One-Minute Poster Presentations

Session One

Anderson
Angles-Alcazar
Borthakur
Chisholm
Churchill
Cooksey
Ford
Hummels
Mathes
Muller-Sanchez
Rudie-Sanchez
Sianà
Zhu
Lan

The Baryon Cycle
June 14, 2012
In The Hole
Sanch
Borthakur

On Deck
Daniel
Angles-Alcazar

At Bat
Mike Anderson
Observational Constraints on Hot Halo Gas Around Nearby Galaxies

Mike Anderson\textsuperscript{1}, Joel Bregman\textsuperscript{1}, Xinyu Dai\textsuperscript{2}
1. University of Michigan  2. University of Oklahoma

Accounting for the missing baryons from galaxies is critical for understanding galaxy formation. I present results from four papers that constrain the amount of mass in hot gaseous halos around nearby galaxies. Some highlights:

- Simple estimate of Milky Way hot halo mass – $1.5 \times 10^{10} \, M_\odot$ – based on dispersion measure of LMC pulsars
- We detect the first extended hot halos around spiral galaxies, with emission out to 40-50 kpc. The hot halos contain less mass than the stellar disks.
- We detect hot halos around isolated L* galaxies by stacking ROSAT data. Again the hot halos are less massive than the disk, but here we also find more emission around spirals than around ellipticals.
In The Hole
John Chisholm

On Deck
Sanch Borthakur

At Bat
Daniel Angles-Alcazar
Zoom Simulations of $z = 2$ Disk Galaxies: The Impact of Galactic Outflows

Daniel Anglés-Alcázar, Romeel Davé, Feryal Özel
University of Arizona

Star formation rate surface density color coded by SFR-weighted line-of-sight velocity

Size – $M_{\text{star}}$ relation: simulated galaxies vs. the SINS survey

Strong winds are required to bring the morphological and kinematic properties of high-z disks into agreement with data
In The Hole
Chris Churchill

On Deck
John Chisholm

At Bat
Sanch Borthakur
Circumgalactic Gas in Starburst Galaxies

Sanch Borthakur\textsuperscript{1}, Tim Heckman\textsuperscript{1}, Vivienne Wild\textsuperscript{2}, & David Schiminovich\textsuperscript{3}

\textsuperscript{1}Johns Hopkins University; \textsuperscript{2}Royal Observatory Edinburgh; \textsuperscript{3}Columbia University

- 80\% of the starburst galaxies have hot gas.
- Ratio of hot gas to cold gas increases with specific star formation rate.
Peculiarly Strong [Ne V] Emission from a Hot Phase of a Post-Starburst Wind.

John Chisholm (University of Wisconsin-Madison), Christy Tremonti (UWisc), Tim Heckman (JHU), Yanmei Chen (U Wisc), Guinevere Kauffmann (MPA), Kevin Schawinski (Yale), Michael Strauss (Princeton), Alexie Leauthaud (IPMU)

Sloan Digital Sky Survey-3 spectra in black, error spectra in green and continuum fit in red. Zero velocity of lines of interest are marked in blue.
The MgII–Galaxy Catalog: CGM Properties
Nikki Nielsen, Chris Churchill, & Glenn Kacprzak

We constructed a catalog of 170 galaxies with MgII absorption.
We examined $W$(MgII) versus galaxy B and K luminosity, $B$–$K$, $z$, and $D$.
We characterize the MgII absorbing CGM with unprecedented detail.

$W$($2796$) versus $D$...

Luminosity Dependence ($B$– and $K$–band)...

Covering Factor Profiles, $L$, $B$–$K$, $z$ ...

