XIV Latin American Regional IAU Meeting (Florianópolis/SC, Brazil, 25-30 November 2013)
Editors: A. Mateus, J. Gregorio-Hetem & R. Cid Fernandes

ulation of the evolution of the large-scale structure of the universe.

[1] Departamento de Astronomía, Universidad de Guanajuato, Callejón de Jalisco S/N, Valenciana, 36240, Guanajuato, Guanajuato, México. (marcel@astro.ugto.mx, heinz@astro.ugto.mx, caretta@astro.ugto.mx).

HUGE-LQG- THE LARGEST STRUCTURE IN THE UNIVERSE

R. G. Clowes[1], S. Raghunathan[2], K. A. Harris[3], L. E. Campusano[2], I. K. Sochting[4], and M. J. Graham[5]

A large quasar group (LQG) of particularly large size and high membership has been identified in the DR7QSO catalogue of the Sloan Digital Sky Survey. It has characteristic size ($volume^{1/3}$) $\sim$ 500 Mpc (proper size, present epoch), longest dimension $\sim$ 1240 Mpc, membership of 73 quasars and mean redshift z=1.27. In terms of both size and membership, it is the most extreme LQG found in the DR7QSO catalog for the redshift range $1.0 < z < 1.8$ of our current investigation. Its location on the sky is $\sim$ 8.8 degrees north ($\sim$ 615 Mpc projected) of the Clowes & Campusano LQG at the same redshift, $z = 1.28$, which is itself one of the more extreme examples. This new, Huge-LQG appears to be the largest structure currently known in the early Universe. Its size suggests incompatibility with the Yadav et al. (2010) scale of homogeneity for the concordance cosmology, and thus challenges the assumption of the cosmological principle.

[1] Jeremiah Horrocks Institute, University of Central Lancashire, UK.
[2] Departamento de Astronomía, Universidad de Chile, Santiago, Chile.
[3] Department of Physics, Virginia Tech, Blacksburg, VA.
[4] Astrophysics, Denys wilkinson Building, Keble Road, University of Oxford, UK.
[5] California Institute of Technology, Pasadena, CA.

SUPER-MASSIVE BLACK HOLE GROWTH IN THE FIRST GIGAYEAR OF COSMIC HISTORY

J. E. Forero-Romero[1], M. F. Gomez-Alvarez[1], and S. Velasco-Moreno

As two galaxies collide the super-massive black holes in their centers will merge. The resulting black hole will be ejected with a certain kick velocity. The black hole will move in the galaxy's potential well while it oscillates and returns to its initial position due to dynamic friction processes. In this work we use semi-analytic techniques to follow the amount of mass accreted by the BH since the initial kick until its return to a stationary position at the center of the host galaxy. We focus our study on black holes in the mass range $10^6 - 10^9$ Msun. We use these results to re-interpret the observational constraints on the growth of super-massive black holes during the first gigayear of cosmic history.

[1] Departamento de Física, Universidad de los Andes, Cra. 1 No. 18A-10, Edificio Ip, Bogotá, Colombia.

CONTRASTING DISTANCES USING TYPE IA SUPERNOVAE AND GAMMA RAY EVENTS IN THE LOCAL UNIVERSE

R. Girola[1]

In the year 1998, it is discovered -through Type Ia supernova observation- that the universe is expanding at an accelerating rate. One interpretation, which is not contrary to General Relativity, accepts the existence of a cosmological constant other than zero and of Quintessence, a repulsive force. These supernovae are used as standard candles to measure both distances and the accelerating expansion rate of the universe. Although this is based on well-known and proven facts, it was found that the method employed contains systematic errors. The purpose of this study is to present an alternative method to reduce the errors through the measurement of galactic distances, using gamma-ray events from gamma-ray binaries and microquasars. As the actual supernova population is rather small to be statistically reliable, it is supported with numerical simulations to provide a contrast between Type Ia supernovae and gamma-ray events. To this end, we apply the measurement of Type Ia supernovae to nearby galaxies where is possible to measure the accelerating expansion of the universe. Afterwards, assuming that the observations and instrumentations would enable this possibility, we perform the measurements of a group of microquasars, taking on account their approximate equitable distribution of energy which is contrary to the results of supernovae. Our study remains open to further exploration on whether there is a difference between the distances measured or they are compatible and they manage to minimize the systematic error of Type Ia supernova method. In this way, we estimate if the distances are consistent in each case as well as we calculate the measurement of the universe's expansion.

