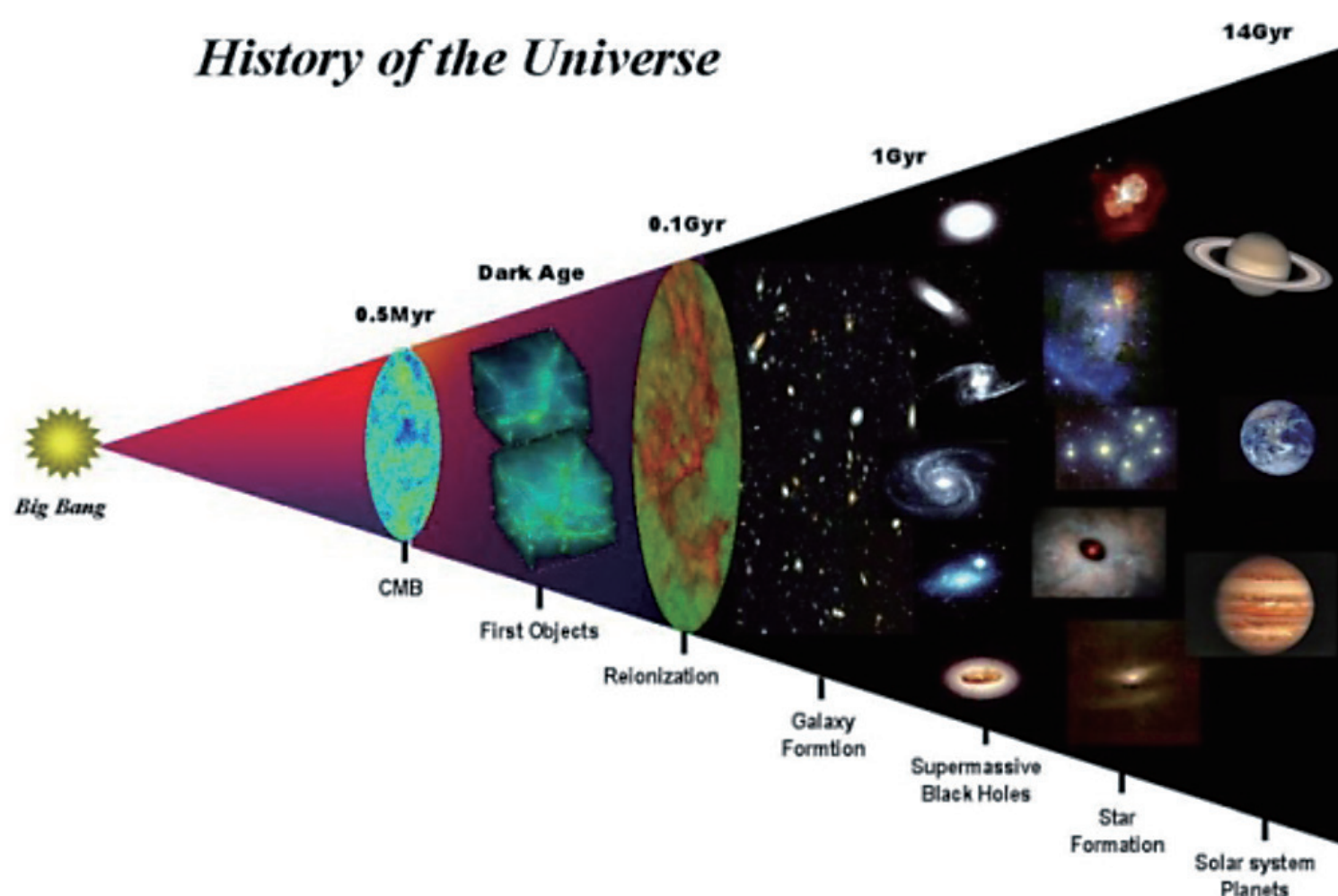


Numerical Astrophysics

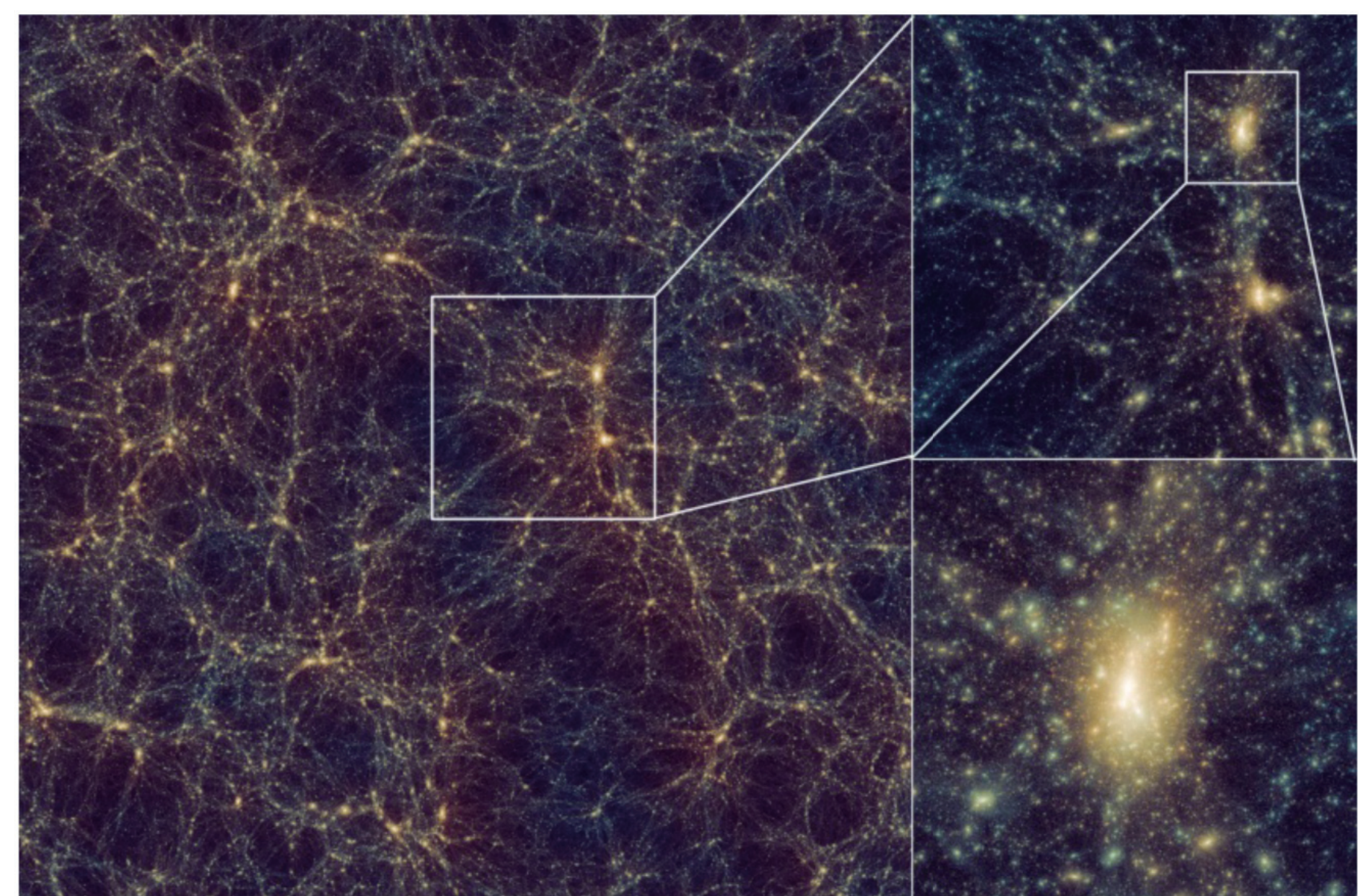
Numerical simulation in astrophysics



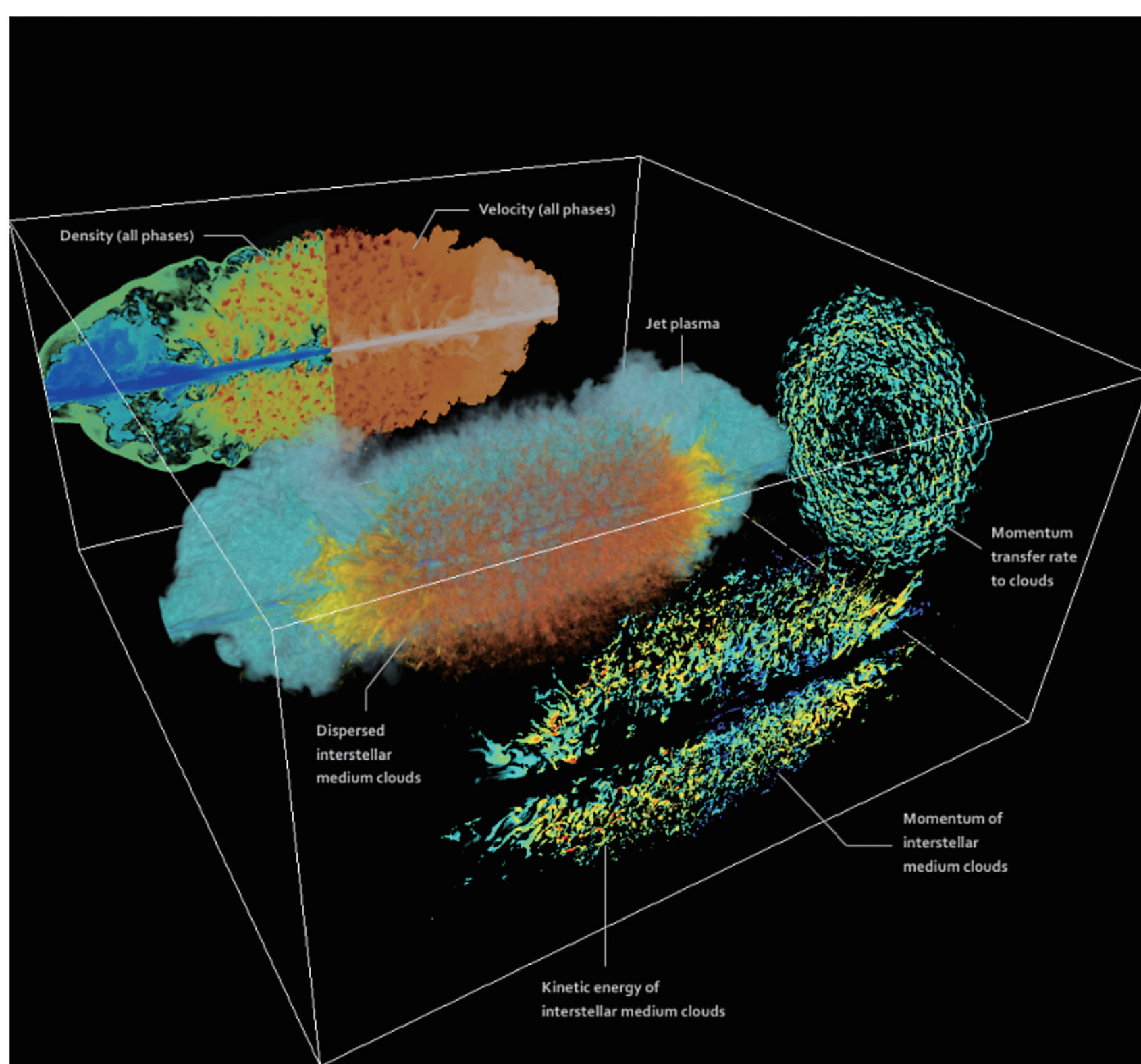
Numerical simulations are indispensable tools for the theoretical research of astrophysics, which accompany, interpret and sometimes lead astronomical observations. We conduct the state-of-the-art simulations of the formations of stars and galaxies in the universe.

Large-scale structure in the universe

Distribution of galaxies and galaxy clusters in our universe has sheet- or filament-like structure. Such 'large-scale structure' in the universe thought to be originated from small ripples of dark matter in the very early universe. Numerical simulations of the large scale structure shown here reveal detailed matter distribution of matter in the universe.



Jet launched by massive black holes



The accretion disks around supermassive black holes at the centers of galaxies are capable of launching powerful, relativistic jets. These jets are thought to interact with the large-scale distribution of gas in the host galaxy, affecting star-formation and the growth of the central black hole through a feedback cycle that is believed to operate since the first galaxies formed. Our 3D hydrodynamic simulations demonstrate how this feedback mechanism works through efficient energy and momentum transfer to the interstellar medium.