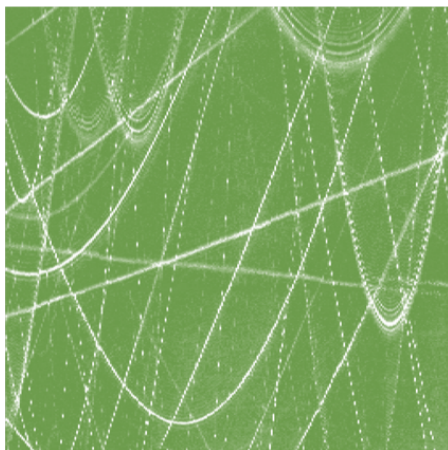


International Workshop
25 February - 1 March 2019

Atomic tunneling Systems and fluctuating Spins interacting with superconducting Qubits

PROGRAM



Scientific coordinators:

Christian Enss • University of Heidelberg, Germany
Moshe Schechter • Ben-Gurion University, Israel
Alexander Shnirman • Karlsruhe Institute of Technology, Germany

Organisation:

Maria Voigt • MPIPKS, Germany



Max-Planck-Institut für Physik komplexer Systeme
Nöthnitzer Str. 38, D-01187 Dresden
Tel.: +49-351-871-1932 / Fax: +49-351-871-2199
Email: tlsqu19@pks.mpg.de
Internet: <http://www.pks.mpg.de/tlsqu19>



The program will be continuously updated during the event. This
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Program

Sunday, 24 February

- | | |
|---------------|--|
| 18:00 - 20:00 | Registration at guest house 4, library |
| 19:00 - 21:00 | Welcome reception and dinner at the MPIPKS |
| 20:00 - 21:30 | Informal discussions |

Monday, 25 February

Probing individual TLS

10:15 - 10:30

**Michael Genkin (MPIPKS) &
scientific coordinators**

Opening

Chair morning talks: Christian Enss

10:30 - 11:15

Jürgen Lisenfeld

(Karlsruhe Institute of Technology)

Mapping the position of defects in
superconducting qubits

11:15 - 12:00

Yaniv Rosen

(Lawrence Livermore National Laboratory)

Probing two level systems at the material
interfaces of superconducting devices

12:00 - 13:00

Lunch break

13:00 - 14:00

Discussions

Chair afternoon talks: Georg Weiss

14:00 - 14:45

Andrew Fefferman (CNRS - Institut Néel)

Toward mechanical measurements of individual
TLSs

14:45 - 15:30

Kevin Osborn (University of Maryland)

Two-level systems driven coherently out of
equilibrium

- 15:30 - 16:00 **Alexander Bilmes**
(Karlsruhe Institute of Technology)
Resolving the Location of Parasitic Defects in
Superconducting Qubits
- 16:00 - 16:30 Coffee break
- Chair t1sq19-colloquium: Alexander Eisfeld (MPIPKS)*
- 16:30 - 17:30 **John Martinis** (Google and University of
California, Santa Barbara)
t1sq19-colloquium: Fluctuations of Energy-Relaxation
Times in Superconducting Qubits
- Chair discussions: Alexey Ustinov*
- 17:30 - 19:00 Discussions
- 19:00 - 20:00 Dinner
- 20:00 - 21:00 Informal discussions

Tuesday, 26 February

Noise in Superconducting Qubits

Chair morning talks: Gerd Schön

09:15 - 10:00

Sergey Kubatkin

(Chalmers University of Technology)

Direct Identification of Dilute Surface Spins on Al₂O₃: Origin of Flux Noise in Quantum Circuits

10:00 - 10:30

Coffee break

10:30 - 11:15

Sebastian de Graaf

(National Physical Laboratory)

Probing the origin of TLS using superconducting resonators

11:15 - 12:00

Clemens Müller (IBM Research - Zurich)

Correlating decoherence in transmon qubits:
Low frequency noise by single fluctuators

12:00 - 13:00

Lunch break

13:00 - 14:00

Discussions

Chair afternoon talks: John Martinis

14:00 - 14:45

Clare Yu (University of California, Irvine)

Flux Noise in Superconducting Qubits

14:45 - 15:30

Joakim Bergli (University of Oslo)

Pure phase decoherence in a ring:
a geometric approach

- 15:30 - 16:00 **Matthias Mergenthaler** (IBM Research - Zurich)
Investigating coherence limitations in transmon qubits
- 16:00 - 16:30 Coffee break
- Chair late afternoon talks: Jared Cole*
- 16:30 - 17:00 **Jonathan Burnett** (National Physical Laboratory)
TLS induced decoherence-instabilities in superconducting qubits
- 17:00 - 17:45 **Dagmar Gerthsen**
(Karlsruhe Institute of Technology)
Optimization of the structural properties of Al/AlO_x/Al-layer systems for Josephson junctions
- 17:45 - 19:00 Poster session I
- 19:00 - 20:00 Dinner
- 20:00 - 21:00 Poster session II

