** 下記の参加登録サイトからお申込みください。締切: 3月19日(木)

<https://forms.gle/vJBYqPm4wfoVYqDx5>



和楽庵 <https://www.kit.ac.jp/anniversary70/>

### Program

**Keynote Lecture** 13:30 – 14:30

**Interfacial Phenomena in Heat and Mass Transfer**

Prof. Dr.-Ing. **Wilko Rohlf s**  
**Institute of Heat and Mass Transfer, RWTH Aachen University**

**Lecture 1** 14:40 – 15:20

**IR-Borescope for Measuring the Wall Temperature Profile of the Hot Passage of a Gas Turbine**

Dr. -Ing. **Daniel Kroniger**  
**Kawasaki Heavy Industries, Ltd.**

**Lecture 2** 15:30 – 16:10

**From Microstructure to Performance: Data-Efficient Machine Learning for Electrochemical Devices**

Prof. Dr. **Anna Sciazko**  
**Institute of Industrial Science, The University of Tokyo**

**Panel Discussion** 16:20 – 17:20

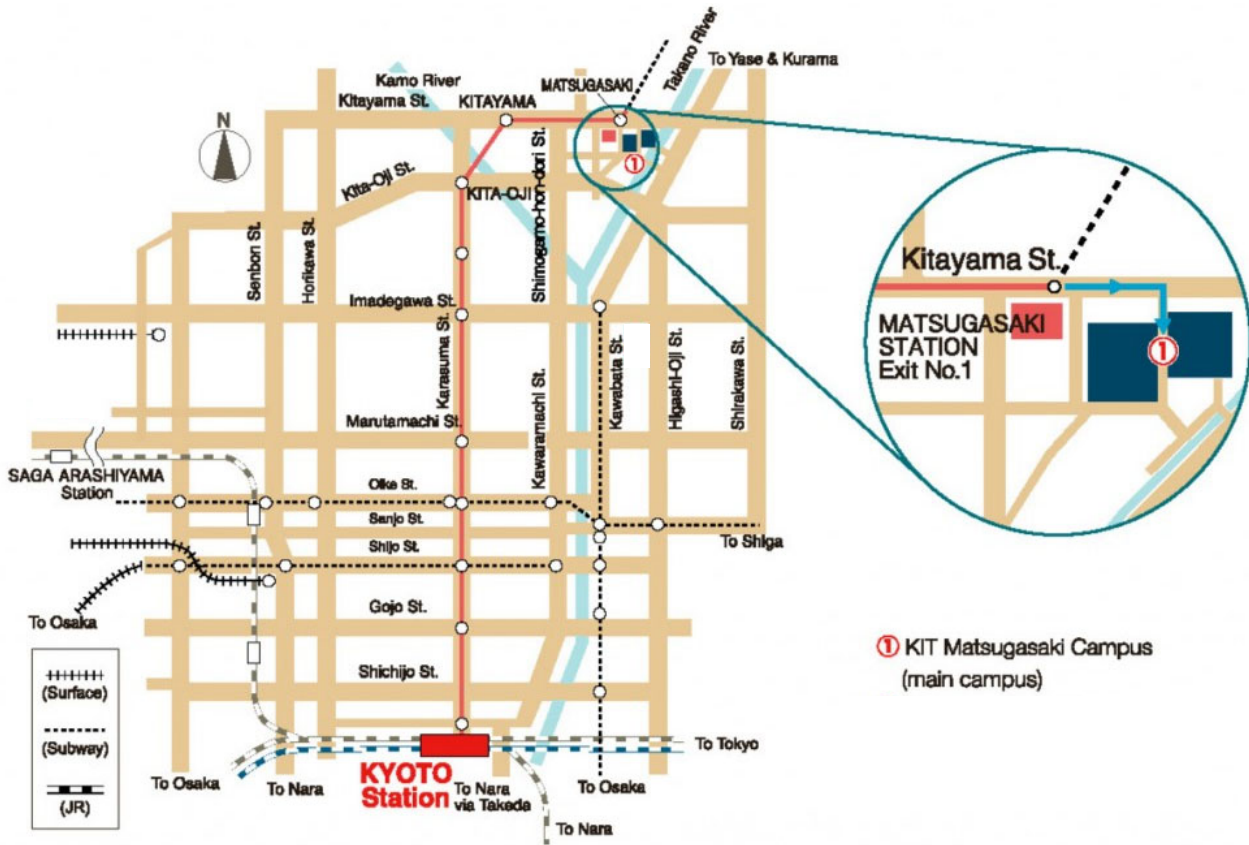
**Engineering Education, Research, and Career Development in Europe and Japan**

