

# Joint meeting of the BeMAGIC and MagnEFi ITN networks

Aalto University

13 – 17 June 2022

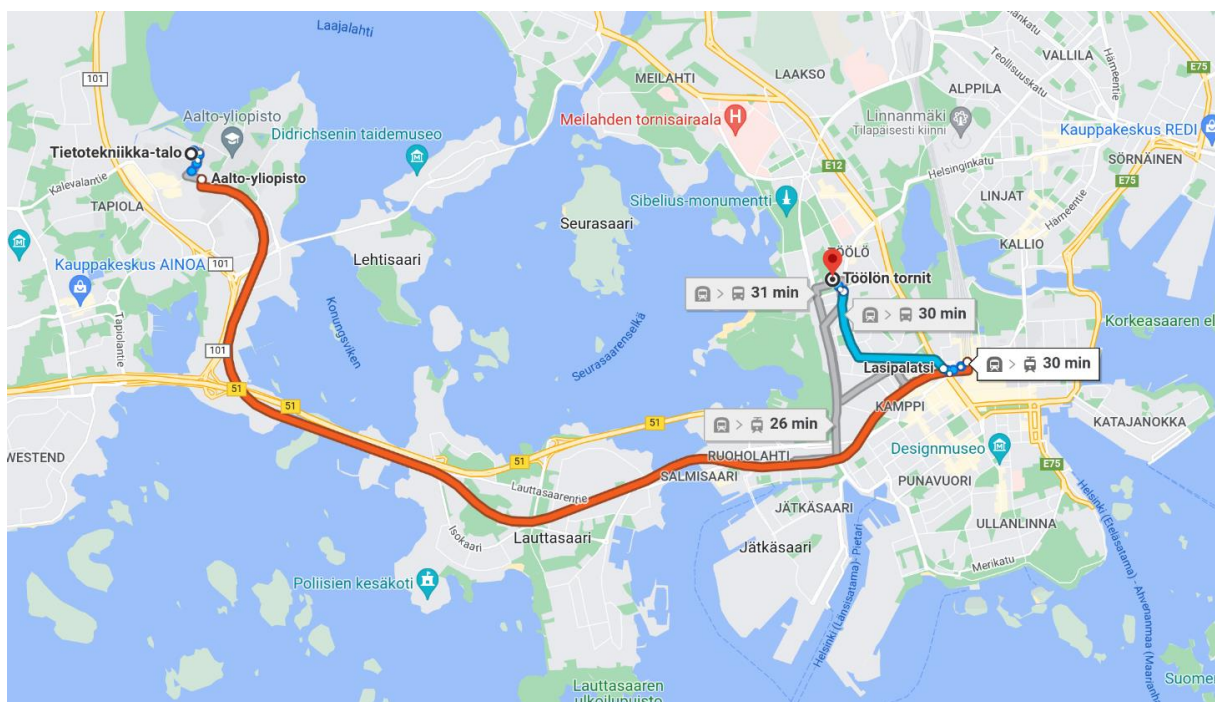


## Travel and arrival in Finland

The meeting takes place at Aalto University, which is located on the Otaniemi campus about 10 km from the city center of Helsinki (Aalto-yliopisto on the map below). You can reach Helsinki by air from most European capitals and many other major cities. From the airport you can take any train (whatever direction) to the city center, or a direct airport bus. It takes 30 - 40 minutes to the center and an additional 15 minutes to the Töölö Towers (ESR accommodation) by walking or tram (line 1 or 2 stop “Lasipalatsi” to “Apollonkatu”).

From the airport to Aalto University, it takes about an hour by train/metro or 30-40 mins and ca. 50 € by taxi.

Most hotels are in Helsinki. Helsinki and Aalto University are connected by a metro line (13 mins). Public transport in the Helsinki area is effective. We recommend you download the local traffic app (HSL) on your mobile phone and book a daily ticket for 5 days (Mon to Fri), valid for all local transport (bus, tram, metro, train). For the trip from Helsinki to Aalto University you need a ticket for zone AB, from the airport to Helsinki ABC (probably two separate single ABC tickets are cheaper than an ABC ticket for several days).



