Title: Session 2 - Luna Zagorac

Speakers:

Collection: POSTDOC WELCOME 2022

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J. Luna Zagorac

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Cosmology

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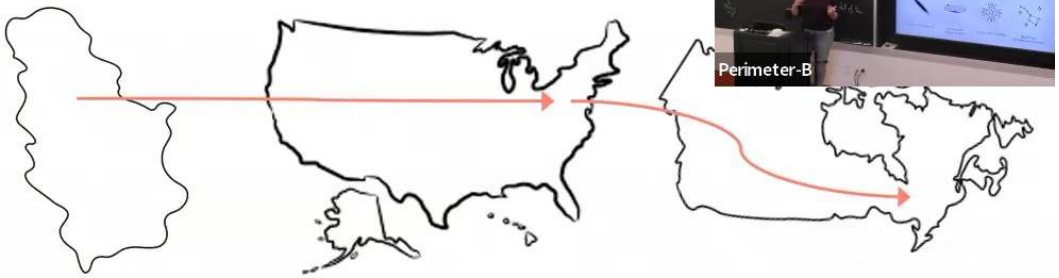
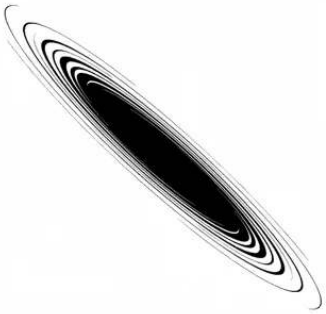
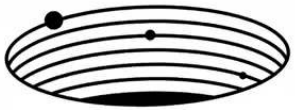
Cosmology

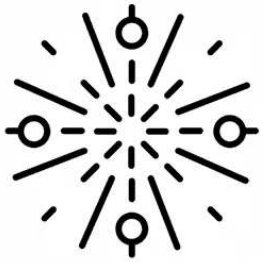




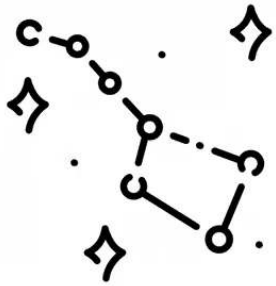
Fuzzy Dark Matter



Primordial Black Holes



Inflation & WIMPs



Egyptian archaeoastronomy

UltraLight Dark Matter

UltraLight Dark Matter (ULDM):

- is an axion-like scalar boson
- has low mass: ~ 10^{-22} eV
- forms Bose-Einstein condensates
- helps with small-scale problems
  - e.g. core-cusp problem (right)
- cool phenomenology!

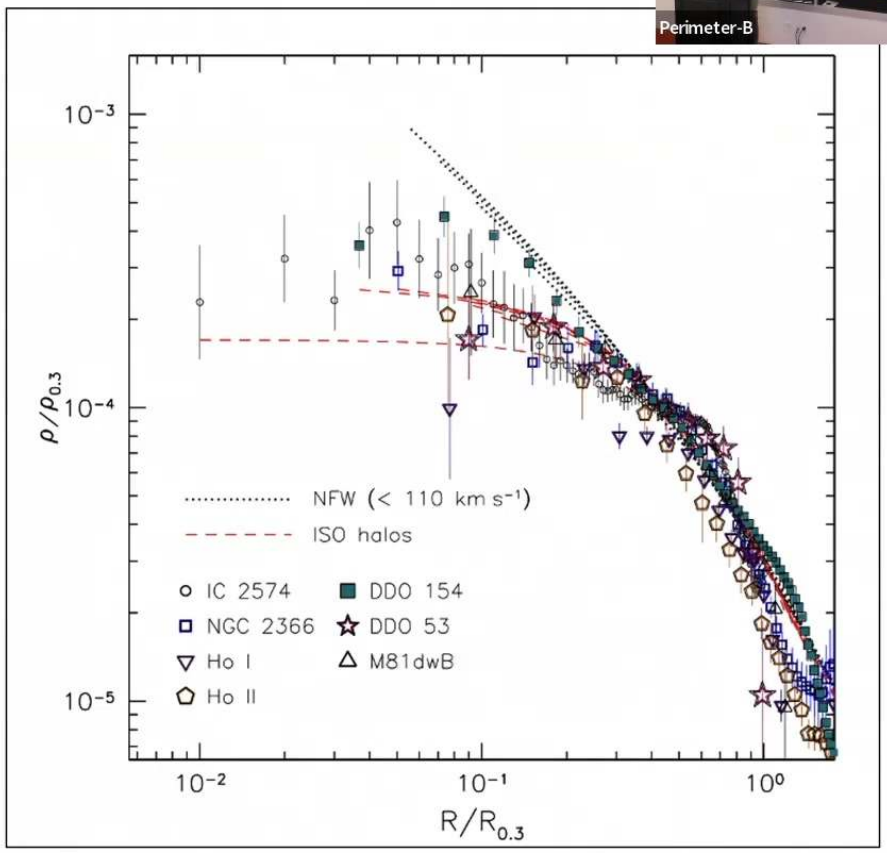
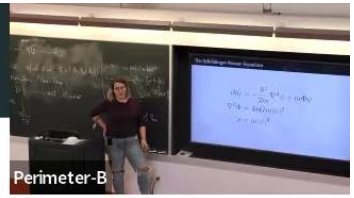


