1172-32-15 **Wei Chen** (`weichensdu@126.com`), Chongqing University, Chongqing, 400065, and **Qi Han*** (`qhan@tamusa.edu`), Texas A&M University-San Antonio, San Antonio, TX 78224. *On entire solutions to eikonal-type equations.*

The eikonal equation $\sum_{j=1}^{N} u_{x_j}^2 = 1$ in $\mathbf{R}^N$ is a nonlinear first-order partial differential equation arising from problems of wave propagation. It is easy to verify that linear functions $c_0 + \sum_{j=1}^{N} c_j x_j$ with $\sum_{j=1}^{N} c_j^2 = 1$ are solutions to the eikonal equation in $\mathbf{R}^N$, and Caffarelli and Crandall found that affine functions are indeed the only global solutions when $N \geq 2$ using some idea from an earlier work of Khavinson.

In this talk, we will discuss several equivalence conditions on entire solutions to eikonal-type nonlinear partial differential equations $u_{z_1}^2 + u_{z_2}^2 = p(z_1, z_2)e^{g(z_1, z_2)}$ in $\mathbf{C}^2$ for polynomials $g(z_1, z_2), p(z_1, z_2)$; all our results turn out to be sharp and are supplemented by examples for accuracy. (Received July 26, 2021)