1106-47-281 **Gelu F Popescu*** (gelu.popescu@utsa.edu). *Euler Characteristic on Noncommutative Polyballs.*

We introduce and study the Euler characteristic associated with algebraic modules generated by arbitrary elements of certain noncommutative polyballs. We provide several asymptotic formulas and prove some of its basic properties. We show that the Euler characteristic is a complete unitary invariant for the finite rank Beurling type invariant subspaces of the tensor product of full Fock spaces $F^2(H_{n_1}) \otimes \cdots \otimes F^2(H_{n_k})$, and prove that its range coincides with the interval $[0, \infty)$. We obtain an analogue of Arveson's version of the Gauss-Bonnet-Chern theorem from Riemannian geometry, which connects the curvature to the Euler characteristic. In particular, we prove that if M is an invariant subspace of $F^2(H_{n_1}) \otimes \cdots \otimes F^2(H_{n_k})$, $n_i \geq 2$, which is graded (generated by multi-homogeneous polynomials), then the curvature and the Euler characteristic of the orthocomplement of M coincide. (Received August 19, 2014)