Toward Insulating Behavior in Bi$_2$Se$_3$ PAUL SYERS, JOHNPIERRE PAGLIONE, University of Maryland — Research in the area of Topological Insulators has made great progress with Bismuth Selenide in recent years. However, achieving true insulating behavior in bulk samples of Bi$_2$Se$_3$ has proven elusive due to the difficulty in controlling the stoichiometry of this compound during synthesis. Here we report on progress with the synthesis and characterization of high purity, undoped Bi$_2$Se$_3$ crystals with the lowest carrier densities and highest resistivities reported to date.