



**SAWtrain Summer School**  
July 11–21, 2017  
Institut d'Études  
Scientifiques de Cargèse  
Corsica, France

# SAWtrain Summer School: “Physics and applications of GHz vibrations in semiconductors”

Cargèse, France – July 11-21, 2017

Program: [Invited Lectures](#) and [Poster Presentations](#)



# Program overview

## First week

Time	Mo 10/07	Tu 11/07	We 12/07	Th 13/07	Fr 14/07	Sa 15/07
8h30-10h15	Arrival	Welcome Tu <sub>1</sub> (1.5h) Dietsche	Tu <sub>3</sub> (1.5h) Fainstein	Tu <sub>4</sub> (1.5h) Kent	Tu <sub>6</sub> (1.5h) Fischerauer	Tu <sub>7</sub> (1.5h) Delsing
10h15-10h45	10h15-10h45 Coffee break					
10h45-12h30	Arrival	Tu <sub>2</sub> (1.5h) Kent	Poster Talk 1(a)	Tu <sub>5</sub> (1.5h) Dietsche	Poster Talk 2(a)	Tu <sub>8</sub> (1.5h) Fischerauer
12h30-14h	12h30-14h Lunch					
14h-15h		ST <sub>1</sub> (45 min) Caliendo	Poster 1(a) refreshments	ST <sub>3</sub> (45 min) Weiler	Poster 2(a) refreshments	
15h:15h30		refreshments		refreshments		
15h30-16h30		ST <sub>2</sub> (45 min) Poizat		ST <sub>4</sub> (45 min) Ruile		
19h30	"Apero de Bienvenue"	Dinner (own program)				

## Second week

Time	Mo 17/07	Tu 18/07	We(b) 19/07	Th 20/07	Fr 21/07	Sa 22/07	
8h30-9h20	Tu <sub>9</sub> (1.5h) Wixforth	PhD talks (SAWtrain)	Sogawa	Tu <sub>12</sub> (1.5h) Tarucha	Tu <sub>14</sub> (1.5h) Marquardt	Departure	
9h20-10h15			Metzger				
10h15-10h45	10h15-10h45 Coffee break						
10h45-11h35	Tu <sub>10</sub> (1.5h) Tarucha	SAWtrain meeting (free for others)	Sotomayor	Tu <sub>13</sub> (1.5h) Bennett	Tu <sub>15</sub> (1.5h) Cleland		
11h40-12h30			Wixforth Bennett				
12h30-14h	12h30-14h Lunch				Closing		
14h-15h	SAWtrain meeting (free for others)	ST <sub>7</sub> (45 min) Leek	ST <sub>9</sub> (45 min) Westerhausen	ST <sub>11</sub> (45 min) Johansson	Departure		
15h:15h30		refreshments	refreshments	refreshments			
15h30-16h		ST <sub>8</sub> (45 min) Meunier	ST <sub>10</sub> (45 min) Krenner	ST <sub>12</sub> (45 min) Delsing			
16h-16h30	PhD talks (SAWtrain)						
17h-18h		free time	free time	free time			
18h-19h	ST <sub>5</sub> (45min) Ford						
19h30	Dinner (own program)	Classical music concert	Dinner (own program)	Barbecue			

(a) See complete program for details; (b)Symposium: "Applications of Acousto-Electric Devices"

- Tutorials (Tu): 90 min long with additional 15 min for discussions.
- Short lectures (ST): 45 min talks with additional 15 min for discussions.
- Poster and Poster Talks: see program on page 20;
- Sessions *SAWtrain internal meeting*: only for members of the SAWtrain network.
- The **full program** can be found on page 16.

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## 1 Welcome!

**SAWtrain Summer School: “Physics and applications of GHz vibrations in semiconductors”** will take place at the campus of the Institut d’Etudes Scientifiques de Cargèse (**IESC**) in Cargèse, Corsica, France, from July 11 to 22, 2017. The school will be organized by the **IESC** and the European Marie Skłodowska Curie network **SAWtrain**.

The Summer School aims to gather leading scientists working in the emerging field of high frequency vibrations in semiconductor and related materials. These experts will provide a solid training at PhD & Post-Doc level and beyond and present their latest achievements in the field. The dynamic modulation of semiconductor structures using high frequency vibrations provides a powerful tool for the control of the materials properties required for novel functionalities in nanophotonics, nanoelectronics, and quantum information processing. Of particular

interest are surface acoustic waves (SAWs): these are vibrations with GHz frequencies and micrometre-size wavelengths that can be generated on a semiconductor chip with standard integrated circuit technology. The combination of SAWs with semiconductor nanostructures has developed into new interdisciplinary fields ranging from the control of chemical reactions to advanced acousto-optical structures and to GHz quantum acoustics, which will be addressed during the school.

*We look forward to meeting you in Cargèse!*

## 2 Venue

The summer school will take place at the campus of the [IESC](#) near Cargèse on the island of Corsica, France. Detailed information about the facilities, accommodation and travel can be found in the IESC [website](#). Unless otherwise specified, accommodation on campus will be provided between July 10, 2017 (arrival) and July 22, 2017 (departure). We will also provide bus transfers between Ajaccio's airport and the IECSC campus on July 10 and July 22 at times to be defined. For information on public transportation between Ajaccio and Cargèse, you can also check the sites [CorsicaBus](#) or [bus schedule](#).

Please note that as July is a vacation period in France, it is highly recommended that the participants make their transportation arrangements well in advance.

## 3 Organization

The school aims at providing an in-depth insight in the field of coherent GHz vibrations to young researchers at the PhD/Postdoctoral levels and beyond. The working program of the School addresses among others the following topics: the generation and control of vibrations in semiconductors and related materials down to single vibrational quanta, their interactions with electronic, photonic, and magnetic excitations in nanostructures, as well as potential applications in electronic and optoelectronic devices.

The program (see Sec. [5.1](#)) combines comprehensive lectures on the above subjects by leading experts with specialized contributions reporting on the latest developments in the field. The vast, pluridisciplinarity scope will be handled by the following pedagogic instruments:

- tutorial lectures by recognized experts, allowing the different groups to share a common knowledge basis to facilitate the discussions;
- seminars introducing recent advances and new trends;

- presentations from the participants promoting discussions involving experts leading to network building and to scientific collaborations.

The two-weeks duration of the School will ensure a steady scientific exchange and personal interactions between young and senior researchers. In particular, we have encouraged the senior lecturers to stay for an extended period to ensure extensive interaction with the participants. This type of organization with more time for discussions will allow more informal contacts between young and senior researchers, a difficult task to achieve in regular conferences.

The Summer School will provide an extensive overview of the state-of-the-art as well as extensive training (at the doctoral and higher levels) in the field of high-frequency vibrations in solids as well as their application for the dynamic electromechanical control of excitations in semiconductor nanostructures. This includes various fields ranging from the technology to generate GHz vibrations on a chip, which is relevant to industrial research, to applications in microfluidics, photonics, and electronic control. The scientific program will be designed to target a wider scientific community working on nanomaterials as well as to increase the visibility to related research areas. One of the main topics will be vibrations in the form of surface acoustic waves (SAW), which are modes propagating on a surface. Emphasis will be placed on GHz quantum acoustics, i.e. the control and manipulation of single vibrational quanta and their interaction with charge, spin, and superconducting qubits for quantum information processing.