## Accommodation

The **ESRs** will stay in Töölö Towers, which is a university hotel facility in the city center of Helsinki (marked by Töölön Tornit in the map above). Rooms at Töölö Towers should be booked through the website: <https://unihome.fi/en/book>. On the website, select ‘Töölö Towers’ for the correct location. Using the promotional code ‘AALTOJUNE’, the discount price for a single room is 89€ per night.

All **other participants** will stay in hotels. Suggestions are given below. Most hotels are in the city center of Helsinki. There is also a hotel on the Otaniemi campus of Aalto University (Radisson Blu Espoo). The prices are rough estimates (based on booking.com on 11/4). Other options can be found on the usual booking sites.

- Radisson Blu Espoo (near venue at Aalto University, 125€ per night, <https://www.radissonhotels.com/en-us/hotels/radisson-blu-espoo>)
- Radisson Blu Royal Helsinki (Helsinki city center, near metro line, 175€ per night, <https://www.radissonhotels.com/en-us/hotels/radisson-blu-helsinki-royal>)
- Scandic Simonkenttä (Helsinki city center, near metro line, 160€ per night, <https://www.scandichotels.com/hotels/finland/helsinki/scandic-simonkentta>)
- Hotel Helka (Helsinki city center, near metro line, 150€ per night, <https://www.hotelhelka.com/>)
- Original Sokos Hotel Presidentti (Helsinki city center, near metro line, 220€ per night, <https://www.sokoshotels.fi/fi/helsinki/sokos-hotel-presidentti>)
- Original Sokos Hotel Vaakuna (Helsinki city center, near metro line, 220€ per night, <https://www.sokoshotels.fi/en/helsinki/sokos-hotel-vaakuna>)
- Radisson Blu Plaza Hotel, (Helsinki city center, near metro line, 175€ per night, <https://www.radissonhotels.com/en-us/hotels/radisson-blu-helsinki>)
- Radisson Blu Aleksanteri (Helsinki city center, 15 mins from metro line, 150€ per night, <https://www.radissonhotels.com/en-us/hotels/radisson-blu-helsinki-aleksanteri>)

## Venue of the meeting

The meeting will take place in lecture hall C202 T1 (second floor) of the computer science building at Aalto University (number 30 on the map below, address: Konemiehentie 2, Espoo). To reach the lecture hall, you take the metro from the city center of Helsinki. From the Aalto University station (M on the map), it is a 2 mins walk.







|               |                                                                                                             |                                                   |
|---------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| 11:00 – 12:00 | Electric field control of magnetism using multiferroics                                                     | Morgan Trassin (ETH Zürich)                       |
| 12:00 – 13:30 | Lunch                                                                                                       |                                                   |
| 13:30 – 14:30 | Electric-field control of magnetism in van der Waals magnet Cr <sub>2</sub> Ge <sub>2</sub> Te <sub>6</sub> | Hide Kurebayashi (University College London)      |
| 14:30 – 15:30 | Hot electron induced ultrafast demagnetization and magnetization reversal                                   | Gregory Malinowski (University de Lorraine)       |
| 15:30 – 16:00 | Coffee break                                                                                                |                                                   |
| 16:00 – 17:00 | New frontiers in nanoscale magnetism: towards three dimensional materials and devices                       | Amalio Fernández-Pacheco (University of Zaragoza) |
| 17:30         | Sauna and dinner                                                                                            |                                                   |

### Wednesday 15.6 – Invited talks and social event

|               |                                                                                                  |                                  |
|---------------|--------------------------------------------------------------------------------------------------|----------------------------------|
| 9:00 – 10:00  | Highly sensitive composite magnetoelectric magnetic field sensors – the role of magnetic domains | Jeffrey McCord (Kiel University) |
| 10:00 – 10:30 | Coffee break                                                                                     |                                  |
| 10:30 – 11:30 | Electrochemical synthesis and magneto-ionic control of iron-based magnetic nanostructures        | Karin Leistner (TU Chemnitz)     |
| 11:30 – 13:00 | Lunch                                                                                            |                                  |
| 15:00 – 19:30 | Boat trip of the Helsinki archipelago and visit to the Suomenlinna fortress island               |                                  |
| 20:00         | Dinner in Helsinki (Sori Taproom)                                                                |                                  |

