1086-35-2043   **E N Barron**, **R Goebel** and **R R Jensen*** (`rjensen@luc.edu`). *Quasiconvexity, Nonlinear PDEs, and Principal Curvature.*

In this talk I will present joint work on a second order characterization of functions which have convex level sets (quasiconvex functions). This leads to a discontinuous, nonlinear degenerate, elliptic operator $L_0(Du, D^2u)$. In two dimensions it is the mean curvature operator; and in higher dimensions it is the the first principal curvature operator of the surfaces $S = u^{-1}(c)$. Our main results include a comparison principle for $L_0(Du, D^2u) = g$ when $g \geq C_g > 0$ and a comparison principle for quasiconvex solutions of $L_0(Du, D^2u) = g$ when $g \geq 0$. We also consider a continuous version of L_0, $L_\alpha(Du, D^2u)$, which characterizes α-robustly quasiconvex functions - i.e., functions which remain quasiconvex under small linear perturbations. A comparison principle is proved for L_α; and approximation of quasiconvex functions by α-robustly quasiconvex functions is established. (Received September 24, 2012)

1