Fig. 7 in Oh, Se-Heon, et al. AJ, 2011.

The Schrödinger-Poisson Equations

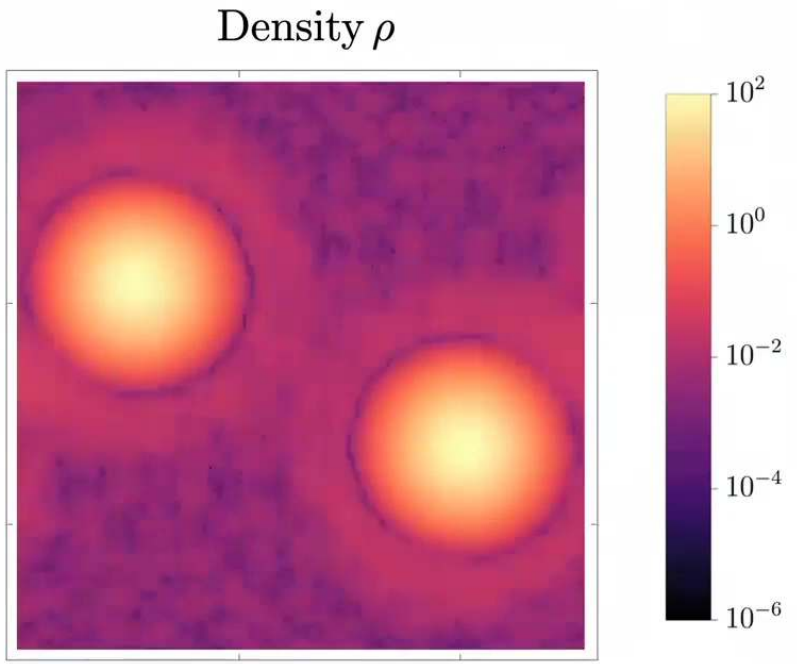


$$i\hbar\dot{\psi} = -\frac{\hbar^2}{2m}\nabla^2\psi + m\Phi\psi$$

$$\nabla^2\Phi = 4\pi G m|\psi|^2$$