### Thursday 16.6 – ESR talks (15 min. + 5 min. discussion) and PI meetings

|               |                     |                                                                        |
|---------------|---------------------|------------------------------------------------------------------------|
| 9:00 – 9:20   | Rohit Pachat        | University of Paris-Saclay (UPSaclay)                                  |
| 9:20 – 9:40   | Zhengwei Tan        | Autonomous University of Barcelona (UAB)                               |
| 9:40 – 10:00  | Beatrice Bednarz    | Johannes Gutenberg-Universität Mainz (JGU)                             |
| 10:00 – 10:20 | Uday Gajera         | National Research Council (CNR)                                        |
| 10:20 – 10:40 | Jintao Shuai        | University of Leeds (LEEDS)                                            |
| 10:40 – 11:10 | Coffee break        |                                                                        |
| 11:10 – 11:30 | Muireann de h-Óra   | University of Cambridge (UCAM)                                         |
| 11:30 – 11:50 | Adithya Rajan       | Johannes Gutenberg-Universität Mainz (JGU)                             |
| 11:50 – 12:10 | Gajanan Pradhan     | National Institute for Metrological Research (INRIM)                   |
| 12:10 – 12:30 | Adrien Petrillo     | Eindhoven University of Technology (TU/e)                              |
| 12:30 – 14:00 | Lunch               |                                                                        |
| 14:00 – 14:20 | Zhibo Zhao          | Karlsruher Institute of Technology (KIT)                               |
| 14:20 – 14:40 | Giovanni Masciocchi | Sensitec GmbH (SENSITEC)                                               |
| 14:40 – 15:00 | Maksim Kutuzau      | Leibniz Institute for Solid State and Materials Research Dresden (IFW) |
| 15:00 – 15:20 | Adriano di Pietro   | National Institute for Metrological Research (INRIM)                   |

|               |                              |                                                     |
|---------------|------------------------------|-----------------------------------------------------|
| 15:20 – 15:50 | Coffee break                 |                                                     |
| 15:50 – 16:10 | Sofia Martins                | Autonomous University of Barcelona (UAB)            |
| 16:10 – 16:30 | Sreeveni Das                 | Aalto University (AALTO)                            |
| 16:30 – 16:50 | Joaquim Llacer               | Swiss Federal Institute of Technology Zurich (ETHZ) |
| 17:00 – 18:00 | MagnEFi PI meeting           | BeMagic PI meeting                                  |
| 20:00         | Dinner in Helsinki (Shelter) |                                                     |

### Friday 17.6 – ESR talks (15 min. + 5 min. discussion)

|               |                           |                                                            |
|---------------|---------------------------|------------------------------------------------------------|
| 9:00 – 9:20   | Mandy Syskaki             | Singulus Technologies AG (SINGULUS)                        |
| 9:20 – 9:40   | Song Chen                 | Spin-Ion Technologies (SPIN-ION)                           |
| 9:40 – 10:00  | Pingzhi Li                | Eindhoven University of Technology (TU/e)                  |
| 10:00 – 10:20 | Eleftherios Niapos        | Thin Film Technological Service s.r.o. (TTS)               |
| 10:20 – 10:40 | Mouad Fattoui             | University of Salamanca (USAL)                             |
| 10:40 – 11:10 | Coffee break              |                                                            |
| 11:10 – 11:30 | Stratis Matsoukis         | Guger Technologies Medical Engineering OG (G.TEC)          |
| 11:30 – 11:50 | Christina Balan           | National Centre for Scientific Research (CNRS)             |
| 11:50 – 12:10 | Filippos Perdikos         | Catalan Institute of Nanoscience and Nanotechnology (ICN2) |
| 12:10 – 12:30 | Gyan van der Jagt         | National Centre for Scientific Research                    |
| 12:30 – 14:00 | Lunch                     |                                                            |
| 14:00 – 14:20 | Hidelberto Macedo Zamudio | Voxalytic GmbH (VOXALYTIC)                                 |
| 14:20 – 14:40 | Golam Hafiz               | University of Leeds (LEEDS)                                |
| 14:40 – 15:00 | Weijia Zhu                | Aalto University (AALTO)                                   |
| 15:00 – 15:20 | Subhajit Roy              | University of Paris-Saclay (UPSaclay)                      |

