



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

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

Cargèse, France – July 11-21, 2017

Booklet: links to [Invited Lectures](#), [Talks and Posters](#)



SAWtrain  
network



## Summer School Program

### 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) 5 Short Talks	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) Fischerauer	Poster Talk 1(a)	Tu <sub>5</sub> (1.5h) Dietsche	Poster Talk 2(a)	Tu <sub>8</sub> (1.5h) Lal
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	Boat excursion "Promenade en mer"
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  9h20-10h15	Tu <sub>9</sub> (1.5h) Wixforth	PhD talks (SAWtrain)	Sogawa  Metzger	Tu <sub>12</sub> (1.5h) Tarucha	Tu <sub>14</sub> (1.5h) Marquardt	Departure
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		
17h-18h						
18h-19h	ST <sub>5</sub> (45min) Ford	Classical music concert	Dinner (own program)	Barbecue		
19h30	Dinner (own program)					

(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 9;
- Sessions *SAWtrain internal meeting*: only for members of the SAWtrain network.
- The **full program** can be found on page 17.

# Contents

<b>1</b>	<b>Welcome!</b>	<b>3</b>
<b>2</b>	<b>Venue</b>	<b>4</b>
<b>3</b>	<b>Organization</b>	<b>5</b>
3.1	Topics . . . . .	6
3.2	Organizing Committee . . . . .	7
3.3	Program Committee . . . . .	7
3.4	Sponsors . . . . .	8
<b>4</b>	<b>Program</b>	<b>9</b>
4.1	Overview . . . . .	9
<b>5</b>	<b>Talks and Posters</b>	<b>9</b>
5.1	Welcome and Closing Sessions . . . . .	10
5.2	Invited Lectures . . . . .	10
5.3	Short Talks . . . . .	11
5.3.1	Short Talks from Participants . . . . .	11
5.3.2	Talks from SAWtrain PhD Students . . . . .	12
5.4	Posters and Poster Talks . . . . .	13
5.4.1	Posters and Poster Talks I . . . . .	13
5.4.2	Poster Talks II . . . . .	15
<b>6</b>	<b>Appendix</b>	<b>17</b>
6.1	School program . . . . .	17
6.2	Photos . . . . .	21
6.2.1	Group photo: first week . . . . .	22
6.2.2	Group photo: second week . . . . .	23
6.3	Summer School poster . . . . .	24
6.4	List of Participants . . . . .	25

## 1 Welcome!

**SAWtrain Summer School:** “Physics and applications of GHz vibrations in semiconductors” took 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 was organized by the [IESC](#) and the European Marie Skłodowska Curie network [SAWtrain](#).

The Summer School aimed to gather leading scientists working in the emerging field of high frequency vibrations in semiconductor and related materials. These experts provided a solid training at PhD & Post-Doc level and beyond as well as 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 would like to thank all participants for attending the Summer School! We have had the attendance of over 90 participants, including 24 lecturers and the members of the organizing committee. We have had an international audience with a wide geographical distribution of participants coming from 17 different countries. We would specially like to acknowledge the large number of participants from overseas including eight from North America, three from South America, and five from Asia.

We thank the members of the program committee (Sec. 3.3) for their excellent job in the selection of the scientific contributions. The organization of the school counted on the great support from the IESCS team: here, we would like to thank the local staff in Cargèse and, in particular Brigitte Cassegrain, Dominique Donzella, and Nathalie Giudicelli. We are also indebted to Kai Hablitzel for the support for the SAWtrain network and Irene Krawczyk for the nice website and logo. Finally, we thank all sponsors (see list in Sec. 3.4) for the support of the SAWtrain Summer School!

## 2 Venue

The summer school took 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 IESCS [website](#). Accommodation on campus or on the Village of Cargèse was provided between July 10, 2017 (arrival) and July 22, 2017 (departure). We have provided bus (or taxi) transfers between Ajaccio's airport and the IESCS campus on July 10 and on July 21 and 22. For information on public transportation between Ajaccio and Cargèse, the participants could also

use the information in the sites [CorsicaBus](#) or [bus schedule](#).

### 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 scientific program of the School provided 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 was 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 was vibrations in the form of surface acoustic waves (SAW), which are modes propagating on a surface. Emphasis was 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 as well as potential applications in electronic and optoelectronic devices.

The program (see Sec. 6.1) combined comprehensive lectures on the above subjects by leading experts with specialized contributions reporting on the latest developments in the field. The vast, pluridisciplinary topical scope was conveyed via the following pedagogic instruments:

- tutorial lectures by recognized experts, allowing the different groups to share a common knowledge basis to facilitate discussion;
- seminars introducing recent advances and new trends;
- presentations from the participants promoting discussions involving experts leading to network building and scientific collaborations.