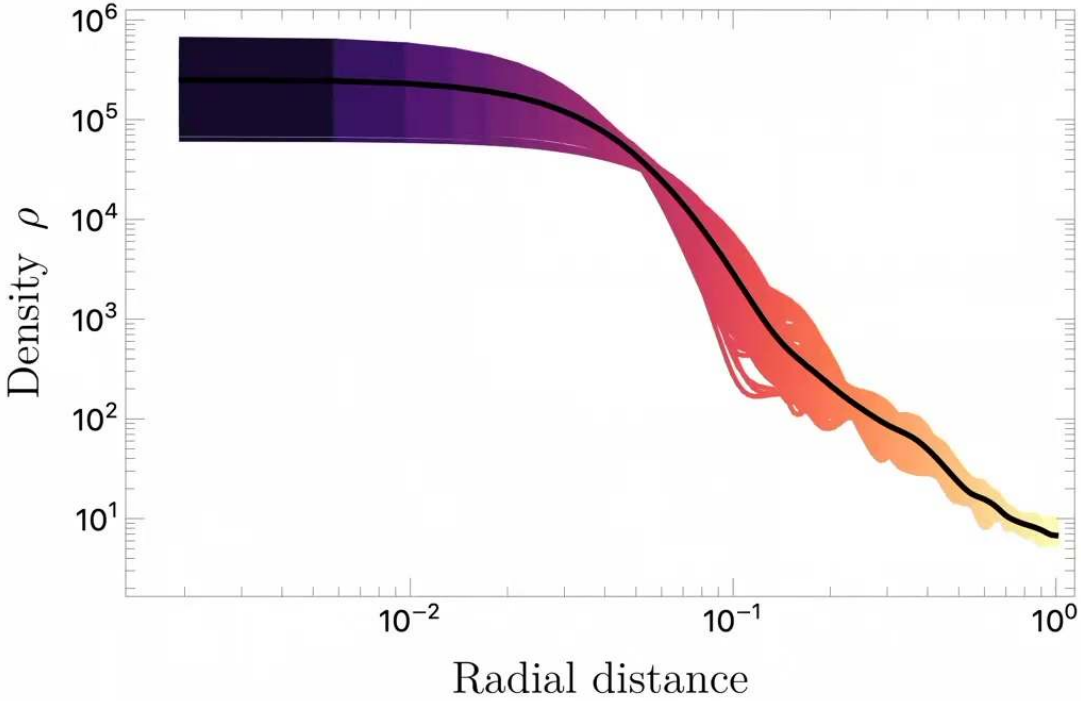
$$\rho = m|\psi|^2$$

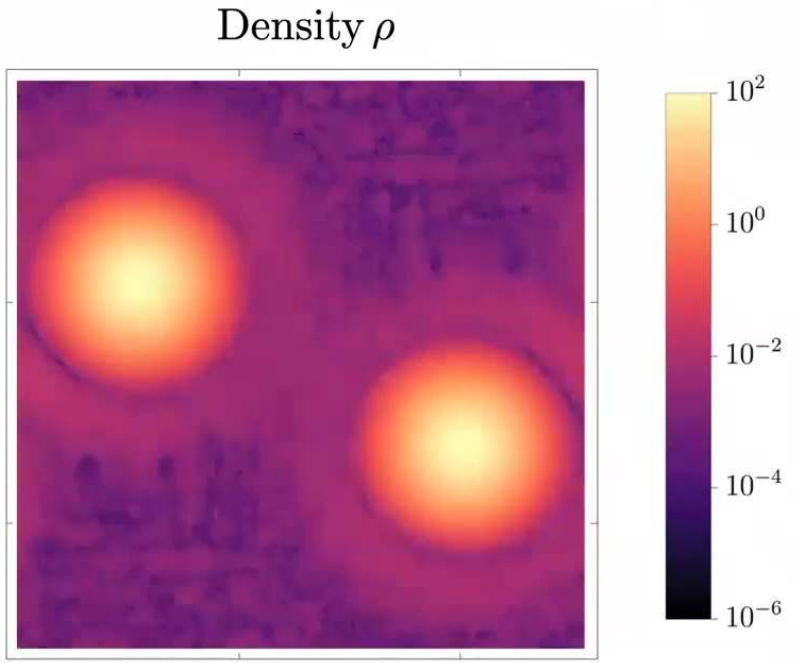
Making a ULDM Halo



(Everything presented in code units)
(Because I do computation and don't believe in units)