Color Sequence along Luminosity Functions...
Tracking the Evolution of Strong, $1.5 < z < 4.5$ CIV Absorbers with Thousands of Systems

Kathy Cooksey, Melodie Kao, Rob Simcoe, John O'Meara, J. Xavier Prochaska, Eddie Seyffert

16,459 CIV systems

Apples-to-apples comparisons

Detect turnover in CIV distribution

Strong CIV absorbers trace extended gaseous halos of Lyman-break galaxies (LBGs)

Future Work

Stacking and serendipitous discoveries
At Bat

In The Hole
Nigel Mathes

On Deck
Cameron Hummels

At Bat
Amanda Ford
Hydrogen and Metal Line Absorption Around Low-Redshift Galaxies in Cosmological Hydrodynamic Simulations

Amanda Brady Ford, University of Arizona
Ben Oppenheimer, Romeel Davé, Neal Katz, Juna A. Kollmeier, David Weinberg

Full paper now posted: http://arxiv.org/abs/1206.1859
In The Hole
Francisco Muller-Sanchez

On Deck
Nigel Mathes

At Bat
Cameron Hummels
Constraints on Hydrodynamical Subgrid Models from Quasar Absorption Line Studies of the Circumgalactic Medium

Cameron Hummels, Greg Bryan, Britton Smith, and Matthew Turk

Species probed (compared to observations): H I, Mg II, Si II, Si III, Si IV, C IV, N V, O VI, & O VII
Galaxy Orientation and HI, CIV, and OVI Absorption
Nigel Mathes, Chris Churchill, & Glenn Kacprzak

We measure the galaxy orientations using GIM2D.
We measure the absorption strengths in COS/STIS spectra.

RESULT 1: there is suggestion of stronger OVI and CIV along major and minor axes.
RESULT 2: W(CIV) correlates with orientation; stronger along minor axis.

This is similar to the results for MgII found by Kacprzak, Churchill, & Nielsen (2012; arXiv:1205.0245)

SUGGESTS that CGM highly structured.
Plausibly wind/accretion geometries.
Measuring AGN Feedback from Seyfert Galaxy Outflows: The asymmetric bipolar outflow of NGC 3081

Francisco Müller-Sanchez (UCLA), Matt Malkan (UCLA) & Erin Hicks (UW)

Seeing limited [OIII] image

HST [OIII] image (400 s)

VLT/SINFONI [SiVI] image

Müller-Sanchez et al. 2012
In The Hole

Guangtun Zhu

On Deck

Brian Siana

At Bat

Gwen Rudie
Neutral Hydrogen in the CGM of z~2.3 Star-Forming Galaxies

Gwen Rudie (Caltech)

- 15 HIRES spectra of hyper-luminous QSOs within the fields of large galaxy redshift surveys (886 galaxies)
- Full Voigt profile fit to Lyα forest containing ~6000 absorbers
- Precision measurement of the quantity, distribution, kinematics, and physical properties of HI in z~2.3 CGM
Brian Siana
Guangtun Zhu
Ting-Wen Lan
Low Lyman Continuum Escape Fraction from L* LBGs at z~3.1

Brian Siana (UCR), Alice Shapley, Kristin Kulas, Dan Nestor (UCLA), Chuck Steidel (Caltech), Harry Teplitz (IPAC)

**HST LyC Imaging**

1700 Å  LyC

**NIRSPEC K-band Spectroscopy**

Low-z contamination

[OIII] 5007 Å at z=3.09
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Ting-Wen Lan

Guangtun Zhu
Absorption-Line Pipeline:
- 100,000 Quasars from DR7
- NMF + Optimal Filter Search
- 40,000 (35,000 intervening) Mg II Absorbers

$\frac{\partial^2 N}{\partial z \partial W^{\lambda_{2796}}}$ (MgII):
- New parameterization of evolution
- Strikingly similar to the Cosmic SFH
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Ting-Wen Lan
Principal Component Analysis of Metal Absorbers

Ting-Wen Lan, Brice Ménard, & Guangtuwn Zhu
Johns Hopkins University

Mean spectrum and eigenspectra

Median coefficient as a function of redshift

Coefficient 2 (ratio)

Coefficient 4 (shift)
thanks everyone!