Wednesday, 27 February

Noise in Superconducting Devices

Chair morning talks: Sebastian Kempf

- 09:15 - 10:00 **Pertti Hakonen** (Aalto University)
High-quality superconducting junctions using
suspended single-walled carbon nanotubes
- 10:00 - 10:10 Group photo
(to be published on the event's web page)
- 10:10 - 10:30 Coffee break
- 10:30 - 11:15 **Yuri Galperin** (University of Oslo)
Two-level fluctuators, $1/f$ noise and decoherence
of qubits
- 11:15 - 12:00 **Nadav Katz** (The Hebrew University of Jerusalem)
Quality factors of high kinetic inductance
Tungsten Silicide resonators
- 12:00 - 13:00 Lunch break
- 13:00 - 13:45 Discussions

- 13:45 Departure to the Altstadt of Dresden by tram from the institute (*meeting point: reception of MPIPKS*)
- 14:30 - 15:15 Coffee break at the **Grand Café Coselpalais**,
An der Frauenkirche 12, Tel.: +49 351 498 98 12
- 15:15 - 15:30 Walk along the Brühlsche Terrassen to the Royal Castle Dresden
- 15:30 - 17:00 Guided English speaking tour of the **Royal Castle Dresden**, Taschenberg 2,
Tel.: +49 351 491 420 00
- 17:00 - 18:00 Guided walking tour from the Altstadt to the Neustadt of Dresden
- 18:00 - 20:00 Menu-dinner at the restaurant **Hierschönessen**,
Görlitzer Str. 20, Tel.: +49 351 256 528 98

Thursday, 28 February

Physics and Dynamics of TLS

Chair morning talks: Moshe Schechter

09:15 - 10:00 **Georg Weiss** (Karlsruhe Institute of Technology)
Dielectric measurements of the dynamics of atomic tunneling systems in thin-film AlOx

10:00 - 10:30 Coffee break

10:30 - 11:15 **Jared Cole** (RMIT University)
Microscopic models of TLS, atomic structure and phonons

11:15 - 12:00 **Martin Cyster** (RMIT University)
Simulation of the fabrication and electronic properties of Al/AlOx/Al Josephson junctions

12:00 - 13:00 Lunch break

13:00 - 14:00 Discussions

Chair afternoon talks: Kevin Osborn

14:00 - 14:45 **Alexander Burin** (Tulane University)
Theory of nonlinear absorption by interacting two-level systems

14:45 - 15:30 **Shlomi Matityahu**
(Ben Gurion University of the Negev)
Dynamical decoupling of two-level systems by coherent multiple Landau-Zener transitions

- 15:30 - 16:00 **Andreas Fleischmann** (Heidelberg University)
Nuclear spin driven dynamics in non-equilibrium
disordered quantum systems
- 16:00 - 16:30 Coffee break
- Chair late afternoon talks: Yuri Galperin*
- 16:30 - 17:00 **Vassiliy Lubchenko** (University of Houston)
Low-temperature anomalies in disordered solids:
a cold case of contested relics?
- 17:00 - 17:30 **Daniel Kaplan** (Weizmann Institute of Science)
Microscopic realization of the two TLS model
- Chair discussions: Clare Yu*
- 17:30 - 19:00 Discussions
- 19:00 - 20:00 Dinner
- 20:00 - 21:00 Informal discussions

Friday, 01 March

Physics and Fabrication of SC Devices

Chair morning talks: Sergey Kubatkin

09:15 - 10:00

Lara Faoro

(Centre National de la Recherche Scientifique)
TLS dynamics and charge noise in
superconducting circuits

10:00 - 10:30

Coffee break

10:30 - 11:15

Jukka Pekola (Aalto University)

Photonic heat transport controlled by supercon-
ducting qubits

11:15 - 12:00

Sebastian Kempf (Heidelberg University)

Recent insights in low-frequency excess flux noise
of superconducting quantum devices

12:00 - 13:00

Lunch break

Chair afternoon talk: Alexander Shnirman

13:00 - 13:45

Peter Nalbach (Westfälische Hochschule Gelsenkirchen)

Frustrated relaxation due to non-commuting noise

13:45 - 14:00

Closing remarks

14:00 - 16:00

Informal discussions & departure