Chair: Prof. Kazuya Tatsumi  
Short presentations by:  
Prof. Rohlf s, Dr. Kroniger, Prof. Sciazko, Prof. Matsumoto  
Followed by open discussion.

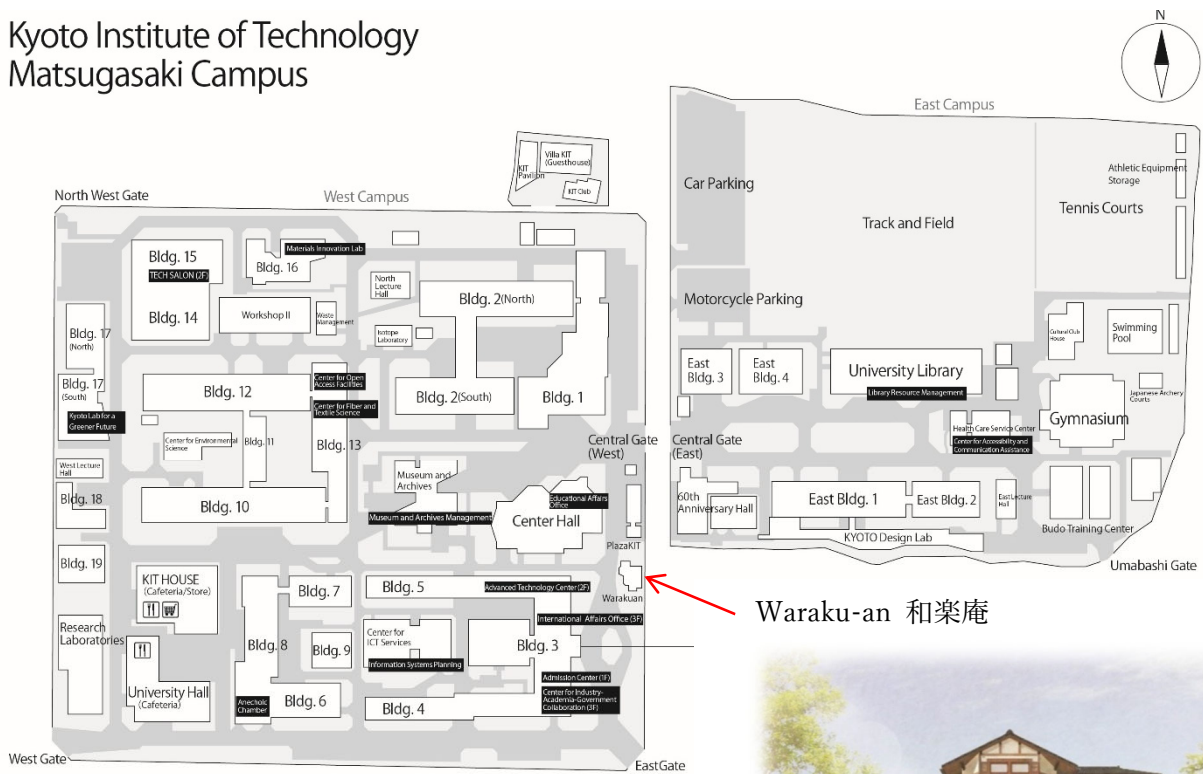
**Networking Session** 17:30 - 19:00 @ Waraku-ann 1st floor

Following the seminar, an in-person Discussion & Networking Session will be held on the ground floor of Waraku-ann. The participation fee will be around JPY 5,000.

