Sarah Wellons
Northwestern University

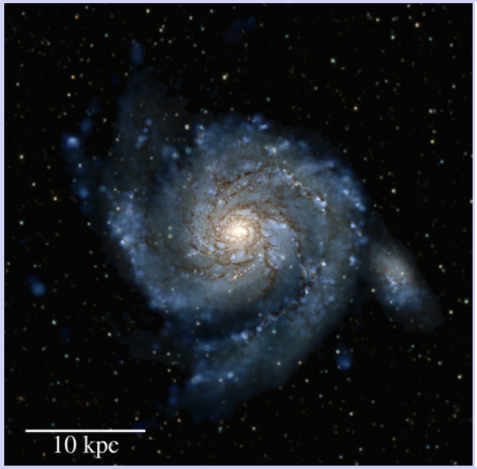
I study galaxy formation using massively parallel physics simulations

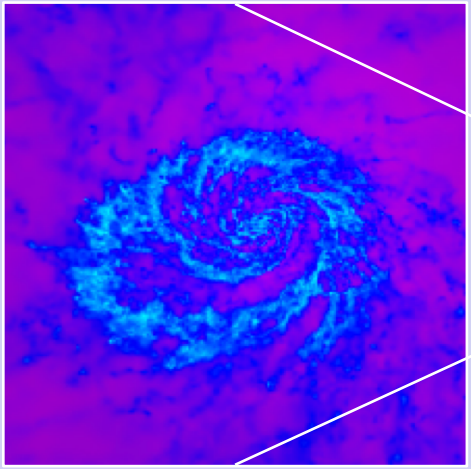
Simulations include gravity, hydrodynamics, magnetic fields (sometimes), radiation (sometimes) + models for star formation, supernovae, etc.

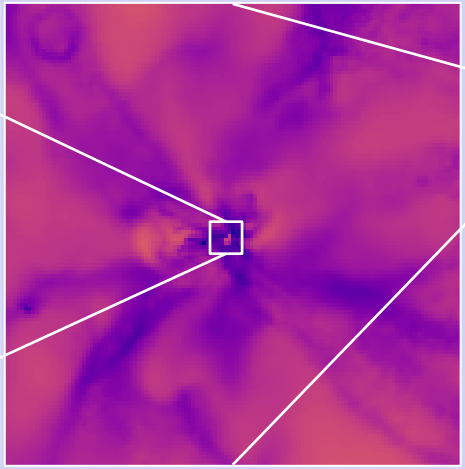
Large collaborations, community codes

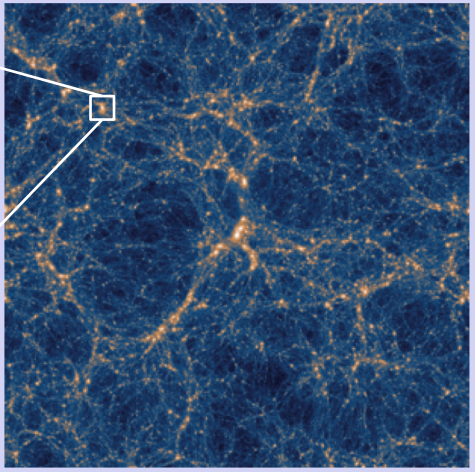
Large dynamic range -> computationally expensive

Lots of highly multi-dimensional data, requires HPC resources









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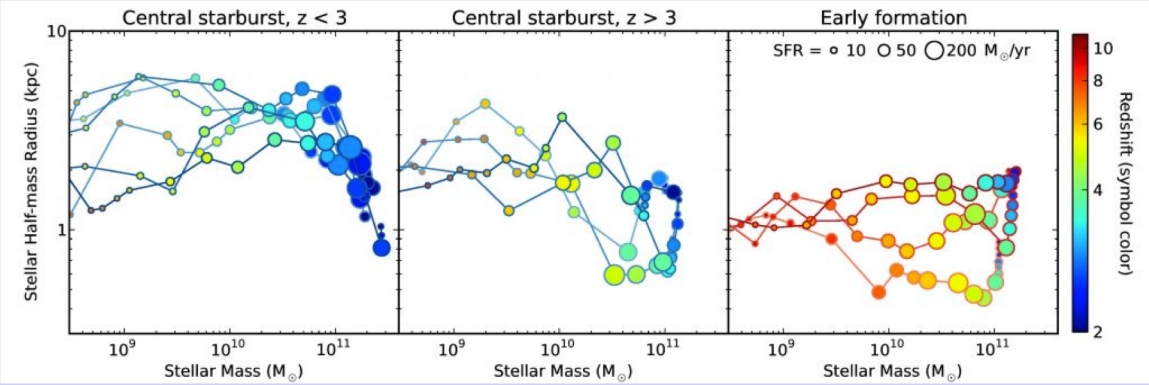
Challenges/goals

Working with large, multidimensional datasets:

Efficient manipulation of / calculations with data (thanks numba!)

Effective visualization of complex data



Technical knowledge can be siloed within a collaboration – I want to be more knowledgeable about the parallelization under the hood