from astropy.io import fits

import matplotlib.pyplot as plt

import numpy as np

# Path to your FITS file (update this to your actual file path)

fits\_path = "hlsp\_frontier\_model\_abell370\_cats\_v4\_kappa.fits"

# Load FITS file

hdul = fits.open(fits\_path)

hdul.info()

# Usually the mass map is in the primary HDU or first extension

mass\_map = hdul[0].data # or try hdul[1].data if needed

# Close the FITS file after reading

hdul.close()

# Check shape and some stats

print("Mass map shape:", mass\_map.shape)

print("Mass map stats - min:", np.min(mass\_map), "max:", np.max(mass\_map))

# Plot the convergence/mass map

plt.figure(figsize=(8, 6))

plt.imshow(mass\_map, origin='lower', cmap='inferno')

plt.colorbar(label='Mass Density / Convergence (κ)')

plt.title('Galaxy Cluster Mass Map from FITS')

plt.xlabel('Pixel X')

plt.ylabel('Pixel Y')

plt.show()