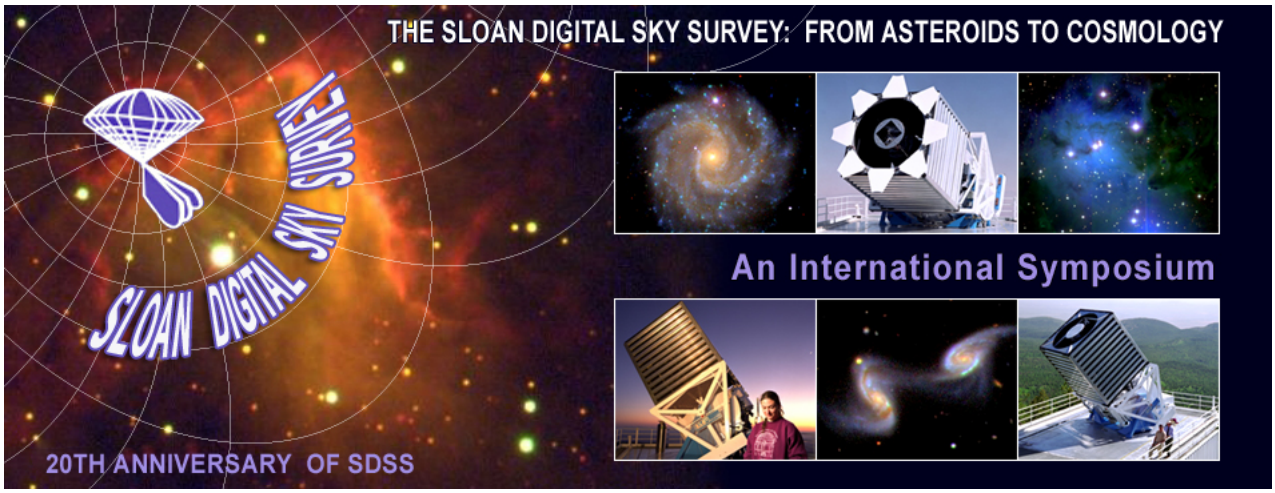

http://sdss2008.uchicago.edu/

SYMPOSIUM ABSTRACTS

1. **Deokkeun An** (Ohio State University)
   Poster: ***Galactic Globular and Open Clusters in SDSS: Crowded Field Photometry and Cluster Fiducial Sequences in ugriz***
   Session: **Galaxies**
   August 15 - 16, 2008

   We present photometry for globular and open cluster stars observed with SDSS. In order to exploit over 100 million stellar objects observed by SDSS, we need to understand the characteristics of stars in the SDSS ugriz filters. While star clusters provide important calibration samples for stellar colors, the regions close to globular clusters, where the fraction of field stars is smallest, are too crowded for the standard SDSS photometric pipeline PHOTO to process. To complement the SDSS imaging survey, we reduce the SDSS imaging data for crowded cluster fields using the DAOPHOT/ALLFRAME suite of programs and present photometry for 17 globular clusters and 3 open clusters in a SDSS value-added catalog. Our photometry and cluster fiducial sequences are on the native SDSS 2.5-meter ugriz photometric system, and the fiducial sequences can be directly applied to the SDSS photometry without relying upon any transformations. We test various stellar evolutionary models with ugriz fiducials of well-studied clusters. We also use these fiducial sequences to provide better distances to individual stars in SDSS.

2. **James T. Annis** (Fermilab)
   Poster: ***Weak Lensing Masses for the Abell Catalog***
   Session: **Large-Scale Structure and Galaxy Clusters**
   August 17 - 18, 2008

   We report on a project to measure masses for the clusters of the Abell catalog using the single pass data of the SDSS North. Our first cluster was Coma. Nine of the next 21 $z<0.12$ cluster we attempted had sufficient shear to yield a mass estimate. We will extend this to analysis to the Abell catalog clusters that overlap the SDSS North data set. This is a remarkable result given the shallowness of the SDSS data.

3. **Kentaro Aoki** (Subaru Telescope, NAOJ)
   Poster: ***Search for Balmer absorption lines in FeLoBAL quasars***
   Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
   August 15 - 16, 2008

   The SDSS has discovered unprecedented number of Iron Low Ionization Broad Absorption Line (FeLoBAL) quasars. Those newly-discovered FeLoBAL quasars show unique characteristics which were not recognized before. One of them is non-stellar Balmer absorption lines. By near-infrared spectroscopy, we discovered three FeLoBALs with Balmer absorption lines among 11 FeLoBALs (three at $1.3 < z < 1.65$ and eight at $2.1 < z < 2.8$). Two $z < 1$ FeLoBALs have been confirmed to have Balmer absorption lines. Balmer absorption lines have similar line widths and velocity shifts to Fe II and Mg II absorption lines. All objects with show relatively strong [O III] emission lines and rare He I absorption lines. Large change in Fe II and Balmer absorption lines are seen between five years in one FeLoBAL quasar, SDSS J1632+4204 while Mg II and He I absorption lines remain same strength. More details of those results will be presented at the conference.

4. **Steven P. Bamford** (University of Portsmouth)
   Talk: ***Galaxy Zoo: the independence of morphology and colour***
   Session: **Galaxies**
   August 15, 2008 (11:55 AM - 12:15 PM)

   The Galaxy Zoo project has obtained visual morphologies for nearly one million SDSS galaxies, including the entire DR6 Main Galaxy Sample. This was made possible by inviting members of the public to classify these galaxies via a specially designed website. Visual inspection removes the uncertainty inherent in the use of automatic morphology measurements and proxies, such as concentration, and enables direct interpretation of our results in terms of the traditional notion of galaxy morphology. I will describe the Galaxy Zoo project and the properties of the resulting dataset, before focusing on the dependence of morphology and colour on environment. Using a sample of over 130,000 objects, I will demonstrate that the colour and morphology bimodalities are mostly independent functions of environment. Although early-type galaxies always have higher red fractions than spiral galaxies, this is sub-dominant compared with the dependence of red fraction on stellar mass and environment. Environmental trends of early-type and red fractions exist at fixed stellar mass, and are strongest for lower mass galaxies. Our results strongly imply the existence of a significant environmental effect beyond that expected simply from the variation of the galaxy mass function with environment. Furthermore, the responsible mechanism must transform galaxies from blue to red on significantly shorter timescales than any transformation from spiral to early-type morphology, and have a greater influence on lower mass galaxies.

5. **Timothy C. Beers** (Michigan State University)
   Invited Talk: ***Stars***
   Session: **Stars**
   August 16, 2008 (2:55 PM - 3:25 PM)

6. **Byron E. Bell** (Kennedy-King College)
   Poster: ***Data analysis of multi-wavelength magnitudes the SDSS-DR3 using a AutoRegressive Conditional Heteroskedasticity (ARCH) process***
   Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
   August 15 - 16, 2008

   The view of multi-wavelength magnitudes of the quasar dataset optical bands of the Sloan Digital Sky Survey Data Release 3 (SDSS-DR3) of Penn State University is more unique by using a AutoRegressive Conditional Heteroskedasticity (ARCH) method from econometrics. Viewing square error terms of SDSS-DR3, sig_u, sig_g, sig_r, sig_i as independent variables. And variance of the sig_z (Sigma Squard of z) as a dependent term is utilized. KEYTERMS: Quasar, MBH, ARCH, Variability.

7. **Pierre Bergeron** (Universite de Montreal)
   Invited Talk: ***White Dwarf Stars in the SDSS: Exploring the Tail of the Distributions***
   Session: **Stars**
   August 16, 2008 (2:25 PM - 2:55 PM)

   The Sloan Digital Sky Survey represents by far the most important development in the last few years in terms of observational data of white dwarfs. Not only has the SDSS more than tripled the number of spectroscopically confirmed white dwarfs since the last published version of the McCook & Sion catalog, but it has provided a phenomenal source of homogeneous photometric observations in the ugriz system as well as optical spectroscopy for most objects. I will review how the SDSS has changed our view of the nature and the evolution of white dwarf stars, with a particular emphasis on new, exciting, and exotic discoveries that were made possible due the large number of objects identified in this survey.

8. **Rahul Biswas** (University of Illinois at Urbana-Champaign)
Poster: ***Bayesian Forecasting of Constraints on Cosmological Parameters from Future Experiments***
Session: **Supernovae and Supernova Cosmology**
August 17 - 18, 2008

   In the era of precision cosmology, observational efforts are driven by expensive well planned missions. As we move towards more precise measurements, it is thus imperative to estimate the constraints from the proposed observational survey, more accurately. Here, we propose a method of forecasting cosmological parameter constraints from future surveys which go beyond the usual method of Fisher Analysis.

9. **Dmitry Bizyaev** (APO/NMSU)
Poster: ***Dust-free structural parameters of edge-on galaxies in SDSS***
Session: **Galaxies**
August 15 - 16, 2008

   We perform 3-D modeling of multicolor images of edge-on galaxies in SDSS to obtain extinction-free structural parameters of their stellar disks and bulges.

