

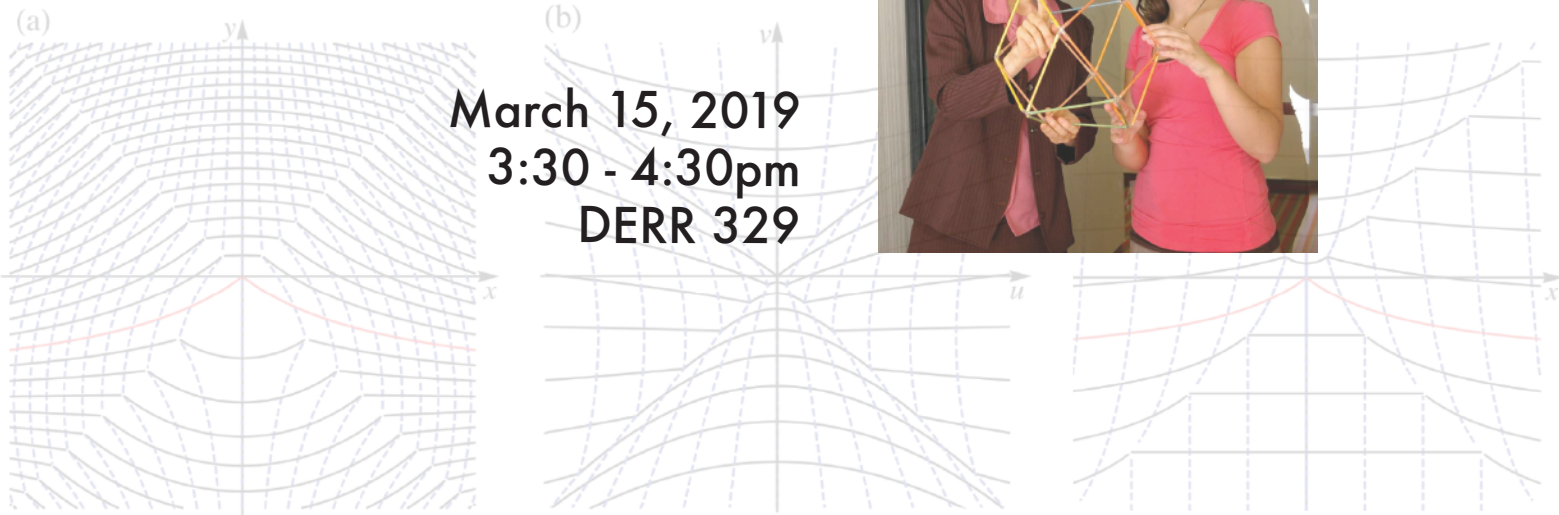
Department of Mathematics Colloquium

What happens when $a^2 + b^2 = c^2$
changes to $|a^2 - b^2| = c^2$?

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In our everyday experience, we describe distance and length using the Pythagorean relationship $a^2 + b^2 = c^2$. Changing this to $|a^2 - b^2| = c^2$ opens up an intriguing new world of Lorentzian geometry. This amounts to switching from the complex number system where $i^2 = -1$ to a hyperbolic system where $t^2 = 1$. While conformal transformations of the complex plane satisfy the Cauchy-Riemann equations and the Laplace equation, Lorentz-conformal mappings satisfy the Lorentz-Cauchy-Riemann equations and the wave equation. In this colloquium, we explore and contrast these two geometries.