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Impurity Scattering in Superfluid ^{3}He: A New Phase JAMES BAUMGARDNER, Stanford University — We present continuous-wave NMR measurements of superfluid ^{3}He confined to two low-density silica aerogels, with porosities of 99.3% and 98.6%. We find within the aerogel two superfluid phases of differing symmetries separated by a first-order transition. The transition between these two phases is broadened by strong interfacial pinning, even near T_c. This should preclude determination of the equilibrium transition temperature between the two phases, but we have developed a method for determining this temperature, despite the pinning. We find that the thermodynamic transition temperature versus sample pressure within the aerogel differs greatly from the bulk, yet is independent of aerogel density. We conclude that the presence of aerogel has stabilized a new phase, not known to exist previously.

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