## Invited talks

### **DFT simulations of magnetoelectric materials and their application in energy**

Chiara Gattinoni

*Department of Chemical and Energy Engineering, London South Bank University*

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In this talk we investigate the properties of prototypical multiferroic magnetoelectric material BiFeO<sub>3</sub> using density functional theory calculations, following on both the successes and challenges of using this powerful technique. I will also show how the nanoscale interfacial character of BiFeO<sub>3</sub> thin films and nanoparticles, combined with its magnetoelectric bulk properties, can be used to build effective catalysts for water splitting and pollutant degradation.

### **Electric field control of magnetism using multiferroics**

Morgan Trassin

*ETH Zurich, Materials department, Switzerland*

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I will review the recent progress in the field of multiferroic magnetoelectric materials. After a brief introduction to the different ferroic states, the emphasis will be placed on materials exhibiting simultaneously strong and coupled magnetic and ferroelectric orders. The full potential of low energy consumption magnetic based devices for spintronics lies in our understanding of the magnetoelectric coupling at the scale of the ferroic domains. The microscopic mechanism supporting the coexistence of an electric polarization and a long range magnetic order will be discussed. The lack of single-phase room temperature multiferroic candidates motivates the development of so-called artificial multiferroic heterostructures, in which robust ferroic orders are combined by assembling different materials. The electric field induced manipulation of magnetism in such multilayers will be discussed. On the way to the ultimate goal; the electric field induced magnetization reversal at room temperature, interesting phenomena were discovered, new experimental tools were developed. I will present some key results in this direction too.

### **Electric-field control of magnetism in van der Waals magnet Cr<sub>2</sub>Ge<sub>2</sub>Te<sub>6</sub>**

Hidekazu Kurebayashi

*London Centre for Nanotechnology, University College London, London WC1H 0AH, United Kingdom*

Email: h.kurebayashi@ucl.ac.uk

Two-dimensional (2D) van der Waals (vdW) materials have been intensively and extensively studied in the last two decades. A magnetic version of vdW systems has only gained attention since 2017 where a few mono-layers of exfoliated magnetic vdW ones were

reported to sustain magnetism [1,2]. Since then, scientists started to seriously explore the physics and materials science of this new class of materials by applying their own research ideas and growth/measurement techniques. Magnetic vdW systems [] are richly diverse, in terms of conductivity and magnetic ground states. Furthermore, inherent low symmetry nature of vdW materials will offer a wealth of spin-orbit Hamiltonians [4] that are the backbone of current-induced magnetization switching research and future technologies.

In this talk, I would like to start with a brief introduction of magnetic 2D vdW materials and seminal works of electric field on their systems. I then move on to our work on electric field control of magnetism in Cr<sub>2</sub>Ge<sub>2</sub>Te<sub>6</sub> (CGT) [5]. A drastic carrier doping by electric field turns insulating CGT into metallic, accompanied by the enhancement of Curie temperature in CGT by more than 100 K. Furthermore, we found that the out-of-plane magnetic easy axis was changed into the hard axis by electric field. The driving mechanisms have been discussed by comparing CGT samples with chemical doping where magneto-transport and ferromagnetic resonance techniques are performed.

[1] Gong et al. Nature 546 265 (2017).

[2] Huang et al., Nature 546, 270 (2017).

[3] e.g. K. S. Burch et al., Nature 563, 47 (2018).

[4] H. Kurebayashi et al., 4, 150 (2022).

[5] Verzhbitskiy et al., Nature Electron. 3, 460 (2020).

### **Hot electron induced ultrafast demagnetization and magnetization reversal**

Grégory Malinowski

*Institut Jean Lamour, UMR CNRS 7198 – Université de Lorraine – 2 allée André Guinier, 54011 Nancy, France*

Email: gregory.malinowski@univ-lorraine.fr

Understanding and controlling the magnetization dynamics on the femtosecond timescale is becoming essential both at the fundamental level and to develop future technological applications. While direct laser excitation of a ferromagnetic layer was commonly used during the past twenty years, laser induced hot-electrons femtosecond pulses and subsequent transport in magnetic multilayers has recently attracted a lot of attention. Indeed, replacing photons by hot-electrons offers complementary information to improve our understanding of ultrafast magnetization dynamics and to provide new possibilities for manipulating the magnetization in a thin magnetic heterostructure on the femtosecond timescale.

