1077-47-198 **Joseph A Ball*** (`joball@math.vt.edu`), Department of Mathematics, Virginia Tech, Blacksburg, VA 24061. *Realization and interpolation theory for the Herglotz-Agler class over the poly-right-halfplane.* Preliminary report.

The Schur-Agler class of functions is defined as the class of holomorphic functions S on the polydisk $\mathbb{D}^d$ for which $S(T_1, \dots, T_d)$ has norm at most 1 whenever $T_1, \dots, T_d$ is a commutative tuple of strict contraction operators on a Hilbert space $\mathcal{H}$. The Herglotz-Agler class is the class of holomorphic functions H on the d-variable poly-right-halfplane for which $H(X_1, \dots, X_n)$ has positive real part whenever $X_1, \dots, X_d$ is a commutative family of operators with each having strictly positive real part. While the Herglotz-Agler class is just a linear-fractional transform of the Schur-Agler class and the realization theory for the Schur-Agler class (i.e., realization of S as the transfer function of a multidimensional conservative input/state/output linear system) is well understood, the realization theory for the Herglotz-Agler class is considerably more subtle, especially in the several-variable case. We discuss several approaches to the realization theory for the Herglotz-Agler class with special attention to the rational case, and also indicate connections with a homogeneous subclass (the so-called Bessmertnyi class) of the Herglotz-Agler class. (Received August 11, 2011)