The two-weeks duration of the School ensured 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 participants and senior researchers, a difficult task to achieve in regular conferences.

The school was 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 semiconductors and related materials from Europe, Asia and America. A review meeting of the network was integrated in the program of the school on July 17 and 18, 2017. The summer school was 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 was highly beneficial for networking purposes, especially for the young researches to build up firsthand contacts with the leading scientists in the field. Simultaneously, it brought together academic and industrial partners working in the field. On the other hand, the school was a forum for discussions about the future perspectives for the field.

We have the attendance of over 90 participants, including 24 lecturers and the four members of the organizing committee. The participants had a wide geographical distribution including, in addition to Europe, several residents of North and South America and Asia.

### 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 was to help in the creation of a new domain of research, relying on emerging physical concepts and renewed investigation techniques. The program covered 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 crys-  
tals / 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 of the Summer School was 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'Etudes Scientifiques de Cargese  
([www.iesc.univ-corse.fr](http://www.iesc.univ-corse.fr))



Nanosciences foundation  
([fondation-nanosciences.fr](http://fondation-nanosciences.fr))



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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. 6.1. 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 (normally 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.). The list of tutorials can be found in Sec. 5.2;
- seminars (1 h long including 15 in discussions), which will cover the most recent developments in the field. The latter also included a symposium on *Applications of Acousto-Electric Devices* on Wed. July 19, 2017 with contributions from the academic and industrial sectors. The list of lectures can be found in Sec. 5.2;
- contributions from participants in the form of posters (4 h long poster sessions, Sec. 5.4) and short exposures (10-20 min-long talks, cf. Secs. 5.3 and 5.3.2);

We thank all invited lectures for participating in the SAWtrain Summer School!

## 5 Talks and Posters

We would like to thank all lecturers for their excellent contributions to the Summer School! We have got a lot of positive feedback from the participants concerning the high quality of the presentation!

In the following tables you will find the complete list of lectures and posters as well as password-protected links to the abstracts for the lectures and posters, as well as to the slides provided by the lecturers for access by the participants (SAWtrain members can also log in using their credential for the SAWtrain cloud server). The links will be distributed to the participants by email.

## 5.1 Welcome and Closing Sessions

Lecture	Title
<b>Chris Bäuerle</b> , Institut Néel (Grenoble, France)	<i>Welcome to the SAWtrain Summer School</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Chris Bäuerle</b> , Institut Néel (Grenoble, France)	<i>SAWtrain Summer School: closing remarks</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>The SAWtrain Organizing Committee</b> , Institut Néel (Grenoble, France)	<i>Group Photos</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).

## 5.2 Invited Lectures

The list of invited lecturers together with links to their abstracts and talks are found in the following table.

Lecture	Title
<b>Cinzia Caliendo</b> , CNR Rome (Rome, Italy)	<i>SAW-based Sensors</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Per Delsing</b> , Chalmers University (Goteborg, Sweden)	<i>Introduction to Quantum Acoustics : Essentials &amp; SAW/SC Qubit Coupling</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Werner Dietsche</b> , Max-Planck-Institut (Stuttgart, Germany)	<i>Physics of Acoustic Phonons in the 1 GHz to 1 THz range I</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Werner Dietsche</b> , Max-Planck-Institut (Stuttgart, Germany)	<i>Physics of Acoustic Phonons in the 1 GHz to 1 THz range II</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Alex Fainstein</b> , Centro Atomico de Bariloche (Bariloche, Argentina)	<i>Introduction to acousto-optical interactions</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Gerhard Fischerauer</b> , University of Bayreuth (Bayreuth, Germany)	<i>Introduction to Surface Acoustic Waves: Fundamentals and Applications I</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Gerhard Fischerauer</b> , University of Bayreuth (Bayreuth, Germany)	<i>Introduction to Surface Acoustic Waves: Fundamentals and Applications II</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Chris Ford</b> , University of Cambridge (Cambridge, UK)	<i>Single-electron Manipulation</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Göran Johansson</b> , Chalmers University (Goteborg, Sweden)	<i>The giant acoustic atom - a single quantum system with a deterministic time delay</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Amit Lal</b> , Cornell University (Ithaca, NY, USA)	<i>GHz Ultrasonics for On Chip Delay Lines, Communications, Timing, Memory, and Sensing</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Hubert Krenner</b> , University of Augsburg (Augsburg, Germany)	<i>Interfacing quantum emitters by propagating surface acoustic waves</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Peter Leek</b> , Oxford University (Erlangen, Germany)	<i>Coupling superconducting qubits to surface acoustic wave resonators</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).