The school will be integrated into the PhD training program of the Innovative Training Network (ITN) [SAWtrain](#), a Marie Skłodowska-Curie Action of the European program [Horizon 2020](#). This network brings together 25 leading partners from the academic and industrial sectors working in the field of SAWs on semiconductor and related materials from Europe, Asia and America. The summer school will be open to PhD students as well as post-doctoral and young researchers, hence going well beyond the bounds of the SAWtrain network. The framework of the Marie Curie Network will be highly beneficial for networking purposes, especially for the young researches to build up firsthand contacts with the leading scientists in the field. Simultaneously, it will bring together academic and industrial partners working in the field. On the other hand, the school will serve as a forum for discussions about the future perspectives for the field.

We expect the attendance of at least 80 participants, including 24 lecturers and the four members of the organizing committee.

### 3.1 Topics

**SAWtrain Summer School: “Physics and applications of GHz vibrations in semiconductors”** addresses the very active field of research of high-frequency

coherent vibrations and their interactions with photons, carriers, and spins at nanometer scales. The aim is to help in the creation of a new domain of research, relying on emerging physical concepts and renewed investigation techniques. The program covers the following topics:

- **Physics of Vibrations**  
Introduction to Phonons & GHz Bulk and Surface Acoustic Waves (SAWs) / Nanomechanics / Nanofluidics
- **Technology for GHz waves on semiconductors and related materials**  
Modelling / Sensors / Nanomechanical devices / AcoustoPhotoCatalysis / SAWs and Graphene
- **Acousto-Optics**  
Acousto-optics/integrated optics using SAWs / Photonic and Phononic crystals / Microcavities and polaritons / Plasmonics & Acoustics
- **SAW Based Quantum Transport**  
Semiconductor quantum dots & flying qubits / Superconducting qubits / Quantum information / Single carrier manipulation with SAWs / Single Photon Sources / Quantum Acoustics
- **General Topics on Phonons—Future Perspectives**  
Research in an Industrial Environment / Phonons in Electronic Devices / Energy Conversion

### 3.2 Organizing Committee

The Organizing Committee is composed by the following members:

- **Chris Bäuerle**  
*Institut Néel, Grenoble, France*
- **Per Delsing**  
*Chalmers University, Göteborg, Sweden*
- **Paulo Santos**  
*Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany*
- **Achim Wixforth**  
*University of Augsburg, Augsburg, Germany*

### 3.3 Program Committee

The Program Committee responsible for the scientific program and evaluation of the applications consists of the following members:

- **Andres Cantarero**  
*University of Valencia, Spain*
- **Wilfred van der Wiel**  
*University of Twente, The Netherlands*
- **Eva Weig**  
*Universität Konstanz, Germany*
- **Jorge Pedrós**  
*Universidad Politécnica de Madrid, Spain*
- **Christine Kolczewski**  
*Deutsches Museum, Germany*
- **Stefan Ludwig**  
*Paul-Drude-Institut, Berlin, Germany*
- **Shintaro Takada**  
*Institut Néel - CNRS & Université Grenoble Alpes, France*

### 3.4 Sponsors

We would like to thank the following institutions for their support:



MCSA SAWtrain  
([www.sawtrain.eu](http://www.sawtrain.eu))



Deutsche Französisch Hochschule  
([www.dfh-ufa.org](http://www.dfh-ufa.org))



Institut d'Études Scientifiques de Cargese  
([www.iesc.univ-corse.fr](http://www.iesc.univ-corse.fr))



Universität Augsburg  
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([www.uni-augsburg.de](http://www.uni-augsburg.de))



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## 4 The Scientific Program

### 4.1 Overview

An overview of the Summer School program is displayed in the back cover of this document. The full program can be found in Sec. 5.1. Please note that the sessions *SAWtrain internal meeting* on Monday July 17 from 14h to 17h and on Tuesday July 18 from 10h45 to 12h15 are exclusively for members of the SAWtrain network.

The school comprises three types of events:

- in-depth tutorial lectures (typically from 1.5 to 3 h long followed by 30 min discussions) at the postgraduate/postdoctoral level covering fundamental topics in the field, i.e., the theoretical description of the acoustic (transfer matrix, first principles methods...) and acousto-optic (photoelasticity, piezoelectricity...) properties. The tutorials will also introduce classical and emerging acousto-optic devices (bulk and surface waves, phonon lasers, phononic crystals, nano-acoustic resonators) and experimental investigation methods (acousto-electric methods, low-temperature transport, advanced spectroscopy, light scattering, etc.);
- seminars (1 h long including 15 in discussions), which will cover the most recent developments in the field;
- contributions from participants in the form of posters (4 h long sessions) and short exposures (4 h long);
- a symposium on *Applications of Acousto-Electric Devices* on Wed. July 19, 2017 with contributions from the academic and industrial sectors.

### 4.2 Invited Lectures

Please note that the abstracts can only be accessed via a password-protected link provided by the school organizers.

**Cinzia Caliendo:** CNR Rome, Rome, Italy

- [SAW-based Sensors](#)

**Andrew Cleland:** University of Chicago, Chicago, US

- *Quantum Nanomechanics.*

**Per Delsing:** Chalmers University, Goteborg, Sweden

- [Introduction to Quantum Acoustics : Essentials & SAW/SC Qubit Coupling](#)

**Werner Dietsche:** Max-Planck-Institut, Stuttgart, Germany

- [Physics of Acoustic Phonons in the 1 GHz to 1 THz range](#)

**Alex Fainstein:** Centro Atomico de Bariloche, Bariloche, Argentina

- [Introduction to acousto-optical interactions](#)

**Gerhard Fischerauer:** University of Bayreuth, Bayreuth, Germany

- [Introduction to Surface Acoustic Waves: Fundamentals and Applications](#)

**Chris Ford:** University of Cambridge, Cambridge, UK

- [Single-electron Manipulation](#)

**Göran Johansson:** Chalmers University, Goteborg, Sweden

- [The giant acoustic atom - a single quantum system with a deterministic time delay](#)

**Anthony Kent:** University of Nottingham, Nottingham, UK

- [Introduction to Acoustic Waves](#)

**Hubert Krenner:** University of Augsburg, Augsburg, Germany

- [Interfacing quantum emitters by propagating surface acoustic waves](#)

**Peter Leek:** Oxford University, Erlangen, Germany

- [Coupling superconducting qubits to surface acoustic wave resonators](#)

**Florian Marquardt:** University of Erlangen, Oxford, UK

- *Introduction to Nanomechanics.*

**Thomas Metzger:** Qualcomm Germany RFFE GmbH, Munich, Germany

- [Micro-acoustic Technologies and System Integration for LTE based Mobile Phones](#)

**Tristan Meunier:** Institut Neel, Grenoble, France

- [Long-range transfer of spin information at the single electron level using surface acoustic waves](#)