10. **Michael R. Blanton** (New York University)
Invited Talk: ***Galaxy Properties in the SDSS***
Session: **Galaxies**
August 15, 2008 (9:30 AM - 10:00 AM)

11. **John Bochanski** (University of Washington)
Talk: ***Exploring the Local Milky Way: The Low-Mass Stellar Luminosity and Mass Functions***
Session: **Stars**
August 16, 2008 (4:30 PM - 4:50 PM)

   I present my dissertation results, using observations of over 15 million M dwarfs to measure the field stellar luminosity and mass function. This result is based on a dataset three orders of magnitude larger than any previous study on this topic. The observations span the entire SDSS footprint, about 8,400 square degrees. Using this 5-color photometry and improved color-absolute magnitude relations, I derive luminosities and masses for each star in our sample. The uncertainties in the analysis are quantified using results from a calibration region of 30 square degrees, where we have spectroscopic observations of several thousand stars. Additionally, the structure of the local Milky Way is measured, determining the density profiles of the thin and thick disks.

12. **Adam Bolton** (Institute for Astronomy, University of Hawaii)
Talk: ***The Sloan Lens ACS Survey***
Session: **Galaxies**
August 15, 2008 (10:00 AM - 10:20 AM)

   The Sloan Lens ACS (SLACS) Survey has combined SDSS spectroscopy with Hubble Space Telescope imaging to assemble an unprecedented sample of over 70 galaxy-scale strong gravitational lenses. I will review the observational and scientific results of SLACS, with a particular focus on the mass-density structure and empirical scaling relations of elliptical galaxies. My talk will be aimed primarily at "non-lensers", and will feature both novel quantitative results and stunning astronomical images.

13. **Michael J. I. Brown** (Monash University)
Poster: ***The past 7 Gyr of Red Galaxy Growth***
Session: **Galaxies**
August 15 - 16, 2008

The growth of red galaxies is one of the most controversial topics in the field of galaxy evolution. In a Lambda CDM cosmology, massive dark matter halos undergo rapid growth via merging between z=1 and z=0. In contrast to this view, many observers find no significant growth of massive red galaxies since z=1. I will discuss recent measurements of the space density and clustering of red galaxies with wide-field and deep surveys, including recent work by the Bootes field collaboration. We find that the evolving space density of massive red galaxies differs from pure passive evolution, although the implied rate of stellar mass growth is low. We have determined how red galaxies reside within dark matter halos, using the halo occupation distribution constrained with measurements of galaxy clustering. We find that the relationship between red galaxy stellar mass and host halo mass has undergone little or no evolution since z=1. In the most massive dark matter halos, much of the stellar mass resides within satellite galaxies and the diffuse intra-cluster light. As a consequence, the most massive galaxies do not grow as rapidly as their host dark matter halos.

14. **Yanchuan Cai** (Durham University)
Poster: ***Exploiting the forthcoming Pan-STARRS dataset***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

Pan-STARRS (Panoramic Survey Telescope and Rapid Response System) 3pi survey will cover 3/4 of the sky. For using the forthcoming Pan-STARRS data to study Large Scale Structure, we have used the Millennium N-body simulation and the GALFORM semi-analytical galaxy formation model to build a mock Pan-STARRS galaxy catalogue. This allows us to determine the basic properties expected for the Pan-STARRS surveys, such as the number counts of galaxies and their redshift distribution. These mocks have been produced for use by the Pan-STARRS consortium to test the performance of photometric redshift estimation codes. Applications of this work such as impact of photo-z errors on the measurement of baryonic acoustic oscillations will be addressed.

15. **Daniela Carollo** (RSAA, Mount Stromlo Observatory, ANU Australia)
Poster: ***Structural and kinematic parameters of the two halo components of the Milky Way: preliminary results***
Session: **The Milky Way and Its Neighbors**
August 15 - 16, 2008

The structure of the halo of the Milky Way has been recently shown by Carollo et al. (Nature, 2007) to be clearly divisible into two overlapping stellar components, the inner and the outer halo. The first structure dominates at Galactocentric distances R < 10-15 kpc, exhibits highly eccentric orbits, has a slightly prograde rotation, and comprises stars with a peak in their metallicity distribution function (MDF) around [Fe/H] = -1.6. The outer-halo component dominates at R > 15-20 kpc, exhibits a much more uniform distribution of orbital eccentricities, has a clear (and statistically significant) net retrograde rotation, and comprises stars with a peak in their MDF a factor of three lower than the inner halo ([Fe/H] = -2.2). Such properties indicate that one might associate two distinct modes of formation, and timescales, for the assembly of these two structures. The dataset upon which these claims are based has recently been increased by 50% with the addition of the new SDSS/SEGUE. I will present the first results of a Maximum Likelihood technique that provides estimates for the structural parameters of the inner- and outer-halo components, including estimates of the fraction of stars within each population as a function of distance. Such numbers are critical for refining ongoing and future searches for the most metal-poor stars in the Galaxy.

16. **Kenneth C. Chambers** (Institute for Astronomy)
Talk: ***The Pan-STARRS 1 Science Mission***
Session: **The Near Future**
August 18, 2008 (3:00 PM - 3:20 PM)

PS1, the Pan-STARRS Telescope No. 1 is a prototype telescope for a distributed aperture cyclical sky survey telescope: the Panoramic Survey Telescope and Rapid Response System. The 3.5 year PS1 Science Mission is expected to begin early fall of 2008. The PS1 System, including the Observatory, Telescope, 1.4 Gigapixel Camera, Image Processing Pipeline , PSPS relational database and science specific software clients will be operated for the duration of the Mission by the PS1 Science Consortium. The planned PS1 Sky Surveys to be carried out include: (1) A 3pi Steradian survey with associated Calibration Fields; (2) A Medium Deep survey of 10 PS1 footprints spaced around the sky; (3) A solar system survey of NEO "Sweet Spots", (4) a Stellar Transit Survey; and (5) a Deep Survey of M31. These surveys, their scientific goals, and the observing strategy to meet these goals will be discussed. Images and commission data will be presented, along with a summary of the expected PS1 Mission data products. It should be emphasized that there will be some immediate release of PS1 data to the community, and all PS1 data and data products will be released to the astronomical community within one year of the completion of the PS1 Science Mission.

17. **Chin-Wei Chen** (Graduate Institute of Astronomy, National Central University)
Poster: ***Homogeneous ugriz Photometry for ACS Virgo Cluster Survey Galaxies***
Session: **Galaxies**
August 15 - 16, 2008

I will present our work on the photometrical and structural analysis for 100 ACS Virgo Cluster Survey(ACSVCS) galaxies with SDSS images. The ACSVCS project targets 100 early-type galaxies in Virgo Cluster with high-resolution HST/ACS imaging (0.1" FWHM). On one hand, the HST observations provide the best data to date for studying the central region of galaxies. However, due to the limited field (3'), large extrapolations are required to compute total magnitudes, leading to correspondingly uncertain colors. The main goal of our work is to use SDSS (DR5) images, which have both the homogeneity and wide sky coverage needed to overcome those limitations. We developed a pipeline which masks the sources around the target galaxy and derive its structural parameters, i.e. total luminosity, axis ratio, effective radius, orientation angle. Then, for the masked image, we derive the surface brightness profiles in five bands using an IRAF package "ellipse". In general, the five band results are consistent with each other well and the g and z results are quite consistent with the HST results. The comparison of our result to previous measurements will also be presented.

18. **James G. Cresswell** (ICG, University of Portsmouth, UK)
Poster: ***Scale and Magnitude Dependent Bias in DR5***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

We present the results of a study parameterizing and fitting scale and absolute magnitude dependent models of galaxy bias for red and blue galaxies in DR5.

19. **Scott M. Croom** (University of Sydney)
Invited Talk: ***Answers and Questions from Quasar Surveys***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15, 2008 (2:30 PM - 3:00 PM)

In the last decade the major 2QZ and SDSS surveys have revolutionized our understanding of quasars. I will outline some of the key results that have been achieved, including measurements of evolution, clustering and spectral properties. I will then focus on a number of issues that are still to be resolved, and point to some possible solutions.

20. **Licai Deng** (National Astronomical Observatories)
*Poster: **LAMOST Galactic structure survey***
Session: **The Milky Way and Its Neighbors**
August 15 - 16, 2008

LAMOST is going to have its first light by the end of 2008. One of the key projects is on the Structure of the Galaxy.

