

# 30 Years of Photodissociation Regions:

A symposium to honor David Hollenbach's lifetime in science  
Asilomar, CA, USA - June 28<sup>th</sup> to July 3<sup>rd</sup>, 2015

## INVITED TALK

### PDRs and the structure of protoplanetary disks

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Protoplanetary disks evolve in very harsh, intensely irradiated environments. Young stars are very luminous at ultraviolet and X-ray wavelengths due to their high chromospheric activity and due to rapid accretion that results in high-temperature shocks at the stellar surface. PDRs and XDRs form on the irradiated disk surface heating the gas to temperatures that far exceed local dust temperatures. This heating drives thermal flows or photoevaporative winds from the disk surface and in combination with viscous accretion, the disk rapidly loses mass and disperses (e.g., Hollenbach et al. 2000, Dullemond et al. 2007, Alexander et al. 2014). Indeed, observations indicate that primordial gas and dust in disks are short-lived, with lifetimes of the order  $\sim$  few Myr (e.g., Zuckerman et al. 1995, Haisch et al. 2001, Pascucci et al. 2006), comparable to planet formation timescales.

I will describe thermochemical models of disks and review our current understanding of the structure of protoplanetary disks. I will discuss disk dispersal in various contexts and the implications of photoevaporation for planet formation.

#### REFERENCES

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