**Jean-Philippe Poizat:** Institut Neel, Grenoble, France

- [Hybrid Nanomechanical Systems](#)

**Werner Ruile:** RF360 Europe GmbH, Munich, Germany

- [Piezoelectric Materials](#)

**Anthony Bennett:** Toshiba Research Lab, Cambridge, UK

- [Introduction to Semiconductor Single Photon Sources](#)

**Tetsuomi Sogawa:** NTT-BRL Atsugi, Atsugi, Japan

- [Acoustic Control of Optical Properties and Carrier Dynamics in Semiconductors](#)

**Clivia Sotomayor-Torres:** ICREA Barcelona, Barcelona, Spain

- [GHz phonons in Si phononic crystals](#)

**Seigo Tarucha:** University of Tokyo, Tokyo, Japan

- [Introduction to Quantum information: Essentials & Spin Qubits I - Qubit, entanglement and dephasing](#)

**Seigo Tarucha:** University of Tokyo, Tokyo, Japan

- [Introduction to Quantum information: Essentials & Spin Qubits II - Multiple qubits, high fidelity and versatile spin control](#)

**Matthias Weiler:** Walther-Meißner-Institut, Garching, Germany

- [Magnetoacoustics: Interaction of GHz-frequency surface acoustic waves with magnons](#)

**Christoph Westerhausen:** University of Augsburg, Augsburg, Germany

- [SAW-based catalysis](#)

**Achim Wixforth:** University of Augsburg, Augsburg, Germany

- [Introduction to Microfluidics: Honey I shrunk the lab!](#)

### 4.3 Poster Presentations

There will be two poster sessions (P1 and P2) and two poster teaser sessions (PT1 and PT2):

- **Poster Session P1**, on Wednesday, July 12 from 17h-19h, **Poster teaser session PT1**: Wednesday, July 12 from 10h45-12h15;
- **Poster Session P2**, on Friday, July 14 from 17h-19h, **Poster teaser session PT2**: Friday, July 14 from 10h45-12h15.

The participants submitting poster contributions should prepare a poster with size A0 (841 x 1189 mm<sup>2</sup>). Poster walls and materials to attach/hang the poster will be provided by the [local organization](#).

The participants are also kindly requested to prepare presentations slides for the short “Poster Teaser” talks. The short talks should be 2 min long followed by one min for questions/discussions.

Please note that the abstracts of the poster contributions in the table below can only be accessed via a password-protected link provided by the school organizers.

Poster	Author	Title
P1-1	<b>Matteo Agostini</b> (Scuola Normale Superiore di Pisa, Italy)	<a href="#">Surface acoustic wave-based biosensors and microfluidic devices for life-science applications.</a>
P1-2	<b>Gustav Andersson</b> (Chalmers University of Technology, Sweden)	<a href="#">Quantum acoustic with qubits: the SAW giant atom.</a>
P1-3	<b>Andreas Ask</b> (Chalmers University of Technology, Sweden)	<a href="#">Simulating SAW interacting with a transmon qubit using Matrix Product States.</a>
P1-4	<b>Umesh Kumar Bhaskar</b> (Purdue University, USA)	<a href="#">Acoustoelectric interactions with GHz Lamb waves.</a>

- P1-5 **André Bilobran** (University of Valencia, Spain) *High-Q one- and two-dimensional phononic cavities.*
- P1-6 **Delia Brick** (University of Konstanz, Germany) *Structural Characterization of Rolled-up GaAs/In<sub>0.2</sub>Ga<sub>0.8</sub>As Multilayer Tubes by Coherent Phonon Spectroscopy.*
- P1-7 **Laure Bruhat** (Chalmers University of Technology, Sweden) *Coupling a transmon qubit to a surface acoustic wave resonator.*
- P1-8 **Dominik Bühler** (University of Valencia, Spain) *Advanced acoustically tuned optical modulators for integrated photonics.*
- P1-9 **Edgar Cerda-Méndez** (Universidad Autónoma de San Luis Potosí, Mexico) *Modulation of polariton quantum fluids of light with surface acoustic waves.*
- P1-10 **Odilon Couto** (State University of Campinas, Brazil) *Modulation of highly piezoelectric planar optical microcavities with surface acoustic waves.*
- P1-11 **Antonio Crespo Poveda** (Materials Science Institute University of Valencia, Spain) *Tunable arrayed waveguide grating driven by surface acoustic waves.*
- P1-12 **Erno Damskägg** (Aalto University, Finland) *Squeezing of quantum noise of motion in a micromechanical resonator.*
- P1-13 **Hermann Edlbauer** (Institute Neel, CNRS, France) *Electron quantum optics on the many and single particle level.*
- P1-14 **Maria Ekström** (Chalmers University of Technology, Sweden) *Efficient conversion between electrical microwave signals and surface acoustic waves using unidirectional transducers and catch/release of microwave phonons.*
- P1-15 **Rajveer Fandan** (Universidad Politécnica de Madrid, Spain) *Acoustically-driven surface phonon-plasmon polaritons in graphene/h-BN/AlN heterostructures.*
- P1-16 **Anton Frisk Kockum** (RIKEN, Japan) *Quantum optics with giant artificial atoms in a 1D waveguide.*
- P1-17 **Giorgos Georgiou** (Institute Neel - CNRS, FRANCE) *Excitation of charge pulses at picosecond time scales.*
- P1-18 **Gina Greco** (Scuola Normale Superiore di Pisa, Italy) *Surface acoustic wave (SAW)-enhanced surface plasmon resonance (SPR) microfluidic biosensor.*
- P1-19 **Lingzhen Guo** (Karlsruhe Institute of Technology (KIT), Germany) *The giant acoustic atom – a single quantum system with a deterministic time delay.*
- P1-20 **Muhammad Hamidullah** (Istituto di Fotonica e Nanotecnologie (IFN-CNR), Italy) *Higher order quasi-longitudinal lamb wave for liquid sensing application.*
- P1-21 **Paul Helgers** (Paul-Drude-Institut für Festkörperelektronik, Germany) *Acoustic modulated single-photon sources.*
- P1-22 **Alberto Hernández-Mínguez** (Paul-Drude-Institut für Festkörperelektronik, Germany) *SAW-driven magneto-elastic dynamics in ferromagnetic layers.*
- P1-23 **Hangtian Hou** (The University of Cambridge, United Kingdom) *Spectroscopy of SAW-driven dynamic quantum dots.*

