CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

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2:00 – 3:00 PM
Maria Sanford, Room 101

STABILITY INDEX JUMP FOR CONSTANT MEAN CURVATURE HYPERSURFACES OF SPHERES

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(Joint work with Aldir Brasi)

Abstract: It is well known that every square symmetric matrix can be diagonalized. This is, for every linear transformation T from R^n to R^n such that <T(v) , w> = <v , T(w)> for all v and w in R^n , we can find n real numbers $\mu_1, \ldots, \mu_n$ and n orthonormal vectors $v_1, \ldots, v_n$ such that $T(v_i)= \mu_i v_i$ for i=1,…,n. In the notation above <v,w> is the Euclidean dot product. When M is a compact hypersurface of the (n+1)-dimensional unit sphere with constant mean curvature, the operator J from the space of smooth functions $C^\infty(M)$ to $C^\infty(M)$ given by

$$J(f) = - \Delta f - \|II\|^2 f - n f$$

satisfies $< J(f) , g> = < f , J(g) >$ for all f and g in $C^\infty(M)$. Here $< f, g> = \int_M f g \, dV$ and $\|II\|^2$ is the square of the norm of the second fundamental form. As in the case of symmetric matrices, the operator J has eigenvalues $\mu_1 < \mu_2 \leq \mu_3 \leq \ldots$ that are discrete. The number of negative eigenvalues is called the stability index. In this talk we will explain the interpretation of the stability index and we will show that if M is not a Euclidean sphere, then its stability index is greater than or equal to n+1. Recall that n is the dimension of M.

For further information:
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