Abstract for an Invited Paper
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**Entropy, Order Parameters, and Complexity: Incorporating the last 50 years into the statistical mechanics curriculum**[1]

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The purview of statistical mechanics has grown rapidly in the past decades, with nonequilibrium extensions and applications to dynamical systems, molecular biology and bioinformatics, complex systems and networks, digital communication and information theory, and econophysics and other social sciences. It is our responsibility to join these new insights to the old wisdom in the field, and to distill the key ideas for the next generation. We should include (a) Shannon entropy, data compression, and reversible computation, (b) chaotic motion, ergodicity and the KAM theorem, and renormalization-group treatments of the onset of chaos, (c) molecular motors and hidden Markov models for analyzing genomic data. We should make statistical mechanics useful and comprehensible to those outside of physics, eschewing applications (Clausius-Clapeyron equations, $c_p$ vs. $c_v$) and methods (quantum mechanics) accessible and interesting only to condensed-matter physicists and physical chemists. See *Entropy, Order Parameters, and Complexity* (http://www.physics.cornell.edu/sethna/StatMech/), OUP, 2006.

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