- P1-24 **TZU-KAN HSIAO** (Semiconductor Physics Group, Cavendish Laboratory, UK) *Development of a SAW-driven single-photon source in an undoped GaAs quantum well structure.*
- P1-25 **Colin Hubert** (Paul-Drude-Institut für Festkörperelektronik, Deutschland) *Mutual Indirect exciton interactions in double quantum well stacks.*
- P1-26 **Fernando Iikawa** (State University of Campinas, Brazil) *Effects of surface acoustic wave on the Raman scattering in semiconductors.*
- P1-27 **Baptiste Jadot** (CNRS - Institut Néel, France) *Towards Quantum Computing in Si MOS Technology: Single-shot Readout of Spin states in a FDSOI Split-Gate Device with Built-in Charge Detector.*
- P1-28 **Johannes Knörzer** (Max Planck Institute of Quantum Optics, Germany) *Solid-State Quantum Simulators Based on Acoustic Lattices.*
- P1-29 **Miguel Sinusía Lozano** (Instituto Sistemas Optoelectrónicos Y Microelectrónica, ISOM-ETSIT, Spain) *Synthesis and compositional analysis of reactively sputtered  $Sc_xAl_{1-x}N$  thin films.*
- P1-30 **Amit Lal** (Cornell University, USA) *GHz Ultrasonics for On Chip Delay Lines, Communications, Timing, Memory, and Sensing.*
- P2-1 **Daan Kooij** (MESA+ Institute for Nanotechnology / University of Twente, The Netherlands) *no abstract: equal to Ukropec: Ultrahigh-frequency Silicon Acousto-Electronics.*
- P2-2 **Matthias Küß** (University of Augsburg, MNTF, Germany) *Surface acoustic wave mediated magneto elastic investigation of magnetic thin film systems.*
- P2-3 **Alexander Kuznetsov** (Paul-Drude-Institut für Festkörperelektronik, Germany) *Time-resolved emission of polariton condensates in acoustic lattices.*
- P2-4 **Snezana Lazic** (Universidad Autónoma de Madrid, Spain) *Acoustic tuning of single photon emission from site-controlled GaN/InGaN nanowire heterostructures.*
- P2-5 **Hugo V. Lepage** (University of Cambridge, United Kingdom) *GPU-accelerated simulations of SAW-driven single-electron transport.*
- P2-6 **Yi-Ting Liou** (Paul-Drude-Institut für Festkörperelektronik, Germany) *Acousto-electric modulation of epitaxial graphene.*
- P2-7 **Samuel Margueron** (Université de Lorraine, France) *LiNbO<sub>3</sub> Films for High-Frequency Acoustic Wave Applications.*
- P2-8 **Sergej Markmann** (IBM Research - Zurich, Switzerland) *Coupling of surface acoustic waves and electron spins through spin-orbit interaction.*
- P2-9 **Isabella Miele** (University of Cambridge, United Kingdom) *Acoustic waveguide sensor for liquids and particle detection.*
- P2-10 **Pierre-Andre Mortemousque** (Universite Grenoble Alpes, Institut Neel, France) *Charge Control of a Nine Quantum Dot Array.*
- P2-11 **Madeleine Msall** (Bowdoin College, USA) *Surface Acoustic Wave Measurement and Control of Low-dimensional Electron Systems.*

- P2-12 **Adrian Nosek** (University of California, Riverside, USA) *Devices for investigating low temperature electronic transport in graphene under surface acoustic wave irradiation.*
- P2-13 **Emeline Nysten** (Institut für Physik, Universität Augsburg, Germany) *Hybrid quantum dots-surface acoustic wave resonators.*
- P2-14 **Ayato Okada** (The University of Tokyo, Japan) *Cavity optomechanics with surface acoustic wave.*
- P2-15 **Alexander Reiner** (Universität Augsburg, Germany) *Development of Electrically Conductive MOFs and their Integration in Multiparametric MOF@SAW Sensor Devices.*
- P2-16 **Antonio Rubino** (University of Cambridge, United Kingdom) *Development of a SAW-driven source of polarised single photons.*
- P2-17 **Mathias Sander** (University of Potsdam, Germany) *Spatio-temporal coherent control of thermal excitations in solids by two transient grating excitations.*
- P2-18 **Jorge Santos** (Aalto University, Finland) *Approaching the quantum ground state in millimeter-sized piezoelectric resonators.*
- P2-19 **Marco Scigliuzzo** (Chalmers University of Technology, Sweden) *Population inversion and stimulated emission of phonons in a transmon qubit coupled to phonons.*
- P2-20 **Miguel Sinusía Lozano** (Instituto Sistemas Optoelectrónicos Y Microelectrónica, ISOM-ETSIT, Spain) *Temperature characterization of SAW resonators on  $Sc_xAl_{1-x}N$ /poly-diamond layered structure.*
- P2-21 **Matthew Storey** (Purdue University, USA) *Numerical FEA Modeling of the Acousto-Electric Effect in SAW Piezoelectric-Semiconductor Heterostructures.*
- P2-22 **Shintaro Takada** (Institut Neel / CNRS, France) *Demonstration of a directional coupler for a single flying electron transferred by surface acoustic waves.*
- P2-23 **Shuhui Tang** (Purdue University, the United State) *Read out circuit for RF correlator using surface acoustic wave.*
- P2-24 **Lars Tiemann** (University of Hamburg, Germany) *Giant acoustoelectric current in suspended quantum point contacts.*
- P2-25 **Robert Ukropec** (MESA+ Institute for Nanotechnology / University of Twente, The Netherlands) *Ultrahigh frequency silicon acoustoelectronics.*
- P2-26 **Nicolás Antonio Ulloa Castillo** (Paul-Drude-Institut für Festkörperelektronik, Germany) *Acoustic fields to explore coherent electron spin transport in dipolaritons condensates.*
- P2-27 **Yigitcan Uzun** (University of Twente, MESA+ Institute for Nanotechnology, Netherlands) *Complex-oxide Acousto Electronics.*
- P2-28 **Bruno Villa** (Toshiba Research Europe Ltd., United Kingdom) *Monolithic and hybrid quantum photonic devices.*
- P2-29 **Sixuan Wang** (University of Augsburg, Germany) *SAW-assisted water splitting reaction.*

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P2-30	<b>Masahiko Yokoi</b> (Osaka University, Japan)	<i>Electrical conduction of NbSe<sub>2</sub> thin film modulated by surface acoustic wave.</i>
P2-31	<b>Mingyun Yuan</b> (Paul-Drude-Institut für Festkörperelektronik, Germany)	<i>Generation of non-piezoelectric surface acoustic waves with ZnO/Au layers.</i>

## 5 Appendix

### 5.1 School program

The program of the Summer School is listed in the next pages. Please note that the sessions marked *SAWtrain internal meeting* on Monday July 17 from 14h to 16h and on Tuesday July 18 from 10h15 to 12h30 are exclusively for members of the SAWtrain network (free time for the other participants).





