

Microwave Amplifiers in the Quantum Regime

Agenda

2-6 June 2025,
Les Houches School of Physics



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	Sunday 01.06.	Monday 02.06.	Tuesday 03.06.	Wednesday 04.06.	Thursday 05.06.	Friday 06.06.
09:00-09:40		Welcome	1: Archana Kamal	1: Boon Kok Tan	3: Pasquale Scarlino	3: Laure Mercier de L'epinay
09:40-10:20		1: Philippe Campagne-Ibarcq	1: Logan Howe	1: Maxime Malnou	3: José Aumentado	5: Ofer Naaman
10:20-10:50		Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
10:50-11:30		1: Nikita Klimovich	1: Kevin O'Brien	1: Matthew Bell	3: Michael Hatridge	5: Visa Vesterinen
11:30-12:10		1: Emanuele Enrico	1: Sandbo Chang	3: R Vijay	3: Florent Lecocq	5: A. Mert Bozkurt
12:30-13:30		Lunch	Lunch	Lunch	Lunch	Lunch
13:30-16:00		Free discussion	Free discussion	Free discussion	Free discussion	
16:00-16:40	Arrivals from 15:00	2: Haruna Katayama			4: Yvonne Gao	
16:40-17:20		2: Konrad Lehnert	Results from TruePA project	4: Benjamin Huard	4: Angela Kou	
17:20-17:50		Coffee break	Coffee break	Coffee break	Coffee break	
17:50-18:30		2: Federica Mantegazzini	2: Sorin Paroanu	4: Giovanna Tancredi	5: Baleegh Abdo	
18:30-19:10		Welcome Aperitif	2: Gary Steele	4: Mollie Schwartz	5: Andrew Patterson	
19:30	Dinner	Dinner	Dinner	Conference Dinner	Dinner	
Evening			Poster session I		Poster session II	

Sessions

1 Next Generation TWPA's: novel circuits & operation protocols

2 Basic Science and Quantum Optics with TWPA's

3 Resonant Parametric Amplifiers

4 Amplifiers and Quantum Information Processing in Research

5 Amplifiers and Quantum Information Processing in Industry

Sunday, 01.06.2025

From 15:00	Arrivals
19:30	<i>Dinner</i>

Monday, 02.06.2025

09:00-09:40	Welcome Anja Metelmann, Karlsruhe Institute of Technology, coordinator of TruePA project
Morning Session Chair: Pegah Darvehi (CNR)	
09:40-10:20	Philippe Campagne-Ibarcq (Inria Paris, F) <i>Mixing of counterpropagating signals in a traveling-wave Josephson device</i>
10:20-10:50	<i>Coffee break</i>
10:50-11:30	Nikita Klimovich (University of Oxford, UK) <i>Kinetic-Inductance Travelling Wave Parametric Amplifiers and Frequency Converters</i>
11:30-12:10	Emanuele Enrico (INRIM Torino, IT) <i>Scalable Generation of Entangled Microwave Cluster States with Multi-Tone Josephson Metamaterials</i>
12:30-13:30	<i>Lunch</i>
13:30-16:00	Free discussion
Afternoon Session Chair: Gwenael Le Gal (CNRS NÉEL)	
16:00-16:40	Haruna Katayama (Hiroshima University, JP) <i>Analogue Hawking radiation in Josephson traveling-wave parametric amplifiers</i>
16:40-17:20	Konrad Lehnert (JILA, US) <i>Optimizing fundamental sensitivity and practical operation in Josephson amplifiers</i>
17:20-17:50	<i>Coffee break</i>
17:50-18:30	Federica Mantegazzini (Fondazione Bruno Kessler, IT) <i>Development and applications of nonlinear high kinetic inductance waveguides</i>
19:00	<i>Welcome Aperitif</i>
19:30	<i>Dinner</i>

Tuesday, 03.06.2025

Morning Session Chair: Pietro Campana (INFN)

