



## Physical Sciences Seminar

# Microwave photonic devices in superconducting circuit

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Host: Johannes Fink

Circuit QED allows the realization of strong and controllable light-matter interaction in superconducting circuit at the quantum level in unprecedented detail. This provides a powerful platform to study the manipulation of microwave photon and demonstrate microwave photonic devices applicable in quantum network and quantum information processing. This talk will be divided into two parts to introduce our research on manipulation, storage, and generation of microwave photons in superconducting circuit. In the first part, I will introduce a versatile and highly scalable approach to prepare generalized and multipartite cat states for itinerant microwave photon. This approach is based on the cavity assisted qubit-photon interaction. With the same interaction, we have also realized a single photon transistor in microwave regime with gain up to 53.4dB and extinction ratio above 20dB. In the second part, I will introduce our research based on frequency tunable CPW resonator, including the realization of on-demand storage and retrieval of weak coherent microwave photon pulses using a multiresonator quantum memory, and the demonstration of a cryogenic coherent microwave pulse generator.

**Thursday, April 11, 2024 11:00am - 12:00pm**

Office Bldg West / Ground floor / Heinzl Seminar Room (I21.EG.101)



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

Please find a schedule of the ISTA Shuttle on our webpage:

<https://ista.ac.at/en/campus/how-to-get-here/> The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.