Thermodynamically compatible family of non-relativistic self-gravitating weakly nonlocal fluids

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- How universal is thermodynamics?
  - Gravity?

$$\Delta\varphi = 4\pi G \left[\varrho + \nabla \cdot \left(C \frac{\nabla \varrho}{\varrho} \right) \right]$$

  - Quantum mechanics? $\implies$ Korteweg fluids $\implies$ Bohmian (hydrodynamical) formulation of QM
- How universal is holographic property?

$$\varrho\dot{\mathbf{v}} = -\nabla \cdot \mathbf{P}_{\text{perfect}} \qquad \overset{?}{\Longleftrightarrow} \qquad \varrho\dot{\mathbf{v}} = -\varrho\nabla\Phi$$

- Does a thermodynamically consistent family of fluids exist? $\implies$ YES

Thank you for your attention!