



## Monthly Notes of the Alternative Cosmology Group – December 2010

The ACG Webmaster who distributes this newsletter to subscribers would prefer not to receive related correspondence.

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The ACG newsletter is distributed gratis to subscribers. Get onto our mailing list without obligation at [www.cosmology.info/newsletter](http://www.cosmology.info/newsletter). The current newsletter is a review of 1264 papers published on arXiv under astro-ph, together with 670 under gen-phys, for the month of November, 2010. We now include papers archived elsewhere, provided access is full and open. The Alternative Cosmology Group draws its mandate from the open letter published in *New Scientist*, 2004 ([www.cosmologystatement.org](http://www.cosmologystatement.org)), and these monthly notes seek to publicise recently published empirical results that are aligned with that ethos. In other words, what observations seem anomalous in terms of the Standard Model of Cosmology? We prefer observational results and tend to avoid complete cosmologies and purely theoretical work. Discussion of method is welcome. If you would like to suggest recently published or archived papers for inclusion, please send the arXiv, viXra or other direct reference and a brief exposition to Hilton Ratcliffe ([hilton@hiltonratcliffe.com](mailto:hilton@hiltonratcliffe.com)). Note that our spam filter rejects slash and colon in the text, so please write web addresses commencing “www”.

### **I. Editorial comment**

Of interest this month is a paper by Steinhardt and Elvis entitled ‘*Comment on "Biases in the Quasar Mass-Luminosity Plane"*’. One of the outstanding issues in contemporary cosmology is the conundrum of quasar redshifts. If quasar remoteness is given by their redshift, then they have truly spectacular properties, very difficult to explain with conventional physics. The standard interpretation of their apparently gigantic energy levels invokes Black Hole mass, in effect a tuneable parameter. This paper takes the view that the standard interpretation is flawed, and this has stark implications for astrophysical method.

## II. Plasma Cosmology

The standard range of mechanisms for variability is fraught with mechanical difficulties. Lighthouse effects have to cope with ultra-high spin rates, and other models for variability tend to be arcane. Perhaps a more viable answer lies in electro-magnetism?

1. **Title: Discovery of a Peculiar Dip from GX 301-2**  
**Authors: [Ersin Gogus](#) , [Ingo Kreykenbohm](#) , [Tomaso Belloni](#)**  
**[arXiv:1011.3899](#)**

Quote: *“We present temporal and spectral properties of a unique X-ray dip in GX 301-2 as seen with Rossi X-ray Timing Explorer in May 2010. The X-ray pulsation from the source gradually declined prior to the dip, disappears for one spin cycle during the dip and is abruptly restored in the spin cycle immediately after the dip. Moreover, the phase-integrated spectrum of the source becomes softer before and during the dip and it quickly hardens again following the dip. Our findings indicate the fact that the mechanism for pulsations gradually turned off briefly and underlying dim and softer emission likely from the accretion column became observable in the brief absence of high level emission due to wind accretion.”*

## III. CMBR anomalies

1. **Title: Concentric circles in WMAP data may provide evidence of violent pre-Big-Bang activity**  
**Authors: [V.G.Gurzadyan](#), [R.Penrose](#)**  
**<http://arxiv.org/abs/1011.3706>**

Quote: *“Conformal cyclic cosmology (CCC) posits the existence of an aeon preceding our Big Bang 'B', whose conformal infinity 'I' is identified, conformally, with 'B', now regarded as a spacelike 3-surface. Black-hole encounters, within bound galactic clusters in that previous aeon, would have the observable effect, in our CMB sky, of families of concentric circles over which the temperature variance is anomalously low, the centre of each such family representing the point of 'I' at which the cluster converges. These centres appear as fairly randomly distributed fixed points in our CMB sky. The analysis of Wilkinson Microwave Background Probe's (WMAP) cosmic microwave background 7-year maps does indeed reveal such concentric circles, of up to  $6\{\sigma\}$  significance. This is confirmed when the same analysis is applied to BOOMERanG98 data, eliminating the possibility of an instrumental cause for the effects. These observational predictions of CCC would not be easily explained within standard inflationary cosmology.”*

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## IV. Redshifts

1. **Title: Cosmological and Intrinsic Redshifts**

**Authors:** [José Francisco García Juliá](#)

[viXra:1011.0043](#)

Quote: *“In a recent article, a single tired light mechanism, based in the interaction between electromagnetic waves, has been proposed for explaining both redshifts: cosmological (without expansion of the universe) and intrinsic. A second paper specifies that said interaction would be the scattering. This article is to reinforce and clarify the whole idea.”*

## V. Black Holes

1. **Title: The Black Hole Catastrophe: a Reply to J. J. Sharples**

**Authors:** [Stephen J. Crothers](#)

[viXra:1011.0062](#)

Quote: *“A recent Letter to the Editor (Sharples J. J., Coordinate transformations and metric extension: a rebuttal to the relativistic claims of Stephen J. Crothers, Progress in Physics, v.1, 2010) has analysed a number of my publications in Progress in Physics. There are serious problems with this treatment which should be brought to the attention of the Journal's readership. Dr. Sharples has committed errors in both mathematics and physics.”*