## SAWtrain Summer School

### Physics and applications of GHz vibrations in semiconductors

Jul 11–21, 2017: Institut d'Etudes Scientifiques de Cargèse ([IESC](#)), Corsica, France

#### Program (week 1): July 10-15, 2017

##### Monday 10/07:

ARRIVAL: 2 buses are organized from Ajaccio airport to IESC ([schedule](#))

19:30 *Apero de Bienvenue*

##### Tuesday 11/07

8:30 - 8:40	<i>Welcome address</i>	
8:40 - 10:15	Tu01: W. Dietsche	<i>Physics of Acoustic Phonons in the 1 GHz to 1 THz range- Part I</i>
10:15 - 10:45	<i>Coffee break</i>	
10:45 - 12:30	Tu02: A. Kent	<i>Introduction to Acoustic Waves I</i>
12:30 - 14:00	<i>Lunch</i>	
14:00 - 15:00	ST1: C. Caliendo	<i>SAW-based Sensors</i>
15:00 - 15:30	<i>Coffee break</i>	
15:30 - 16:30	ST2: J.-P. Poizat	<i>Hybrid Nanomechanical Systems</i>

##### Wednesday 12/07

8:30 - 10:15	Tu03: A. Fainstein	<i>Introduction to acousto-optical Interactions</i>
10:15 - 10:45	<i>Coffee break</i>	
10:45 - 12:30	<b>Poster Talks 1:</b>	30 presentations, 3 min per presentation
12:30 - 14:00	<i>Lunch</i>	
14:00 - 16:30	<b>Poster Session 1</b> (refreshments at 15h)	

##### Thursday 13/07

8:30 - 10:15	Tu04: A. Kent	<i>Introduction to Acoustic Waves II</i>
10:15 - 10:45	<i>Coffee break</i>	
10:45 - 12:30	Tu05: W. Dietsche	<i>Physics of Acoustic Phonons in the 1 GHz to 1 THz range- Part II</i>
12:30 - 14:00	<i>Lunch</i>	
14:00 - 15:00	ST3: M. Weiler	<i>Magnetoacoustics: Interaction of GHz-frequency surface Acoustic waves with magnons</i>
15:00 - 15:30	<i>Coffee break</i>	
15:30 - 16:30	ST4: W. Ruile	<i>Piezoelectric Materials</i>

##### Friday 14/07

8:30 - 10:15	Tu06: G. Fischerauer	<i>Introduction to Surface Acoustic Waves: Fundamentals and Applications I</i>
10:15 - 10:45	<i>Coffee break</i>	
10:45 - 12:30	<b>Poster Talks 2:</b>	30 presentations, 3 min per presentation
12:30 - 14:00	<i>Lunch</i>	
14:00 - 16:30	<b>Poster Session 2</b> (refreshments at 15h)	

[https://d.docs.live.net/2912b554a38cdb41/SAWTrain-Admin/Events/SAWtrain\\_summer\\_school\\_cargese/Applications/SAWtrain\\_Summer\\_School\\_Program.docx](https://d.docs.live.net/2912b554a38cdb41/SAWTrain-Admin/Events/SAWtrain_summer_school_cargese/Applications/SAWtrain_Summer_School_Program.docx)

**Saturday 15/07**

8:30 - 10:15	Tu07: P. Delsing	<i>Introduction to Quantum Acoustics: Essentials &amp; SAW/SC Qubit Coupling I</i>
10:15 - 10:45	Coffee break	
10:45 - 12:30	Tu08: G. Fischerauer	<i>Introduction to Surface Acoustic Waves: Fundamentals and Applications II</i>
12:30 - 14:00	Lunch	
14:00 - 17:00	Excursion: "Promenade en mer"	

**Program (week 2): July 17-22, 2017****Monday 17/07:**

8:30 - 10:15	Tu09: A. Wixforth	<i>Introduction to Microfluidics: Honey, I shrunk the lab!</i>
10:15 - 10:45	Coffee break	
10:45 - 12:30	Tu10: S. Tarucha	<i>Introduction to Quantum information: Essentials &amp; Spin Qubits I</i>
12:30 - 14:00	Lunch	
14:00 - 16:00	Free time (Internal review meeting for members of the SAWtrain network)	
16:00 - 18:00	PhD talks I	Presentations from students of the SAWtrain network
18:00 - 19:00	ST6: C. Ford	<i>Single-Carrier Manipulation</i>

**Tuesday 18/07**

8:30 - 10:15	PhD talks II	Presentations from students of the SAWtrain network
10:15 - 10:45	Coffee break	
10:45 - 12:30		SAWtrain internal review meeting (free time for non-SAWtrain participants)
12:30 - 14:00	Lunch	
14:00 - 15:00	ST7: P. Leek	<i>Coupling superconducting qubits to surface acoustic wave resonators</i>
15:00 - 15:30	Coffee break	
15:30 - 16:30	ST8: T. Meunier	<i>Single Spin Transport</i>
16:30 - 19:30	Free time	
19:30 - 20:30	Classical music concert	

**Wednesday 19/07**

<b>8:30 - 12:30</b>	<b>SYMPOSIUM: Applications of Acousto-Electric Devices</b>	
8:30 - 9:20	T. Sogawa	<i>Acoustic Control of Optical Properties and Carrier Dynamics in Semiconductors</i>
9:20 - 10:15	T. Metzger:	<i>Micro-acoustic Technologies and System Integration for LTE based Mobile Phones</i>
10:15 - 10:45	Coffee break	
10:45 - 11:35	C. Sotomayor:	<i>Phonon Propagation in Two-Dimensional Phononic Crystal</i>
11:40 - 12:30	Discussion round moderated by A. Wixforth and A. Bennett	
12:30 - 14:00	Lunch	
14:00 - 15:00	ST9: C. Westerhausen	<i>SAW-based Catalysis</i>
15:00 - 15:30	Coffee break	
15:30 - 16:30	ST10: H. Krenner	<i>Interfacing quantum emitters by propagating surface acoustic waves</i>

**Thursday 20/07**

8:30 - 10:15	Tu12: S. Tarucha	<i>Introduction to Quantum information: Essentials &amp; Spin Qubits II</i>
10:15 - 10:45	Coffee break	
10:45 - 12:30	Tu13: A. Bennett	<i>Introduction to Quantum information: Single Photon Sources</i>
12:30 - 14:00	Lunch	
14:00 - 15:00	ST11: G. Johansson	<i>The giant acoustic atom – a single quantum system with a deterministic</i>

15:00 - 15:30	Coffee break	<i>time delay</i>
15:30 - 16:30	ST12: P. Delsing	<i>Introduction to Quantum Acoustics: Essentials &amp; SAW/SC Qubit Coupling II</i>
16:30 - 19:30	Free time	
19:30	Institut's barbecue	
<b>Friday 21/07</b>		
8:30 - 10:15	Tu14: F. Marquardt	<i>Introduction to Nanomechanics</i>
10:15 - 10:45	Coffee break	
10:45 - 12:30	Tu15: A. Cleland	<i>Quantum Nanomechanics</i>
12:30 - 12:45	Closing	
12:45 - 14:00	Lunch	

**Saturday 22/07:** DEPARTURE: buses will be organized from IESC to Ajaccio airport ([schedule](#)). In case of sufficient demand, an extra bus may be organized for participants with return flight on Friday evening (21/07).

**Lectures:**

- **Tutorials (Tu): 90 min tutorial + 15 min questions**
- **Short Lectures (ST): 45 min scientific talk + 15 min questions**

## 5.2 Poster Presentations and Talks

There will be two poster sessions (P1 and P2) and two poster teaser sessions (PT1 and PT2, see Sec. 4.3):

- **Poster Session P1**, on Wednesday, July 12 from 17h-19h, **Poster Teaser Session PT1**: Wednesday, July 12 from 10h45-12h15;
- **Poster Session P2**, on Friday, July 14 from 17h-19h, **Poster Teaser Session PT2**: Friday, July 14 from 10h45-12h15.