In this talk, I will focus on the generation and transport of hot-electrons following femtosecond laser pulse excitation. I will discuss their role in the ultrafast loss of magnetization in magnetic multilayers. I will show that hot electrons can induce an ultrafast magnetization reversal in ferrimagnetic GdFeCo alloy. Moreover, these ultrafast currents can be spin-polarized, allowing for sub-ps all-optical control of magnetization in magnetic multilayers.



## **New frontiers in nanoscale magnetism: towards three dimensional materials and devices**

Amalio Fernández-Pacheco

*Institute of Nanoscience & Materials of Aragón, CSIC-University of Zaragoza, Spain*

Email: amaliofp@unizar.es

The expansion of nanomagnetism to three dimensions provides exciting opportunities to explore new physical phenomena and opens great prospects to create 3D magnetic devices for green computing technologies.

In this talk, I will present some of our recent works dedicated to the investigation of three dimensional artificial magnetic materials, including multilayered and complex-shaped geometries. The talk will give an overview of the new methods we have developed to fabricate and characterize these nanomaterials, and some of the new functionalities obtained. This includes the creation of localized spin textures, topological defects and stray fields exploiting geometrical effects, the automotive 3D motion of domain walls, and the generation of chiral spin interactions via geometry and interfacial effects.

[1] A. Fernández-Pacheco et al, Nature Comm. 8, 1 (2017).

[2] A. Fernández-Pacheco et al, Nature Mater. 18, 679 (2019).

[3] L. Skoric, Nano Letters 20, 184 (2020).

[4] D. Sanz-Hernández et al, ACS Nano 11, 11066 (2017).

[5] L. Skoric et al, arXiv:2110.04636.

[6] F. Meng et al, ACS Nano 15, 6765 (2021).

[7] D. Sanz-Hernández et al, ACS Nano 14, 8084 (2020).

[8] C. Donnelly et al, Nature Nanotechnol. 17, 136 (2022).

## **Highly sensitive composite magnetoelectric magnetic field sensors – the role of magnetic domains**

Jeffrey McCord

*Nanoscale Magnetic Materials – Magnetic Domains, Kiel University, Germany*

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Recent advances adopting magnetic films as sensing layers offer promising routes for sensing ultra-low magnetic signals with composite magnetoelectric (ME) cantilever sensors or surface acoustic wave (SAW) devices. As the sensors are operated by external stimuli of various frequencies, the complex behavior of magnetic domain wall activity is one of the most important factors that determine the performance of the magnetic field sensors.

In-operando magnetic domain observations shed light on the related irreversible and hysteretic magnetization changes due to various domain processes including domain wall resonances, domain wall flexure modes, precessional magnetization effects, and spin-wave like phenomena. Using magneto-optical Kerr effect microscopy with time resolutions spanning from DC down to picoseconds, we show the effect of magnetic domains on the noise performance of ME,  $\Delta E$ -effect, and SAW sensors. With spatial and temporal domain

analysis during sensor operation together with complementary electrical measurements, the micromagnetic origins of noise are determined. We show that magnetic noise is the most relevant figure-of-merit determining ME sensor performance. Even minimal magnetic domain activity restricts the achievable limit of field detection of the various types of ME and SAW sensors. For all sensors, we demonstrate that understanding the magnetic domain physics and actively controlling magnetic domain behavior is key to improving sensor performance. The magnetic domain wall activity is directly related to magnetic losses. The presented data prove the significance of micromagnetic processes for real-world applications. Strategies for the elimination of domain wall activities and magnetic losses, which result in a drastic drop of sensor noise, will be discussed.

We acknowledge funding through DFG CRC 1261 “Magnetolectric Sensors: From Composite Materials to Biomagnetic Diagnostics”.

