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Type: **Talk in a parallel session**

## **Time is entropy: A geometric proof**

*Tuesday, 9 July 2024 15:00 (15 minutes)*

We use the formalism of geometrothermodynamics to associate a Riemannian manifold called equilibrium space to any thermodynamic system. In the case of an ideal gas, we show that quasi-static thermodynamic processes correspond to geodesics in the equilibrium space. Interpreting time as the affine parameter along geodesics, we show that the entropy of the ideal gas is linearly proportional to time, and the second law of thermodynamics determines the arrow of time.

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**Session Classification:** Navigating science and philosophy: exploring limits