21. **Daniel Eisenstein** (University of Arizona)
*Invited Talk: **Measuring Cosmic Distances with the Baryon Acoustic Oscillations***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17, 2008 (10:00 AM - 10:30 AM)

I will discuss how the acoustic oscillations that propagate in the photon-baryon fluid during the first million years of the Universe provide a robust method for measuring the cosmological distance scale. The distance that the sound can travel can be computed to high precision and creates a signature in the late-time clustering of matter that serves as a standard ruler. I will present galaxy clustering results from the Sloan Digital Sky Survey that reveal this feature, giving a geometric distance to a redshift of 0.35 and an accurate measurement of Omega_matter. I will then discuss our plans for SDSS-III, which will use the acoustic method to produce 1% distance measurements in order to map the curvature and expansion history of the Universe and measure the evolution of dark energy.

22. **Sandra M. Faber** (UC Observatories, Lick Observatory)
*Invited Talk: **Galaxy Formation Made Simple***
Session: **Galaxies**
August 15, 2008 (9:00 AM - 9:30 AM)

23. **Ryan Foley** (UC Berkeley / CfA)
*Talk: **The Keck/SDSS Supernova Sample***
Session: **Supernovae and Supernova Cosmology**
August 18, 2008 (12:00 PM - 12:20 PM)

We present high-quality rest-frame ultraviolet (UV) through optical spectra of 21 Type Ia supernovae (SNe Ia) at redshift ~0.22 that were discovered by the Sloan Digital Sky Survey-II (SDSS-II). Using the broad-band photometry of the SDSS survey, we are able to reconstruct the SN host-galaxy spectral energy distributions, allowing for a correction to the host-galaxy contamination in the SN~Ia spectra. Comparison of composite spectra constructed from a subsample of 15 high-quality spectra to those created from a low-redshift sample with otherwise similar properties shows that the Keck/SDSS objects have, on average, a UV excess. This observation is confirmed by comparing synthesized broad-band colors of the individual spectra, showing a difference in mean colors at the >3-6 sigma level for various UV colors. We further see a difference in the UV spectral slope between objects with actively star-forming host galaxies and those with little current star formation. Additionally, we detect a relationship between UV slope and peak luminosity that differs from that observed at low redshift. If these differences are not the result of a systematic error, then SNe Ia with z > 1 may have distance moduli larger by ~0.5 mag than what is currently inferred, bringing the highest-redshift SN~Ia distance measurements closer to that of the concordance LambdaCDM cosmology.

24. **Stephan Frank** (The Ohio State University)
Poster: ***Searching for and finding OVI absorbers at high redshift***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15 - 16, 2008

We have analysed a large data set of OVI absorber candidates found in the spectra of 3800 SDSS quasars, focusing on a subsample of 387 AGN sightlines with an average S/N > 5.0, allowing for the detection of absorbers above a rest-frame equivalent width limit of W > 0.19 A for the OVI 1032 A component. Accounting for random interlopers mimicking an OVI doublet, we derive for the first time a secure lower limit for the redshift number density for redshifts z_{abs} > 2.8. With extensive Monte Carlo simulations we quantify the losses of absorbers due to blending with the ubiquitous Lyman forest lines, and estimate the success rate of retrieving each individual candidate as a function of its redshift, the emission redshift of the quasar, the strength of the absorber and the measured S/N of the spectrum by modelling typical Ly forest spectra. These correction factors allow us to derive the 'incompleteness and S/N corrected' redshift number densities of OVI absorbers :Delta N_{OVI, c} / Delta z_{c} (2.8 < z < 3.2) = 4.6 pm 0.3, Delta N _{OVI, c} / Delta z_{c} (3.2 < z < 3.6) = 6.7 pm 0.8,and Delta N _{OVI, c} / Delta z_{c} (3.6 < z < 4.0) = 8.4 pm 2.9$. We can place a secure lower limit for the contribution of OVI to the closure mass density at the redshifts probed here: Omega _{OVI} (2.8 < z < 3.2) > 1.9 x 10^{-8} h^{-1}. We show that the strong lines we probe account for over 65% of the mass in the OVI absorbers; the weak absorbers, while dominant in line number density, do not contribute significantly to the mass density. Making a conservative assumption about the ionisation fraction and adopting the Anders1989 solar abundance values, we derive the mean metallicty of the gas probed in our search : zeta (2.8 < z < 3.2) > 3.6 x 10^{-4} h, in good agreement with other studies. These results demonstrate that large spectroscopic datasets such as SDSS can play an important role in QSO absorption line studies, in spite of the relatively low resolution.

25. **Wendy Freedman** (Carnegie Observatories)
Invited Talk: ***The Carnegie Supernova Survey***
Session: **Supernovae and Supernova Cosmology**
August 18, 2008 (10:00 AM - 10:30 AM)

26. **Josh Frieman** (Fermilab and U. Chicago)
Invited Talk: ***The SDSS-II Supernova Survey***
Session: **Supernovae and Supernova Cosmology**
August 18, 2008 (11:30 AM - 12:00 PM)

invited overview talk on SDSS-II SN

27. **Peter Garnavich** (University of Notre Dame)
Talk: ***The Nature of Type Ia SN from the SDSS-II Supernova Survey***
Session: **Supernovae and Supernova Cosmology**
August 18, 2008 (12:20 PM - 12:40 PM)

The large volume searched in the SDSS-II Supernova Survey provides a unique window on the nature of type Ia explosions. Unusual and peculiar have been found that provide clues to the progenitors and explosion mechanisms. Studying the large sample of host galaxies and connecting them to the supernova properties can probe the origin of the explosions and search for subtle evolutionary effects.

28. **Gerry Gilmore** (Institute of Astronomy, Cambridge)
Talk: ***Properties of the smallest galaxies***
Session: **The Milky Way and Its Neighbors**
August 16, 2008 (10:00 AM - 10:20 AM)

SDSS discoveries have extended our sample of dSph satellites to very low luminosity and surface brightness. I review the properties of these galaxies, kinematics, chemistry and structures.

29. **Juan E. Gonzalez** (Institute for Computational Cosmology, Durham University)
Poster: ***Using the Sloan Digital Sky Survey to test galaxy formation models.***
Session: **Galaxies**
August 15 - 16, 2008

We take advantage of the large spectroscopic area mapped by the SDSS survey to perform a detailed comparison with the galaxy properties predicted by galaxy formation models. We use two different versions of the Durham semi-analytical model of galaxy formation (GALFORM). The Baugh et al 2005 version of GALFORM, which assumes a variable IMF, has been shown to successfully reproduce the local optical and IR luminosity functions, as well as the abundance of sub-mm and Lyman-break galaxies at high redshift. On the other hand, the Bower et al 2006 version of GALFORM, which incorporates AGN feedback, better reproduces the evolution of the K-band luminosity and stellar mass functions. In this work, we calculate the same quantities for model galaxies (Petrosian magnitude, concentration index and Sersic profile fit) as are used in the SDSS survey to characterize observed galaxies. We then compare the luminosity function, galaxy colours, sizes and morphology distributions between the models and the observation data. We find that the Bower et al model better reproduces the detailed shape of the luminosity function, the morphology-luminosity relation and the colour bimodality observed in the SDSS data, but that the Baugh et al model is much more successful in predicting galaxy sizes for late-type galaxies. Both models have problems with the predicted sizes of early-type galaxies, which are very different from the observed relation. These results help to identify which physical processes in the model, like cooling and feedback on different mass scales, are crucial to reproduce the observed galaxy properties.

30. **Genevieve J. Graves** (UCO/Lick Observatory)
Talk: ***Dissecting the Red Sequence: Star Formation Histories vs. Structural Parameters***
Session: **Galaxies**
August 15, 2008 (11:35 AM - 11:55 AM)

I use 16,000 galaxy spectra from the Sloan Digital Sky Survey to probe the varying stellar populations of early type galaxies throughout the Fundamental Plane. Not only do early type galaxies span a 2-dimensional family in the Fundamental Plane, but they also span a 2-dimensional family in star formation histories. In addition to known variations with galaxy mass, I present evidence that stellar populations in these galaxies are intimately linked with their central dark matter fractions, revealing a connection between star formation history and structural evolution. I discuss these results in the context of different models for galaxy evolution in a hierarchical universe.

