CCSU

DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, September 29

3:00 – 4:00 PM

Maria Sanford, Room 101

THE STABILITY INDEX AND YAU'S CONJECTURE FOR CARLOTTO-SCHULZ MINIMAL HYPERTORI

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Abstract: A minimal surface in the 3-dimensional Euclidean space $\mathbb{R}^3$ is a surface with the property that every small portion of it minimizes area with respect to surfaces sharing the same boundary of that small portion. It is not difficult to show that there are no compact (closed and bounded) minimal surfaces in $\mathbb{R}^3$.

The notion of a minimal surface can be extended to higher dimensions and different ambient spaces. We will consider minimal hypersurfaces when the ambient space is not $\mathbb{R}^3$ but the $2n$-dimensional unit sphere $\mathbb{S}^{2n}$. This ambient space admits compact examples. We can perturb a minimal hypersurface to get nearby hypersurfaces in infinitely many linearly independent directions (these directions are in one-to-one correspondence with functions on the hypersurface). It is known that a compact minimal hypersurface minimizes its "area" (more precisely, its $(2n-1)$-dimensional volume) in all but finitely many directions. This number of directions is called the stability index of the minimal hypersurface. This index plays an important role in the study of minimal hypersurfaces.

In this talk we show that the stability index for the embedded minimal hypertori $M_n \subset \mathbb{S}^{2n}$ recently discovered by Carlotto and Schulz is at least $6n+3$. The talk is accessible to undergraduate students. A copy of the preprint related to this talk can be found at: https://arxiv.org/pdf/2508.09104.

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/