The subject matter over the last few months has touched upon thermodynamics in a variety of guises. For example, the concept of enthalpy and isentropic flow has played a key role in compressible fluid flow. In the posts discussing the Maxwell relations, the thermodynamics square and the classic relationships between second order partial derivatives were the main tools used to eliminate pesky terms involving the entropy in favor of quantities easier to measure in the lab.

It seems that it is now prudent to put down a few notions about entropy itself. No other physical quantity, with the possible exception of energy, is as ubiquitously used as entropy and none is as poorly understood as entropy. Chemists use entropy to determine the direction of chemical reactions, physicists use it when looking at matter in motion (E. G. Compressible gas and a cylinder ), electrical engineers use it when characterizing information loss on channel, and so on.

Entropy seems to be a Swiss army knife concept with lots of different built in gadgets that can be pulled out and used on a moment’s notice. As Robert Swendsen points out in his article entitled “I don’t remember the name” each scientist has his own pet idea about entropy. It seems about time, but I get my own and that it is the aim of this blog.

Not using entropy on a regular basis, I decided to return to the basic ideas introduced in Halliday and Resnick physics.

One of the most intriguing aspects of entropy is that it is a state variable, that is to say, its value depends only on what the system is doing at any given time and not how the system got there. This is a key concept because it means that we are relieved in trying to find the particular path the system evolved on.