Department of Physics

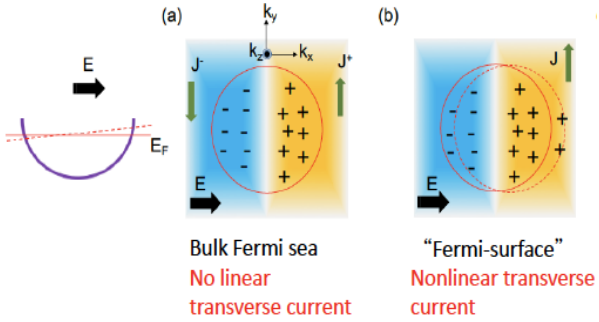
Theoretical study on condensed matter and ultra-cold physics

My research interests are in the theoretical study on condensed matter and ultra-cold physics, with particular focus on non-equilibrium phenomena, nonlinear responses and non-Hermitian systems. We have demonstrated nonlinear Hall responses induced by bulk and surface Berry curvature dipoles in quantum materials. We have also investigated the full counting statistics of nonequilibrium spin transport with an ultracold atomic quantum gas.

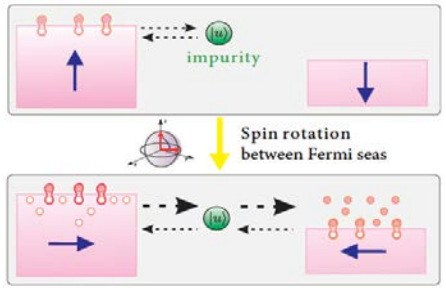
Techniques used in study

Analytical methods: Renormalization group, Toeplitz determinants and bosonization

Numerical methods: Functional determinant approach, density functional theory, quantum monte carlo



New Hall effect goes nonlinear



Spin Atomtronics and non-equilibrium Orthogonality catastrophe

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Background:
Ph.D, Department of Physics, Nation Tsing Hua University

Funding: Ministry of Science and Technology

Publications

- Jhih-Shih You, Richard Schmidt, Michael Knap, Dmitri A. Ivanov, Eugene Demler, 2019, "Atomtronics with a spin: statistics of spin transport and non-equilibrium orthogonality catastrophe in cold quantum gases", Physical Review B 99, 214505.
- Jhih-Shih You, Shiang Fang, Su-Yang Xu, Efthimios Kaxiras, Tony Low, 2018, "The Berry curvature dipole current in transition metal dichalcogenides family", Physical Review B 98, 121109 (Rapid Communications).
- Richard Schmidt, Michael Knap, Dmitri A. Ivanov, Jhih-Shih You, Marko Cetina, Eugene Demler,2018, "Universal many-body response of heavy impurities coupled to a Fermi sea", Reports on Progress in Physics 81 024401.