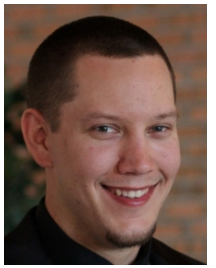
Converting Atomic Hydrogen into Stars in NGC 4214



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Science Goals:

- Characterize the conditions of the ISM around the central star forming region via multi-wavelength observations in a low metallicity environment (12+log(O/H) = 8.2; Kobulnicky & Skillman 1997).
- Understand the role of cold HI in the star formation process.
- Compare locations of cold HI from Warren et al. (*in prep*) to multiple tracers of star formation and molecular gas.
- Search for molecular hydrogen emission in and around locations of CO emission.

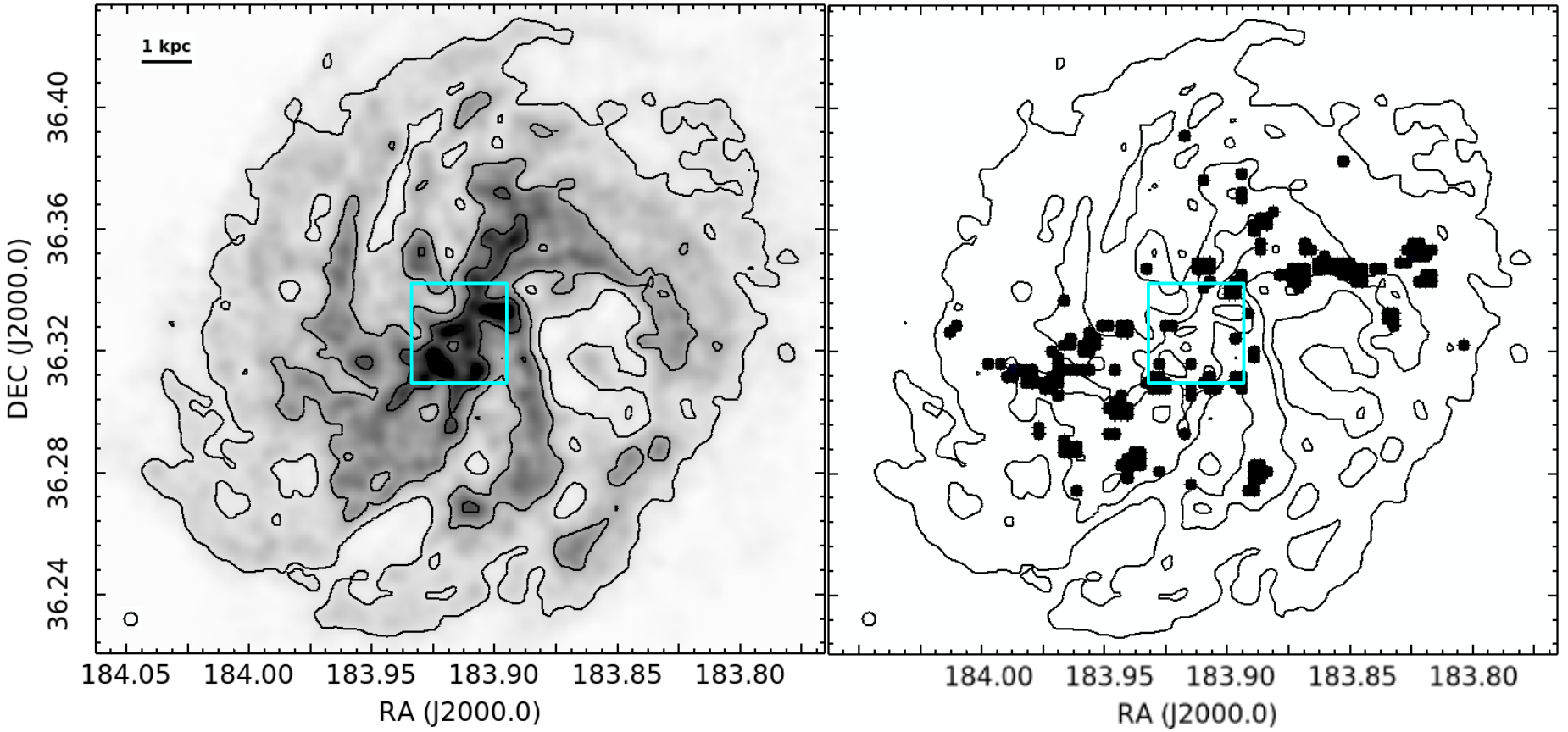
Atomic Hydrogen – The Basic Building Block of Star Formation

VLA HI

THINGS - Walter et al. (2008)

