CCSU

DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

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3:00 – 4:00 PM
Maria Sanford, Room 101

NEW EXAMPLES OF MINIMAL HYPERSURFACES OF SPHERES

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Abstract: The n-dimensional sphere is the set of vectors with n+1 entries with length 1. The 1-dimensional sphere is the unit circle in $\mathbb{R}^2$, the 2-dimensional sphere is the well-known sphere in the Euclidean space $\mathbb{R}^3$, the 3-dimensional sphere is contained in $\mathbb{R}^4$. In general, the n-dimensional sphere is a compact n-dimensional manifold.

To motivate the notion of minimal hypersurface, let us consider the following problem. Assume that we mathematically understand every point in a mountain, and we look for the shortest path in the mountain that connects two points on it. The "geodesics" of the surface of the mountain are the solutions of this problem. The geodesics of an n-dimensional manifold $\mathcal{M}$ are curves (1-dimensional manifolds) that minimize distances in $\mathcal{M}$. They are found by finding curves with "geodesic curvature" equal to zero. Minimal hypersurfaces of an (n+1)-dimensional manifold $\mathcal{M}$ are n-dimensional manifolds that minimize the n-dimensional area in $\mathcal{M}$. Minimal hypersurfaces are found by finding n-dimensional submanifolds with "mean curvature" equal to zero. These manifolds are difficult to find, and new explicit examples are always interesting.

In this talk we will present new examples of compact minimal hypersurface of the (n+1)-dimensional sphere and if time allows, we will explain how to compute the eigenvalues of the Laplace operator on these new examples.

To join us online use the following link: https://ccsu.webex.com/meet/gotchev
For further information: gotchevi@ccsu.edu; 860-832-2839; http://mathcolloquium.sites.ccsu.edu/