[1] Universidad Nacional de Tres de Febrero. Argentina.

COSMOLOGY FROM THE ANGULAR CORRELATION FUNCTION AND GALAXY CLUSTERS

M. Lima[1], H. Camacho, M. Aguena, and DES-Brazil consortium

The large-scale clustering properties of galaxies allows us to investigate models which attempt to explain the recent acceleration of the Universe background expansion. These properties include the correlations of galaxies and the abundance of galaxy clusters. I will present some of the relevant aspects when using these probes to constrain cosmological models. If time allows I will also present some of our recent results on real data from the Sloan Digital Sky Survey DR8 and on mock catalogs of the Dark Energy Survey.

[1] Instituto de Física, Universidade de São Paulo.

THE GALAXY COSMOLOGICAL MASS FUNCTION

A. R. Lopes[1], A. Iribarrem[1], M. B. Ribeiro[2], and W. R. Stoeger[3]

The aim of this work is to present a semi-empirical relativistic approach which uses the general model connecting cosmological theory to observational data derived from galaxy surveys (Ribeiro & Stoeger 2003, ApJ, 592, 1) to study the galactic mass evolution. For this purpose we define a new quantity named the galaxy cosmological mass function (GCMF). We used the FORS Deep Field survey sample of 5558 galaxies in the redshift range $0.5 < z < 5.0$ and its luminosity function in the B-band, as well as this sample's stellar masses. We obtained that the GCMF behaves as a power-law given by $\zeta(z) \propto [\mathcal{M}_g(z)]^{-2.3\pm0.4}$, where $\mathcal{M}_g$ is the average galactic mass in the studied redshift interval. This result can be seen as an average of the galaxy stellar mass function pattern found in the literature, where more massive galaxies were assembled earlier than less massive ones.

[1] Observatório do Valongo, Universidade Federal do Rio de Janeiro, Ladeira Pedro Antônio, 43, 20080-090, Rio de Janeiro, RJ, Brazil (amanda05@astro.ufrj.br).
[2] Instituto de Física, Universidade Federal do Rio de Janeiro, Brazil.
[3] Vatican Observatory Research Group, Steward Observatory, University of Arizona, USA.

THE CFHT/MEGACAM STRIPE-82 SURVEY

B. Moraes[1], J.-P. Kneib[2], A. Leauthaud[3], M. Makler[1], L. Van Waerbeke[4], K. Bundy[3], T. Erben[5], C. Heymans[6], H. Hildebrandt[4,5], L. Miller[7], H. Y. Shan[8,9], D. Woods[4], A. Charbonnier[1], and M. E. Pereira[1]

The CFTH/MegaCam Stripe-82 Survey (CS82) is a joint Canada-France-Brazil project covering ∼ 170 sq. deg. in the SDSS Stripe-82 area down to magnitude 24.1 in the optical i-band with a mean 0.6" seeing (PIs: J.-P. Kneib, A. Leauthaud, M. Makler, L. Van Waerbeke). Its main focus is the study of weak and strong gravitational lensing, with additional applications in other fields such as galaxy evolution and galaxy cluster science. Furthermore, the multitude of existing and future projects in Stripe-82, covering from the radio to the UV and including a large set of spectroscopic data, offers the possibility of exploring applications in many fields of astronomy, thereby enhancing the scientific value of the survey. In this Short Talk, we will give an overview of the main published and ongoing CS82 scientific projects. They include the measurement of the largest contiguous lensing convergence map to date and its peak statistics, providing direct information on the large scale dark matter distribution; the first CMB-lensing × shear cross-correlation measurement, probing the dark matter distribution at redshifts of order 1; galaxy-galaxy lensing measurements around SDSS-III/BOSS galaxies, constraining halo occupation distribution (HOD) models and obtaining complementary mass measurements in combination with BOSS spectroscopic data; the discovery of several new gravitational arc systems and more.

[1] ICRA, Centro Brasileiro de Pesquisas Físicas.
[2] Laboratoire d'Astrophysique de Marseille, Aix Marseille Université.
[3] Institute for the Physics and Mathematics of the Universe, University of Tokyo.

XIV Latin American Regional IAU Meeting (Florianópolis/SC, Brazil, 25-30 November 2013)
Editors: A. Mateus, J. Gregorio-Hetem & R. Cid Fernandes