Theoretical studies in physics entail not only back-of-the-envelope calculations, but also intensive computational work, often employing computer programs containing thousands of lines of code, sophisticated numerical techniques, and the use of supercomputers. The development and refinement of models of physical systems is another important feature of theoretical and computational research. So challenging is modern computational physics, that some have proposed that it be viewed as a third branch of research, alongside theory and experiment. It is rare to find a simple system in which the three branches of research complement each other as agreeably as in the present study of the stability of a partially-filled can of soda under conditions of uniform horizontal acceleration.