



universität**bonn**

Bethe Colloquium

Dmitrij Kharzeev
Stony Brook

Chiral matter: from quarks to quantum materials

Chirality is an ubiquitous concept in modern science, from particle physics to biology. In quantum physics, chirality is linked to the topology of gauge fields due to the quantum chiral anomaly. While the quantum anomaly is usually associated with the short-distance behavior, recently it has been realized that it affects also the macroscopic behavior of fluids with chiral fermions. In particular, the local imbalance between left- and right-handed fermions in the presence of magnetic field induces the non-dissipative transport of electric charge (“the Chiral Magnetic Effect”). In heavy ion collisions, there is an ongoing search for this effect at Relativistic Heavy Ion Collider, with a dedicated isobar run completed in June of 2018. Recently, the Chiral Magnetic Effect has been discovered in ZrTe₅ and other materials possessing chiral quasi-particles. This observation opens a path towards applications in microelectronic devices and quantum computers.

Lecture Hall 1

Physikalisches Institut · Nussallee 12 · 53115 Bonn

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**Bethe Center for
Theoretical Physics**
Physikalisches Institut
Universität Bonn
Nussallee 12
53115 Bonn

phone (+49) 228 / 73-34 32
fax (+49) 228 / 73-32 23



For detailed information visit us at: <http://bctp.uni-bonn.de>