31. **James E. Gunn** (Princeton University, Astrophysical Sciences)
Invited Talk: Conference Summary

August 18, 2008 (4:20 PM - 4:50 PM)

32. **Neeraj Gupta** (CSIRO Australia Telescope National Facility)
Poster: ***GMRT survey of 21cm absorption in intermediate redshift DLA candidates from SDSS***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15 - 16, 2008

Damped Lyman-alpha absorbers (DLAs) seen in the spectra of high-z QSOs allow us to probe the physical conditions in protogalaxies. Our understanding of physical conditions in DLAs at high-z is primarily based on the absorption lines of H_2 molecules and fine-structure transitions. Another important way of probing the thermal state of interstellar medium in these systems is by studying the 21cm absorption in the spectra of background quasars. We are doing systematic searches for 21cm absorption in complete samples of (1) DLA candiates at intermediate redshifts (z~1), (2) DLAs at z>2, and (3) QSO-Galaxy pairs at low redshifts (z<0.3). In this talk I will present the main results of our GMRT survey to search for 21cm absorption in intermediate redshift DLA candidates. Our complete sample of 38 DLA candidates at 1.15<z<1.4 is mainly drawn from the QSO spectra from SDSS DR5. There are 2893 absorption line systems at 1.15<z<1.4 with W(MgII)>1 Angstrom. Using radio flux measurements from the literature we construct a complete sample of strong MgII systems in front of compact quasars and interpolated 610-MHz flux density in excess of 100mJy. Distribution of different equivalent width ratios (i.e. W(MgI)/W(MgII), W(FeII)/W(MgII) etc.) together with the distribution of W(MgII) in our sample is consistent with that observed for the DLAs. Observations of 37 out of 38 sources in our sample are completed and has resulted in 6 new and 2 tentative detections of 21cm absorption. This has significantly increased the number of 21cm absorbers at z>1 as only 4 21cm absorbers were known prior to our survey.

33. **Martin G. Haehnelt** (Institute of Astronomy, University of Cambridge)
Talk: ***Measuring the small scale matter power spectrum with Lyman-alpha forest data***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17, 2008 (2:40 PM - 3:00 PM)

I will discuss measurements of the small scale matter power spectrum based on SDSS and UVES/VLT Lyman-alpha forest data and hydrodynamical simulations. I will put particular emphasis on - implications of the recent evidence for an inverted temperature-density relation for the amplitude of the small scale matter power spectrum and upper limits for neutrino masses; - constraints on the mass of (warm) dark matter particles.

34. **Stephane Herbert-Fort** (University of Arizona)
Poster: ***The SDSS DLA Survey and Metal-Strong DLAs***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15 - 16, 2008

I will review Prochaska, Herbert-Fort & Wolfe (2005; 'The SDSS DLA Survey') and Herbert-Fort et al. (2006; 'The Metal-Strong DLAs'). Both of these works, based on our SDSS quasar spectra-searching algorithm and the resulting very large, high-redshift DLA sample it produced, provided a number of interesting new results.

35. **Stephane Herbert-Fort** (University of Arizona)
Poster: ***The Orbital Distribution of Satellite Galaxies***
Session: **Galaxies**
August 15 - 16, 2008

We measure the distribution of velocities for prograde and retrograde satellite galaxies using a combination of published data and new observations for 78 satellites of 63 extremely isolated disk galaxies (169 satellites total), drawn from the SDSS. We find that the velocity distribution is non-Gaussian (>99.9% confidence), but that it can be described as the sum of two Gaussians, one of which is broad and prograde and the other slightly retrograde and much narrower. The asymmetric velocity distribution demonstrates a connection between the inner, visible disk galaxy, and the kinematics of the outer, dark halo. The reach of this connection, extending even beyond the virial radii, suggests that it is imprinted by the satellite infall pattern and large-scale effects, rather than by higher-level dynamical processes in the formation of the central galaxy or late-term evolution of the satellites.

36. **Rodrigo I. Herrera** (Pontificia Universidad Catolica de Chile)
Poster: ***Star Formation in Pairs of Low Surface Brightness Galaxies***
Session: **Galaxies**
August 15 - 16, 2008

We investigate the effect of galaxy interactions on star formation in a complete volume limited sample of low surface brigthness galaxies (LSBs) and high surface brightness galaxies (HSBs) in the redshift range between 0.01-0.1, selected from the Sloan Digital Sky Survey Data Release 4 (SDSS-DR4). It is clear that the interactions between galaxies became relevant when the central galaxy is LSB and the nearest neighbour is brigther, as we can see in the increase of the specific SFR and the decrease in the average 4000 Å break strength.

37. **Ryan C. Hickox** (Harvard-Smithsonian Center for Astrophysics)
Talk: ***Clustering and evolution of radio, X-ray, and IR-selected AGN***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15, 2008 (5:10 PM - 5:30 PM)

I will present studies of the clustering of active galactic nuclei using data from the 9 square degree multiwavelength Bootes survey, including redshifts from MMT/AGES. AGN selected in different wavebands (radio, X-ray, infrared) have distinctly different host galaxy and clustering properties, and likely represent different modes of supermassive black hole accretion. I will discuss the various AGN modes in the context of the cosmological evolution of galaxies and their central black holes.

38. **Fiona Hoyle** (Widener University)
Poster: ***Voids in the SDSS***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

TBA

39. **Ho Seong Hwang** (Korea Institute for Advanced Study)
Poster: ***Kinematics of Satellite Galaxy Systems***
Session: **Galaxies**
August 15 - 16, 2008

We present a kinematic analysis of satellite galaxy systems using the SDSS data.

40. **Naohisa Inada** (RIKEN)
Talk: ***The SDSS Quasar Lens Search***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15, 2008 (4:30 PM - 4:50 PM)

We are now carrying out The SloanDigital Sky Survey Quasar Lens Search (SQLS), which is a lensed quasar survey using the SDSS data. The SQLS is now recognized as the largest lensed quasar survey; in the course of the SQLS, we have discovered 29 lensed quasars and found 11 previously identified lensed quasars, so far. The current main results are, 1) we have completed a statistical lensed quasar catalog using the SDSS Data Release Three (DR3) and applied it to cosmological tests, and 2) we have succeeded in discovering 2 cluster scale lensed quasars, which are long-predicted but previously undetected lensed quasars produced by clusters of galaxies. We are now extending the statistical lens sample from DR3 to DR5, and finally DR7. Further discoveries of cluster scale lensed quasars are also expected as extending the source quasar sample.

41. **Zeljko Ivezic** (University of Washington)
Invited Talk: ***Solar System Astronomy with SDSS and LSST***
Session: **The Solar System**
August 18, 2008 (9:00 AM - 9:40 AM)

Motivated in part by the great success of the SDSS, the Large Synoptic Survey Telescope (LSST) will be a large, wide-field ground-based system designed to obtain multiple images covering the sky that is visible from Cerro Pachon in Northern Chile. The current baseline design includes an 8.4m (6.5m effective) primary mirror, a 10 sq.deg. field of view, and a 3.2 Gigapixel camera. While without a spectroscopic component, the LSST will open the faint time domain by observing a 20,000 sq.deg. region about 1000 times during the anticipated 10 years of operations starting in 2015. These data will result in a co-added map about 5 magnitudes deeper than SDSS, and in databases including 10 billion galaxies and a similar number of stars. In many aspects, when compared to the SDSS, the LSST's deep-wide-fast survey will represent a leap forward by about a factor of hundred.

42. **Jennifer Johnson** (Ohio State University)
Poster: ***M Giants in the Galactic Halo from SDSS***
Session: **Stars**
August 15 - 16, 2008

The halo of the Milky Way is generally characterized as metal-poor. However, local samples of halo stars have difficulty in studying the metal-rich end of the halo metallicity distribution function because of contamination from the disk. It has been known for decades that the halo harbors M giants, the descendants of metal-rich dwarfs. Indeed, the Sagittarius dwarf spheroidal has left a trail of M giants across the sky. By combining 2MASS photometry and SDSS spectroscopy, we isolate M giant candidates observed by SDSS as contaminants for other programs and begin a census of M giants in the halo.

43. **Kathryn V. Johnston** (Columbia University)
Invited Talk: ***The Milky Way and Near-Field Cosmology***
Session: **The Milky Way and Its Neighbors**
August 16, 2008 (9:00 AM - 9:30 AM)

By mapping the distribution of stars on global scales, SDSS has had a spectacular impact on our understanding of the structure of the Milky Way, revealing abundant substructure in both the nearby and distant Galaxy as well as discovering a host of previously unknown satellites. In this talk I will review what these - and future - findings might tell us about how the Milky Way was formed.

44. **Mario Juric** (Institute for Advanced Study)
Talk: ***Dissecting the Milky Way with SDSS***
Session: **The Milky Way and Its Neighbors**
August 16, 2008 (10:20 AM - 10:40 AM)

The distribution and properties of stars in the Milky Way hold information about the formation and evolution of the Galaxy. Traditionally, samples of stars with such measurements were often biased, included small numbers of stars, or did not extend far beyond the Solar neighborhood. The Sloan Digital Sky Survey allows us overcome these issues, and directly map the number density, kinematics, and metallicity distributions of stars over a representative portion of the Galaxy without the aid of tracers or model assumption. With SDSS, we are able to characterize the global properties of the Milky Way, identify infalling satellites and tidally disrupted remnants, measure the scales of Galactic components, and observe the relationships between various kinematic and physical properties. In particular, the latest maps of metallicity and kinematics reveal in dramatic fashon the differing content of metals and different rotational velocity distributions of disk and halo stars in our Galaxy. Maps such as these put new constraints on the structure and origin of Galactic components, and allowable dynamical models of the Milky Way.

