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Francois J. M. Gay-Balmaz*, francois.gay-balmaz@lmd.ens.fr. *Continuous and discrete variational formulations of nonequilibrium thermodynamics.*

We present a Lagrangian variational formulation for nonequilibrium thermodynamics that extends the Hamilton principle of classical mechanics to include irreversible processes in both discrete and continuum systems. The irreversibility is encoded into a nonlinear nonholonomic constraint given by the expression of entropy production associated to the irreversible processes involved. We explain how this variational formulation can be efficiently used as a modeling tool in continuum thermodynamics and for the derivation of structure preserving discretizations. This is a joint work with Hiroaki Yoshimura. (Received January 28, 2019)