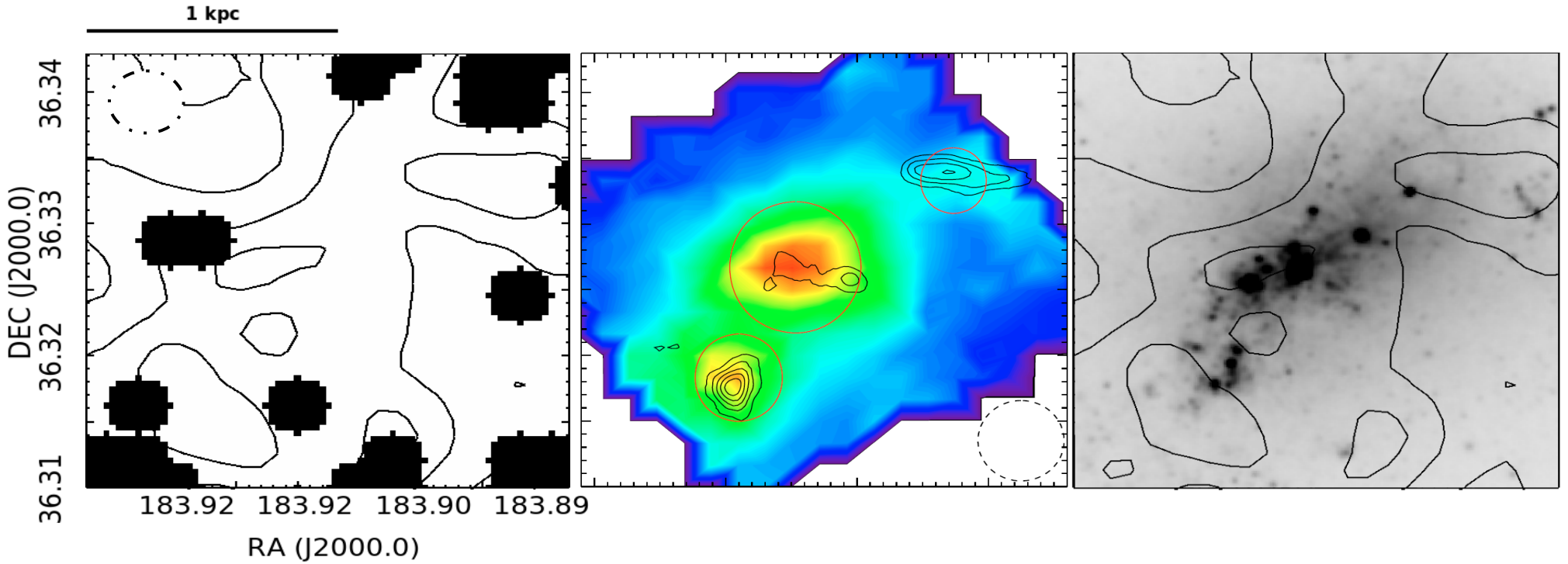
Cold HI locations

Warren et al. (*in prep*)



Central, blue box has been further observed with a suite of observatories across many wavelengths.

Multi-Wavelength Coverage of the Central Star Forming Region



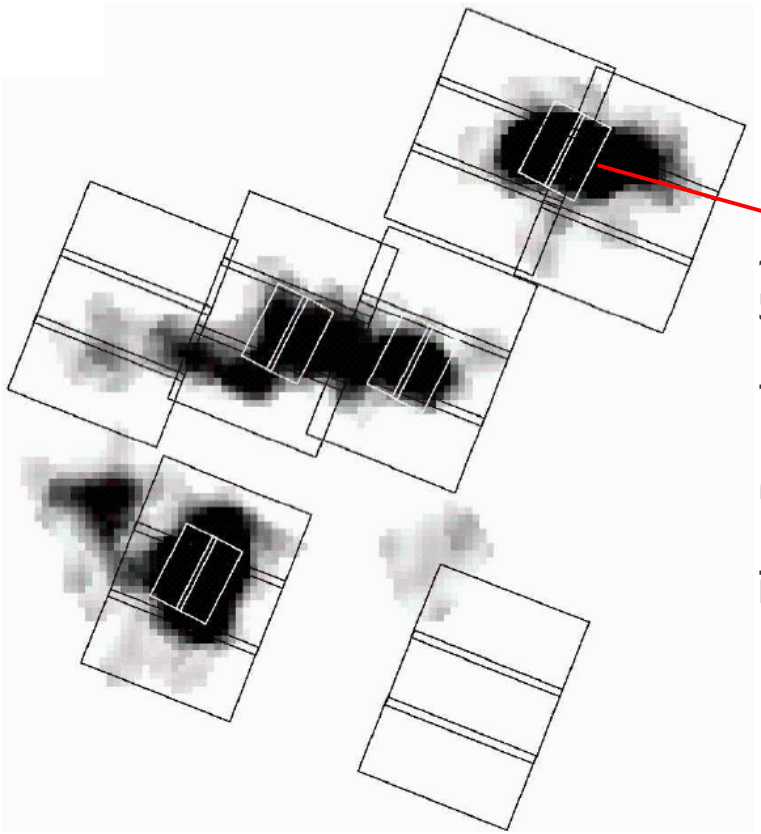
VLA HI contours
Cold HI locations
Walter et al. (2008)
Warren et al. (*in prep*)

