



universität
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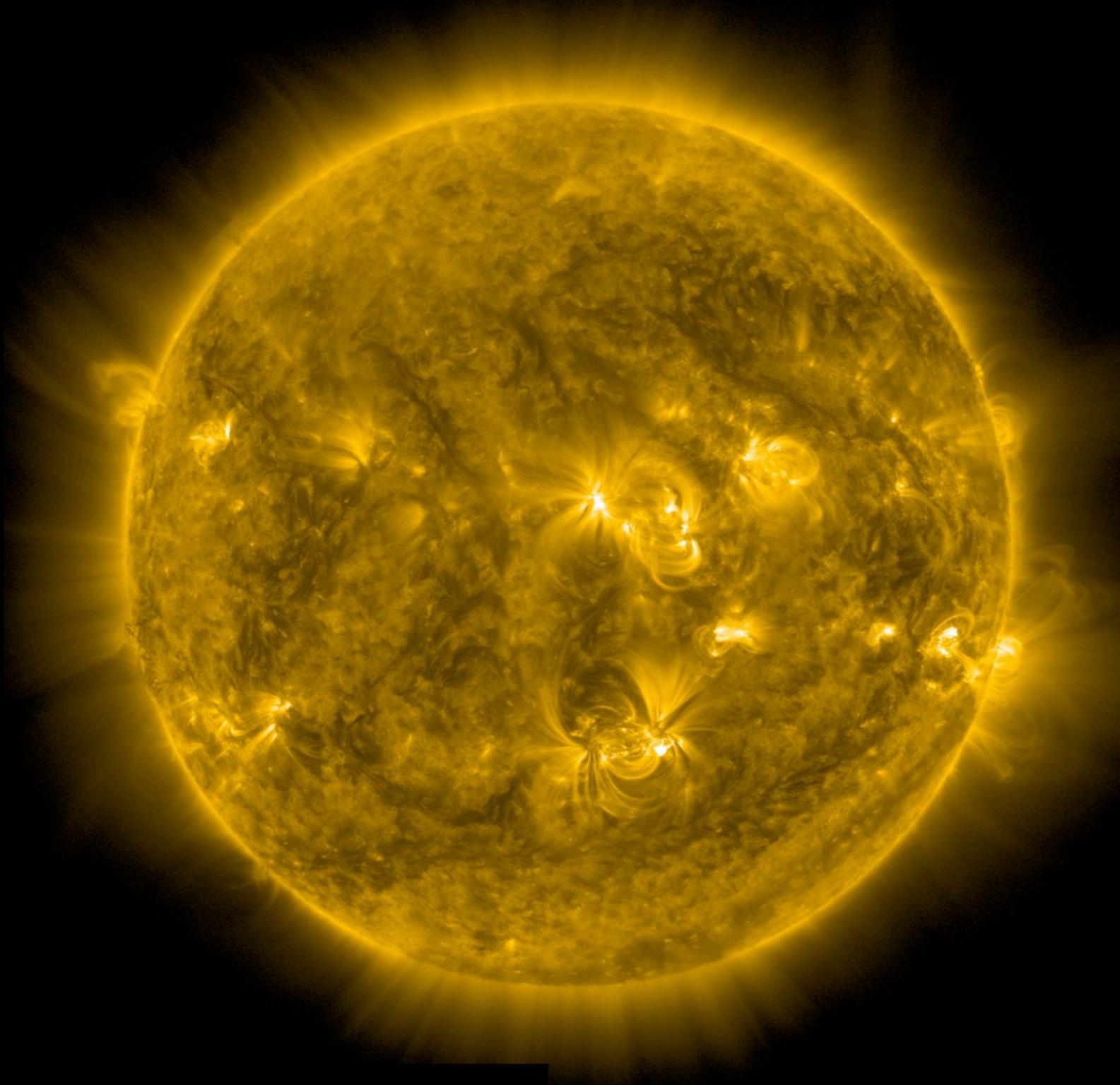
FUWF

