

# Searching for Exomoons

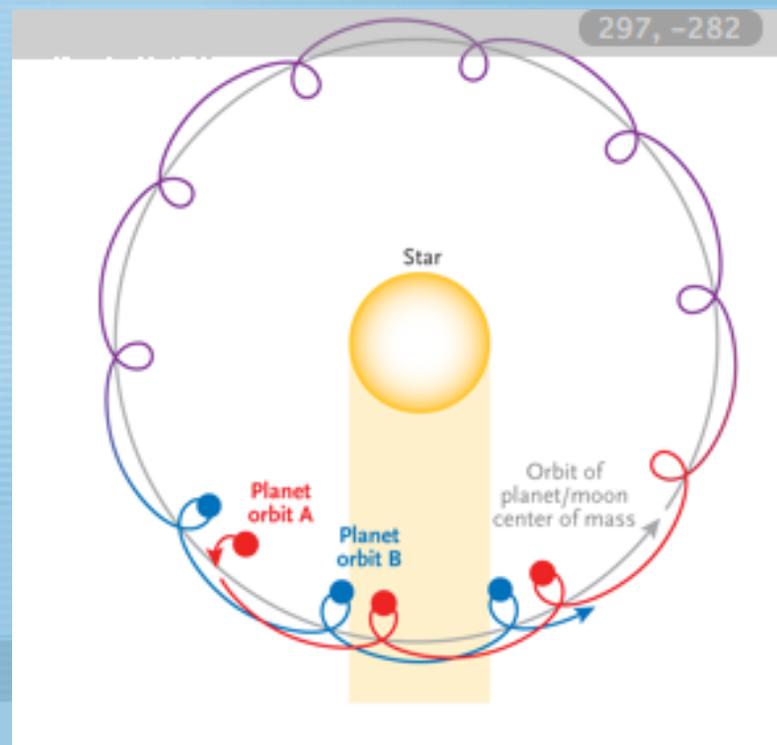
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## The 'Why'

- The Solar System's gas giant planets all host moons
- Exomoons could be frequent, habitable environments
- Discovery would impact on astrobiology, planetary formation, SETI, orbital dynamics, etc...

## The 'How'

- Transits of exoplanets should be periodic
- Deviations from periodicity caused by perturbation of a moon giving TTV.
- Deviations in transit duration also predicted due to velocity perturbations, TDV (Kipping 2009a, 2009b)



## What we can learn

- $TTV \sim M_S * a_S$  where as  $TDV \sim M_S * a_S^{-3/2}$
- $\Rightarrow$  Mass and orbit of exomoon can be determined
- (Additional 2nd order TDV effect) + (Analysis of the TTV & TDV frequencies) = Calculate if moon is pro/retrograde

## Sensitivity

- Kepler could detect habitable zone exomoons down to 0.2 Earth masses and 100 pc away (Kipping et al. 2009c, submitted)