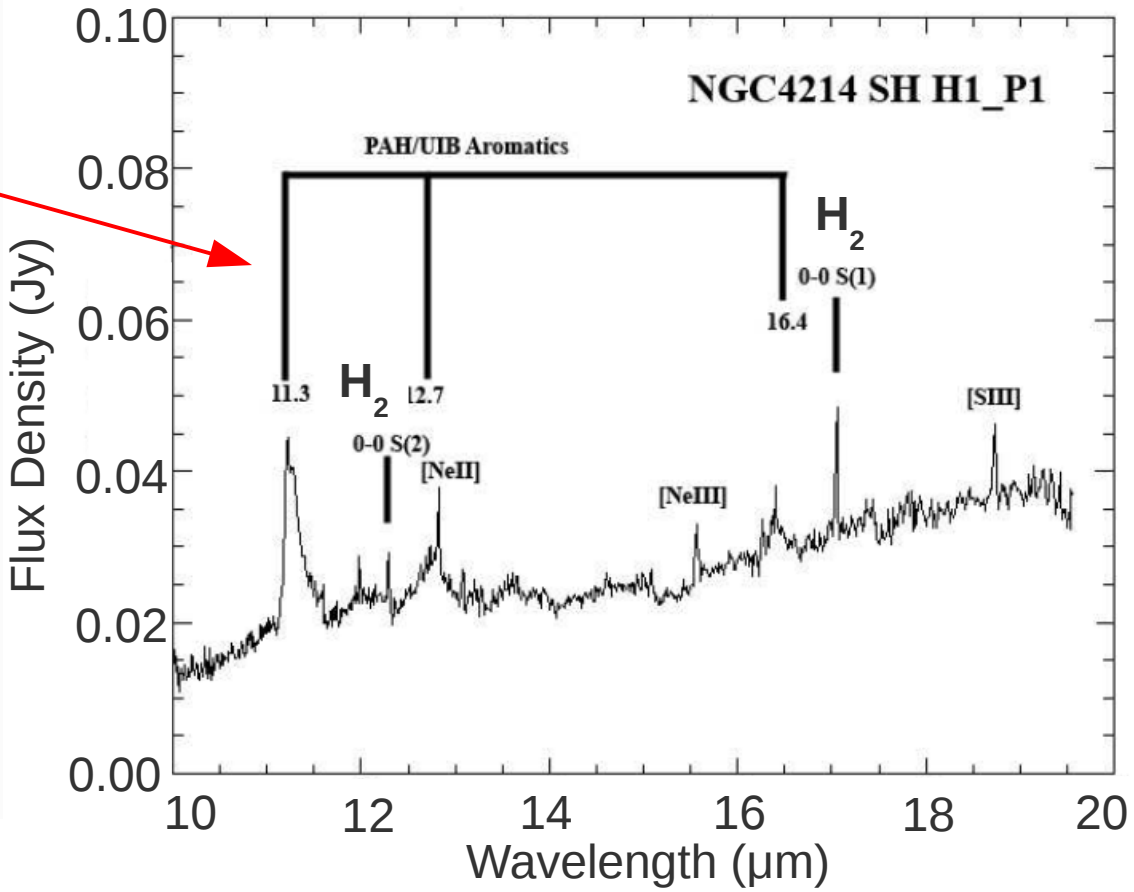
Herschel [C II] 158 μm
OSRO CO (J1-0) contours
Cormier et al. (2010)
Walter et al. (2001)

KPNO R-band
Dale et al. (2009)

(HST WFPC2 and WFC3 observations also available – Williams et al. 2011)

Multi-Wavelength Coverage of the Central Star Forming Region





Spitzer IRS Spectra of CO Clouds Targeting Pure Rotational Modes of H_2

→ H_2 is detected!

Preliminary Results

- Cold HI gas surrounds recent star formation, but is not coincident with it
- Cold HI may be sites for future molecular material given suitable conditions (i.e., cold dust, no recent star formation, etc.)
- Molecular hydrogen is detected

Future Work:

- Compare the spatially resolved star formation history from HST imaging to the Cold HI locations in order to estimate a refractory timescale

- Cold dust observations with Herschel/ALMA