Poster	Author and Title
P1/PT1-1	<b>Matteo Agostini</b> : <i>Surface acoustic wave-based biosensors and microfluidic devices for life-science applications.</i>
P1/PT1-2	<b>Gustav Andersson</b> : <i>Quantum acoustic with qubits: the SAW giant atom.</i>
P1/PT1-3	<b>Andreas Ask</b> : <i>Simulating SAW interacting with a transmon qubit using Matrix Product States.</i>
P1/PT1-4	<b>Umesh Kumar Bhaskar</b> : <i>Acoustoelectric interactions with GHz Lamb waves.</i>
P1/PT1-5	<b>André Bilobran</b> : <i>High-Q one- and two-dimensional phononic cavities.</i>
P1/PT1-6	<b>Delia Brick</b> : <i>Structural Characterization of Rolled-up GaAs/In<sub>0.2</sub>Ga<sub>0.8</sub>As Multilayer Tubes by Coherent Phonon Spectroscopy.</i>
P1/PT1-7	<b>Laure Bruhat</b> : <i>Coupling a transmon qubit to a surface acoustic wave resonator.</i>
P1/PT1-8	<b>Dominik Bühler</b> : <i>Advanced acoustically tuned optical modulators for integrated photonics.</i>
P1/PT1-9	<b>Edgar Cerda-Méndez</b> : <i>Modulation of polariton quantum fluids of light with surface acoustic waves.</i>
P1/PT1-10	<b>Odilon Couto</b> : <i>Modulation of highly piezoelectric planar optical microcavities with surface acoustic waves.</i>
P1/PT1-11	<b>Antonio Crespo Poveda</b> : <i>Tunable arrayed waveguide grating driven by surface acoustic waves.</i>
P1/PT1-12	<b>Erno Damskågg</b> : <i>Squeezing of quantum noise of motion in a micromechanical resonator.</i>
P1/PT1-13	<b>Hermann Edlbauer</b> : <i>Electron quantum optics on the many and single particle level.</i>
P1/PT1-14	<b>Maria Ekström</b> : <i>Efficient conversion between electrical microwave signals and surface acoustic waves using unidirectional transducers and catch/release of microwave phonons.</i>
P1/PT1-15	<b>Rajveer Fandan</b> : <i>Acoustically-driven surface phonon-plasmon polaritons in graphene/h-BN/AlN heterostructures.</i>
P1/PT1-16	<b>Anton Frisk Kockum</b> : <i>Quantum optics with giant artificial atoms in a 1D waveguide.</i>
P1/PT1-17	<b>Giorgos Georgiou</b> : <i>Excitation of charge pulses at picosecond time scales.</i>
P1/PT1-18	<b>Gina Greco</b> : <i>Surface acoustic wave (SAW)-enhanced surface plasmon resonance (SPR) microfluidic biosensor.</i>
P1/PT1-19	<b>Lingzhen Guo</b> : <i>The giant acoustic atom – a single quantum system with a deterministic time delay.</i>

- P1/PT1-20 **Muhammad Hamidullah:** *Higher order quasi-longitudinal lamb wave for liquid sensing application.*
- P1/PT1-21 **Paul Helgers:** *Acoustic modulated single-photon sources.*
- P1/PT1-22 **Alberto Hernández-Mínguez:** *SAW-driven magneto-elastic dynamics in ferromagnetic layers.*
- P1/PT1-23 **Hangtian Hou:** *Spectroscopy of SAW-driven dynamic quantum dots.*
- P1/PT1-24 **TZU-KAN HSIAO:** *Development of a SAW-driven single-photon source in an undoped GaAs quantum well structure.*
- P1/PT1-25 **Colin Hubert:** *Mutual Indirect exciton interactions in double quantum well stacks.*
- P1/PT1-26 **Fernando Iikawa:** *Effects of surface acoustic wave on the Raman scattering in semiconductors.*
- P1/PT1-27 **Baptiste Jadot:** *Towards Quantum Computing in Si MOS Technology: Single-shot Readout of Spin states in a FDSOI Split-Gate Device with Built-in Charge Detector.*
- P1/PT1-28 **Johannes Knörzer:** *Solid-State Quantum Simulators Based on Acoustic Lattices.*
- P1/PT1-29 **Miguel Sinusía Lozano:** *Synthesis and compositional analysis of reactively sputtered  $Sc_xAl_{1-x}N$  thin films.*
- P1/PT1-30 **Amit Lal:** *GHz Ultrasonics for On Chip Delay Lines, Communications, Timing, Memory, and Sensing.*
- P2/PT2-1 **Daan Kooij:** *no abstract: equal to Ukropec: Ultrahigh-frequency Silicon Acousto-Electronics.*
- P2/PT2-2 **Matthias Küß:** *Surface acoustic wave mediated magneto elastic investigation of magnetic thin film systems.*
- P2/PT2-3 **Alexander Kuznetsov:** *Time-resolved emission of polariton condensates in acoustic lattices.*
- P2/PT2-4 **Snezana Lazic:** *Acoustic tuning of single photon emission from site-controlled GaN/InGaN nanowire heterostructures.*
- P2/PT2-5 **Hugo V. Lepage:** *GPU-accelerated simulations of SAW-driven single-electron transport.*
- P2/PT2-6 **Yi-Ting Liou:** *Acousto-electric modulation of epitaxial graphene.*
- P2/PT2-7 **Samuel Margueron:**  *$LiNbO_3$  Films for High-Frequency Acoustic Wave Applications.*
- P2/PT2-8 **Sergej Markmann:** *Coupling of surface acoustic waves and electron spins through spin-orbit interaction.*
- P2/PT2-9 **Isabella Miele:** *Acoustic waveguide sensor for liquids and particle detection.*
- P2/PT2-10 **Pierre-Andre Mortemousque:** *Charge Control of a Nine Quantum Dot Array.*
- P2/PT2-11 **Madeleine Msall:** *Surface Acoustic Wave Measurement and Control of Low-dimensional Electron Systems.*
- P2/PT2-12 **Adrian Nosek:** *Devices for investigating low temperature electronic transport in graphene under surface acoustic wave irradiation.*
- P2/PT2-13 **Emeline Nysten:** *Hybrid quantum dots-surface acoustic wave resonators.*
- P2/PT2-14 **Ayato Okada:** *Cavity optomechanics with surface acoustic wave.*
- P2/PT2-15 **Alexander Reiner:** *Development of Electrically Conductive MOFs and their Integration in Multiparametric MOF@SAW Sensor Devices.*

