

Unveiling the physical and chemical conditions of the youngest disks:

A warm embedded disk in L1527

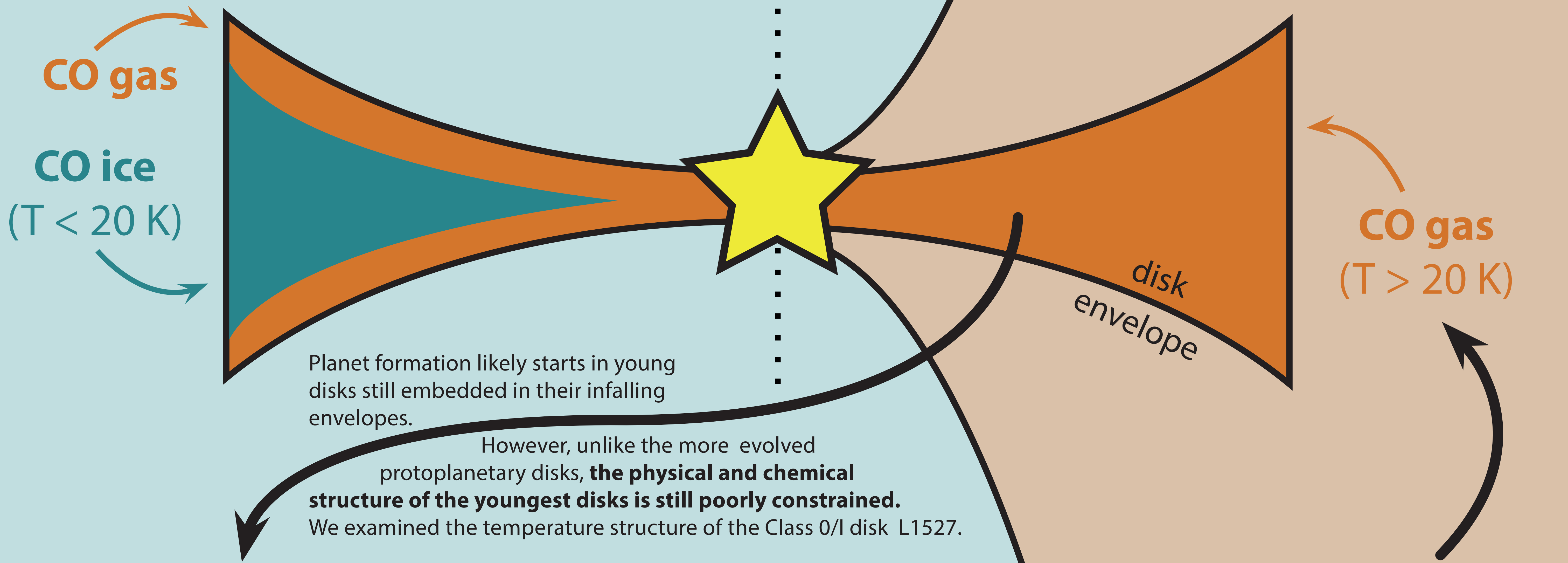
Merel van 't Hoff¹, John Tobin², Daniel Harsono¹ & Ewine van Dishoeck^{1,3}

¹ Leiden Observatory, Leiden University, The Netherlands; vthoff@strw.leidenuniv.nl
² University of Oklahoma, US ³ MPE Garching, Germany

