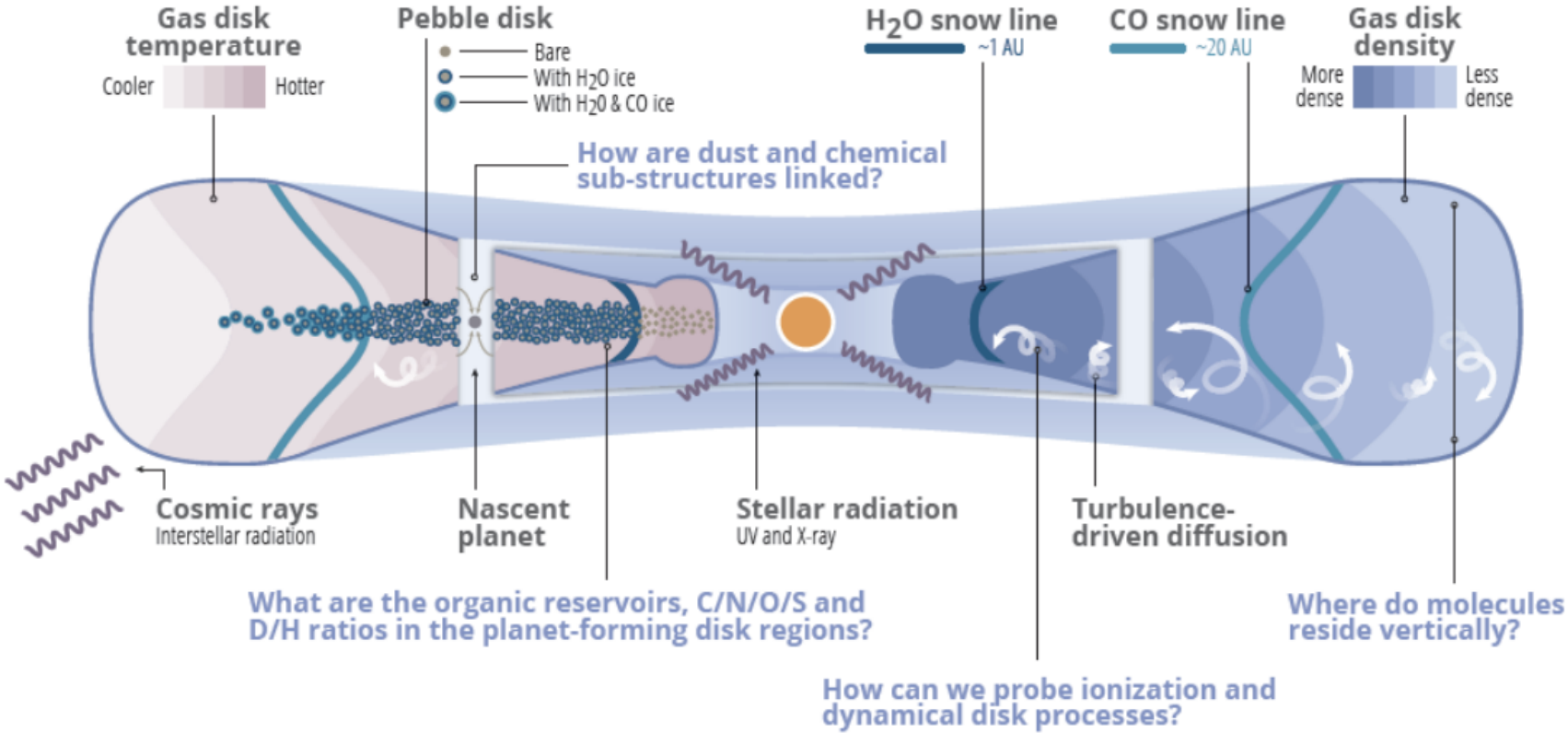

Figure 1. Illustration of the protoplanetary disk structure, on a logarithmic scale, and its coupling to different gas and grain dynamical processes. Note the temperature gradient inward and upward (pink shading), which results in a series of midplane snowlines (shown at typical locations for a disk around a T Tauri star) and 2D snow-surfaces reaching up into the disk atmosphere, as well as the inward and downward density gradient (blue shading). Disk surfaces are characterized by photon processes. Disk midplanes are by contrast cold and UV-poor, and the main volatile reservoirs (other than H_2 and He) are in icy grain and pebble mantles, especially exterior to the CO snowline. The four guiding questions used to design MAPS are written in blue. Image credit: K. Peek, adapted from Öberg & Bergin (2021)