In 1949, Beurling provided a characterization of the invariant subspaces of the unilateral shift operator on $l^2$ by translating the problem into a problem on the Hardy space of analytic functions on the unit disk. This theorem illustrates the power and utility of using a function theoretic identification of a problem in order to answer a question about operator theory. A similar device was used in 1978 by S.W. Drury, who found a generalization of von Neumann’s inequality, which states that if $T$ is contraction and $p$ is a polynomial then $\|p(T)\| \leq \|p\|_{\infty}$, to multidimensional polynomials by identifying that the right hand side of the inequality should be replaced by the norm of the multiplication operator with symbol $p$ on a space that is now referred to as the Drury-Arveson space. After being rediscovered by Arveson nearly twenty years later, the Drury-Arveson space has been considered in several different contexts including Besov-Sobolev spaces, Hilbert spaces with complete Nevanlinna Pick kernels, Hilbert modules, and Hilbert spaces of Dirichlet Series. In this talk, I will provide an overview of the classical theory and fundamental ideas of this subject and then build towards a generalization of Beurling’s Theorem for the Drury-Arveson space.

Refreshments will be served at 2:30 p.m. in the Math Office (SST 258A).