- [1] C. Müller, P. Durdaut, R. B. Holländer, A. Kittmann, V. Schell, D. Meyners, M. Höft, E. Quandt, J. McCord, *Advanced Electronic Materials*, accepted (2022)
- [2] P. Durdaut, C. Müller, A. Kittmann, V. Schell, A. Bahr, E. Quandt, R. Knöchel, M. Höft, J. McCord, *Sensors*, 21, 5631 (2021)
- [3] N.O. Urs, E. Golubeva, V. Röbisch, S. Toxværd, S. Deldar, R. Knöchel, M. Höft, E. Quandt, D. Meyners, J. McCord, *Physical Review Applied* 13, 024018 (2020)
- [4] P. Hayes, M. Jovičević Klug, S. Toxværd, P. Durdaut, V. Schell, A. Teplyuk, D. Burdin, A. Winkler, R. Weser, Y. Fetisov, M. Höft, R. Knöchel, J. McCord, E. Quandt, *Scientific Reports* 9, 16355 (2019)
- [5] M. Jovičević Klug, L. Thormählen, V. Röbisch, S. Salzer, M. Höft, E. Quandt D. Meyners and J. McCord, *Applied Physics Letters* 114, 192410 (2019)
- [6] A. Kittmann, P. Durdaut, S. Zabel, J. Reermann, J. Schmalz, B. Spetzler, D. Meyners, N.X. Sun, J. McCord, M. Gerken, G. Schmidt, M. Höft, R. Knöchel, F. Faupel and E. Quandt, *Scientific Reports* 8, 278 (2018)

## **Electrochemical synthesis and magneto-ionic control of iron-based magnetic nanostructures**

Karin Leistner<sup>1,2</sup>

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Iron and iron oxide nanostructures are of broad interest for numerous applications, such as in the fields of magnetic data storage, spintronics, biosensing and catalysis. In all of these cases, defined deposition on nanometer scale and the energy-efficient control of properties is essential for functionality. In the talk I will focus on (I) advanced nanoelectrodeposition for 2D and 3D iron-based structures and (II) voltage-control of nanomagnetism by magneto-ionic approaches.

Nanoelectrodeposition, compared to physical vapor deposition, is an appealing synthesis method due to the operation at ambient conditions. As one example, I will demonstrate iron/iron hydroxide layers with defined nanoscale thickness and enhanced stability by self-terminated electrodeposition.[1] The underlying mechanism is revealed by electrochemical quartz crystal microbalance measurements, in situ Rutherford backscattering and model calculations based on diffusion theory. Quantitative analysis elucidates the decisive role of the pH increase due to water reduction and the associated formation of ultrathin or bulk  $\text{Fe}(\text{OH})_2$ . As a second example, I will present iron nanocuboids by epitaxial nanoelectrodeposition. Here, by progressive nucleation on  $\text{GaAs}(001)$ , aligned single-crystal iron nanocuboids with sizes ranging 10 to 200 nm are achieved on one sample. Both experiment and theory reveal a sequential transition from Landau pattern to vortex and finally single domain state when decreasing the sizes of the nanocuboids.[2] This combinatorial-like approach leads to a quantitative understanding of the magnetic configurations of the nanomagnets in a broad size range.

In the second part of the talk I will shortly review current advances in magneto-ionic systems [3] and present recent examples from our group. Magneto-ionic control is an emerging approach for the development of ultra-low power magnetic devices for data storage/processing and actuation. In magneto-ionic materials, voltage-triggered electrochemical reactions such as interfacial oxidation/reduction or electrochemical hydrogenation are utilized to set different magnetic states. The focus of my group lies on the electrolytic gating of  $\text{FeOx}/\text{Fe}$  thin films and 3D nanostructures. We achieve electrically tunable magnetization, coercivity and magnetoresistance via reversible oxidation/reduction reactions triggered by a low voltage (around 1 V).[4,5] The underlying mechanisms are revealed by combination of electrochemical analysis, in situ Raman spectroscopy, in situ magneto-transport measurements and in situ Kerr microscopy. For example, the voltage-triggered reduction of the iron oxide layer in  $\text{FeOx}/\text{Fe}$  thin films leads to a magneto-ionic de-blocking mechanism, which relies on changes of the Néel wall interactions. The magneto-ionic functionality can be further extended by combining the tunable ferromagnetic layer with an antiferromagnetic layer. This way, we demonstrate reversible voltage-control of in-plane and perpendicular exchange bias.[6,7]

