CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

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

NEW CMC HYPERSURFACES ON SPHERES

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Abstract: Let us denote by $S^m(r)$ the m-dimensional sphere with radius r. We also denote $S^m = S^m(1)$. Recall that S^1 is the unit circle, S^2 is the unit sphere in the 3-dimentional space R^3, and in general, S^m is the collection of points in the $(m+1)$-dimensional Euclidean space R^{m+1} that are one unit away from the origin.

In this talk, we will construct new one-parametric families of embedded hypersurfaces with constant mean curvature (CMC) into the $(n+1)$-dimensional unit sphere. These hypersurfaces are embeddings of the form $\phi: S^k \times S^{n-k-1} \times S^1 \longrightarrow S^{n+1}$ and are obtained by studying a system of ordinary differential equations.

There are very few other families of one-parametric families of CMC in S^{n+1}:

- The family of spheres $S^n(r)$ with radius smaller than 1.
- The Clifford hypersurfaces $S^k(\mathrm{r}) \times S^{n-k}(\sqrt{1-r^2})$.
- The rotational CMC hypersurface which also can be found by solving a system of ordinary differential equations and are embeddings of the form $\phi: S^{n-1} \times S^l \longrightarrow S^{n+1}$.

The technique to study the new examples is called the continuation method and it is similar to the techniques used by the presenter to find new periodic solutions of the *n*-body problem.

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