# Re: Entropy question

***Source:*** http://sci.tech−archive.net/Archive/sci.physics/2005−08/msg03327.html


- *From*: mmeron@xxxxxxxxxxxxxxxxx
- *Date*: Mon, 22 Aug 2005 23:03:23 GMT


In article <dedbg7$ae2$1@xxxxxxxxxxxxxxxxxxx>, Andy Resnick <andy.resnick@xxxxxxxxxxx> writes:
>Zigoteau wrote:
>
>> I can see where you're coming from, but I'm sticking to my guns.
>> Statistical mechanics reconciles classical thermodynamics with
>> mechanics, either Newtonian or quantum. You are right that for a long
>> time people believed, on the basis of analyses of systems with a small
>> number of degrees of freedom, that time had no inherent direction in
>> Newtonian mechanics. In thermodynamics it definitely does have one.
>> Statistical mechanics explains why such analyses are misguided for
>> systems where the number of degrees of freedom is very large.
>
>I don't know if you read these 2 papers by Jaynes mentioned in another,
>similar, thread:
>
>Phys. Rev. 106, 620−630 (1957)
>Phys. Rev. 108, 171−190 (1957)
>
>But there's an interesting section on the density matrix. Jaynes draws
>a distinction between a "complete" and a "sufficient" density matrix.
>It plays into how entropy increases regardless of the temporal ordering
>of measurement events.
>
>His example is to consider a measurment on a stream of spin 1/2
>particles passing through a magnetic field: the object is to measure if
>the particles are 'up' or 'down'.
>
>A "sufficient" density matrix is the 2 x 2 matrix specified for a single
>particle, while the "complete" matrix for the entire experiment is a 2N
>x 2N matrix, where N is the number of particles measured.
>
>In any case, we may consider the sufficient matrix, and interpret the
>measurement results in terms of a statistical distribution. This is
>what is usually done. Alternatively, we could use the complete matrix,
>but then we have only performed a single experiment, and cannot use
>probability arguments (in addition to the matrix being rather unwieldy)
>to interpret the result.
>
>His point is that when the sufficient matrix is used, we are losing

>information: in this case, the possible correlations which occur between
>different particles (among other possibilities). And, it is this loss
>of information which makes the process irreversible. Now the
>interesting thing is that it can be shown that the entropy goes up as
>information is lost, regardless of the temporal ordering of events− he
>uses multiple experimenters to illustrate this point.
>
>All I'm saying is that there's more to statistical mechanics than just
>statistics and mechanics. There seems to be a way to generate
>higher−level structure: emergence is the current buzzword, I think.
>
>It's funny how the interesting stuff is learned after formal schooling
>is over.....
>
But of course. The main purpose of formal schooling is just to
introduce you to all the interesting stuff that is out there, to be
learned.

Mati Meron | "When you argue with a fool,
meron@xxxxxxxxxxxxxxxxx | chances are he is doing just the same"
.

---


- ***References***:
  - ♦ ***Entropy question***
    - ◊ *From:* Craig Franck
  - ♦ ***Re: Entropy question***
    - ◊ *From:* Gregory L. Hansen
  - ♦ ***Re: Entropy question***
    - ◊ *From:* Craig Franck
  - ♦ ***Re: Entropy question***
    - ◊ *From:* Zigoteau
  - ♦ ***Re: Entropy question***
    - ◊ *From:* Andy Resnick
  - ♦ ***Re: Entropy question***
    - ◊ *From:* Zigoteau
  - ♦ ***Re: Entropy question***
    - ◊ *From:* Andy Resnick

- Prev by Date: ***Re: Neumaier's Modification of Heisenberg 4: The "Generalized HUP"***
- Next by Date: ***Re: Temprature on Moon Surface***
- Previous by thread: ***Re: Entropy question***
- Next by thread: ***Re: Entropy question***
- Index(es):
  - ♦ ***Date***
  - ♦ ***Thread***