[1] M. Nichterwitz, K. Duschek, J. Zehner, S. Oswald, R. Heller, K. Leistner, *Electrochim. Acta* 415, 2022, 140170

[2] S. Guo, M. Henschel, D. Wolf, D. Pohl, A. Lubk, T. Blon, V. Neu, K. Leistner, *Nano Lett.* in press, 2022

[3] K. Leistner, *Curr. Opin. Electrochem.* 25, 2021, 100636

[4] J. Zehner, I. Soldatov, S. Schneider, R. Heller, N.B. Khojasteh, S. Schiemenz, S. Fähler, K. Nielsch, R. Schäfer, K. Leistner, *Adv. Electron. Mater.* 6, 2020, 2000406

[5] M. Nichterwitz, S. Honnali Sudheendra, J. Zehner, S. Schneider, D. Pohl, S. Schiemenz, S.T.B. Goennenwein, K. Nielsch, K. Leistner, *ACS Applied Electronic Materials* 2, 2020, 2543.

[6] J. Zehner, R. Huhnstock, S. Oswald, U. Wolff, I. Soldatov, A. Ehresmann, K. Nielsch, D. Holzinger, K. Leistner, *Adv. Electron. Mater.* 5, 2019, 1900296

[7] J. Zehner, D. Wolf, M.U. Hasan, M. Huang, D. Bono, K. Nielsch, K. Leistner, G.S.D. Beach, *Phys. Rev. Mater.* 5, 2021, L061401

## Lunch

We will have lunch in the TUAS building next to meeting venue.

## Restaurants

On Monday, Wednesday, and Thursday, we will have dinner in the city center of Helsinki. The restaurants are listed below.

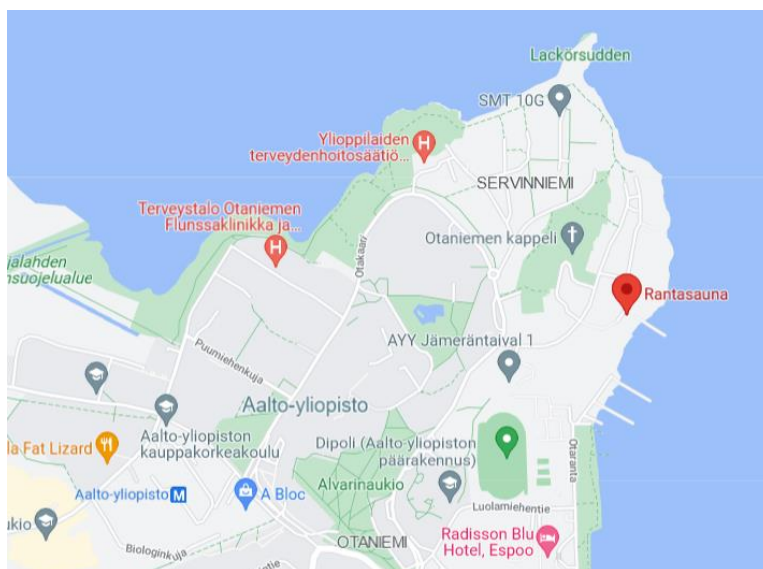
Monday 13 June: Lie Mi Bulevardi (Bulevardi 21, 00180 Helsinki). Time: 19:00

Wednesday 15 June: Sori Taproom (Vuorikatu 16, 00100 Helsinki). Time: 20:00. On this day, we will return to the Helsinki harbour by boat from Porvoo at 19:30. We will walk from the harbour to the restaurant.

Thursday 16 June: Shelter (Kanavaranta 7, 00160 Helsinki). Time: 20:00

## Sauna evening with food

For Tuesday evening, we booked a sauna near the meeting venue on the Otaniemi campus (see map below, address: Jämeräntaival 5). The sauna building is located on the sea and offers sitting areas both inside and outside. The idea is to have a relaxing evening “Finnish style” with food, drinks, sauna, and swimming. Of course, taking a sauna and swimming are voluntary. There are two saunas, one heated by a wood-burning stove for 30 people and one heated by an electrical stove for 10 people. We will use the saunas together (mixed men/women) with swim wear. The sauna building has separate changing rooms for men and women. Besides the saunas, there is also an outdoor Finnish hot tub. A long boardwalk provides access to the sea for swimming. The water is shallow. For those not familiar with the sauna tradition, it would be good to bring swim wear, a towel, and slippers. We will arrange pizza, which will be complemented by snacks and drinks.



