1068-34-332 **Bonita A. Lawrence*** (lawrence@marshall.edu), Department of Mathematics, One John Marshall Drive, Huntington, WV 25755-2560, **Clayton T. Brooks** (brooksc@marshall.edu), Department of Mathematics, One John Marshall Drive, Huntington, WV 25755-2560, and **Richard P. Merritt** (merritt37@marshall.edu), Department of Mathematics, One John Marshall Drive, Huntington, WV 25755-2560. *The Marshall Differential Analzyer Project: Dynamics in Motion.*

Mechanical differential analyzers, used as early as the late 1920's, were the first computers for solving nonlinear differential equations. A resurgence of interest in these machines for the purposes of studying the qualitative behavior of dynamic equations began a few years ago at Marshall University. There a team of undergraduate and graduate students first constructed a small two integrator machine, designed to handle linear differential equations, and then built a much larger four integrator machine, equipped to solve both linear and nonlinear differential equations. Currently the machines are being used to study the qualitative behavior of certain classes of differential equations. In this presentation I will give a bit of history of the project, discuss how the mechanics of the machine models the mathematics, and give a demonstration with our small traveling model we call Lizzie. (Received January 20, 2011)