- Florian Marquardt**, University of Erlangen (Oxford, UK)  
**Thomas Metzger**, Qualcomm Germany RFFE GmbH (Munich, Germany)  
**Tristan Meunier**, Institut Néel (Grenoble, France)  
**Jean-Philippe Poizat**, Institut Néel (Grenoble, France)  
**Werner Ruile**, RF360 Europe GmbH (Munich, Germany)  
**Anthony Bennett**, Toshiba Research Lab (Cambridge, UK)  
**Tetsuomi Sogawa**, NTT-BRL Atsugi (Atsugi, Japan)  
**Clivia Sotomayor-Torres**, ICREA Barcelona (Barcelona, Spain)  
**Seigo Tarucha**, University of Tokyo (Tokyo, Japan)  
**Seigo Tarucha**, University of Tokyo (Tokyo, Japan)  
**Matthias Weiler**, Walther-Meißner-Institut (Garching, Germany)  
**Christoph Westerhausen**, University of Augsburg (Augsburg, Germany)  
**Achim Wixforth**, University of Augsburg (Augsburg, Germany)
- Introduction to Nanomechanics* ([abstract](#), [talk](#)).  
*Micro-acoustic Technologies and System Integration for LTE based Mobile Phones* ([abstract](#), [talk](#)).  
*Long-range transfer of spin information at the single electron level using surface acoustic waves* ([abstract](#), [talk](#)).  
*Hybrid Nanomechanical Systems* ([abstract](#), [talk](#)).  
*Piezoelectric Materials* ([abstract](#), [talk](#)).  
*Introduction to Semiconductor Single Photon Sources* ([abstract](#), [talk](#)).  
*Acoustic Control of Optical Properties and Carrier Dynamics in Semiconductors* ([abstract](#), [talk](#)).  
*GHz phonons in Si phononic crystals* ([abstract](#), [talk](#)).  
*Introduction to Quantum information: Essentials & Spin Qubits I* ([abstract](#), [talk](#)).  
*Introduction to Quantum information: Essentials & Spin Qubits II* ([abstract](#), [talk](#)).  
*Magnetoacoustics: Interaction of GHz-frequency surface acoustic waves with magnons* ([abstract](#), [talk](#)).  
*SAW-based catalysis* ([abstract](#), [talk](#)).  
*Introduction to Microfluidics: Honey I shrunk the lab!* ([abstract](#), [talk](#)).

## 5.3 Short Talks

### 5.3.1 Short Talks from Participants

Five poster contributions were upgrade to 20 min talks during a special session on July 13, 2017.

Lecture	Title
<b>Matteo Agostini</b> , Scuola Normale Superiore di Pisa (Pisa, Italy)	<i>Surface acoustic wave-based biosensors and microfluidic devices for life-science applications</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Edgar Cerda-Méndez</b> , Universidad Autónoma de San Luis Potosí (San Luis Potosí, Mexico)	<i>Modulation of polariton quantum fluids of light with surface acoustic waves</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).

**Erno Damskägg**, Aalto University (Espoo, Finland)

**Maria Ekström**, Chalmers University of Technology (Göteborg, Sweden)

**Shintaro Takada**, Institut Néel / CNRS (Grenoble Cedex 9, France)

*Squeezing of quantum noise of motion in a micromechanical resonator* ([abstract](#), [talk](#)).

*Efficient conversion between electrical microwave signals and surface acoustic waves using unidirectional transducers and catch/release of microwave phonons* ([abstract](#), [talk](#)).

*Demonstration of a directional coupler for a single flying electron transferred by surface acoustic waves* ([abstract](#), [talk](#)).

### 5.3.2 Talks from SAWtrain PhD Students

The fellows of the SAWtrain network have given an overview of their research results in 10 in talks in two sessions on July 17 and 18, 2017.

