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High field fermiology of the metallized Mott insulator NiS_2 JORDAN BAGLO, HUI CHANG, KONSTANTIN SEMENIUK, XIAOYE CHEN, PASCAL REISS, HONG EN TAN, PATRICIA ALIREZA, Cavendish Laboratory, University of Cambridge, ALIX MCCOLLAM, INGE LEERMAKERS, HFML, Nijmegen, SVEN FRIEDEMANN, H. H. Wills Laboratory, University of Bristol, MONIKA GAMZA, Jeremiah Horrocks Institute, University of Central Lancashire, AUDREY GROCKOWIAK, WILLIAM CONIGLIO, STANLEY TOZER, NHMFL, Tallahassee, Florida, F. MALTE GROSCHE, Cavendish Laboratory, University of Cambridge — Long a prominent theme in the physics of strongly correlated electron systems, the Mott metal-to-insulator transition continues to be an active topic of investigation; various mechanisms have been proposed for the formation of the Mott insulating state, but its precise nature remains an open question. In many such systems under study, filling (via chemical doping) is used as a tuning parameter, but the resultant disorder hinders the use of sensitive quantum oscillation techniques to study Fermi surface properties. In the prototypical Mott insulator NiS_2, one can instead use pressure to cleanly tune the ratio U/t of onsite Coulomb repulsion to kinetic energy across the phase diagram. We will present our recent quantum oscillation measurements of NiS_2 under hydrostatic pressures from near the Mott transition up to 55 kbar, comparing the evolution of the Fermi surface and effective masses upon approaching the Mott transition to expectations from DFT calculations. We observe a large Fermi surface persisting to the transition along with a divergent effective mass, consistent with a Brinkman-Rice picture.

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