

Quantum Steampunk: Quantum Information meets Thermodynamics



A colloquium sponsored by the Society of Physics Students

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Thermodynamics has shed light on engines, efficiency, and time's arrow since the Industrial Revolution. But the steam engines that powered the Industrial Revolution were large and classical. Much of today's technology and experiments are small-scale, quantum, far from equilibrium, and processing information. Nineteenth-

century thermodynamics needs re-envisioning for the 21st century. Guidance has come from the mathematical toolkit of quantum information theory. Applying quantum information theory to thermodynamics sheds light on fundamental questions (e.g., how does entanglement spread during quantum thermalization? How can we distinguish quantum heat from quantum work?) and practicalities (e.g., quantum engines and the thermodynamic value of coherences). I will overview how quantum information theory is being used to revolutionize thermodynamics in *quantum steampunk*, named for the steampunk genre of literature, art, and cinema that juxtaposes futuristic technologies with 19th-century settings.



Friday, January 27th, 2022
4:00 PM EST in Jepson 225

Please contact SPS president Abby Swanson at aswanson2@mail.umw.edu with any questions!

Hosted by the Department of Chemistry and Physics

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Open to all who wish to attend