# Access



## Kyoto Institute of Technology Matsugasaki Campus



Waraku-an 和楽庵



食事の写真はイメージです



## Keynote Lecture

### Interfacial Phenomena in Heat and Mass Transfer

Prof. Dr.-Ing. Wilko Rohlf's  
Institute of Heat and Mass Transfer, RWTH Aachen University



Interfacial dynamics govern not only the exchange of momentum, heat, and mass in multiphase systems but also trigger instabilities and regime transitions. This talk aims to connect a set of seemingly diverse phenomena through a unified “interfacial instability” framework: frost formation and growth, falling liquid films exhibiting waviness, dripping and jetting, hydraulic jumps in jet impingement, spray formation including flash boiling, conversion of solid fuels, and contact heat transfer controlled by micro-scale interfacial processes. Using scaling arguments and regime maps as guiding tools, we discuss dominant stabilizing and destabilizing mechanisms—capillarity, inertia, gravity, wetting, and phase change—and show how they shape observable patterns and performance-relevant transitions. Complementary to experiments, interface-resolving simulations (VOF and SMIC) are used to capture topology changes and to link local interfacial physics to macroscopic outcomes such as flow patterns within jumps, droplet statistics, contact heat transfer coefficients, conversion mechanisms, or frost-layer thermal resistance. The overarching goal is to demonstrate how a compact set of physical principles and modelling tools can provide predictive insight across a wide range of engineering applications where interfaces are the key actors.

## Lecture 1

### IR-Borescope for measuring the wall temperature profile of the hot passage of a gas turbine

Dr. -Ing. Daniel Kroniger  
Kawasaki Heavy Industries, Ltd.



The increasing demand for load flexibility, combined with continuously rising turbine inlet temperatures to improve cycle efficiency and reduce emissions, imposes significant challenges for the design of hot gas path components in modern gas turbines. To address these challenges, a novel film-cooling concept for first-stage turbine guide vanes featuring specially shaped openings known as “NEKOMIMI” holes has been successfully implemented in Kawasaki’s L30A gas turbine. This talk reports on the in-engine assessment of this advanced cooling technology using an infrared thermography-based borescope system specifically developed for spatially resolved surface temperature measurements of the first-stage guide vane row. The borescope incorporates advanced cooling solutions that enable reliable operation under the severe thermal and mechanical conditions of a gas turbine. Real-time monitoring of the first-stage guide vanes was successfully demonstrated during engine testing across a wide range of operating conditions, from part load to full load. The mechanical integrity and thermal robustness of the borescope were confirmed, the measurement accuracy was assessed, and the film-cooling efficiency of the “NEKOMIMI” cooling holes was quantitatively determined.

## Lecture 2

### From microstructure to performance: data-efficient machine learning for electrochemical devices

Prof. Dr. Anna Sciazko  
Institute of Industrial Science, The University of Tokyo



Microstructure is a key driver of performance and durability in electrochemical devices. Solid oxide electrolysis and fuel cells enable efficient conversion between electricity and hydrogen, while all-solid-state batteries promise safer, longer-life energy storage, together supporting cleaner power, transport, and industrial transition. In these systems, the 3D arrangement of particles governs transport pathways and reactive-site distribution, so subtle structural changes can cause large shifts in losses and degradation. Yet microstructure-performance datasets are difficult to build, requiring complex experiments, high-resolution 3D imaging, and high-fidelity simulations. Standard black-box machine learning is therefore often impractical as it demands many training samples. This talk presents a data-efficient workflow: ML-guided data acquisition, generative models for physically plausible synthetic microstructures screened by simulation, and grey-box physics-informed learning that blends partial mechanism with limited data. Finally, uncertainty-aware active learning selects the next most informative measurements or simulations to improve the model fastest with reduced data budgets.