

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Using InAs quantum wells to navigate the Majorana parameter space PETER O'MALLEY, PEDRAM ROUSHAN, YU CHEN, BROOKS CAMPBELL, BORZOYEH SHOJAEI, JAVAD SHABANI, BRIAN SHULTZ, CHRIS PALMSTROM, JOHN MARTINIS, University of California, Santa Barbara — Although superconducting contacts laid down on self-assembled nanowires have produced impressive experimental results, the desire to build complex and scalable devices using Majorana modes leads us to want to develop lithographically defined nanowires. Our strategy is to deposit a superconducting layer in situ on an MBE-grown InAs 2DEG, and etch nanowires in subsequent microfabrication. This allows control over nanowire properties as well as the ability to vary the superconductor-semiconductor coupling strength in a precise manner. We plan to present measurements of both Nb coupled to an InAs 2DEG and nanowires fabricated out of two-dimensional InAs systems. We then discuss where these measurements put our system in the parameter space needed to observe the Majorana fermion, and propose a path forward.

Peter O'Malley
University of California, Santa Barbara

Date submitted: 19 Nov 2012

Electronic form version 1.4