1086-58-875   **E. Cabral Balreira*** (`ebalreir@trinity.edu`), One Trinity Place, Department of Mathematics, San Antonio, TX 78212. *The Geometry of P-matrices and the Gale-Nikaido Theorem and Applications.* Preliminary report.

An important problem in global injectivity is the result of Gale-Nikaido which states that if the principal minors of the Jacobian matrix of a map defined on a rectangular region of $\mathbb{R}^n$ are positive, then it must be injective. In this talk, we will provide a new geometric condition, called normal cubic assemblage, which can be checked on the boundary of the domain. This condition is satisfied when the Jacobian matrix is a P-matrix and thus it generalizes the Gale-Nikaido Theorem. Applications of these new ideas to competition models in economics and biology will also be shown. (Received September 14, 2012)