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Vorticity in the Extreme Quantum Limit GEORGE PICKETT, Lancaster University — Superfluid ^{3}He is an ideal material for studying quantum turbulence as we can currently cool the superfluid to below 100 μK where the normal fluid fraction is negligible. This means that whatever decay processes occur they must be quantum processes and not mediated by classical frictional dissipation. The superfluid also has some serendipitous properties which make the detection of vorticity very straightforward unlike in many other quantum systems. We shall review the various methods by which vorticity can be locally generated in the superfluid. We then examine the various detection methods available. Finally we discuss the specific case of turbulence produced by a grid. Here the vorticity is produced as a gas of similar micron-scale vortex loops which then combine by reconnecion to create a vortex tangle. We can detect the sudden onset of this tangle creation and also confirm that the decay process is mediated by quantum rather than classical processes. Future possibilities, including the vortex video, will also be discussed.

George Pickett
Lancaster University

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