Stellar Activity Evolution and the Atmospheres of Terrestrial Planets

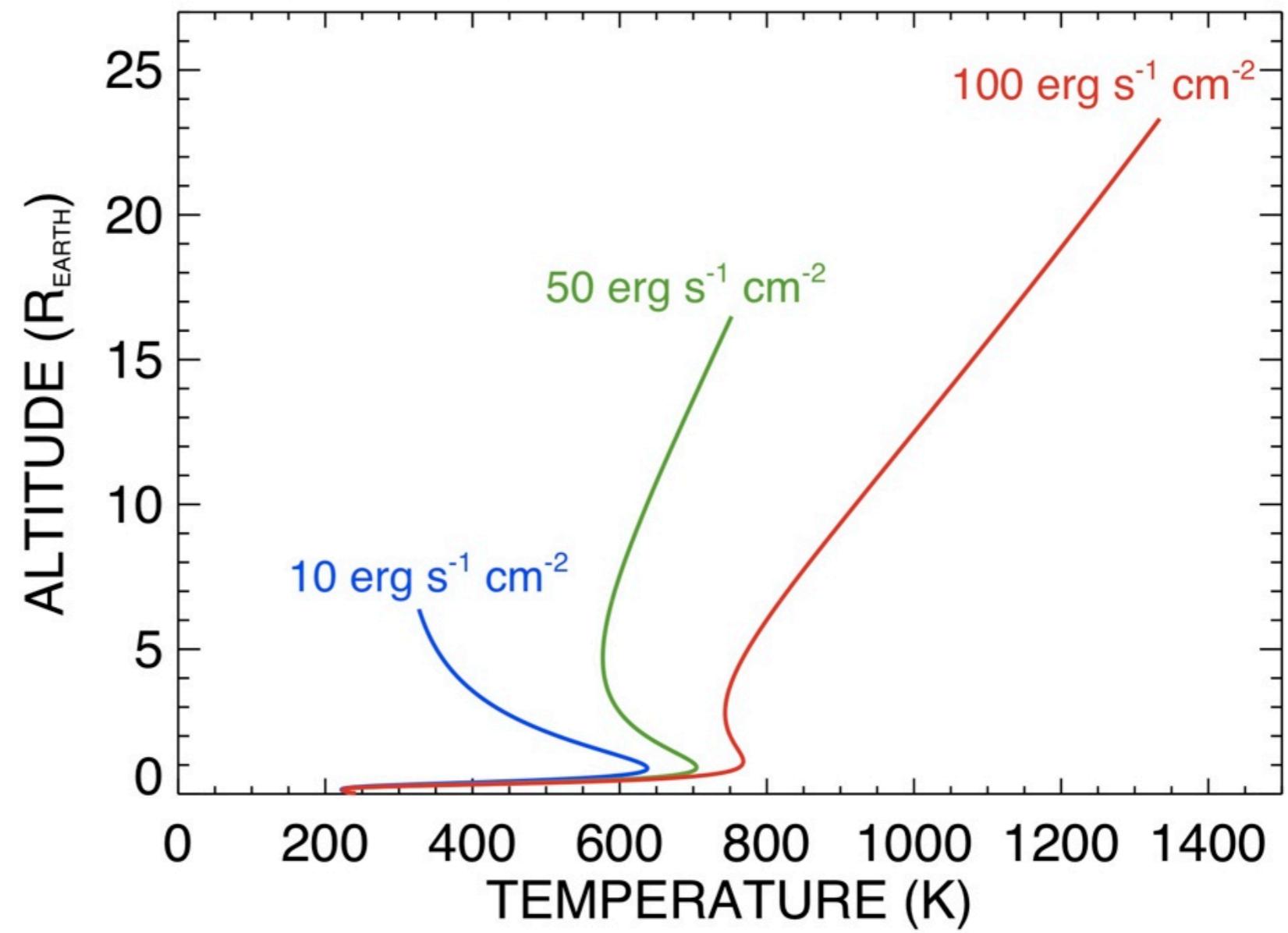
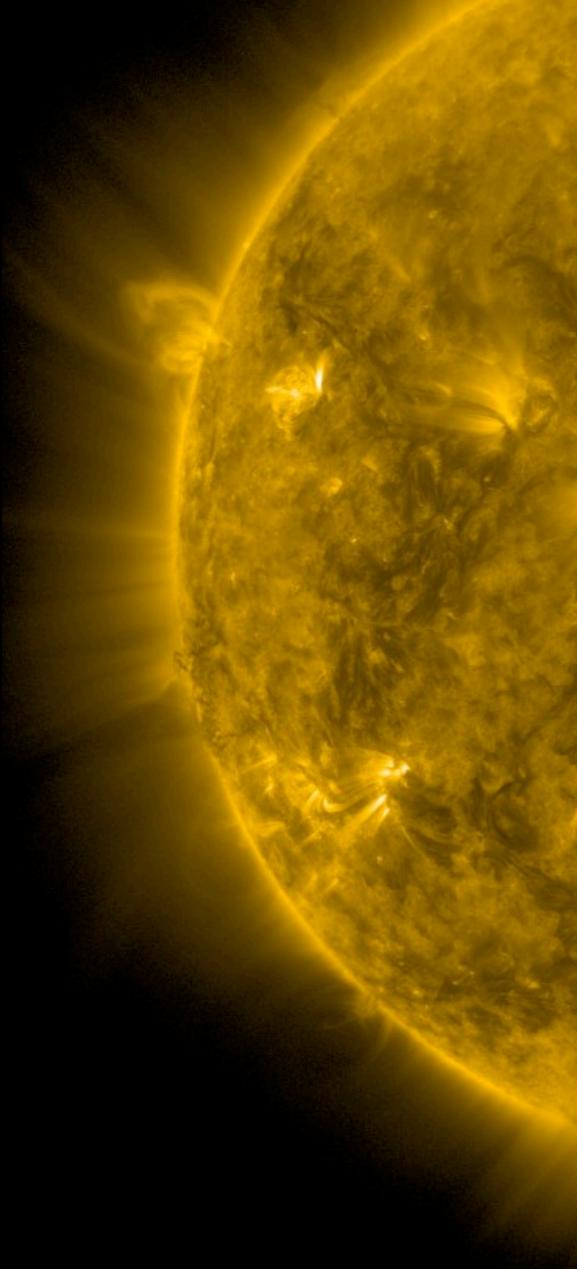
Colin P. Johnstone



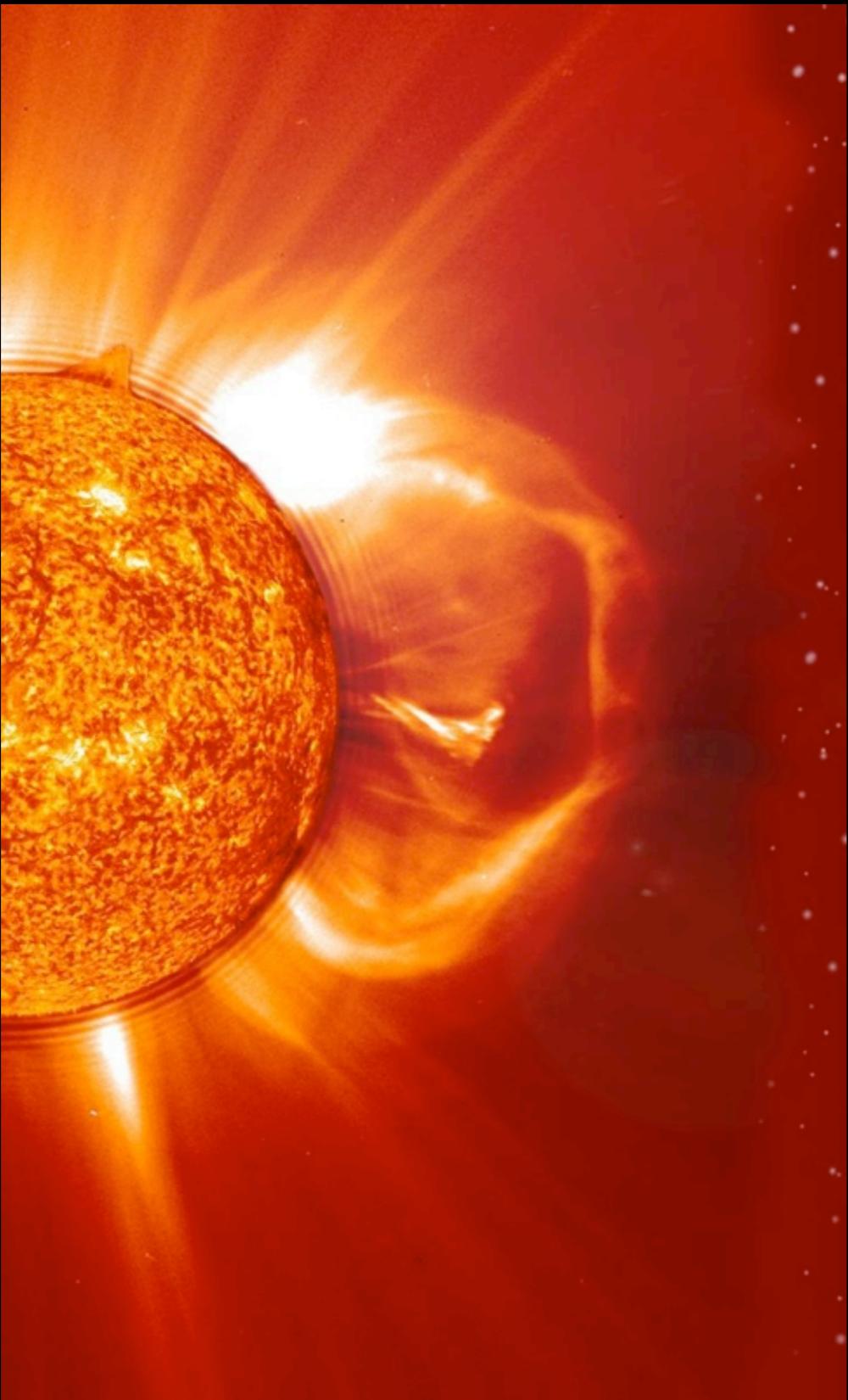
**Stars emit strongly in
EUV and X-rays**