45. **Hwajung Kang** (Dartmouth College)
Poster: ***Peculiar motion and power spectrum of early-type galaxies***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

If one looks at a large enough region, the bulk fow of galaxies should converge to the CMB dipole. There have been many studies of the convergence depth and the dipole direction and magnitudes. Due to lack of data and poor statistics the convergence of the bulk velocity has been an open issue. However, all observations up to 60h⁻¹ Mpc beginning a decade ago have measured the bulk fow with results in agreement with theoretical expectation. In contrast, peculiar velocity surveys larger than 100h⁻¹ Mpc provide inconsistent results varying between surveys. In addition, the peculiar velocities of galaxies is an independent tool to examine the matter density power spectrum. With the assumption that the structure grows via the gravitational instability one can get the relation between the peculiar velocity and the matter distribution in the linear regime. This relation shows that the matter power spectrum can be estimated directly from the measured peculiar velocities. So far, the matter power spectra from the peculiar velocities have shown larger amplitude, inconsistent with the power spectrum obtained from galaxy redshift surveys. Therefore, I will obtain the bulk fow on scales larger than 100h⁻¹ Mpc to see if there is significant bulk fow on that scale and examine the power spectrum from peculiar velocities of galaxies. The distances and peculiar velocities of galaxy clusters are calculated from fundamental plane of early-type galaxies using the recently released SDSS DR6. Before using all possible galaxy cluster data in DR6, here, I will show the result from the small set of data, 720 early-type galaxies, 36 galaxy cluster out to a redshift of 0.067, as a start.

46. **Guinevere A.M. Kauffmann** (Max Planck Institute for Astrophysics)
Invited Talk: ***The Co-evolution of Galaxies and their Supermassive Black Holes: the view from SDSS***
Session: **Galaxies**
August 15, 2008 (1:45 PM - 2:15 PM)

I summarize recent investigations into the relation between the evolution of black holes and galaxies based on optical spectra from the Sloan Digital Sky Survey.

47. **Issha Kayo** (IPMU, University of Tokyo)
Poster: ***Model independent method to measure peculiar velocity dispersion of galaxies***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

48. **Juna A. Kollmeier** (Carnegie Observatories/Princeton Univeristy)
Talk: ***High Velocity Stars in the SDSS***
Session: **Stars**
August 16, 2008 (5:10 PM - 5:30 PM)

Hypervelocity stars (HVS) are a relatively new population of stars in the Galaxy. These stars have the potential to constrain the shape of the Milky Way's halo as well as the nature of star formation at the Galactic Center. To date, only young HVS have been found because the techniques currently being used to locate these rare stars have been focused on the blue for several reasons. However, finding the (potentially more numerous) old-population stars (or lack thereof) would be extremely important in order to exploit the HVS as multi-scale probes of the Galaxy. Exploiting the spectroscopic database for stars in SDSS we search for bound and unbound HVS. I will present the results of this search including a complementary determination of the escape speed and the potential discovery of the elusive "returning population" of bound HVS.

49. **Sergey E. Koposov** (Max Planck Institute for Astronomy, Heidelberg)
Poster: ***Quantitative explanation of the observed population of Milky Way satellite galaxies***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

Authors: Koposov, Yoo, Rix, Weinberg We show that the observed luminosity function, radial distribution and velocity dispersion distribution of the very faint Milky Way satellites can be quantitatively well matched by predictions from cosmological simulations that are based on a canonical population of dark matter sub-halos, if the stellar content of these sub-halos is regulated by the suppression of gas cooling through photo-heating after re-ionization. While this approach to resolving the 'missing satellite' discrepancy has been well established qualitatively, recent developments have permitted a considerably more quantitative and rigorous treatment: the census of Milky Way satellite galaxies has recently been greatly expanded with discoveries of new faint satellites. They have all been characterized photometrically and stellar velocity dispersions exist for most. A recent quantification of SDSS's efficiency and limitations in finding these new objects has shown that for most of them the maximal volume in which they could have been found is much smaller than the 'virial volume' of the MW halo. Starting with a semi-analytic model for the population of dark matter sub-halos, we model their possible stellar content by applying previously published prescriptions about star-formation efficiencies before and after re-ionization and by presuming that star-formation seizes once the small halos become satellites. We then apply the known observational detection function to this set of mock Milky Way satellites and compare them to the observations. Within these detection limitations the observed luminosity distribution can be well matched over large luminosity range for plausible choices of the star-formation suppression. The distribution of stellar velocity dispersions can be well matched too.

50. **Andrey V. Kravtsov** (KICP, The University of Chicago)
Talk: ***Modeling spatial distribution of galaxies in the SDSS***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17, 2008 (2:20 PM - 2:40 PM)

51. **Varsha P. Kulkarni** (University of South Carolina)
Talk: ***Evolution of Metals and Dust in Galaxies: Damped and Sub-damped Lyman-alpha Quasar Absorbers from SDSS***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15, 2008 (4:50 PM - 5:10 PM)

The evolution of elements in galaxies is a fundamental topic in astrophysics. Damped Lyman-alpha (DLA) and sub-damped Lyman-alpha (sub-DLA) absorbers in quasar spectra provide the most comprehensive probes of chemical composition of distant galaxies. They can therefore be used to test predictions of cosmic chemical evolution models over ~90% of the cosmic history. The SDSS has led to a tremendous growth in the number of DLA and sub-DLA absorbers available for such studies. We have carried out spectroscopic studies of DLAs and sub-DLAs discovered in SDSS with MMT, VLT, and Magellan. These studies, together with our earlier HST studies, have increased the number of DLA and sub-DLA metallicity measurements at $z < 1.5$ by a factor of ~4. Surprisingly, these studies have indicated that low-redshift DLAs are largely metal-poor, and the global mean metallicity of DLAs does not appear to evolve strongly. Where are these "missing metals"? Recently, we have discovered a number of metal-rich sub-DLA absorbers (several with even super-solar metallicity!) and the fraction of metal-rich sub-DLAs appears to be considerably larger than that of metal-rich DLAs. We will discuss the evolution of element abundances in sub-DLAs and DLAs, their role in the cosmic metal budget, the implications for galaxy evolution, and for the nature of DLAs and sub-DLAs. Finally, we will also discuss the observations of dust in DLAs. I would like to acknowledge my collaborators in this work (especially D. G. York, C. Peroux, J. Meiring, and P. Khare). This work is supported in part by NSF grant AST-0607739 to the University of South Carolina.

52. **Ofer Lahav** (University College London)
Invited Talk: ***Large Scale Structure in 2dF, SDSS, and beyond***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17, 2008 (9:30 AM - 10:00 AM)

The talk will compare and contrast results from 2dF and SDSS, in particular regarding galaxy biasing, the halo model and cosmological parameters, including neutrino mass. The appearance of large superclusters in both surveys will be highlighted. The next generation of wide field imaging surveys calls for new approaches, using photometric redshifts. Applications to a sample of over 1.5 million SDSS Luminous Red Galaxies with photometric redshifts will be presented, and the prospects for new imaging surveys, e.g. the Dark Energy Survey Pan-STARRS and EUCLID, will be discussed. The revival of the redshift distortion method as a test of modified gravity will be assessed in the context of the next generation of spectroscopic surveys e.g. WFMOS.

53. **David K. Lai** (UC Santa Cruz)
Talk: ***The Abundances of Metal-poor Stars in the Outer Halo of the Milky Way***
Session: **Stars**
August 16, 2008 (4:50 PM - 5:10 PM)

I will discuss a recently begun program measuring the abundance ratios of stars in the outer halo of the Milky Way. Using the metal-poor candidates from SDSS-SEGUE and follow-up spectra with ESI+Keck we efficiently measure metallicity, alpha-ratio abundances, and certain neutron-capture abundance ratios for stars out to distances of about 20 kpc, thereby placing them in situ in the outer halo (Carollo et al. 2007). By studying metal-poor stars in this relatively unexplored region we can look for evidence of different star formation environments and potentially discover interesting individual stars. For example, in a preliminary sample of only nine stars we have already discovered one new r-process-enhanced metal-poor star. In terms of the larger sample, if the population statistics of these outer halo stars in their abundance ratios differ significantly from nearby samples, then this would be direct evidence of varied star formation environments in the outer halo and can provide an important constraint on current Galaxy formation scenarios (e.g., Bullock & Johnston 2005).