## Boat trip of the Helsinki archipelago and visit to Suomenlinna fortress island

Unfortunately, we had to change our plans for the social activity on Wednesday afternoon because the ferry company taking us from Porvoo to Helsinki canceled at the very last moment. We are now organizing a boat trip of the Helsinki archipelago which departs from the Helsinki harbor at the Market Square. The boat will leave at 15:00. Please arrive about 15 minutes early. The name of the boat is M/s Amiraali. The boat trip will take 2 hours and ends at the Suomenlinna fortress island, which is an UNESCO heritage site. On the boat, small snacks and drinks will be served. We are still trying to organize a guided tour of the island (more details will be given during the conference). After visiting Suomenlinna, we will take a regular ferry back to Helsinki (10-15 mins). As the ferry is operated by HSL (the public transportation company in Helsinki), it would be best to buy a HSL day ticket for Wednesday. After the trip, we will have dinner in restaurant Sori Taproom.



Suomenlinna

## COVID-19 regulations

### Entry to Finland

Finland has two points where Covid certificates can be checked on entry. By border guards at passport control and at health check stations inside the airport.

When entering from a Schengen or EU country there is no requirement to present any certificates relating to coronavirus at passport control. However, health checks after passport control may require the presentation of one of:

- a certificate of a [complete and valid vaccination series](#). At least 7 days must have passed since the last vaccine dose has been received. A certificate of a full series of vaccinations (usually two) is valid for 9 months. After this, a booster shot is required. After the booster shot, the certificate is valid until further notice. **OR**
- a recovery certificate verifying recovery from the COVID-19 disease within the last 6 months, **OR**



- a test certificate obtained in a test taken no earlier than 72 hours before entry and showing a negative result. A second test is then required 3-5 days after entry.

If none of these can be provided the traveller is required to take a test at the point of entry followed by a second test after 3-5 days.

Up-to-date information on health checks can be found at:

<https://thl.fi/en/web/infectious-diseases-and-vaccinations/what-s-new/coronavirus-covid-19-latest-updates/travel-and-the-coronavirus-pandemic>

From outside the EU/Schengen (e.g. from the UK) travellers are required to present one of the following at passport control:

- a certificate of a [complete and valid vaccination series](#). At least 7 days must have passed since the last vaccine dose has been received. A certificate of a full series of vaccinations is valid for 9 months. After this, a booster shot is required. After the booster shot, the certificate is valid until further notice. **OR**

- a single certificate that the person has recovered from covid-19 virus and has gotten one dose of [valid vaccine](#). It is equated to a complete covid-19 vaccination series. **OR**

- [EU digital COVID certificate](#) that proves the person has recovered from covid-19 within 6 months.

They are also subject to the health checks as stated for EU/Schengen travellers above.

For up-to-date information and official entry rules, see: <https://raja.fi/en/guidelines-for-border-traffic-during-pandemic>

## In Finland

Covid restrictions have been mostly revoked within Finland. Covid certificates are not checked within the country, face masks are not required on public transport nor at Aalto University. However, the number of Covid infections is still high. We ask for participants not to participate in conference activities if feeling ill.

Face masks and Covid home tests are available at any supermarket or pharmacy.

## Questions

For questions and inquiries, please contact:

- Sebastiaan van Dijken (chair), [sebastiaan.van.dijken@aalto.fi](mailto:sebastiaan.van.dijken@aalto.fi) (+358503160969)

- Susanna Marttala (in charge of travel reimbursement for invited speakers), [susanna.marttala@aalto.fi](mailto:susanna.marttala@aalto.fi) (+358503442369)

- Sara Bouarich (in charge of participation-fee invoicing), [sara.bouarich@aalto.fi](mailto:sara.bouarich@aalto.fi) (+358503642836)