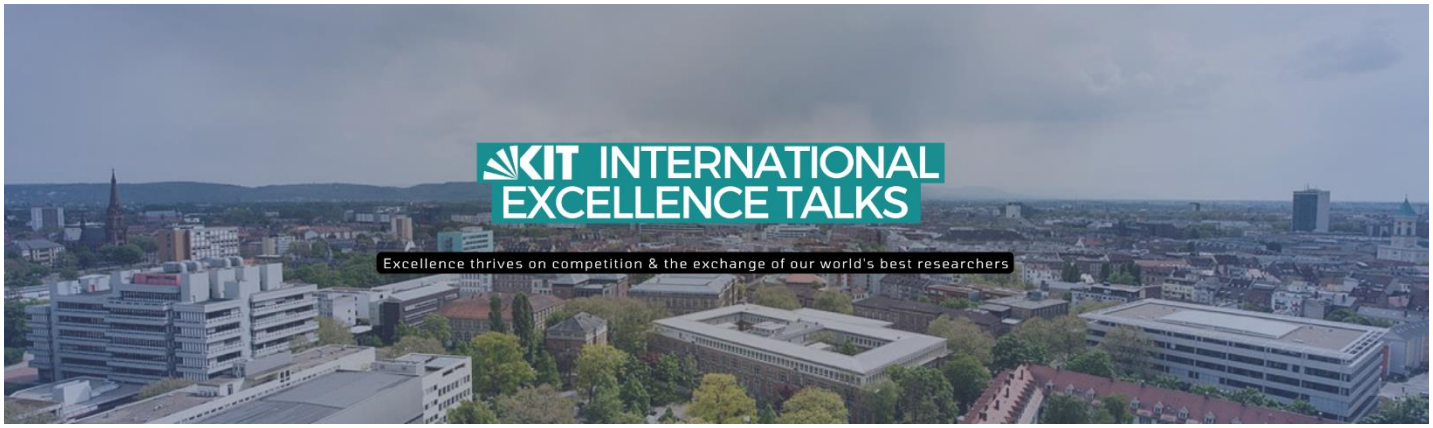

We cordially invite you to join

the International Excellence Talks

with **Prof. Dr. Christian Beck** on the topic

Data-driven Load Profiles and the Complex Dynamics of Electricity Consumption

and with **Assoc. Prof. Dr. Cigdem Yalcin** on the topic

A New Perspective on Complex Network Representation

Date: Thursday, June 27, 2024 at 3:00 PM (CEST)

Venue: KIT, Campus North, Building 449, Lecture Hall 140
(interactive Campus plan here)

or virtually via **Zoom:** Zoom Link

Professor Dr. Christian Beck

KIT International Excellence Fellow (2024)

- Head of Centre for Complex Systems, School of Mathematical Sciences, Queen Mary University of London
- International Excellence Fellow at the Institute for Automation and Applied Informatics (IAI)

Abstract: Power grids are the biggest machines on Earth. They are also the most complex ones, as they involve human beings and their complex correlated electricity consumption patterns. In this talk I will give some short overview on data-driven research dealing with frequency fluctuations in power grids. Whereas variations in the dynamics of renewable energy generation are reasonably well studied, a deeper understanding of the variations in consumer consumption dynamics is still missing. I will talk about highly resolved residential electricity consumption data of Austrian, German and UK households and introduce a stochastic model to quantitatively capture the highly intermittent demand fluctuations.

Assoc. Professor Dr. Cigdem Yalcin

KIT International Excellence Fellow (2023/2024)

- Associate Professor (PhD) of Physics Department in the Faculty of Sciences at Istanbul University
- International Excellence Fellow at the Institute for Automation and Applied Informatics (IAI)

Abstract: Numerous real-world systems, whether they are of natural or human origin, display complex interactions and dynamics evolving over time. As well known, transforming time series data into a complex network representation helps to gain a deep understanding of the dynamics underlying the data. In this talk, I will provide an introduction about converting time series to complex networks and then introduce a new approach in the context of physics for converting spatial-temporal series data into a complex network. And as an example study, I will discuss its application to the air quality of various regions in Istanbul, the largest metropolitan city in Turkey with a population of approximately 16 million.

After the keynote lecture, we invite you to join the networking session with the speakers Prof. Dr. Christian Beck and Assoc. Prof. Dr. Cigdem Yalcin and other participants with drinks and snacks.

To attend the **in-person event**, please register, so that we can plan accordingly. **Registration for in-person event**	Via **Zoom**, no registration is necessary. **Zoom Link**

In case you have any questions or would like to receive updates on topics, lecturers and more, please send us an email to ieg@intl.kit.edu.

Recordings of previous talks

To get inspired before the talks, have a look at our previous speakers and topics on the KIT International Excellence YouTube Channel and on our website.

The lecture series is organized by the International Scholars and Welcome Office (IScO) of KIT in the framework of the International Excellence Grants Program with funds granted to the University of Excellence concept "The Research University in the Helmholtz Association I Living the Change".

Karlsruher Institut für Technologie