Lecture	Title
<b>Robert Ukropec</b> , MESA+ Institute for Nanotechnology / University of Twente (Enschede, The Netherlands)	<i>Ultrahigh frequency silicon acousto-electronics</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Yi-Ting Liou</b> , Paul-Drude-Institut für Festkörperelektronik (Berlin, Germany)	<i>Acousto-electric modulation of epitaxial graphene</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Yigitcan Uzun</b> , University of Twente, MESA+ Institute for Nanotechnology (Enschede, Netherlands)	<i>Complex-oxide Acousto Electronics</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Muhammad Hamidullah</b> , Istituto di Fotonica e Nanotecnologie (IFN-CNR) (Roma, Italy)	<i>Higher order quasi-longitudinal lamb wave for liquid sensing application</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Sixuan Wang</b> , University of Augsburg (Augsburg, Germany)	<i>SAW-assisted water splitting reaction</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>André Bilobran</b> , University of Valencia (Paterna (Valencia), Spain)	<i>High-Q one- and two-dimensional phononic cavities</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Bruno Villa</b> , Toshiba Research Europe Ltd. (Cambridge, United Kingdom)	<i>Monolithic and hybrid quantum photonic devices</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Emeline Nysten</b> , Institut für Physik, Universität Augsburg (Augsburg, Germany)	<i>Hybrid quantum dots-surface acoustic wave resonators</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Dominik Bühler</b> , University of Valencia (Paterna, Spain)	<i>Advanced acoustically tuned optical modulators for integrated photonics</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Gustav Andersson</b> , Chalmers University of Technology (Gothenburg, Sweden)	<i>Quantum acoustic with qubits: the SAW giant atom</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).

<b>Paul Helgers</b> , Paul-Drude-Institut für Festkörperelektronik (Berlin, Germany)	<i>Acoustic modulated single-photon sources</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Antonio Rubino</b> , University of Cambridge (Cambridge, United Kingdom)	<i>Development of a SAW-driven source of polarised single photons</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Hermann Edlbauer</b> , Institute Neel, CNRS (Grenoble, France)	<i>Electron quantum optics on the many and single particle level</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Hugo V. Lepage</b> , University of Cambridge (Cambridge, United Kingdom)	<i>GPU-accelerated simulations of SAW-driven single-electron transport</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Rajveer Fandan</b> , Universidad Politecnica de Madrid (Madrid, Spain)	<i>Acoustically-driven surface phonon-plasmon polaritons in graphene/h-BN/AlN heterostructures</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).

## 5.4 Posters and Poster Talks

There were two poster sessions (P1 and P2) preceded by 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 (Sec. [5.4.1](#));
- **Poster Session P2**, on Friday, July 14 from 17h-19h, **Poster teaser session PT2**: Friday, July 14 from 10h45-12h15 (Sec. [5.4.2](#)).

The participants submitting poster contributions have prepared 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 were 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.

### 5.4.1 Posters and Poster Talks I

Lecture	Title
<b>Gustav Andersson</b> , Chalmers University of Technology (Gothenburg, Sweden)	<i>Quantum acoustic with qubits: the SAW giant atom</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Andreas Ask</b> , Chalmers University of Technology (Göteborg, Sweden)	<i>Simulating SAW interacting with a transmon qubit using Matrix Product States</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Umesh Kumar Bhaskar</b> , Purdue University (West Lafayette, USA)	<i>Acoustoelectric interactions with GHz Lamb waves</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>André Bilobran</b> , University of Valencia (Paterna (Valencia), Spain)	<i>High-Q one- and two-dimensional phononic cavities</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).

**Delia Brick**, University of Konstanz (Konstanz, Germany)

**Dominik Bühler**, University of Valencia (Paterna, Spain)

**Edgar Cerda-Méndez**, Universidad Autónoma de San Luis Potosí (San Luis Potosí, Mexico)

**Odilon Couto**, State University of Campinas (Campinas - SP, Brazil)

**Antonio Crespo Poveda**, Materials Science Institute University of Valencia (Valencia, Spain)

**Erno Damskägg**, Aalto University (Espoo, Finland)

**Hermann Edlbauer**, Institute Néel, CNRS (Grenoble, France)

**Maria Ekström**, Chalmers University of Technology (Göteborg, Sweden)

**Rajveer Fandan**, Universidad Politécnica de Madrid (Madrid, Spain)

**Anton Frisk Kockum**, RIKEN (Wako, Saitama, Japan)

**Giorgos Georgiou**, Institute Néel - CNRS (Grenoble, FRANCE)

**Gina Greco**, Scuola Normale Superiore di Pisa (Pisa, Italy)

**Lingzhen Guo**, Karlsruhe Institute of Technology (KIT) (Karlsruhe, Germany)

**Muhammad Hamidullah**, Istituto di Fotonica e Nanotecnologie (IFN-CNR) (Roma, Italy)

**Paul Helgers**, Paul-Drude-Institut für Festkörperelektronik (Berlin, Germany)

**Alberto Hernández-Mínguez**, Paul-Drude-Institut für Festkörperelektronik (Berlin, Germany)

**Hangtian Hou**, The University of Cambridge (Cambridge, United Kingdom)

*Structural Characterization of Rolled-up GaAs/In<sub>0.2</sub>Ga<sub>0.8</sub>As Multilayer Tubes by Coherent Phonon Spectroscopy* ([abstract](#), [talk](#)).