- P2/PT2-16 **Antonio Rubino:** *Development of a SAW-driven source of polarised single photons.*
- P2/PT2-17 **Mathias Sander:** *Spatio-temporal coherent control of thermal excitations in solids by two transient grating excitations.*
- P2/PT2-18 **Jorge Santos:** *Approaching the quantum ground state in millimeter-sized piezoelectric resonators.*
- P2/PT2-19 **Marco Scigliuzzo:** *Population inversion and stimulated emission of phonons in a transmon qubit coupled to phonons.*
- P2/PT2-20 **Miguel Sinusía Lozano:** *Temperature characterization of SAW resonators on  $Sc_xAl_{1-x}N$ /poly-diamond layered structure.*
- P2/PT2-21 **Matthew Storey:** *Numerical FEA Modeling of the Acousto-Electric Effect in SAW Piezoelectric-Semiconductor Heterostructures.*
- P2/PT2-22 **Shintaro Takada:** *Demonstration of a directional coupler for a single flying electron transferred by surface acoustic waves.*
- P2/PT2-23 **Shuhui Tang:** *Read out circuit for RF correlator using surface acoustic wave.*
- P2/PT2-24 **Lars Tiemann:** *Giant acoustoelectric current in suspended quantum point contacts.*
- P2/PT2-25 **Robert Ukropec:** *Ultrahigh frequency silicon acousto-electronics.*
- P2/PT2-26 **Nicolás Antonio Ulloa Castillo:** *Acoustic fields to explore coherent electron spin transport in dipolaritons condensates.*
- P2/PT2-27 **Yigitcan Uzun:** *Complex-oxide Acousto Electronics.*
- P2/PT2-28 **Bruno Villa:** *Monolithic and hybrid quantum photonic devices.*
- P2/PT2-29 **Sixuan Wang:** *SAW-assisted water splitting reaction.*
- P2/PT2-30 **Masahiko Yokoi:** *Electrical conduction of  $NbSe_2$  thin film modulated by surface acoustic wave.*
- P2/PT2-31 **Mingyun Yuan:** *Generation of non-piezoelectric surface acoustic waves with  $ZnO/Au$  layers.*

## 5.3 Summer School poster



**SAWtrain Summer School**  
Jul 11-21, 2017: Institut d'Etudes Scientifiques  
de Cargèse, Corsica, France

 **ABSTRACT DEADLINE MARCH 20, 2017**  
[summerschool.sawtrain.eu](http://summerschool.sawtrain.eu)

**Physics and applications of GHz vibrations****Lecturers**

C. Caliendo (CNR, Italy)	T. Meunier (Institut Néel, France)
M. M. de Lima, Jr (University of Valencia, Spain)	G. Nash (Exeter University, UK)
P. Delsing (Chalmers University, Sweden)	J. P. Poizat (Institut Néel, France)
W. Dietsche (Max-Planck-Institut, Germany)	L. Reindl (University of Freiburg, Germany)
A. Fainstein (CA, Bariloche, Argentina)	W. Ruile (EPCOS, Germany)
C. Ford (University of Cambridge, UK)	A. Shields (Toshiba Europe, UK)
G. Johansson (Chalmers University, Sweden)	T. Sogawa (NTT-BRL, Japan)
A. Kent (University of Nottingham, UK)	C. Sotomayor-Torres (ICREA, Barcelona, Spain)
H. Krenner (University of Augsburg, Germany)	S. Tarucha (University of Tokyo, Japan)
P. Leek (Oxford University, UK)	M. Weiler (Walter-Schottky-Institut, Germany)
F. Marquardt (Erlangen University, Germany)	C. Westerhausen (University of Augsburg, Germany)
T. Metzger (EPCOS, Germany)	A. Wixforth (University of Augsburg, Germany)

Organizers: Christopher Bäuerle, Per Delsing, Paulo V. Santos, Achim Wixforth



## 5.4 List of Participants

Name	Affiliation	S <sup>1</sup>
Matteo Agostini	Scuola Normale Superiore di Pisa, Pisa, Italy	P
Gustav Andersson	Chalmers University of Technology, Gothenburg, Sweden	P
Andreas Ask	Chalmers University of Technology, Göteborg, Sweden	P
Christopher Bäuerle	Institut Neel, CNRS, Grenoble, France	O
Umesh Kumar Bhaskar	Purdue University, West Lafayette, USA	P
André Bilobran	University of Valencia, Paterna (Valencia), Spain	P
Delia Brick	University of Konstanz, Konstanz, Germany	P
Laure Bruhat	Chalmers University of Technology, Göteborg, Sweden	P
Dominik Bühler	University of Valencia, Paterna, Spain	P
Cinzia Caliendo	CNR, Rome, Rome, Italy	I
Andres Cantarero	University of Valencia, Valencia, Spain	P
Edgar Cerda-Méndez	Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico	P
Andrew Cleland	University of Chicago, Chicago, US	I
Odilon Couto	State University of Campinas, Campinas - SP, Brazil	P
Antonio Crespo Poveda	Materials Science Institute University of Valencia, Valencia, Spain	P
Erno Damskägg	Aalto University, Espoo, Finland	P
Per Delsing	Chalmers University, Goteborg, Sweden	I
Werner Dietsche	Max-Planck-Institut, Stuttgart, Germany	I
Hermann Edlbauer	Institute Neel, CNRS, Grenoble, France	P
Maria Ekström	Chalmers University of Technology, Göteborg, Sweden	P
Alex Fainstein	Centro Atomico de Bariloche, Bariloche, Argentina	I
Rajveer Fandan	Universidad Politecnica de Madrid, Madrid, Spain	P
Gerhard Fischerauer	University of Bayreuth, Bayreuth, Germany	I
Chris Ford	University of Cambridge, Cambridge, UK	I
Céspedes Urquieta Francisco	Institut Català de Nanociència i Nanotecnologia, Barcelona, Spain	P
Anton Frisk Kockum	RIKEN, Wako, Saitama, Japan	P
Giorgos Georgiou	Institute Neel - CNRS, Grenoble, FRANCE	P
Gina Greco	Scuola Normale Superiore di Pisa, Pisa, Italy	P
Lingzhen Guo	Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany	P
Kai Hablitzel	Paul Drude Institute, Berlin, Germany	O
Muhammad Hamidullah	Istituto di Fotonica e Nanotecnologie (IFN-CNR), Roma, Italy	P
Paul Helgers	Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany	P
Alberto Hernández-Mínguez	Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany	P
Hangtian Hou	The University of Cambridge, Cambridge, United Kingdom	P
Tzu-Kan Hsiao	Semiconductor Physics Group, Cavendish Laboratory, Cambridge, UK	P
Colin Hubert	Paul Drude Institut für Festkörperelektronik, Berlin, Deutschland	P
Fernando Iikawa	State University of Campinas, Campinas-SP, Brazil	P
Baptiste Jadot	CNRS - Institut Néel, Grenoble, France	P
Göran Johansson	Chalmers University, Goteborg, Sweden	I
Anthony Kent	Univ. of Nottingham, Nottingham, UK	I
Johannes Knörzer	Max Planck Institute of Quantum Optics, Garching, Germany	P
Daan Kooij	MESA+ Institute for Nanotechnology, Univ. of Twente, Enschede, The Netherlands	P
Hubert Krenner	University of Augsburg, Augsburg, Germany	I
Matthias Küß	University of Augsburg, MNTF, Augsburg, Germany	P
Alexander Kuznetsov	Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany	P
Amit Lal	Cornell University, New York, USA	P
Snezana Lasic	Universidad Autónoma de Madrid, Madrid, Spain	P
Peter Leek	Oxford University, Erlangen, Germany	I
Hugo V. Lepage	University of Cambridge, Cambridge, United Kingdom	P
Yi-Ting Liou	Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany	P
Samuel Margueron	Université de Lorraine, Metz, France	P
Sergej Markmann	IBM Research - Zurich, Rüschlikon, Switzerland	P
Florian Marquardt	University of Erlangen, Oxford, UK	I