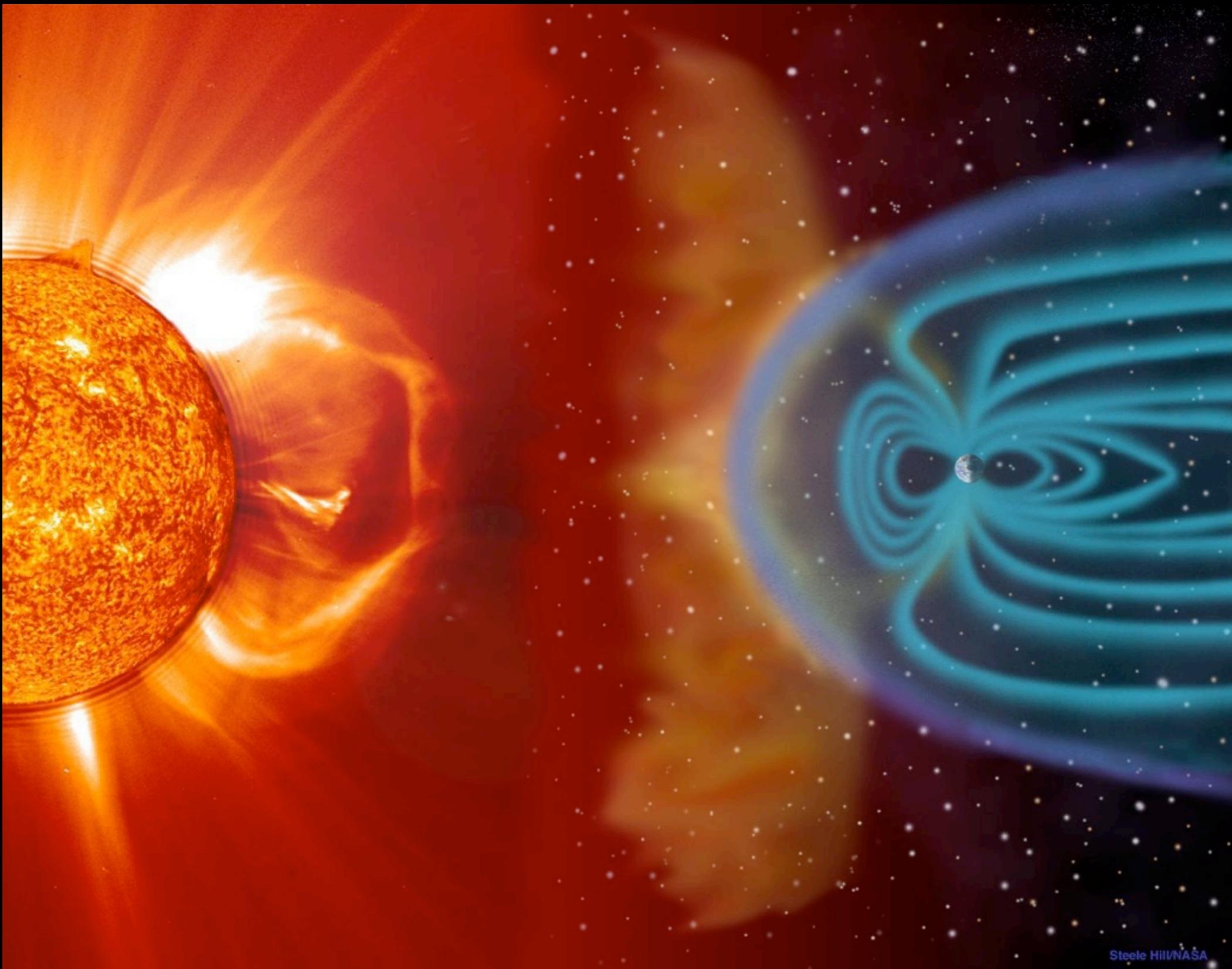
Stellar EUV and X-rays drive atmospheric expansion



