Galaxies acquire gas from the cosmic web. As they convert this gas into stars that then blow up as supernovas, gas enriched with freshly produced heavy elements is expelled back into the galaxies' diffuse environs. Thus, to understand how galaxies evolve through cosmic time, we must understand the physics governing the extensive and massive reservoirs of extremely low-density gas surrounding them.

Though this circumgalactic gas is structurally and kinematically complex, its low density makes it difficult to observe directly. With cosmological simulations evolved on NASA's Pleiades supercomputer, we model how galaxies and gas change through time. Mock data generated from these simulations then helps us interpret real data.