



## 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 Matteo Agostini  Maria Ekström  Erno Damskagg  Shintaro Takada  Edgar Cerda-Méndez	Five 20 min talks by participants <i>Surface acoustic wave-based biosensors and microfluidic devices for life-science applications</i> <i>Efficient conversion between electrical microwave signals and surface acoustic waves using unidirectional transducers and catch/release of microwave phonons</i> Squeezing of quantum noise of motion in a micromechanical Resonator <i>Demonstration of a directional coupler for a single flying electron transferred by surface acoustic waves</i> <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 *Coffee break*  
 15:30 - 16:30 ST10: H. Krenner *Interfacing quantum emitters by propagating surface acoustic waves*

#### **Thursday 20/07**

8:30 - 10:15 Tu12: S. Tarucha *Introduction to Quantum information: Essentials & Spin Qubits II*  
 10:15 - 10:45 *Coffee break*  
 10:45 - 12:30 Tu13: A. Bennett *Introduction to Quantum information: Single Photon Sources*  
 12:30 - 14:00 *Lunch*  
 14:00 - 15:00 ST11: G. Johansson *The giant acoustic atom – a single quantum system with a deterministic time delay*  
 15:00 - 15:30 *Coffee break*  
 15:30 - 16:30 ST12: P. Delsing *Introduction to Quantum Acoustics: Essentials & SAW/SC Qubit Coupling II*  
 16:30 - 19:30 *Free time*  
 19:30 *Institut's barbecue*

#### **Friday 21/07**

8:30 - 10:15 Tu14: F. Marquardt *Introduction to Nanomechanics*  
 10:15 - 10:45 *Coffee break*  
 10:45 - 12:30 Tu15: A. Cleland *Quantum Nanomechanics*  
 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**