9:00-09:40	Archana Kamal (Northwestern University, US) <i>Efficient broadband amplification and squeezing with 1D Josephson metamaterials</i>
09:40-10:20	Logan Howe (NIST, Boulder, US) <i>Pushing the Functional Limits of Kinetic Inductance TWPAs</i>
10:20-10:50	<i>Coffee break</i>
10:50-11:30	Kevin O'Brien (MIT, US) <i>High-Efficiency, Low-Loss Floquet-mode Traveling Wave Parametric Amplifiers</i>
11:30-12:10	Sandbo Chang (RIKEN, JP) <i>Low-intrinsic-loss Josephson traveling-wave parametric amplifiers</i>
12:30-13:30	<i>Lunch</i>
13:30-16:40	Free discussion

Afternoon Session Chair: Nicolas Zapata González (KIT)

16:40-17:20	Mitchell Field (KIT), Christoph Kissling (PTB), Bekim Fazliji (CNRS NÉEL) <i>Results from TruePA project</i>
17:20-17:50	<i>Coffee break</i>
17:50-18:30	Sorin Paraoanu (Aalto University, FI) Critical parametric detection of microwave photons
18:30-19:10	Gary Steele (TU Delft, NL) <i>Parametric phenomena in superconducting Kerr oscillators: Negative mass Bogoliubov modes, period double transitions, and transitions to chaos</i>
19:30	<i>Dinner</i>
Evening	Poster Session I

Wednesday, 04.06.2025

Morning Session Chair: Guiliam Butseraen (Silent Waves)

09:00-09:40	Boon Kok Tan (University of Oxford, UK) <i>Efforts in Developing Superconducting Parametric Amplifiers at Oxford</i>
09:40-10:20	Maxime Malnou (NIST, Boulder, US) <i>Artificial Transmission Line Synthesis Tailored for Traveling-Wave Parametric Processes</i>
10:20-10:50	<i>Coffee break</i>
10:50-11:30	Matthew Bell (MIT Boston, US) <i>Traveling-Wave Parametric Amplifier with Passive Reverse Isolation</i>
11:30-12:10	R Vijay (TIFR Mumbai, IN) <i>The driven non-oscillator as an ultra-low noise analog and digital amplifier</i>
12:30-13:30	<i>Lunch</i>
13:30-16:40	Free discussion
Afternoon Session Chair: Isita Chatterjee (CNR)	
16:40-17:20	Benjamin Huard (ENS Lyon, FR) <i>Microwave echoes from dielectric defects in Josephson traveling wave amplifiers</i>
17:20-17:50	<i>Coffee break</i>
17:50-18:30	Giovanna Tancredi (Chalmers University of Technology, SE) <i>Towards building a large-scale quantum processor</i>
18:30-19:10	Mollie Schwartz (MIT, US) <i>Efficient Routing and Interconnects for Superconducting Qubits</i>
19:30	<i>Conference Dinner</i>

Thursday, 05.06.2025

Morning Session Chair: Victor Gaydamachenko (PTB)

09:00-09:40	Pasquale Scarlino (EPFL, CH) <i>Three-wave-mixing quantum-limited kinetic inductance parametric amplifier operating at 6 T near 1 K</i>
09:40-10:20	José Aumentado (NIST, Boulder, US) <i>Graphs for Parametric Coupled Mode Theory</i>
10:20-10:50	<i>Coffee break</i>
10:50-11:30	Michael Hatridge (Yale University, US) <i>Gates, readout, and amplification with paired gain and conversion processes</i>
11:30-12:10	Florent Lecocq (NIST, Boulder, US) <i>Qubit measurements using nonreciprocal amplifiers</i>
12:30-13:30	<i>Lunch</i>
13:30-16:00	Free discussion

Afternoon Session Chair: Najmeh Etehad Abari (KIT)

16:00-16:40	Yvonne Gao (National University of Singapore) <i>Quantum Information Processing with Cat States in Bosonic cQED</i>
16:40-17:20	Angela Kou (University of Illinois, US) <i>Fluxonia interacting with cavities: benefits and precautions</i>
17:20-17:50	<i>Coffee break</i>
17:50-18:30	Baleegh Abdo (IBM Quantum, US) <i>Developing high-performance JPAs for fault-tolerant quantum computers</i>
18:30-19:10	Andrew Patterson (Rigetti Computing, US) <i>Readout chain and amplification requirements for multiplexed superconducting qpus</i>
19:30	<i>Dinner</i>
Evening	Poster Session II