*Advanced acoustically tuned optical modulators for integrated photonics* ([abstract](#), [talk](#)).

*Modulation of polariton quantum fluids of light with surface acoustic waves* ([abstract](#), [talk](#)).

*Modulation of highly piezoelectric planar optical microcavities with surface acoustic waves* ([abstract](#), [talk](#)).

*Tunable arrayed waveguide grating driven by surface acoustic waves* ([abstract](#), [talk](#)).

*Squeezing of quantum noise of motion in a micromechanical resonator* ([abstract](#), [talk](#)).

*Electron quantum optics on the many and single particle level* ([abstract](#), [talk](#)).

*Efficient conversion between electrical microwave signals and surface acoustic waves using unidirectional transducers and catch/release of microwave phonons* ([abstract](#), [talk](#)).

*Acoustically-driven surface phonon-plasmon polaritons in graphene/h-BN/AlN heterostructures* ([abstract](#), [talk](#)).

*Quantum optics with giant artificial atoms in a 1D waveguide* ([abstract](#), [talk](#)).

*Excitation of charge pulses at picosecond time scales* ([abstract](#), [talk](#)).

*Surface acoustic wave (SAW)-enhanced surface plasmon resonance (SPR) microfluidic biosensor* ([abstract](#), [talk](#)).

*The giant acoustic atom – a single quantum system with a deterministic time delay* ([abstract](#), [talk](#)).

*Higher order quasi-longitudinal lamb wave for liquid sensing application* ([abstract](#), [talk](#)).

*Acoustic modulated single-photon sources* ([abstract](#), [talk](#)).

*SAW-driven magneto-elastic dynamics in ferromagnetic layers* ([abstract](#), [talk](#)).

*Spectroscopy of SAW-driven dynamic quantum dots* ([abstract](#), [talk](#)).

**Tzu-Kan Hsiao**, Semiconductor Physics Group, Cavendish Laboratory (Cambridge, UK)

**Colin Hubert**, Paul-Drude-Institut für Festkörperelektronik (Berlin, Deutschland)

**Fernando Iikawa**, State University of Campinas (Campinas-SP, Brazil)

**Baptiste Jadot**, CNRS - Institut Néel (Grenoble, France)

**Johannes Knörzer**, Max Planck Institute of Quantum Optics (Garching, Germany)

**Miguel Sinusía Lozano**, Instituto Sistemas Optoelectrónicos Y Microelectrónica, ISOM-ETSIT (Madrid, Spain)

*Development of a SAW-driven single-photon source in an undoped GaAs quantum well structure* ([abstract](#), [talk](#)).

*Mutual Indirect exciton interactions in double quantum well stacks* ([abstract](#), [talk](#)).

*Effects of surface acoustic wave on the Raman scattering in semiconductors* ([abstract](#), [talk](#)).

*Towards Quantum Computing in Si MOS Technology: Single-shot Readout of Spin states in a FDSOI Split-Gate Device with Built-in Charge Detector* ([abstract](#), [talk](#)).

*Solid-State Quantum Simulators Based on Acoustic Lattices* ([abstract](#), [talk](#)).

*Synthesis and compositional analysis of reactively sputtered  $Sc_xAl_{1-x}N$  thin films* ([abstract](#), [talk](#)).

### 5.4.2 Poster Talks II

Lecture	Title
<b>Laure Bruhat</b> , Chalmers University of Technology (Göteborg, Sweden)	<i>Coupling a transmon qubit to a surface acoustic wave resonator</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Daan Kooij</b> , MESA+ Institute for Nanotechnology / University of Twente (Enschede, The Netherlands)	<i>Ultrahigh-frequency Silicon Acousto-Electronics</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Matthias Küß</b> , University of Augsburg, MNTF (Augsburg, Germany)	<i>Surface acoustic wave mediated magneto elastic investigation of magnetic thin film systems</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Alexander Kuznetsov</b> , Paul-Drude-Institut für Festkörperelektronik (Berlin, Germany)	<i>Time-resolved emission of polariton condensates in acoustic lattices</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Snezana Lazic</b> , Universidad Autónoma de Madrid (Madrid, Spain)	<i>Acoustic tuning of single photon emission from site-controlled GaN/InGaN nanowire heterostructures</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).
<b>Hugo V. Lepage</b> , University of Cambridge (Cambridge, United Kingdom)	<i>GPU-accelerated simulations of SAW-driven single-electron transport</i> ( <a href="#">abstract</a> , <a href="#">talk</a> ).



