

# Review of: "Thermodynamics, Infodynamics and Emergence"

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**Potential competing interests:** No potential competing interests to declare.

The article "Thermodynamics, Infodynamics and Emergence" is review about the different aspects of thermodynamics, information and emergence, and their interrelations. The article begins with a glossary of thermodynamic terms and associated laws. Then the author goes on to describe complexity and information. This part again lists various terms used in this domain, including negentropy, structural information, etc. Then two equations, one defining free energy and the other defining useful information, are provided. Then multidimensional systems and emergence is described. In this part, various ways in which emergent behavior is observed in collections of small units is described, including aspects like emotions and conscience. Sociological emergences have been briefly discussed.

In my opinion, the review should be more detailed and span a smaller area to be well-understood. Most of the concepts are well-known (like the definitions of several terms) and can be done away with by referring to standard textbooks. A simple model can be taken up and solved mathematically to allow the user to gain more insights. "Entropy" should be strictly differentiated from energy. Also, absorbed heat (in the example of the car engine) cannot be called a Free energy. Using the term free energy in areas like politics, division of labor, conjugal life, etc. is unclear and need not be included, unless substantiated by mathematics. Overall, from a physicist's point of view, I felt that the paper needs more focus on physical aspects of the terms used in its title, providing solvable toy models and removing definitions that are easily available elsewhere.