Friday, 06.06.2025	
By 09:00	Check out of rooms
Morning Session Chair: Christian Schlager (OEAW)	
09:00-09:40	Laure Mercier de L'épinay (Aalto University, FI) <i>Directional optomechanical parametric amplifiers</i>
09:40-10:20	Ofer Naaman (Google Quantum AI, US) <i>Impedance-engineered parametric amplifiers: concepts and directions</i>
10:20-10:50	Coffee break
10:50-11:30	Visa Vesterinen (Arctic Instruments, FI) <i>Demonstrating quantity and consistency of three-wave mixing TWPAs</i>
11:30-12:10	Ahmet Mert Bozkurt (QuantWare, NL) <i>Towards Scalable Architectures: Integrating the Readout Module for Superconducting Qubits</i>
12:30-13:30	Lunch
	Departure

Posters at Poster Session I, Tuesday 03.06.2025

Andersson, Linus	<i>Latest results on kinetic inductance TWPAs</i>
Bhardwaj, Lakshay	<i>The road to high-fidelity qubit measurements using parametric amplifiers</i>
Campana, Pietro	<i>Simultaneous Gain and Active Isolation in a Kinetic Inductance Traveling Wave Parametric Amplifier</i>
Cappelli, Giulio	<i>A negative index Josephson waveguide</i>
Darvehi, Pegah/ Chatterjee, Isita	<i>Two-mode squeezing generation in a flux tunable Josephson Traveling Wave Parametric Amplifier</i>
Etehadi Abari, Najmeh	<i>Standing-Wave Bogoliubov Parametric Amplifier in Multi-Tone Setup</i>
Fasolo, Luca	<i>JTWPA's at INRIM: Design, Fabrication, and Experimental Characterization</i>
Fazliji, Bekim	<i>Qubit measurement with a travelling wave parametric amplifier isolator</i>
Field, Mitchell	<i>Why use granular aluminium for Parametric devices?</i>
Gaydamachenko, Victor	<i>An rf-SQUID-based traveling-wave parametric amplifier with -84 dBm input saturation power across more than one octave bandwidth</i>
Giraud, Anthony	<i>Implementing a non-reciprocal superconducting circuit</i>
Hazra, Sumeru	<i>Parsing the mechanisms of driven unwanted state transitions in superconducting circuits</i>
Herrig, Tobias	

Posters at Poster Session II, Thursday 05.06.2025

Bera, Tanmoy/ Schlager, Christian	<i>Vacuum-Gap Microstrips for Impedance-Matching Traveling-Wave Parametric Amplifiers</i>
Hung, Chih-Chiao	<i>Broadband Kinetic-Inductance Parametric Amplifiers with Impedance Engineering</i>
Kissling, Christoph	<i>Frequency Conversion: A hidden loss mechanism in three-wave-mixing metamaterials</i>
Le Gal, Gwenael	<i>Two-Mode Squeezing Breakdown in Josephson Traveling-Wave Parametric Amplifiers</i>
Mastrovito, Pacquale	<i>Superconducting qubit readout with a Reversed Kerr Traveling Wave Parametric Amplifier</i>
Milward, Philippine	<i>Simulations and Fabrication for Kinetic Inductance Travelling-Wave Parametric Amplifiers</i>
Miller, Benton	<i>Qubit measurement and backaction in a multimode nonreciprocal system</i>
Navarro Montilla, Javier	<i>Single-shot qubit state readout using TWPA idler mode</i>
Nowicki, Maria	<i>Optimizing rf-SQUID Parametric Amplifiers</i>
Peugeot, Ambroise	<i>DC-biased Josephson junction for the parametric coupling of quantum systems</i>
Roy, Camille	<i>Three-Wave-Mixing Quantum-Limited Kinetic Inductance Parametric Amplifier at 6T near 1K</i>
Villiers, Marius	<i>Parametric amplification in the Bogoliubov regime</i>
Zapata González, Nicolas	<i>Multi-tone parametric amplifier using a granular aluminum bose-hubbard dimer</i>