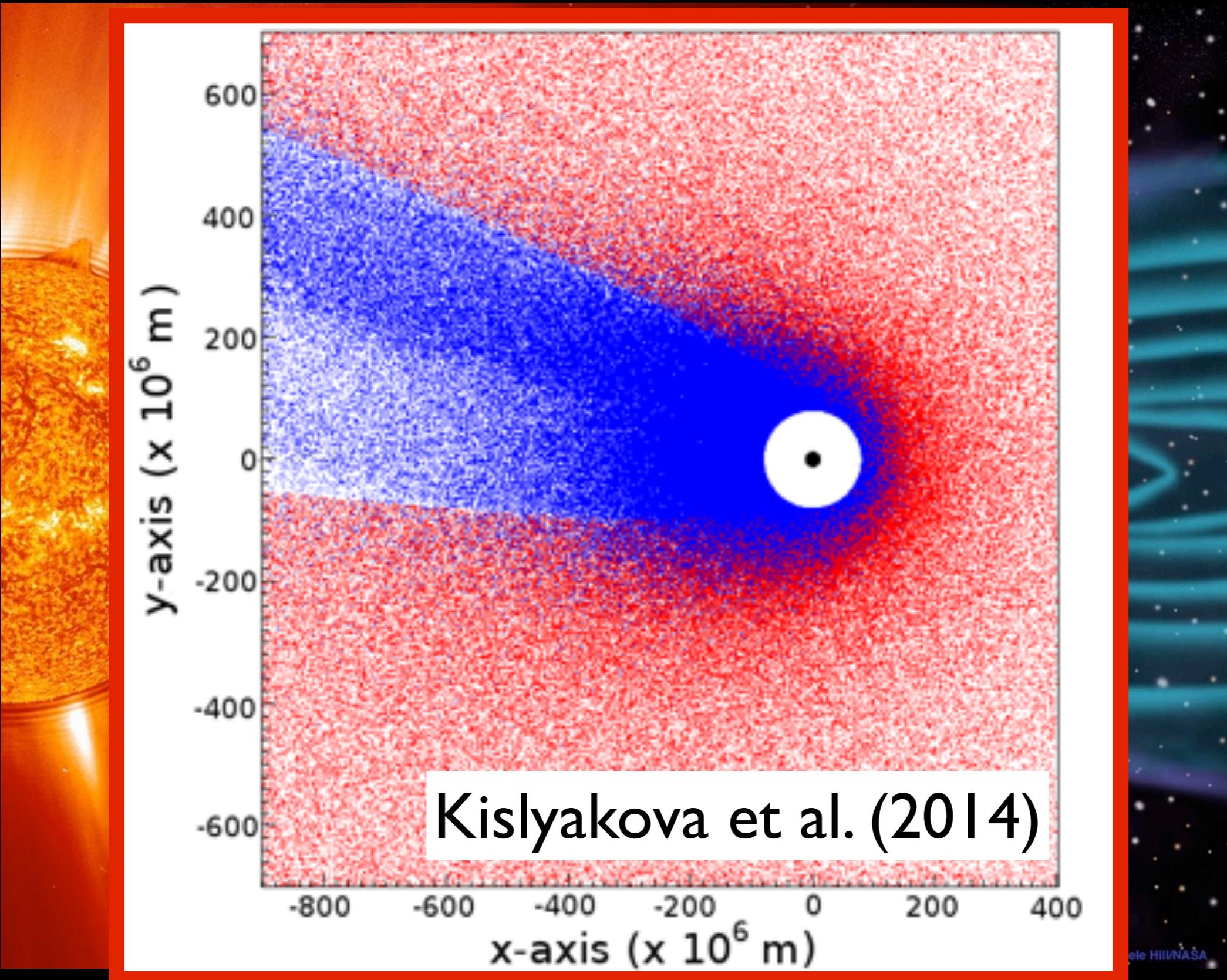
Stars have supersonic winds (a few 100 km/s)



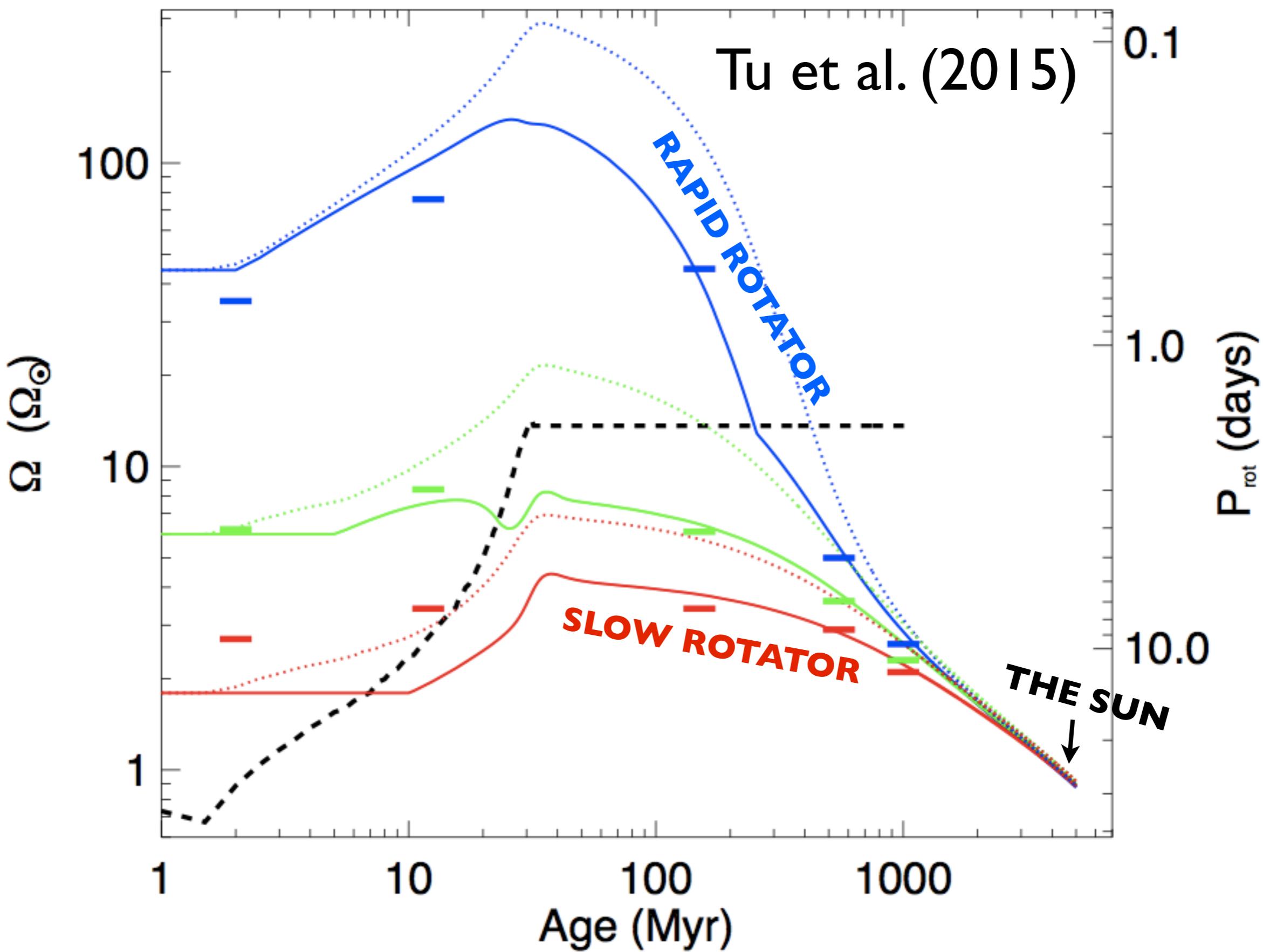
Winds impact planets and compress magnetospheres