Making a ULDM Halo





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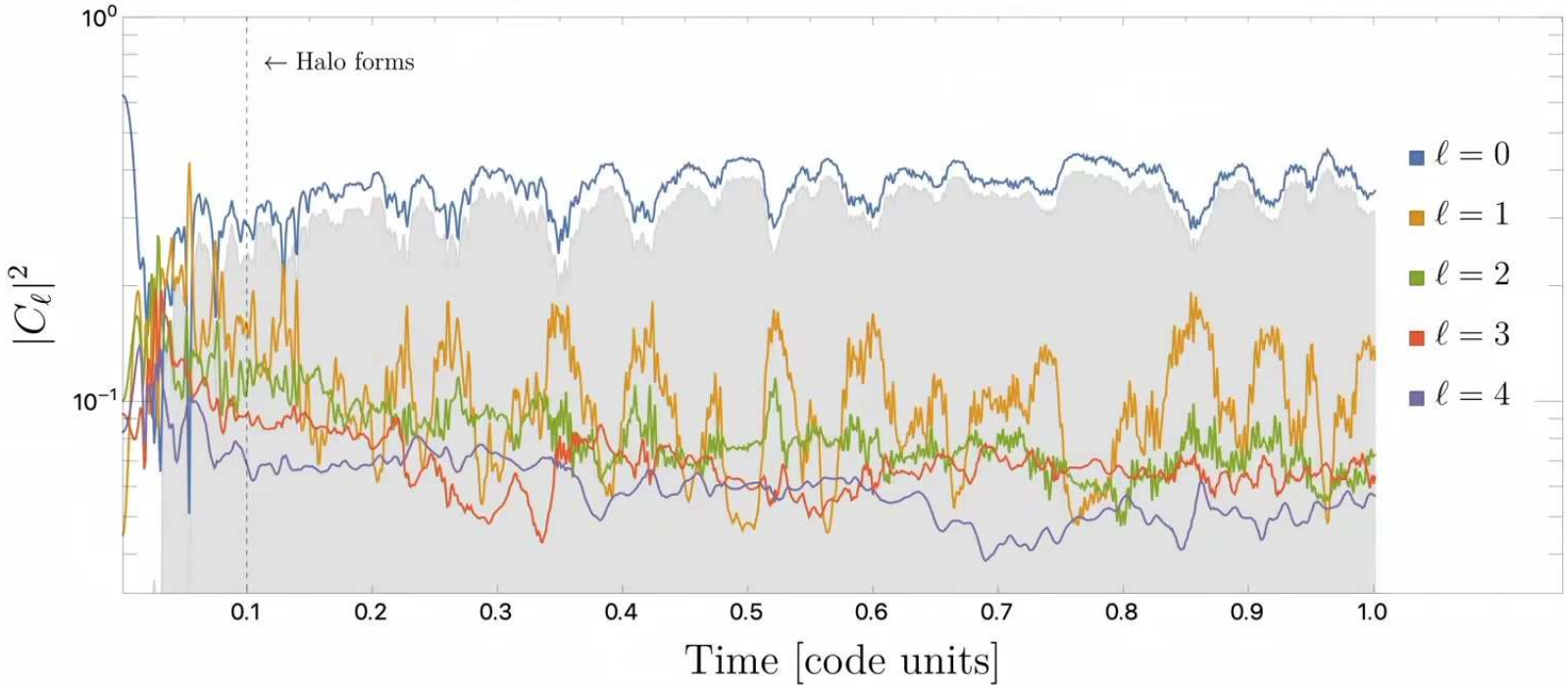
The Schrödinger ~~-Poisson~~ Equation~~s~~ *and its eigenstates*

$$i\hbar\dot{\psi} = -\frac{\hbar^2}{2m}\nabla^2\psi + m\langle\Phi\rangle\psi$$



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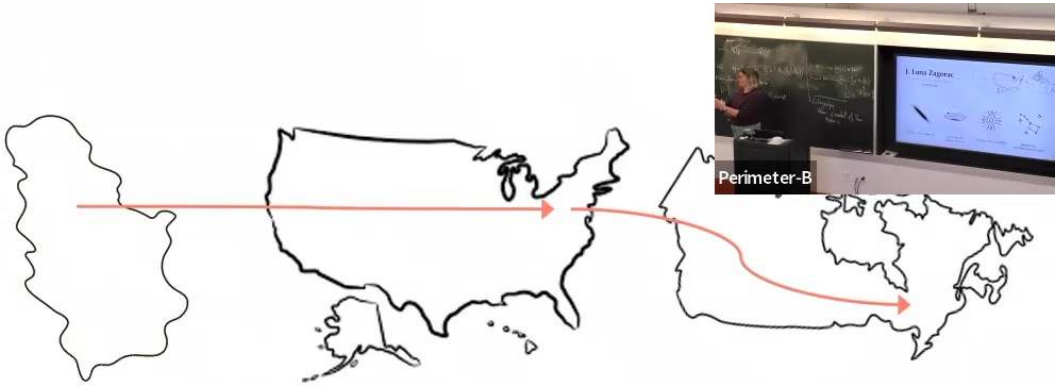

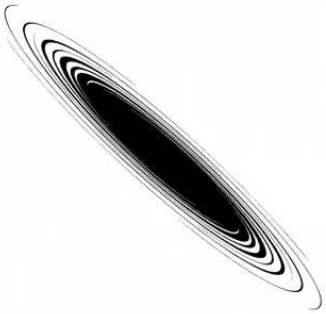

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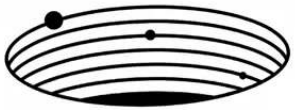

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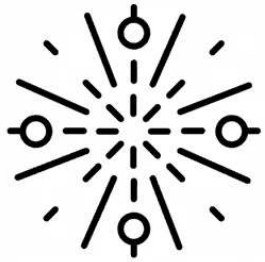

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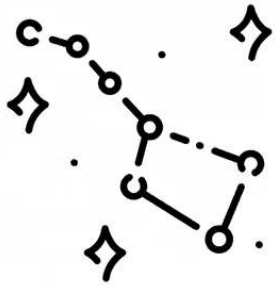

Egyptian archaeoastronomy