Curtis Pro
CSU Stanislaus

Dr. Hopf's Love
or: How I Learned To Stop Worrying
and Start Visualizing the 3-sphere

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Abstract: In this talk, we will introduce the 3-sphere as a motivating example of a geometric object just slightly outside of our 3-dimensional world, but close enough to make connections with familiar stuff like circles (1-spheres) and spheres (2-spheres). With a little algebra and trigonometry we will see a beautiful geometric structure emerge within the round 3-sphere. After a brief introduction to the normed division algebras, we will see how this geometric structure in the 3-sphere belongs to a natural family of such structures found by Heinz Hopf in the early 1930s. These *Hopf fibrations* paved the way for much of the modern mathematics done today.

Background: Calculus I. Also helpful, but not required, to have experience with complex numbers and polar and spherical coordinates.

About the speaker: Curtis Pro received his Ph.D. from UC Riverside. He is currently an assistant professor at CSU Stanislaus. His research is in Riemannian geometry with a lower sectional curvature bound.