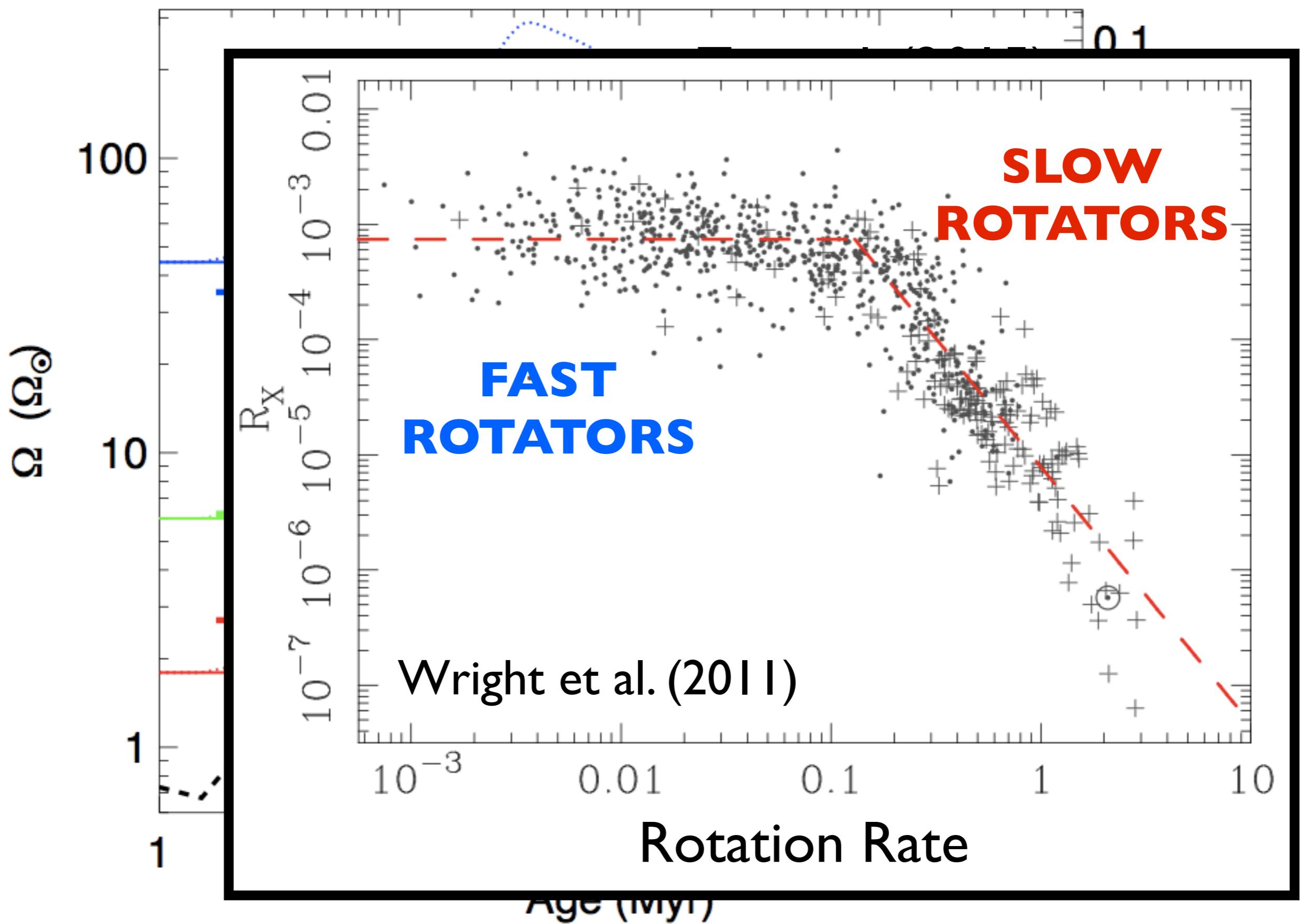
Wind-atmosphere interactions cause atmospheric loss



