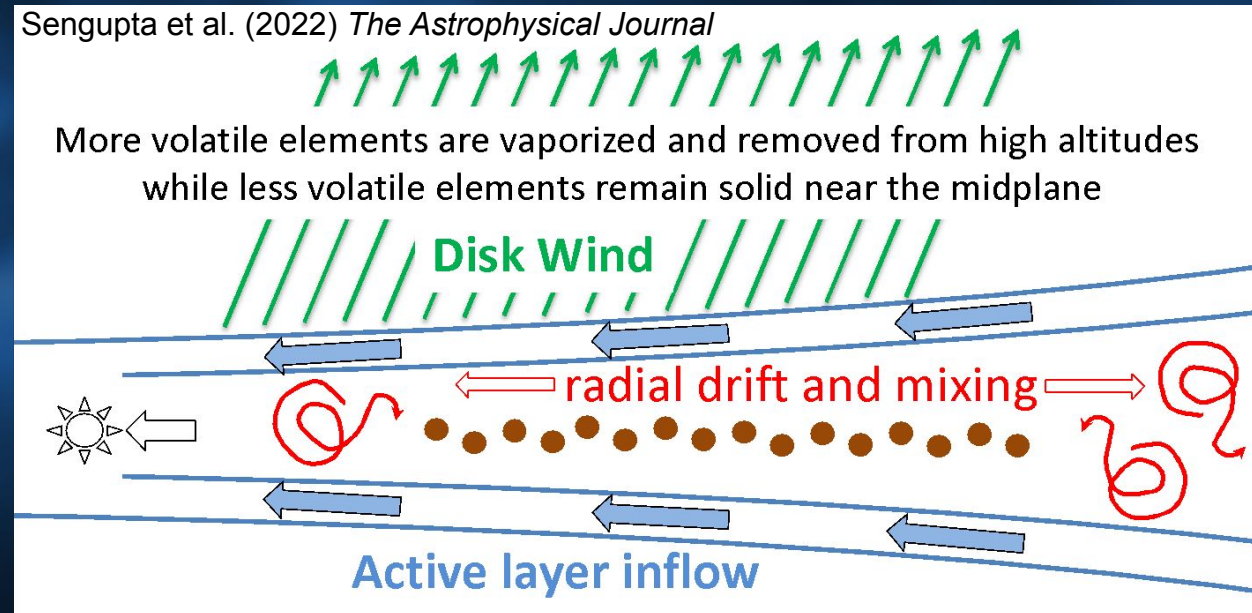
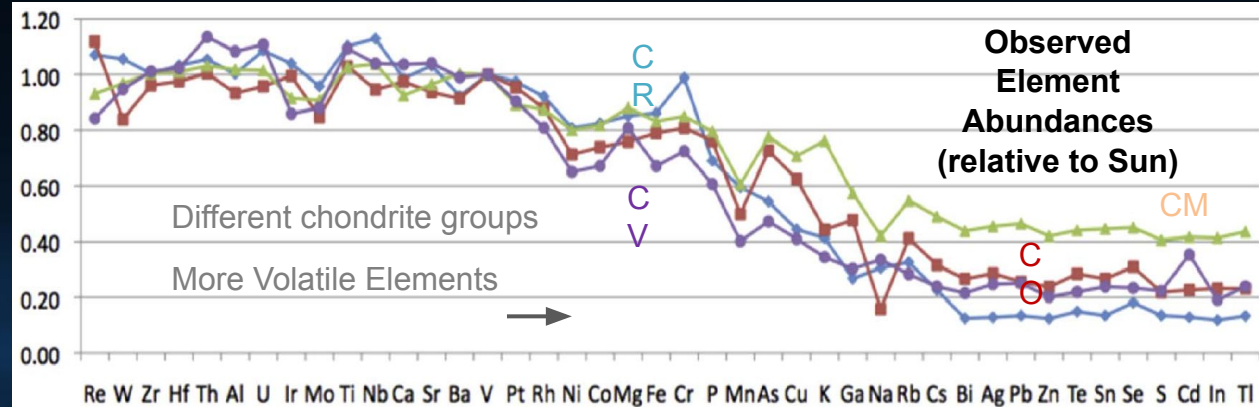


# Composition of Primitive Meteorites Coupled to Loss of Vapor from the Early Solar Nebula

Primitive carbonaceous chondrites show a systematic depletion of the more volatile rock- and metal-forming elements (top figure), and a recent study wanted to explore why.

- Research scientists developed a global model of particle growth and drift in a hot early solar nebula, including for the first time “open system” loss of material.
- Results from the model show that in the hot inner regions, the more volatile rock- and metal-forming elements evaporate and can be irreversibly lost as vapor, while the less volatile elements are left behind in particles near the nebula midplane (bottom figure).
- In observing bursts and outflows in other young stars today, we may be witnessing the creation of the “pebbles” that formed our own asteroids and ultimately our planets.



**Top:** Elemental abundances of various carbonaceous chondrites.  
**Bottom:** Conceptual representation for open-system loss of moderately volatile elements to space or the sun.