

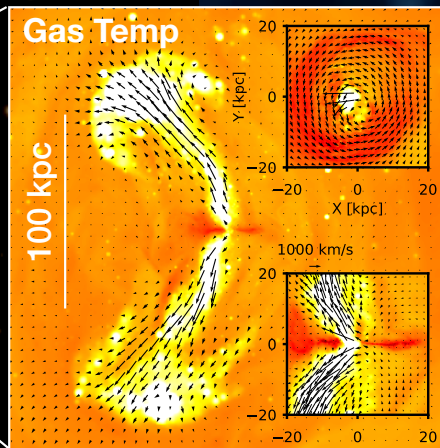
The ROMULUS Simulations

Certified organic, free-range, locally grown supermassive black holes

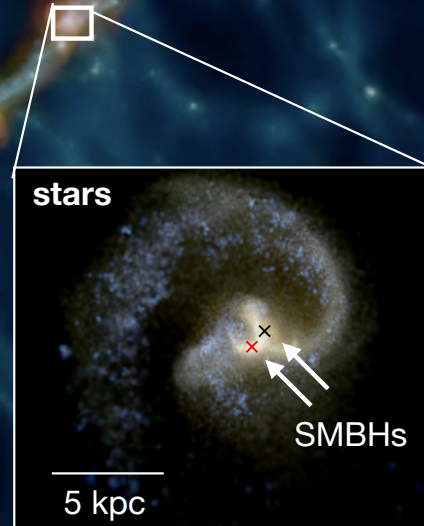
- ✓ Early Seeding in low mass halos
- ✓ Self-consistent and physically motivated dynamics, growth, and feedback
- ✓ Naturally produces large-scale outflows
- ✓ **No unnecessary additives or assumptions**

ROMULUSC

$10^{14} M_{\text{sun}}$ Galaxy Cluster
Tremmel+ 2019
(stars, uvj colors)



CHANGA



ROMULUS25

25 Mpc Volume
Tremmel+ 2017
(gas temp)

Resolution:
250 pc (grav)
50 pc (hydro)
 $\sim 1e5 M_{\text{sun}}$