54. **Dustin Lang** (University of Toronto)
Poster: ***Measuring the Undetectable: Parallaxes and proper motions for extremely faint sources***
Session: **Stars (II)**
August 17 - 18, 2008

The near future of astrophysics involves many large solid-angle, multi-epoch, multi-band imaging surveys. These surveys will, at their faint limits, have data on large numbers of sources that are too faint to be detected at any individual epoch. Here we show that it is possible to measure in multi-epoch data not only the fluxes and positions, but also the parallaxes and proper motions of sources that are too faint to be detected at any individual epoch. The method involves fitting a model of a moving point source simultaneously to all imaging, taking account of the noise and point-spread function in each image. By this method it is possible---in well-understood data---to measure the proper motion of a point source with an uncertainty (found after marginalizing over flux, mean position, and parallax) roughly equal to the minimum possible uncertainty given the information in the data, which is limited by the point-spread function, the distribution of observation times, and the total signal-to-noise in the combined data. We demonstrate our technique on artificial data and on multi-epoch Sloan Digital Sky Survey imaging of the SDSS Southern Stripe. With the SDSSSS data we show that with this technique it is possible to distinguish very red brown-dwarf stars from very high-redshift quasars more than 1.6 mag fainter than by the traditional technique, and with better better fidelity than by multi-band imaging alone. We re-discover all 10 known brown dwarfs in our sample and present 12 new candidate brown-dwarf stars in the SDSSSS, identified on the basis of high proper motion.

55. **Yun Hee Lee** (KSG)
Poster: ***The central offset of nearby galaxies***
Session: **Galaxies**
August 15 - 16, 2008

TBA

56. **Huan Lin** (Fermilab)
Talk: ***The Dark Energy Survey***
Session: **The Near Future**
August 18, 2008 (2:40 PM - 3:00 PM)

The Dark Energy Survey (DES) is a 5-filter grizY imaging survey of 5000 sq. deg. of the South Galactic Cap to a depth i~24. The DES will use a new 3 sq. deg. mosaic CCD camera on the Blanco 4-m telescope at Cerro Tololo Inter-American Observatory (CTIO). The survey data will allow us to measure the dark energy and dark matter densities and the dark energy equation of state through four independent methods: galaxy clusters, weak lensing, baryon acoustic oscillations, and Type Ia supernovae. These methods are doubly complementary: they constrain different combinations of cosmological model parameters and are subject to different systematic errors. By deriving the four sets of measurements from the same data set with a common analysis framework, we will obtain important cross checks of the systematic errors and thereby make a substantial and robust advance in the precision of dark energy measurements.

57. **Yen-Ting Lin** (Princeton)
Poster: ***Statistical Properties of Radio Galaxies in the Local Universe***
Session: **Galaxies**
August 15 - 16, 2008

Combining rich datasets from SDSS, NVSS, and FIRST, we have constructed the largest sample of radio galaxies (RGs) in the local Universe (z<0.3) to date, consisting of 10,500 objects. Utilizing the statistical power of this sample, we characterize several fundamental properties of the RGs, including the radio-optical bi-variate luminosity function and the two-point correlation function, to unprecedented accuracy. We show that the RGs cluster more strongly than the radio-quiet galaxies, a conclusion that remains true even when the galaxies are further divided into various optical color and luminosity subsamples. Incorporating the Halo Occupation Distribution formalism into our analysis, we suggest that RGs most likely reside in massive halos ($>10^{13} M_odot$), and discuss possible triggering mechanisms for the radio-loud AGN phenomenon.

58. **Sebastian Lopez** (Universidad de Chile)
Poster: ***Probing cluster galaxies with background QSOs***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15 - 16, 2008

I will present results of the first survey of intervening MgII absorption systems associated with high-z cluster galaxies. We investigated the incidence (dN/dz) of MgII absorbers in z = 0.3-0.9 cluster galaxies using a correlation between Sloan QSOs and RCS clusters. While strong (W_0>1.0 Å) absorbers show a significant excess (up to 10x), weak (W_0<0.3 Å) absorbers conform to the field statistics. We argue that this dichotomy could be explained if cluster galaxies that give rise to weak MgII absorption have their cold halos truncated as a consequence of environmental effects.

59. **Felipe Marin** (University of Chicago)
Poster: ***Luminous Red Galaxies Bias from the 3-point correlation function***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

We present updated and new measurements of the redshift space three-point correlation function (3PCF) of the Luminous Red Galaxies (LRG) sample from the Sloan Digital Sky Survey (SDSS). Using an improved binning scheme, we can study the 3PCF in scales from 0.5 up to 80 Mpc/h. On large scales we measure galaxy biasing and are able to reject the zero non-linear bias hypothesis and study the prospects of using the 3PCF to put constrains on cosmological parameters. On small scales, we show that the 3PCF can help on constraining and improving HOD models.

60. **Heather Morrison** (CWRU)
Talk: ***The nature of the Monoceros overdensity***
Session: **The Milky Way and Its Neighbors**
August 16, 2008 (11:35 AM - 11:55 AM)

Monoceros, originally discovered by SDSS, has been explained either as the remains of a small satellite which has disrupted just outside the galactic disk (Penarrubia et al 2005), or as the response of the thin disk to the infall of a larger satellite which produced the thick disk (Kazantzidis et al 2008). We present an analysis of SDSS imaging and spectroscopy to distinguish between these two scenarios.

61. **Heidi Jo Newberg** (Rensselaer Polytechnic Institute)
Invited Talk: ***Milkyway Substructure***
Session: **The Milky Way and Its Neighbors**
August 16, 2008 (9:30 AM - 10:00 AM)

62. **Bob Nichol** (ICG Portsmouth)
Talk: ***Latest from the ISW***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17, 2008 (11:55 AM - 12:15 PM)

We have now completed a full and detailed analysis of the Integrated Sachs-Wolfe (ISW) effect using a range of different LSS tracers. In this talk I will review of this work and show how it helps the cosmological constraints.

63. **Chris Orban** (The Ohio State University)
Poster: ***Delving Deeper into the Tumultuous Lives of Galactic Dwarfs: Modeling Star Formation Histories***
Session: **The Milky Way and Its Neighbors**
August 15 - 16, 2008

64. **Danny C. Pan** (Drexel University)
Poster: ***Cosmic Void Ellipticity in SDSS***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

Voids in the Universe are believed to evolve spherically in shape as predicted by linear gravitation theory (Icke 1984). Voids in redshift space can have different shapes from voids in real space either due to nonlinear redshift space distortions along the line of sight, or linear infall onto structures. These effects cause asphericity in the voids. To measure this effect, we compute the ellipticity of voids from the sample of 526 voids in the SDSS DR5 void catalog (Pan et al. 2008). For each void, we determine the best-fit ellipsoid for the volume. We calculate the line of sight projections of the major axes and determine possible effects of redshift distortions by comparing to effects in a mock catalog provided by Park et al.

65. **John K. Parejko** (Drexel University)
*Poster: **X-ray Emitting Galaxies in the SDSS***
Session: **Galaxies**
August 15 - 16, 2008

Matching the ROSAT All Sky Survey and the SDSS results in many ambiguous matches. In a previous paper we described a method for statistically identifying likely matches between these surveys. We use this method to describe the X-ray properties for "ordinary" galaxies and narrow-line AGN in the SDSS. We also apply the matching method developed with SDSS to match other galaxy catalogs to ROSAT, and thus constrain the X-ray properties of star forming galaxies.

66. **Changbom Park** (Korea Institute for Advanced Study)
*Talk: **Morphology and Luminosity Segregation by Galaxy-Galaxy Interactions in Clusters of Galaxies***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17, 2008 (11:35 AM - 11:55 AM)

We have found that the hydrodynamic interactions between individual galaxies do critical role in the morphology and luminosity segregation in galaxy clusters.

67. **Alex Parker** (University of Victoria)
*Talk: **The Size Distributions of Asteroid Families in the SDSS MOC 4***
Session: **The Solar System**
August 18, 2008 (9:40 AM - 10:00 AM)

Asteroid families, traditionally defined as clusters of objects in orbital parameter space, often have distinctive optical colors. We show that the separation of family members from background interlopers can be improved with the aid of SDSS colors as a qualifier for family membership. Based on an sim88,000 object subset of the Sloan Digital Sky Survey Moving Object Catalog 4 with available proper orbital elements, we define 37 statistically robust asteroid families with at least 100 members (12 families have over 1000 members) using a simple Gaussian distribution model in both orbital and color space. The interloper rejection rate based on colors is typically sim10% for a given orbital family definition, with four families that can be reliably isolated only with the aid of colors. About 50% of objects in this data set belong to families, with this fraction increasing from about 35% to 60% as asteroid size drops below sim25 km, as predicted by earlier work. The size distribution varies significantly among families, and is typically different from size distributions for background populations. The size distributions for 15 families display a well-defined change of slope and can be modeled as a "broken" double power-law. Such "broken" size distributions are twice as likely for S-type familes than for C-type families (73% vs. 36%), and are dominated by dynamically old families. The remaining families with size distributions that can be modeled as a single power law are dominated by young families ($<$1 Gyr). When size distribution requires a double power-law model, the two slopes are correlated and are steeper for S-type families. No such slope--color correlation is discernible for families whose size distribution follows a single power law. For several very populous families, we find that the size distribution varies with the distance from the core in orbital-color space, such that small objects are more prevalent in the family outskirts. This "size sorting" is consistent with predictions based on the Yarkovsky effect.