**Yi-Ting Liou**, Paul-Drude-Institut für Festkörperelektronik (Berlin, Germany)

**Samuel Margueron**, Université de Lorraine (Metz, France)

**Sergej Markmann**, IBM Research - Zurich (Rüschlikon, Switzerland)

**Isabella Miele**, University of Cambridge (Cambridge, United Kingdom)

**Pierre-Andre Mortemousque**, Université Grenoble Alpes, Institut Néel (Grenoble, France)

**Madeleine Msall**, Bowdoin College (Brunswick, Maine, USA)

**Adrian Nosek**, University of California, Riverside (Riverside, USA)

**Emeline Nysten**, Institut für Physik, Universität Augsburg (Augsburg, Germany)

**Ayato Okada**, The University of Tokyo (Tokyo, Japan)

**Alexander Reiner**, Universität Augsburg (Augsburg, Germany)

**Antonio Rubino**, University of Cambridge (Cambridge, United Kingdom)

**Mathias Sander**, University of Potsdam (Potsdam, Germany)

**Jorge Santos**, Aalto University (Espoo, Finland)

**Marco Scigliuzzo**, Chalmers University of Technology (Göteborg, Sweden)

**Miguel Sinusía Lozano**, Instituto Sistemas Optoelectrónicos Y Microelectrónica, ISOM-ETSIT (Madrid, Spain)

**Matthew Storey**, Purdue University (West Lafayette, Indiana, USA)

**Shintaro Takada**, Institut Néel / CNRS (Grenoble Cedex 9, France)

*Acousto-electric modulation of epitaxial graphene* ([abstract](#), [talk](#)).

*LiNbO<sub>3</sub> Films for High-Frequency Acoustic Wave Applications* ([abstract](#), [talk](#)).

*Coupling of surface acoustic waves and electron spins through spin-orbit interaction* ([abstract](#), [talk](#)).

*Acoustic waveguide sensor for liquids and particle detection* ([abstract](#), [talk](#)).

*Charge Control of a Nine Quantum Dot Array* ([abstract](#), [talk](#)).

*Surface Acoustic Wave Measurement and Control of Low-dimensional Electron Systems* ([abstract](#), [talk](#)).

*Devices for investigating low temperature electronic transport in graphene under surface acoustic wave irradiation* ([abstract](#), [talk](#)).

*Hybrid quantum dots-surface acoustic wave resonators* ([abstract](#), [talk](#)).

*Cavity optomechanics with surface acoustic wave* ([abstract](#), [talk](#)).

*Development of Electrically Conductive MOFs and their Integration in Multiparametric MOF@SAW Sensor Devices* ([abstract](#), [talk](#)).

*Development of a SAW-driven source of polarised single photons* ([abstract](#), [talk](#)).

*Spatio-temporal coherent control of thermal excitations in solids by two transient grating excitations* ([abstract](#), [talk](#)).

*Approaching the quantum ground state in millimeter-sized piezoelectric resonators* ([abstract](#), [talk](#)).

*Population inversion and stimulated emission of phonons in a transmon qubit coupled to phonons* ([abstract](#), [talk](#)).

*Temperature characterization of SAW resonators on Sc<sub>x</sub>Al<sub>1-x</sub>N/poly-diamond layered structure* ([abstract](#), [talk](#)).

*Numerical FEA Modeling of the Acousto-Electric Effect in SAW Piezoelectric-Semiconductor Heterostructures* ([abstract](#), [talk](#)).

*Demonstration of a directional coupler for a single flying electron transferred by surface acoustic waves* ([abstract](#), [talk](#)).



**Shuhui Tang**, Purdue University  
(West Lafayette, the United State)

**Lars Tiemann**, University of  
Hamburg (Hamburg, Germany)

**Robert Ukropec**, MESA+ Insti-  
tute for Nanotechnology / Univer-  
sity of Twente (Enschede, The Net-  
herlands)

**Nicolás Antonio Ulloa Cas-  
tillo**, Paul-Drude-Institut für Fest-  
körperelektronik (Berlin, Germany)

**Yigitcan Uzun**, University of  
Twente, MESA+ Institute for Nano-  
technology (Enschede, Netherlands)

**Bruno Villa**, Toshiba Research  
Europe Ltd. (Cambridge, United  
Kingdom)

**Sixuan Wang**, University of  
Augsburg (Augsburg, Germany)

**Masahiko Yokoi**, Osaka Univer-  
sity (Toyonaka, Japan)

**Mingyun Yuan**, Paul-Drude-  
Institut für Festkörperelektronik  
(Berlin, Germany)

*Read out circuit for RF correlator using surface acou-  
stic wave* ([abstract](#), [talk](#)).