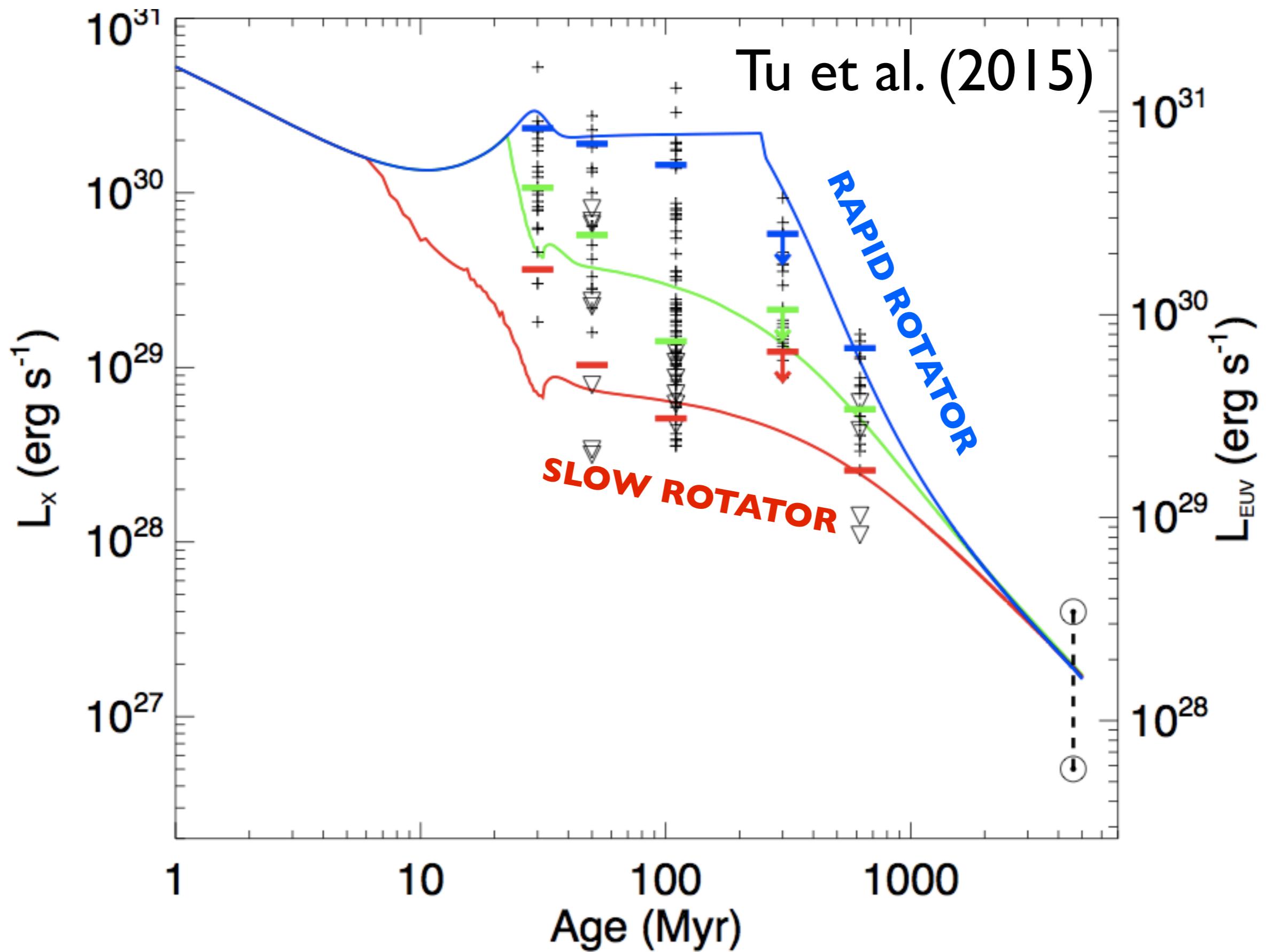
Rotational Evolution of a Sun-like Star



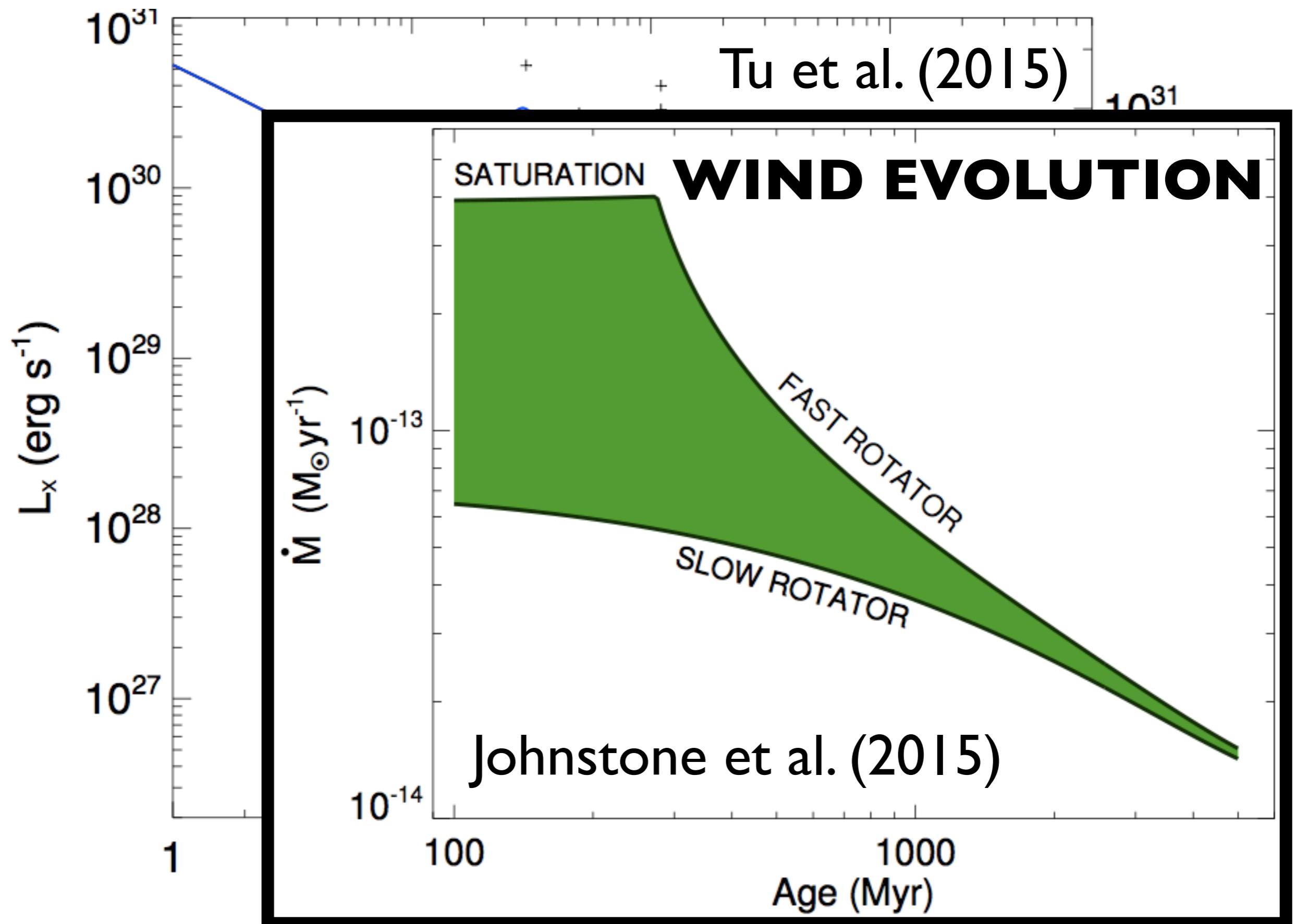
Rotational Evolution of a Sun-like Star

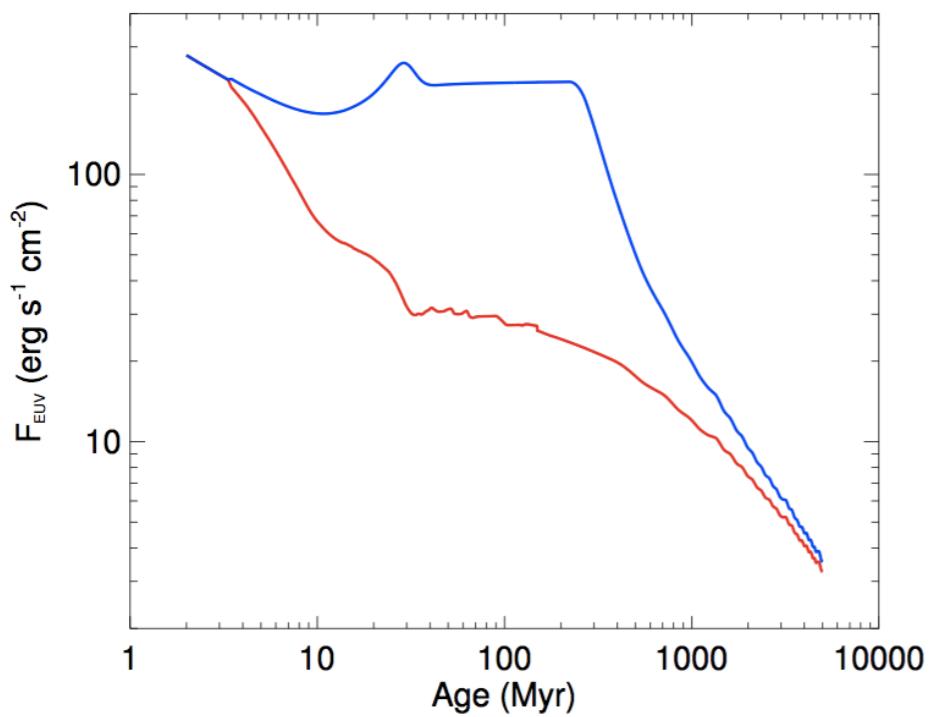


EUV and X-ray Evolution of a Sun-like Star

