

Combi Seminar

Wednesday, 10.5.22 | 1:30 | Foege Auditorium

remote viewing option: <https://depts.washington.edu/gstrestrc/remote.htm>



Dr. Hong Qian

University of Washington

“Internal Energy, Fundamental Thermodynamic Relation, and Gibbs’ Ensemble Theory as Laws of Statistical Counting”

Counting ad infinitum is the holographic observable to a statistical dynamics with finite states under independent repeated sampling. Entropy provides the infinitesimal probability for an observed frequency \mathbf{n} w.r.t. a probability prior \mathbf{p} . Following Callen's thermodynamic postulate and through Legendre-Fenchel transform, without help from mechanics, we show an internal energy \mathbf{u} emerges; it provides a linear representation of real-valued observables with full or partial information. Gibbs' fundamental thermodynamic relation and theory of ensembles follow mathematically. \mathbf{u} is to \mathbf{n} what omega is to t in Fourier analysis.

<https://amath.washington.edu/people/hong-qian>

Questions? Contact Brian Giebel at bgiebel@uw.edu or visit the Combi website at <http://www.gs.washington.edu/news/combi.htm>

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