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Brian Seguin* (bseguin@andrew.cmu.edu), Dept. of Math Sciences, Wean Hall 6113, Carnegie Mellon University, Pittsburgh, PA 15213. *An Introduction to Frame-Free Continuum Mechanics.*

The Principle of Material Frame-Indifference is a fundamental concept in continuum mechanics. In 1972 Walter Noll showed that one can formulate constitutive laws without using any external frames of reference. Constitutive laws formulated in this way vacuously satisfy the Principle of Material Frame-Indifference. I will motivate and describe the basic concepts involved in this frame-free formulation. I will also describe how other basic concepts in continuum mechanics, such as a continuous body and a deformation, can be formulated without the use of a frame of reference. (Received January 16, 2010)