

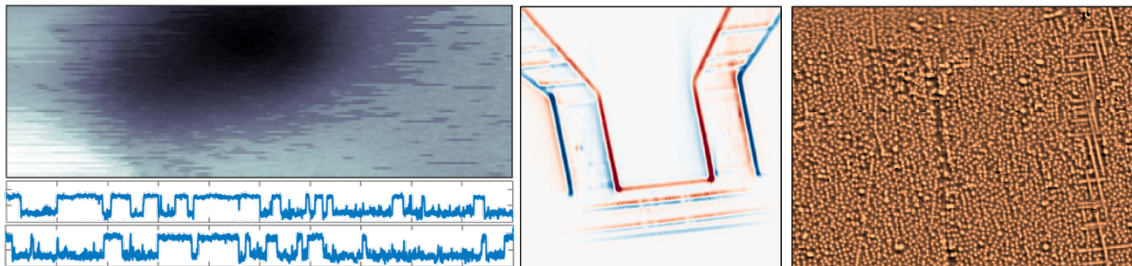
Imaging phase transitions with scanning SQUID

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Close to critical points, systems become susceptible to small perturbations, such as defects and disorder. Understanding how these perturbations affect the system near the transition, is key to understanding the underlying electronic phases involved.

I will describe how we use sensitive magnetic imaging to track the spatial distribution of electronic states in systems undergoing phase transitions. Near the superconductor-insulator transition in NbTiN we use scanning superconducting quantum interference device (SQUID) susceptometry to track superconducting fluctuations and detect non-trivial behavior near the quantum critical point. Near the metal to insulator transition at the 2D LaAlO₃/SrTiO₃ interface we use SQUID magnetometry and identify how different types of defects control the current distribution near the transition.



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