68. **Santiago G. Patiri** (Case Western Reserve University)
*Poster: **The properties of galaxies in voids***
Session: **Galaxies**
August 15 - 16, 2008

69. **Molly S. Peeples** (Ohio State University)
Poster: ***Outliers from the Mass--Metallicity Relation***
Session: **Galaxies**
August 15 - 16, 2008

I will discuss two samples of outliers from the mass--metallicity relation of star-forming galaxies from SDSS. The first are low-mass metal-rich dwarf galaxies with 8.6 < [12 + log(O/H)] < 9.3 over a range of -14.4 > M_B > -19.1 and 7.4 < log M_*/M_solar < 10 that are surprisingly non-pathological. They have typical specific star formation rates and are found in fairly isolated environments with no obvious companions except for a few unremarkable exceptions. Morphologically, they resemble dwarf spheroidal or dwarf elliptical galaxies. I will explain why we predict that their observed high oxygen abundances are due to relatively low gas fractions and conclude that these are transitional dwarf galaxies nearing the end of their star formation activity. The second sample is a set of high-mass, low-metallicity outliers from the mass--metallicity relation that have high specific star formation rates and include many morphologically disturbed systems. I will discuss possible explanations for these galaxies, as well as possible implications for determining GRB host galaxy metallicities.

70. **Will Percival** (University of Portsmouth)
Talk: ***Observing BAO in the SDSS***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17, 2008 (2:00 PM - 2:20 PM)

I will talk about recent observations of BAO in the SDSS LRG and main galaxy samples. These demonstrate the potential of using BAO as a cosmological distance ruler. The promise of future surveys including DES and SDSS-III that intend to use this technique to discover the properties of dark energy will be discussed.

71. **Beth A. Reid** (Princeton University)
Poster: ***Precise Luminous Red Galaxy (LRG) Mock Catalogs and Techniques for Large-Scale Structure Studies***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

We first present a new technique, Counts-In-Cylinders, to constrain the Halo Occupation Distribution of LRGs using higher-order statistics of the observed density field. We use these results to suggest an improved method for compressing Fingers-of-God's and reconstructing a halo density field before estimating P(k). We present a set of mock catalogs which replicate Counts-In-Cylinder LRG statistics as well as the projected correlation function wp(rp) and P(k). We argue that the halo density field is a better tracer of the matter density field then the galaxy distribution.

72. **Reinabelle Reyes** (Princeton University-Astrophysics Department)
Poster: ***Space density of optically-selected type 2 quasars***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15 - 16, 2008

73. **Gordon Richards** (Drexel University)
Invited Talk: ***Quasars and the SDSS***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15, 2008 (3:00 PM - 3:30 PM)

Internal review of SDSS Quasar Science

74. **Nicholas Ross** (Pennsylvania State University)
Talk: ***The clustering of redshift z<2.2 SDSS Quasars***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15, 2008 (4:10 PM - 4:30 PM)

We present new results from the SDSS spectroscopic Quasar survey, examining the clustering properties of quasars via the 2-point correlation function. The evolution of quasar bias is discussed and put in context with recent observational measurements at z~2 and comparisions to theoretical models are made.

75. **David Schiminovich** (Columbia University)
Talk: ***New lessons from panchromatic (UV-IR) observations of the SDSS main galaxy sample***
Session: **Galaxies**
August 15, 2008 (10:20 AM - 10:40 AM)

The powerful combination of GALEX+SDSS+Spitzer is providing a wealth of new information about the physical properties and evolutionary histories of galaxies. In this talk I will discuss several results based on UV and IR photometry and spectroscopy of the SDSS main galaxy sample that allow us to establish a coherent picture of star formation in galaxies and a deeper understanding of the dominant processes in galaxy assembly.

76. **Kevin C. Schlaufman** (Astronomy and Astrophysics Department, University of California, Santa Cruz)
Talk: ***The Stellar Accretion History of the Milky Way Through SEGUE Observations of Halo Substructure***
Session: **The Milky Way and Its Neighbors**
August 16, 2008 (11:15 AM - 11:35 AM)

We identify 20 (17 for the first time kinematically cold streams in the inner halo of the Milky Way. Our result is based on the observed spatial and radial velocity distribution of metal-poor main sequence turn-off (MPMSTO) stars in 117 Sloan Extension for Galactic Understanding (SEGUE) lines-of-sight. We show that the observed distribution is consistent with a smooth stellar component of the Milky Way's halo at large scales, but disagrees significantly at the radial velocities that correspond to our detections. We prove that all of our detections are significant to more than 10-sigma and that we expect only one of our detections to be a false-positive. These cold streams represent the observable stellar populations of those dark matter halos that merged to form the Milky Way, and we use our detections and estimates of our completeness to predict that approximately 3000 streams are present in the entire inner halo. We compare our detections with the very high resolution dark matter-only Via Lactea simulation to constrain the mapping of dark matter halos to their stellar content. Finally, we consider the implications of our detections in the context of the formation of Milky Way.

77. **Katharine J. Schlesinger** (Ohio State University)
Poster: ***Understanding Early Star Formation using Metal-Poor Stars and SEGUE***
Session: **Stars**
August 15 - 16, 2008

Low-mass, low-metallicity stars (a.k.a. M subdwarfs) can in principle be used to give the most complete census of low-mass star formation at different metallicities. Thanks to their long lifetimes, these stars are critical for understanding the initial mass function and metallicity distribution function in the Galaxy, as they reflect those early conditions. Unfortunately, the spectra of M subdwarfs are complicated with many broad molecular bands. Current atmosphere models cannot explain these features with adequate precision or allow for accurate metallicity estimates. We plan to provide an empirical calibration of the metallicity of M subdwarfs and apply it to SEGUE. We select pairs of binary stars in which the brighter (primary) star in the binary is an F, G or K subdwarf while the fainter (secondary) member is an M subdwarf. We use high-resolution spectroscopy to measure the metallicities of the primaries and then measure spectral line indices of the secondaries using moderate-resolution spectroscopy. Assuming that the metallicity of the secondary is the same as the primary, we are developing a calibration system between line indices and metallicity. We expect to sample a metallicity range of -2<[Fe/H]<-0.5 at roughly 0.3 dex steps and a few hundred degrees of effective temperature (~K7-M5). Thus far, we have observed around 60 pairs out of a sample of 200 proper motion pairs, and have observations of around 40 additional secondaries. This calibration of M subdwarf metallicities can then be applied to the large samples of sdM stars observed by SEGUE. SEGUE has observed at least 6000 M subdwarfs and measured molecular indices for the TiO and CaH bands in the stellar pipeline reduction, allowing us to thoroughly explore the low mass end of the initial mass function and metallicity distribution function.

78. **Branimir Sesar** (University of Washington)
Poster: ***Milky Way halo substructures in the SDSS***
Session: **The Milky Way and Its Neighbors**
August 15 - 16, 2008

We discuss Milky Way halo substructures discovered using SDSS data.

79. **Francesco Shankar** (The Ohio State University)
Talk: ***Constraining the evolution of Super-Massive Black Holes***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15, 2008 (5:30 PM - 5:50 PM)

Supermassive black holes (SMBHs) seem to be ubiquitous at the center of all galaxies which have been observed with high enough sensitivity with HST. SMBH masses are tightly linked with the masses and velocity dispersions of their host galaxies. Also, SMBHs are considered to be the central engines of active galactic nuclei (AGN). It is however still unclear how SMBHs have grown and if they have co-evolved with their hosts. In my talk I will derive, in ways independent of specific models, constraints on how SMBHs and galaxies must have evolved within their dark matter halos. I will describe the accretion history of SMBHs from z~6 to z~0 by interconnecting a variety of data sets, including the AGN luminosity function, their clustering properties, and Eddington ratio distributions. I'll show results obtained through a novel numerical code which evolves the SMBH mass function and clustering adopting broad distributions of Eddington ratios.

80. **Ramin A. Skibba** (Max Planck Institute for Astronomy)
Poster: ***A Halo Model of Galaxy Colors and Clustering in the SDSS***
Session: **Large-Scale Structure and Galaxy Clusters**
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Successful halo-model descriptions of the luminosity dependence of clustering distinguish between the central galaxy in a halo and all the others (satellites). To include colors, we provide a prescription for how the color-magnitude relation of centrals and satellites depends on halo mass. This follows from two assumptions:(i) the bimodality of the color distribution at fixed luminosity is independent of halo mass, and (ii) the fraction of satellite galaxies which populate the red sequence increases with luminosity. We show that these two assumptions allow one to build a model of how galaxy clustering depends on color without any additional free parameters than those required to model the luminosity dependence of galaxy clustering. We then show that the resulting model is in good agreement with the distribution and clustering of colors in the SDSS, both by comparing the predicted correlation functions of red and blue galaxies with measurements, and by comparing the predicted color mark correlation function with the measured one. Mark correlation functions are powerful tools for identifying and quantifying correlations between galaxy properties and their environments: our results indicate that the correlation between halo mass and environment is the primary driver for correlations between galaxy colors and the environment; additional correlations associated with halo 'assembly bias' are relatively small. We also investigate the colors of central and satellite galaxies predicted by the model and compare them to those of two galaxy group catalogs constructed from the SDSS. In both the model and the catalogs, we find that at fixed luminosity or stellar mass, central galaxies tend to be bluer than satellites. In contrast, at fixed group richness or halo mass, central galaxies tend to be redder than satellites, and galaxy colors become redder with increasing mass.

