1125-P5-1699   **Itai Seggev*** (`is+research@cs.hmc.edu`), 2000 Trade Center, Champaign, IL 61801. *The Tautochrone: Times are the Same, Times are Different.*

The tautochrone problem is one of the classical problems of elementary physics: determine the shape for which the time of descent of a frictionless bead sliding from rest is independent of initial position. This problem found various geometric and analytic solutions from the early days of calculus until it led to the development of integral equations by Abel. But taking the next step of actually determining the motion of the beads leads to a treacherous path, where the pitfalls of energy and numerical methods rear their ugly heads. In this talk I describe my journey to create an animation of the tautochrone. This will serve as launching point to discuss traps that we often mention in passing to our students but then promptly forget ourselves. (Received September 18, 2016)