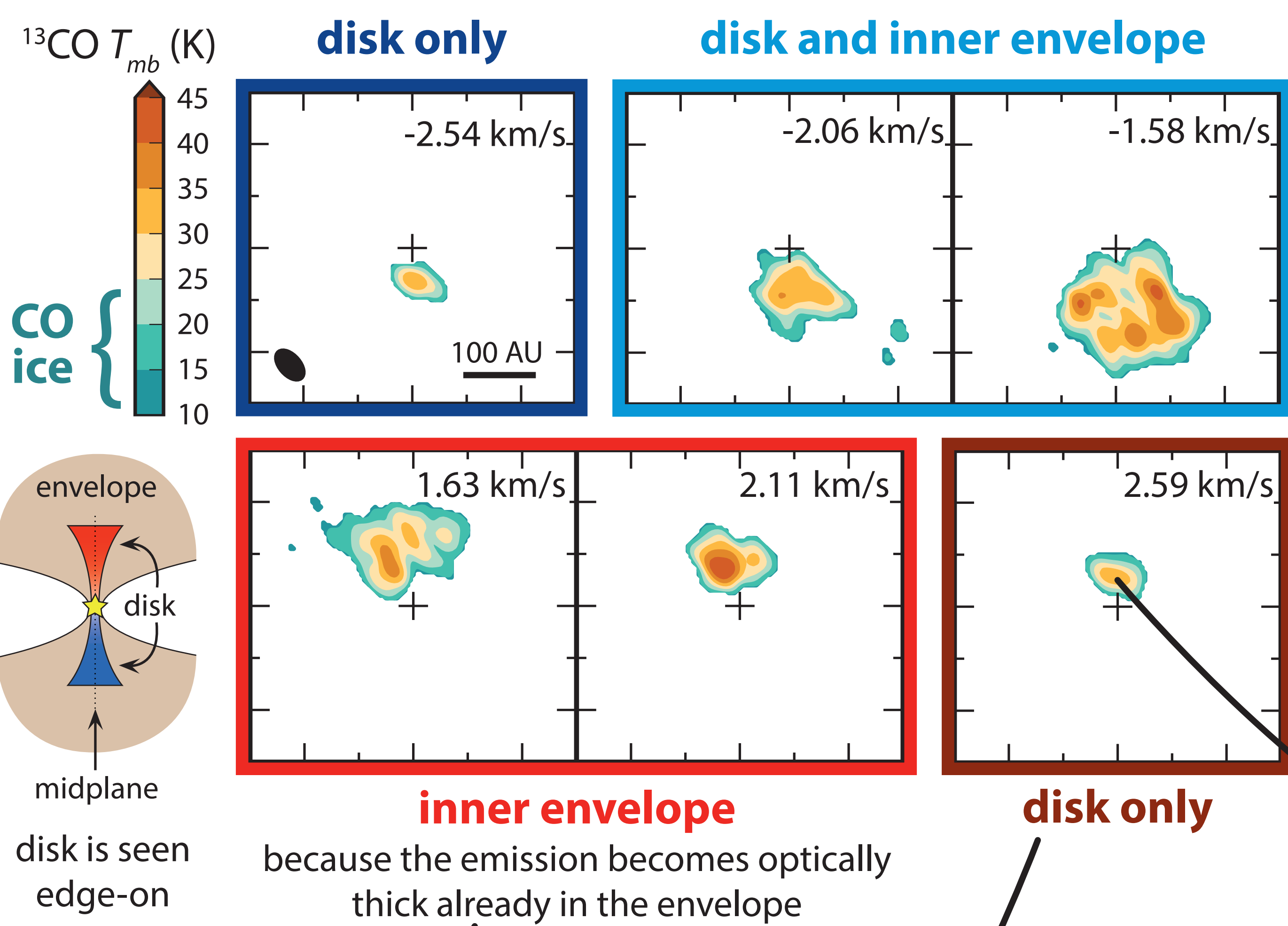


Typical protoplanetary disk

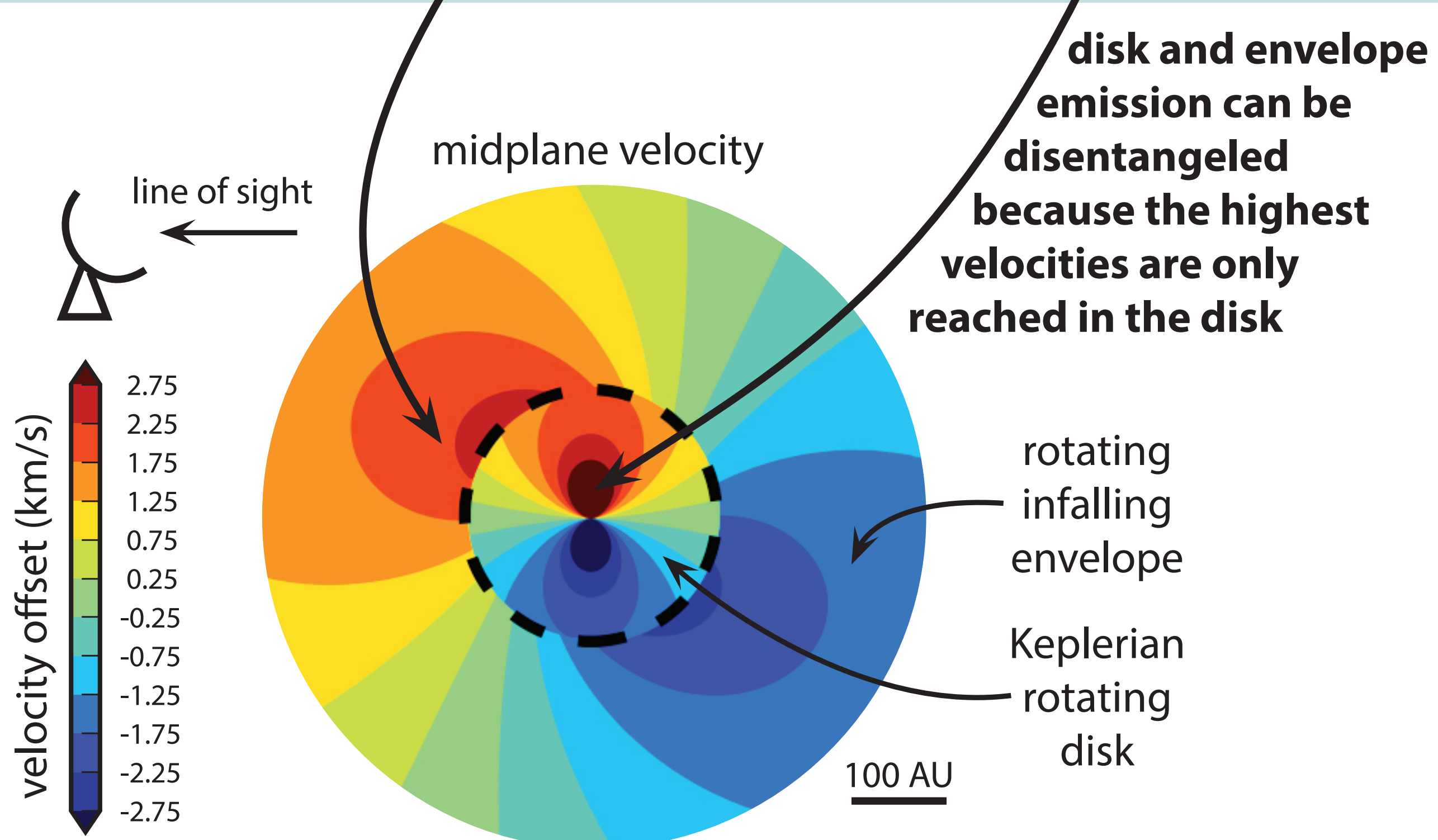
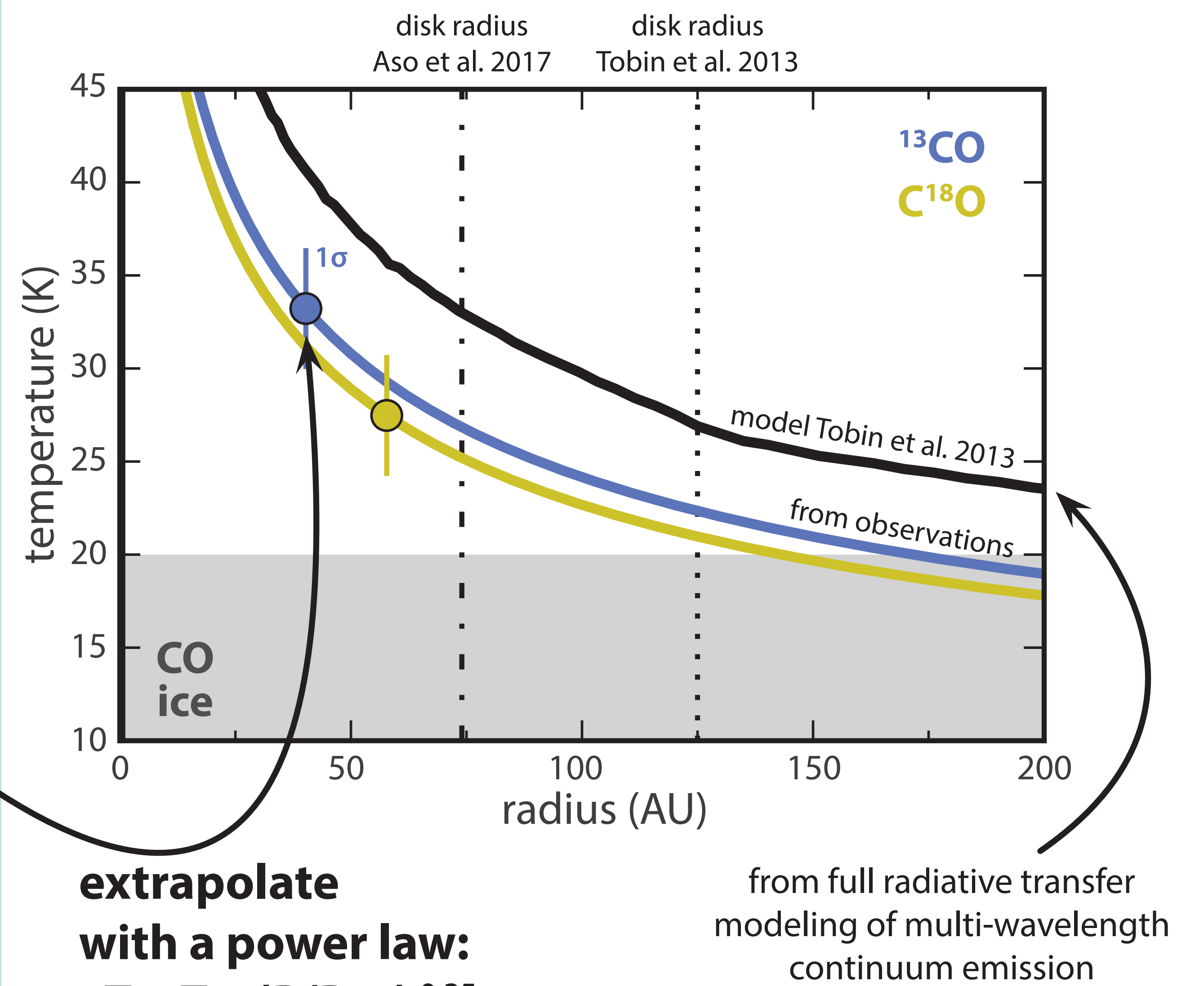
E.g., TW Hya [1,2], HD 163296 [3], IM Lup [4], Flying Saucer disk [5].



Get temperature from optically thick ¹³CO emission: the midplane temperature is > 25 K



Extrapolate measured temperature: the entire disk is likely warmer than 20 K



No detection of N₂D⁺

N₂D⁺ can only be abundant when CO is frozen out, so this suggests that CO does not freeze out in the disk