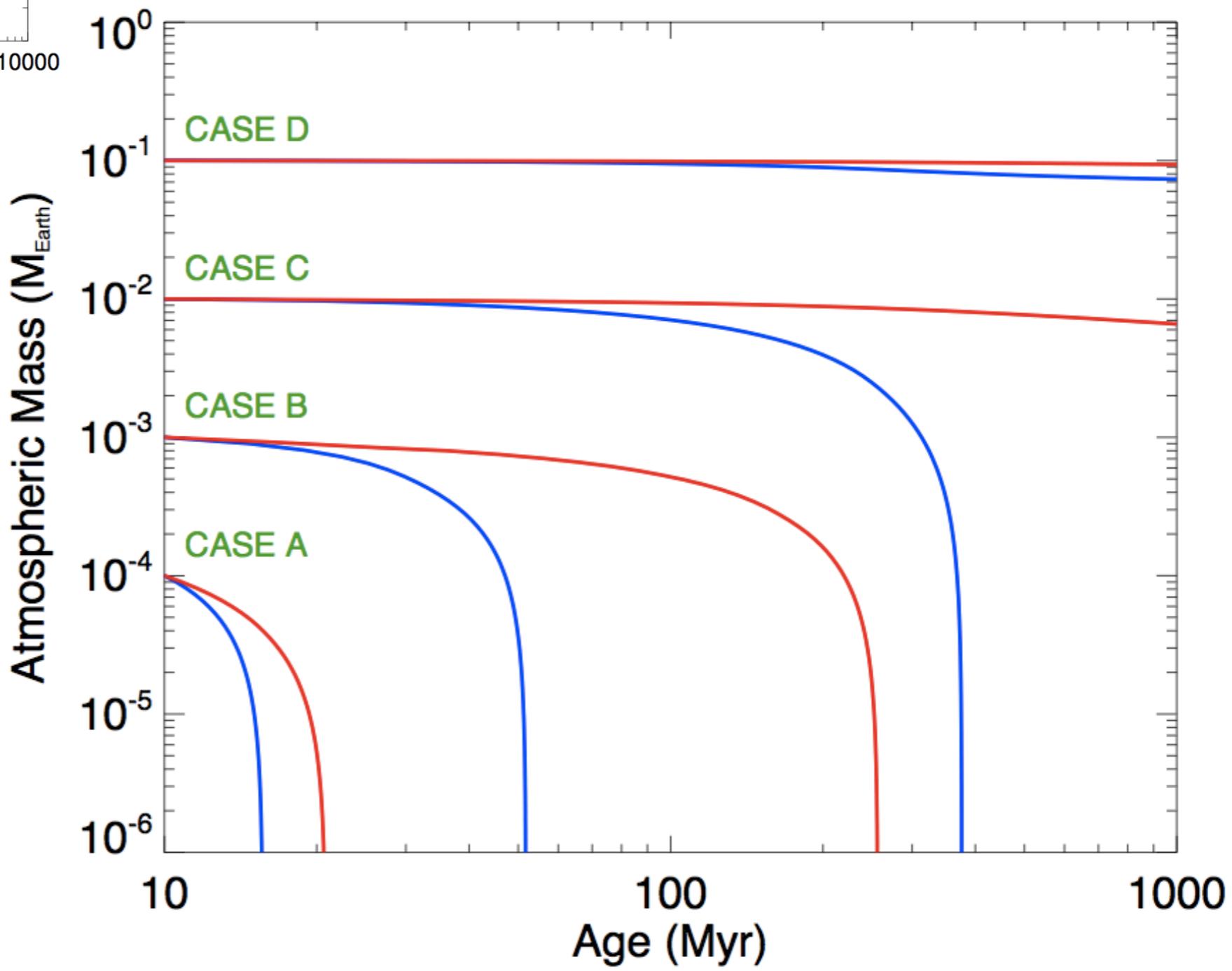


EUV and X-ray Evolution of a Sun-like Star

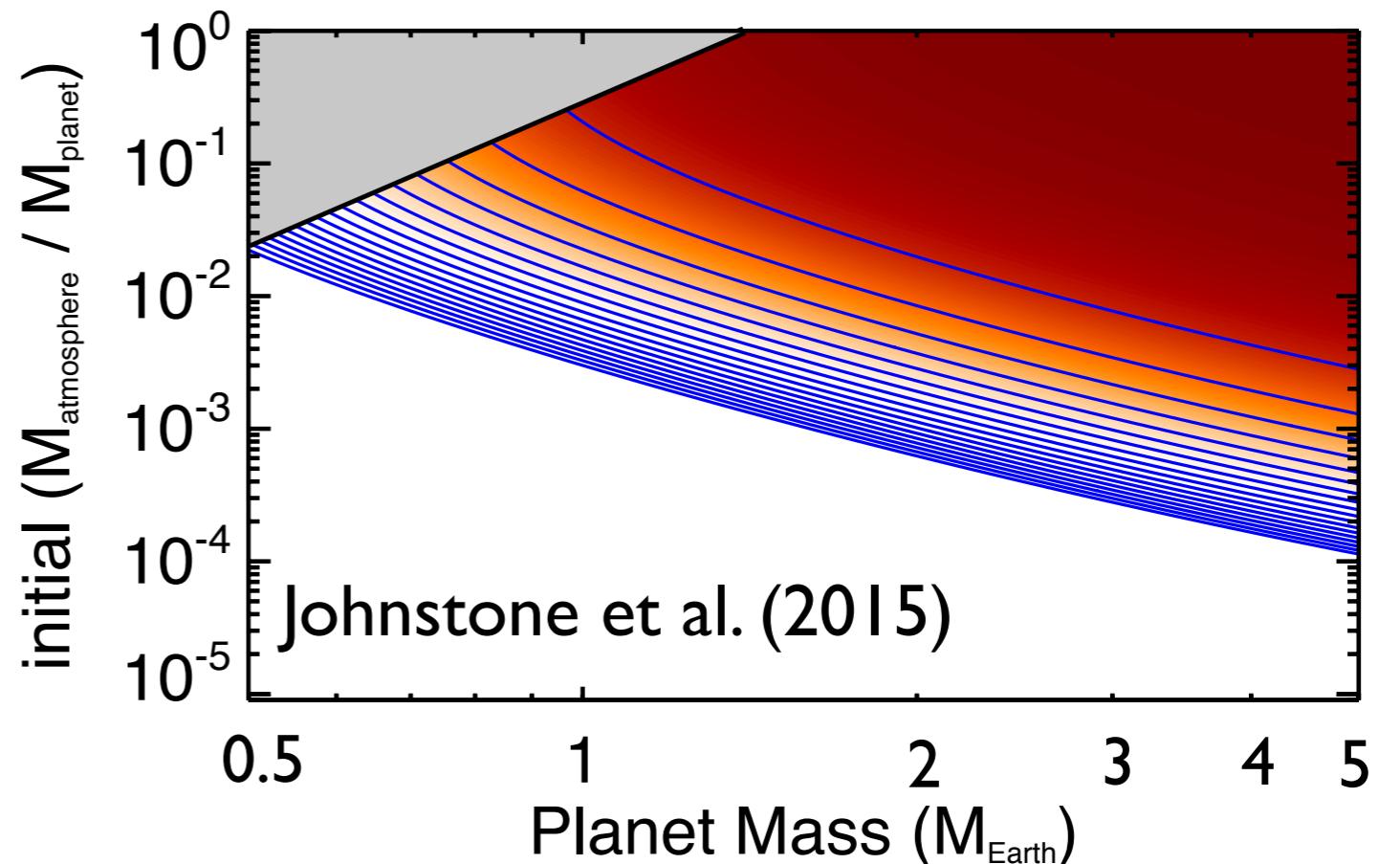




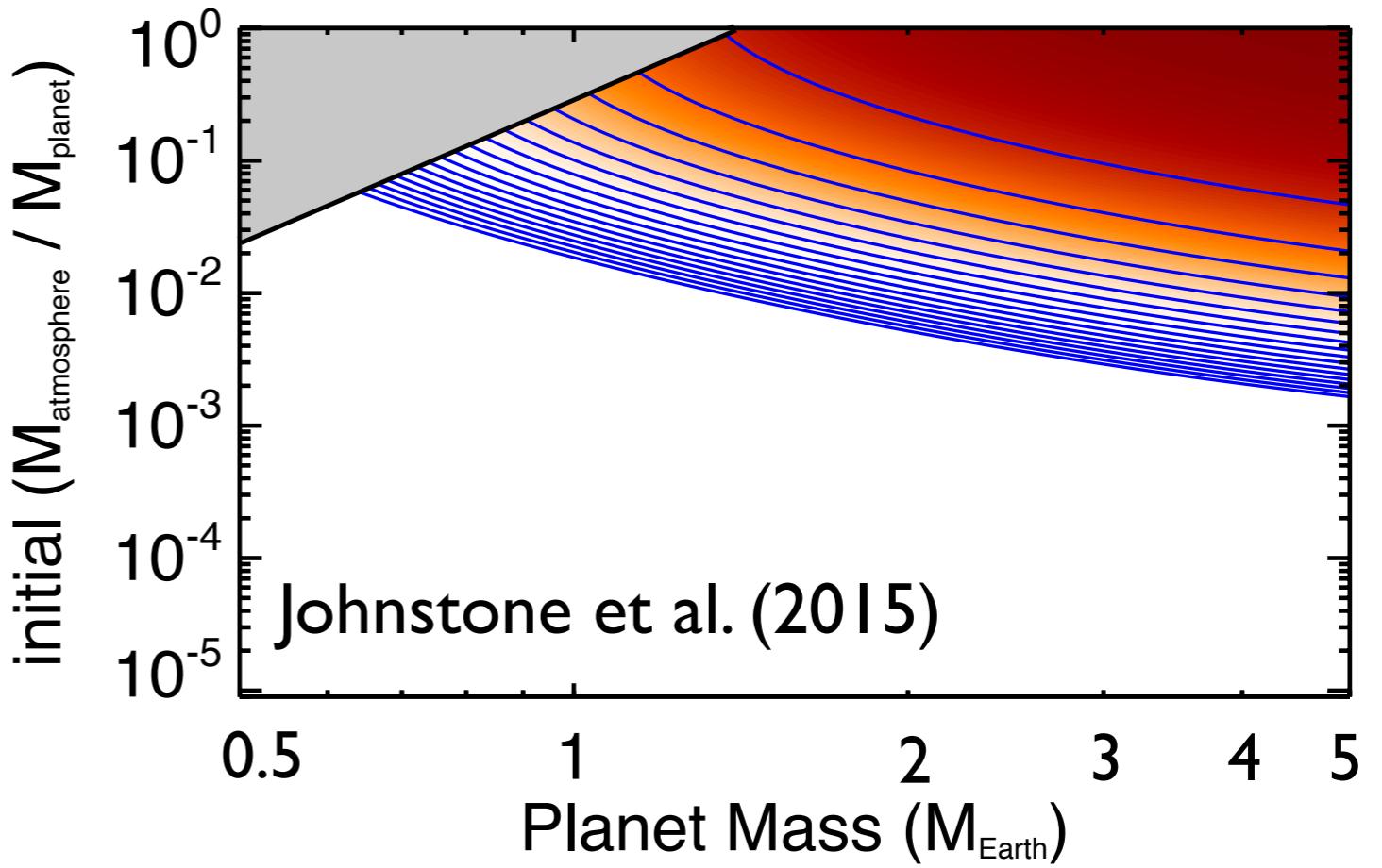
Evolution of a hydrogen dominated atmosphere of an Earth mass planet



Slow rotating star:



Fast rotating star:



Lammer et al. (2014):

small cores loss H/He atmospheres

large cores keep H/He atmospheres

Stökl et al. (submitted)

pickup of atmosphere depends on core size and time in disk