<sup>1</sup>(I)nvited, (P)articipant, (O)rganizer



Thomas Metzger	Qualcomm Germany RFFE GmbH, Munich, Germany	I
Tristan Meunier	Institut Neel, Grenoble, France	I
Isabella Miele	University of Cambridge, Cambridge, United Kingdom	P
Pierre-Andre Mortemousque	Universite Grenoble Alpes, Institut Neel, Grenoble, France	P
Madeleine Msall	Bowdoin College, Brunswick, Maine, USA	P
Geoffrey Nash	Exeter University, Exeter, UK	I
Adrian Nosek	University of California, Riverside, Riverside, USA	P
Emeline Nysten	Institut für Physik, Universität Augsburg, Augsburg, Germany	P
Ayato Okada	The University of Tokyo, Japan	P
Jorge Pedrós	Universidad Politécnica de Madrid, Madrid, Spain	P
Jean-Philippe Poizat	Institut Neel, Grenoble, France	I
Alexander Reiner	Universität Augsburg, Augsburg, Germany	P
Antonio Rubino	University of Cambridge, Cambridge, United Kingdom	P
Werner Ruile	RF360 Europe GmbH, Munich, Germany	I
Mathias Sander	University of Potsdam, Potsdam, Germany	P
Jorge Santos	Aalto University, Espoo, Finland	P
Paulo V. Santos	Paul Drude Institute, Berlin, Germany	O
Marco Scigliuzzo	Chalmers University of Technology, Göteborg, Sweden	P
Anthony Bennett	Toshiba Research Lab, Cambridge, UK	I
Miguel Sinusía Lozano	Instituto Sistemas Optoelectrónicos y Microelectrónica, ISOM, Madrid, Spain	P
Tetsuomi Sogawa	NTT-BRL, Atsugi, Atsugi, Japan	I
Max Sonner	Univ. Augsburg, Polling, Germany	P
Clivia Sotomayor-Torres	ICREA, Barcelona, Barcelona, Spain	I
Matthew Storey	Purdue University, West Lafayette, Indiana, USA	P
Shintaro Takada	Institut Neel / CNRS, Grenoble Cedex 9, France	P
Shuhui Tang	Purdue University, West Lafayette, the United State	P
Seigo Tarucha	University of Tokyo, Tokyo, Japan	I
Lars Tiemann	University of Hamburg, Hamburg, Germany	P
Robert Ukropec	MESA+ Institute for Nanotechnology / University of Twente, Enschede, The Netherlands	P
Nicolás Antonio Ulloa Castillo	Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany	P
Yigitcan Uzun	University of Twente, MESA+ Institute for Nanotechnology, Enschede, Netherlands	P
Wilfred van der Wiel	University of Twente, Enschede, The Netherlands	P
Bruno Villa	Toshiba Research Europe Ltd., Cambridge, United Kingdom	P
Sixuan Wang	University of Augsburg, Augsburg, Germany	P
Matthias Weiler	Walther-Meißner-Institut, Garching, Germany	I
Christoph Westerhausen	University of Augsburg, Augsburg, Germany	I
Achim Wixforth	University of Augsburg, Augsburg, Germany	I
Masahiko Yokoi	Osaka University, Toyonaka, Japan	P
Mingyun Yuan	Paul-Drude-Institut, Berlin, Germany	P

# Program overview

## First week

Time	Mo 10/07	Tu 11/07	We 12/07	Th 13/07	Fr 14/07	Sa 15/07
8h30-10h15	Arrival	Welcome Tu <sub>1</sub> (1.5h) Dietsche	Tu <sub>3</sub> (1.5h) Fainstein	Tu <sub>4</sub> (1.5h) Kent	Tu <sub>6</sub> (1.5h) Fischerauer	Tu <sub>7</sub> (1.5h) Delsing
10h15-10h45	10h15-10h45 Coffee break					
10h45-12h30	Arrival	Tu <sub>2</sub> (1.5h) Kent	Poster Talk 1(a)	Tu <sub>5</sub> (1.5h) Dietsche	Poster Talk 2(a)	Tu <sub>8</sub> (1.5h) Fischerauer
12h30-14h	12h30-14h Lunch					
14h-15h		ST <sub>1</sub> (45 min) Caliendo	Poster 1(a) refreshments	ST <sub>3</sub> (45 min) Weiler	Poster 2(a) refreshments	
15h:15h30		refreshments		refreshments		
15h30-16h30		ST <sub>2</sub> (45 min) Poizat		ST <sub>4</sub> (45 min) Ruile		
19h30	"Apero de Bienvenue"	Dinner (own program)				

## Second week

Time	Mo 17/07	Tu 18/07	We(b) 19/07	Th 20/07	Fr 21/07	Sa 22/07	
8h30-9h20	Tu <sub>9</sub> (1.5h) Wixforth	PhD talks (SAWtrain)	Sogawa	Tu <sub>12</sub> (1.5h) Tarucha	Tu <sub>14</sub> (1.5h) Marquardt	Departure	
9h20-10h15			Metzger				
10h15-10h45	10h15-10h45 Coffee break						
10h45-11h35	Tu <sub>10</sub> (1.5h) Tarucha	SAWtrain meeting (free for others)	Sotomayor	Tu <sub>13</sub> (1.5h) Bennett	Tu <sub>15</sub> (1.5h) Cleland		
11h40-12h30			Wixforth Bennett				
12h30-14h	12h30-14h Lunch				Closing		
14h-15h	SAWtrain meeting (free for others)	ST <sub>7</sub> (45 min) Leek	ST <sub>9</sub> (45 min) Westerhausen	ST <sub>11</sub> (45 min) Johansson	Departure		
15h:15h30		refreshments	refreshments	refreshments			
15h30-16h		ST <sub>8</sub> (45 min) Meunier	ST <sub>10</sub> (45 min) Krenner	ST <sub>12</sub> (45 min) Delsing			
16h-16h30	PhD talks (SAWtrain)	free time	free time	free time	Departure		
17h-18h							
18h-19h	ST <sub>5</sub> (45min) Ford						
19h30	Dinner (own program)	Classical music concert	Dinner (own program)	Barbecue			

(a) See complete program for details; (b)Symposium: "Applications of Acousto-Electric Devices"

- Tutorials (Tu): 90 min long with additional 15 min for discussions.
- Short lectures (ST): 45 min talks with additional 15 min for discussions.
- Poster and Poster Talks: see program on page 20;
- Sessions *SAWtrain internal meeting*: only for members of the SAWtrain network.
- The **full program** can be found on page 16.