

Yet another entropy paradox...

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 - *Date:* 24 Aug 2005 18:38:49 -0700
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But I hope, a novel one.

We conventionally affect to be puzzled by the coexistence of microlaws symmetric under time reversal and the noticeably time reversal asymmetric macrolaws which live with them. But what if the microlaws were also asymmetric under time reversal -- would that make us feel any better?

In considering a time reversal of the force law $f = q v \times B$, the convention is that B be flipped, so that the time reversed law has the same form. Suppose we don't adopt this convention, so now the law has lost its time reversal symmetry. Is this proper? We don't have to argue whether this alternate convention is proper, we can model it!

Consider a plasma of electrons and protons in a parallel magnetic and gravitational field, and also consider a plasma of positrons and anti-protons in the same set-up. The charge conjugated version then obeys the proposed dynamics of the time-reversed system (gravitation merely defines a distinct vertical).

Well, before we seemed to be bothered that symmetric microlaws led to asymmetric macrolaws, and now we have some asymmetric microlaws, so we should be all set, right? Well, not quite: the two systems are time reversed models of each other, yet both stubbornly evolve towards increasing entropy in lab time.

So besides asking how symmetric microlaws fail to produce a symmetric macroworld, we also may ask how reversed asymmetric microlaws fail to produce asymmetric macroscopic results.

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 ◇ *From:* Ken Muldrew

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 - ◇ *From:* Uncle Al
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 - ◇ *From:* Autymn D. C.

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