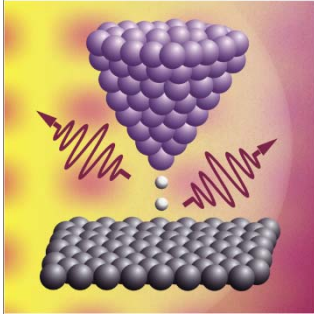


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| Light-matter interaction through the Josephson-Effect: The Josephson Junction as a Light Source 15GS | | Start Date: December 2017 |
| PhD: Haonan Huang (MPI) | PIs: Dr. Christian Ast (MPI) Jun.-Prof. Jens Anders (Ulm) Prof. Klaus Kern (MPI) Prof. Joachim Ankerhold (Ulm) | |
| <div style="display: flex; align-items: flex-start;"> <div style="flex: 1;">  </div> <div style="flex: 2; padding-left: 10px;"> <p>Abstract: The Josephson effect is among the most versatile phenomena in solid state physics, because of its extreme sensitivity to the environmental conditions. Its most notable application is in the definition of the voltage standard allowing the volt to be measured to much higher precision than was previously possible. Even more than fifty years after its discovery, there are regimes of the Josephson effect that remain to be explored and better understood. In general terms, this concerns the interaction of light and matter by means of the Josephson effect. More specifically, we are interested in how the Josephson effect can be exploited as a microwave light source and how the generated light interacts with the tunneling Cooper pairs in the Josephson junction.</p> </div> </div> | | |
| Recent results: <ul style="list-style-type: none"> • <i>New publication on exploring the high dissipation regime, where the environmental interaction dominates the phase fluctuations across the tunnel junction</i> • <i>Photon sources at different frequencies (50 GHz, 92 GHz and 160 GHz) fabricated and characterized</i> | Publications: Sensing the quantum limit in scanning tunnelling spectroscopy , Christian R. Ast, Berthold Jäck, Jacob Senkpiel, Matthias Eltschka, Markus Etzkorn, Joachim Ankerhold & Klaus Kern, <i>Nature Communications</i> 7 , 13009 (2016) Quantum Brownian motion at strong dissipation probed by superconducting tunnel junctions Berthold Jäck, Jacob Senkpiel, Markus Etzkorn, Joachim Ankerhold, Christian R. Ast, and Klaus Kern, <i>Physical Review Letters</i> (accepted) (2017) | |
| Further Collaborators: <ul style="list-style-type: none"> • Reinhold Kleiner (U Tübingen) • Michael Siegel (KIT Karlsruhe) • Oliver Kieler (PTB Braunschweig) | | |