81. **Marcelle Soares-Santos** (Fermilab)
Poster: ***Voronoi Tesselation Cluster Finder***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

82. **Mark Sullivan** (University of Oxford)
Invited Talk: ***The Supernova Legacy Survey***
Session: **Supernovae and Supernova Cosmology**
August 18, 2008 (11:00 AM - 11:30 AM)

83. **Takamitsu Tanaka** (Columbia University Dept. of Astronomy)
Poster: ***Assembly Models for Redshift 6 Sloan Quasar Black Holes***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
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84. **Jeremy Tinker** (University of Chicago)
Talk: ***Cosmology with Cluster Mass-to-Light Ratios***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17, 2008 (11:15 AM - 11:35 AM)

I will present constraints on cosmological parameters from a combination of cluster mass to light ratios combined with halo occupation analysis of the galaxy autocorrelation function. In two-point clustering, cosmology an bias are degenerate; good fits to the correlation function can be obtained for a wide variety of comologies. However, in order to match the observed level of clustering, each cosmology predicts a different amount of light per unit mass at the cluster mass scale. A combination of DR7 galaxy clustering results and M/L data from the weak-lensing analysis of the maxBCG catalog break the degeneracy between cosmology and bias, leading to tight constraints on Omega_m and sigma_8.

85. **Jose Antonio Vazquez** (Instituto de Astronomia, UNAM)
Poster: ***A New Catalogue of Isolated Galaxies from SDSS***
Session: **Galaxies**
August 15 - 16, 2008

Isolation is an important requirement beyond the concept of "field" galaxies. A galaxy is isolated if it has not suffered any interaction with another normal galaxy or with a group environment over a Hubble time or at least since approximately one half of its mass was assembled. This makes important the observational finding and study of isolated galaxies because, among other reasons, (i) they can be used then as comparison objects in studies of the environmental effects on galaxies belonging to groups and clusters, and (ii) they are ideal for confronting with theoretical and model predictions of galaxy evolution. In this poster we present the general properties of a new sample of isolated galaxies gathered from the SDSS database.

86. **David A. Wake** (University of Durham)
Talk: ***The evolution of the most massive red galaxies: A problem for hierarchical galaxy formation?***
Session: **Galaxies**
August 15, 2008 (11:15 AM - 11:35 AM)

The apparent early formation and passive evolution of massive early-type galaxies has long been suggested as a problem for the hierarchical picture of galaxy formation. In particular it appears that the most massive galaxies formed earliest and have evolved the least in an apparently anti-hierarchical fashion. In order to test this we have constructed large samples of the most massive luminous red galaxies (LRGs) to z~0.9 using SDSS imaging and spectra from the Anglo-Australian telescope as part of the 2SLAQ and AUS surveys. By combining these with spectroscopic LRG samples from the SDSS we have measured the evolution of the luminosity function and clustering of LRGs since z~0.9. These measurements indeed present a picture where the most massive red galaxies show little evolution beyond the passive ageing of their stars, although a small amount of merging (~2% per Gyr) is required by the measured evolution of the LRG clustering. However, despite this apparently clear example of anti-hierarchical galaxy formation we show that the latest semi-analytic models of galaxy formation are able to broadly reproduce the evolution of the most massive galaxies in the universe, even if they are still unable to quite get all the details correct.

87. **Bart P. Wakker** (University of Wisconsin-Madison)
Talk: ***Distances to high-velocity clouds using SDSS stars***
Session: **The Milky Way and Its Neighbors**
August 16, 2008 (11:55 AM - 12:15 PM)

We have used Blue Horizontal Branch (BHB) and RR Lyrae stars found in the SDSS and 2MASS surveys to determine distance brackets to several Galactic high-velocity clouds (HVCs). These objects trace a variety of phenomena: (a) a Galactic Fountain, (b) tidal streams and (c) accreting low-metallicity gas. We note that models predict that supernovae drive gas to a circulate at a rate of ~1 solar mass per year between Disk and Halo, while models of galactic chemical evolution predict that there is a present-day inflow of about 1 solar mass per year of gas with a metallicity (Z) of about 0.1 solar. We used SDSS/2MASS photometry to identify BHB/RR stars at distances of 5--30 kpc in the direction of 60 HVC fields. We then used SDSS spectroscopy, new data from APO and new photometry to determine good distances to about 800 of these stars. Next, we used the VLT and Keck to obtain high-resolution spectroscopy for about 60 stars. From these spectra we derived distances ranging from 2 to 15 kpc for a total of about 10 HVCs. One of these, complex C, h as Z=0.15 solar, a mass of ~10⁷ solar masses, and represents an inflow of 0.2 solar masses per year (including HI, H⁺ and He). A number of other clouds with as-yet unknown metallicity represent a total inflow rate of another ~0.2 solar masses per year. We also identified HVCs that trace the outflowing material in the Galactic Fountain.

88. **Douglas Watson** (Vanderbilt University)
Poster: ***LasDamas Mock Catalogs***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

We introduce the LasDamas (Large suite of Dark matter simulations) project, which is running many cosmological N-body simulations in order to facilitate the modeling of galaxy clustering. LasDamas will produce many SDSS mock galaxy catalogs and make them publicly available. We report on the status of LasDamas.

89. **David H. Weinberg** (Ohio State University)
Talk: ***SDSS-III: Massive Spectroscopic Surveys of the Distant Universe, the Milky Way Galaxy, and Extra-Solar Planetary Systems***
Session: **The Near Future**
August 18, 2008 (3:20 PM - 3:40 PM)

90. **Simon D.M. White** (Max Planck Institute for Astrophysics)
Invited Talk: ***Cosmic Structure Formation***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17, 2008 (9:00 AM - 9:30 AM)

Over the last decade the LCDM model has graduated from a spectulative theory to the standard model of cosmic structure formation.I will look back on how this happened, emphasising the role of SDSS both in confirming important aspects of the model and in clarifying how the galaxy/AGN population may have evolved within it. I will also summarise outstanding issues in this area that may be addressed with SDSS-3.

91. **Hartmut Winkler** (University of Johannesburg)
Poster: ***Seyfert galaxies with hyper-strong coronal emission lines (and other oddities discovered by SDSS)***
Session: **Quasars, Absorption Systems, and the Intergalactic Medium**
August 15 - 16, 2008

92. **Edward L. Wright** (UCLA)
Poster: ***WISE - the Wide-field Infrared Survey Explorer***
Session: **Large-Scale Structure and Galaxy Clusters**
August 17 - 18, 2008

WISE will survey the whole sky in 4 infrared bands centered at 3.3, 4.7, 12 and 23 microns. The 5 sigma sensitivity will be 120, 160, 650 and 2600 microJy in these bands. WISE is scheduled for launch in late 2009, and the first data release should occur in 2011. WISE should measure radiometric diameters for a few hundred thousand asteroids, about a thousand brown dwarfs cooler than 750 K, about 2.5 million AGNs or QSOs, millions of LIRGS and ULIRGS, and the light from the old stellar population of more than 100 million galaxies. A combination of SDSS and WISE data on galaxies will be extremely valuable for studying large scale structure and galaxy evolution.

93. **Chen Zheng** (KIPAC/Stanford University)
Poster: ***Spectroscopy for the SDSS-II Supernova Survey***
Session: **Supernovae and Supernova Cosmology**
August 17 - 18, 2008

We present results from our spectroscopic follow-up campaigns that complement the SDSS-II Supernova Survey. Telescopes with a wide range of apertures were used (HET, APO, Subaru, MDM, NTT, NOT, SALT, WHT, KPNO, and Keck), providing over a thousand spectra of SNe and their host galaxies, including 500 spectroscopically confirmed SN Ia's and 100 core-collapse SNe, during our 3-season campaign. The large data set allows us to explore the diversity of SN spectra, understand the underlying SN physics, and investigate the potential for using SN Ia spectra as luminosity indicators. The majority of our spectra, however, have significant contamination from the host galaxy, making galaxy subtraction a critical step for the SN identification and subsequent spectral analysis. In order to extract a clean SN spectra, we adopt a composite PCA plus template-fitting program with color constraints from the photometry. We demonstrate the reliability of our procedures, and present preliminary results of our study of the diverse spectral features and correlations with the optical light curves.