*Giant acoustoelectric current in suspended quantum  
point contacts* ([abstract](#), [talk](#)).

*Ultrahigh frequency silicon acousto-electronics* ([ab-  
stract](#), [talk](#)).

*Acoustic fields to explore coherent electron spin trans-  
port in dipolaritons condensates* ([abstract](#), [talk](#)).

*Complex-oxide Acousto Electronics* ([abstract](#), [talk](#)).

*Monolithic and hybrid quantum photonic devices* ([ab-  
stract](#), [talk](#)).

*SAW-assisted water splitting reaction* ([abstract](#),  
[talk](#)).

*Electrical conduction of NbSe<sub>2</sub> thin film modulated  
by surface acoustic wave* ([abstract](#), [talk](#)).

*Generation of non-piezoelectric surface acoustic wa-  
ves with ZnO/Au layers* ([abstract](#), [talk](#)).

## 6 Appendix

### 6.1 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**  
network

## 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: G. Fischerauer	<i>Introduction to Surface Acoustic Waves: Fundamentals and Applications 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: Short talks	Five 20 min talks by participants
	Matteo Agostini	<i>Surface acoustic wave-based biosensors and microfluidic devices for life-science applications</i>
	Maria Ekström	<i>Efficient conversion between electrical microwave signals and surface acoustic waves using unidirectional transducers and catch/release of microwave phonons</i>
	Erno Damskägg	<i>Squeezing of quantum noise of motion in a micromechanical Resonator</i>
	Shintaro Takada	<i>Demonstration of a directional coupler for a single flying electron transferred by surface acoustic waves</i>
	Edgar Cerda-Méndez	<i>Modulation of polariton quantum fluids of light with surface acoustic waves</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 *Coffee break*  
 15:30 - 16:30 ST4: W. Ruile *Piezoelectric Materials*

**Friday 14/07**

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

**Saturday 15/07**

8:30 - 10:15 Tu07: P. Delsing *Introduction to Quantum Acoustics: Essentials & SAW/SC Qubit Coupling I*  
 10:15 - 10:45 *Coffee break*  
 10:45 - 12:30 Tu08: A. Lal *Applications II Ultrasonic microsystems – kHz to GHz transducers and applications to signal processing and sensing.*  
 12:30 - 14:00 *Lunch*  
 14:00 - 17:00 *Boat excursion: "Promenade en mer"*

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

8:30 - 10:15 Tu09: A. Wixforth *Introduction to Microfluidics: Honey, I shrunk the lab!*  
 10:15 - 10:45 *Coffee break*  
 10:45 - 12:30 Tu10: S. Tarucha *Introduction to Quantum information: Essentials & Spin Qubits 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 *Single-Carrier Manipulation*

**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 *Coupling superconducting qubits to surface acoustic wave resonators*  
 15:00 - 15:30 *Coffee break*  
 15:30 - 16:30 ST8: T. Meunier *Single Spin Transport*  
 16:30 - 19:30 *Free time*  
 19:30 - 20:30 *Classical music concert*

**Wednesday 19/07**

**8:30 - 12:30 SYMPOSIUM: Applications of Acousto-Electric Devices**  
 8:30 - 9:20 T. Sogawa *Acoustic Control of Optical Properties and Carrier Dynamics in Semiconductors*  
 9:20 - 10:15 T. Metzger: *Micro-acoustic Technologies and System Integration for LTE based Mobile Phones*  
 10:15 - 10:45 *Coffee break*  
 10:45 - 11:35 C. Sotomayor: *Phonon Propagation in Two-Dimensional Phononic Crystal*  
 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 *SAW-based Catalysis*

15:00 - 15:30	<i>Coffee break</i>	
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	<i>Coffee break</i>	
10:45 - 12:30	Tu13: A. Bennett	<i>Introduction to Quantum information: Single Photon Sources</i>
12:30 - 14:00	<i>Lunch</i>	
14:00 - 15:00	ST11: G. Johansson	<i>The giant acoustic atom – a single quantum system with a deterministic time delay</i>
15:00 - 15:30	<i>Coffee break</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	<i>Free time</i>	
19:30	<i>Institut's barbecue</i>	

**Friday 21/07**

8:30 - 10:15	Tu14: F. Marquardt	<i>Introduction to Nanomechanics</i>
10:15 - 10:45	<i>Coffee break</i>	
10:45 - 12:30	Tu15: A. Cleland	<i>Quantum Nanomechanics</i>
12:30 - 12:45	<i>Closing</i>	
12:45 - 14:00	<i>Lunch</i>	

