

# 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

### How we can constrain the transition from atomic to molecular hydrogen; a Planck-based approach to the “optically thick” HI 21cm spectrum

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The HI 21 cm emission in the Galaxy is assumed to be optically thin. Recent works (Fukui et al. 2014; 2015) indicate that the 21 cm spectrum is usually optically thick with an average HI optical depth around 2 by assuming that the dust optical properties are uniform in the local interstellar volume near the sun. I will discuss the implications of the results on the interstellar physics.

#### REFERENCES

- Fukui, Y., Okamoto, R., Kaji, R. et al. (2014) ApJ, 796, 59  
Fukui, Y., Torii, K., Onishi, T. et al. (2015) ApJ, 798, 6