**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).

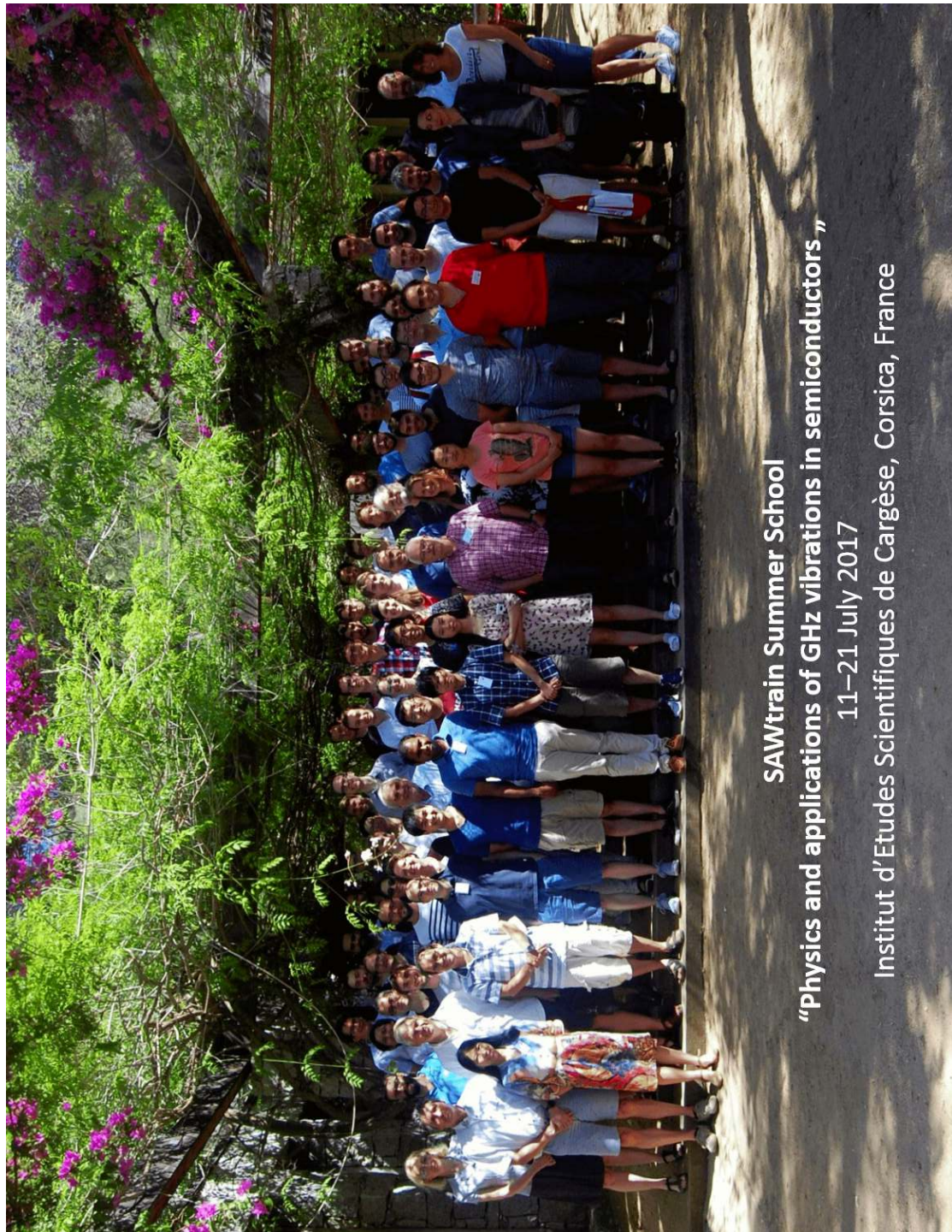
**Lectures:**

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

## 6.2 Photos

Photos from the event can be found under this [link](#).

## 6.2.1 Group photo: first week





## 6.2.2 Group photo: second week



### 6.3 Summer School poster




**SAWtrain**  
network

# 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





## 6.4 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	Institut 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	Institut 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	I
Snezana Lazic	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

## Summer School Program

### 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) 5 Short Talks	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) Fischerauer	Poster Talk 1(a)	Tu <sub>5</sub> (1.5h) Dietsche	Poster Talk 2(a)	Tu <sub>8</sub> (1.5h) Lal
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	Boat excursion "Promenade en mer"
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					
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		
17h-18h						
18h-19h	ST <sub>5</sub> (45min) Ford	Classical music concert	Dinner (own program)	Barbecue		
19h30	Dinner (own program)					

(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 9;
- Sessions *SAWtrain internal meeting*: only for members of the SAWtrain network.
- The **full program** can be found on page 17.