2. **Title: On Gravitational Collapse**

**Authors:** [R. Wayte](#)

[viXra:1010.0061](#)

Quote: *“Gravitational collapse of diffuse material has been investigated using a new solution of Einstein's equations of general relativity. This replaces the theory of black-hole formation developed for the standard vacuum solution of Schwarzschild. The bodies which now form have reasonable physical properties, such as nuclear hard core density in collapsed stars, or  $10^4$ kg/l in galactic centres, and only 1kg/l in quasars. Accreting material converts to kinetic energy and radiation, so that a singularity cannot be produced.”*

## VI. Stellar Evolution and Large-Scale Structure

1. **Title: Simultaneous Falsification of LCDM and Quintessence with Massive, Distant Clusters**

**Authors:** [Michael J. Mortonson](#), [Wayne Hu](#), [Dragan Huterer](#)

[arXiv:1011.0004](#)

Quote: *“Observation of even a single massive cluster, especially at high redshift, can falsify the standard cosmological framework consisting of a cosmological constant and cold dark matter (LCDM) with Gaussian initial conditions by exposing an inconsistency between the well-measured expansion history and the growth of structure it predicts.”*

2. **Title: A critical analysis of the UV Luminosity Function at redshift $\sim$ 7 from deep WFC3 data**

**Authors:** [A. Grazian et al](#)

[arXiv:1011.6569](#)

Quote: *“The study of the Luminosity Function (LF) of Lyman Break Galaxies (LBGs) at  $z=7$  is important for ascertaining their role in the reionization of the Universe ... We have found that the number density of faint LBGs at  $z\sim 7$  is only marginally sensitive to the color selection adopted, but it is strongly dependent from the assumption made on the half light distributions of the simulated galaxies, used to correct the observed sample for incompleteness. The slope of the faint end of the LBGs LF has thus a rather large uncertainty, due to the unknown distribution of physical sizes of the  $z\sim 7$  LBGs. We conclude that galaxies at  $z\sim 7$  are unable to reionize the Universe unless there is a significant*

evolution in the clumpiness of the IGM or in the escape fraction of ionising photons or, alternatively, there is a large population of  $z \sim 7$  LBGs with large physical dimensions but still not detected by the present observations.”

## VII. MOND

### 1. Title: THINGS about MOND

**Authors:** [G. Gentile](#), [B. Famaey](#), [W. J. G. de Blok](#)  
[arXiv:1011.4148](#)

Quote: “We present the analysis of 12 high-resolution galactic rotation curves from The HI Nearby Galaxy Survey (THINGS) in the context of modified Newtonian dynamics (MOND). These rotation curves were selected to be the most reliable for mass modeling, and they are the highest quality rotation curves currently available for a sample of galaxies spanning a wide range of luminosities. We fit the rotation curves with the “simple” and “standard” interpolating functions of MOND, and we find that the “simple” function yields better results. We also redetermine the value of  $a_0$ , and find a median value very close to the one determined in previous studies,  $a_0 = (1.22 \pm 0.33) \times 10^{-8} \text{ cm/s}^2$ . Leaving the distance as a free parameter within the uncertainty of its best independently determined value leads to excellent quality fits for 75% of the sample. Among the three exceptions, two are also known to give relatively poor fits also in Newtonian dynamics plus dark matter. The remaining case (NGC 3198), presents some tension between the observations and the MOND fit, which might however be explained by the presence of non-circular motions, by a small distance, or by a value of  $a_0$  at the lower end of our best-fit interval,  $0.9 \times 10^{-8} \text{ cm/s}^2$ . The best-fit stellar M/L ratios are generally in remarkable agreement with the predictions of stellar population synthesis models. We also show that the narrow range of gravitational accelerations found to be generated by dark matter in galaxies is consistent with the narrow range of additional gravity predicted by MOND.”

### 2. Title: The MOND Fundamental Plane

**Authors:** [V.F. Cardone](#), [G. Angus](#), [A. Diaferio](#), [C. Tortora](#), [R. Molinaro](#)  
[arXiv:1011.5741](#)

**Quote:** “Modified Newtonian Dynamics (MOND) has been shown to be able to fit spiral galaxy rotation curves as well as giving a theoretical foundation for empirically determined scaling relations, such as the Tully - Fisher law, without the need for a dark matter halo. As a complementary analysis, one should investigate whether MOND can also reproduce the dynamics of early - type galaxies (ETGs) without dark matter. As a first step, we here show that MOND can indeed fit the observed central velocity dispersion  $\sigma_0$  of a large sample of ETGs assuming a simple MOND interpolating functions and constant anisotropy. We also show that, under some assumptions on the luminosity dependence of the Sersic  $n$  parameter and the stellar M/L ratio, MOND predicts a fundamental plane for ETGs : a log - linear relation among the effective radius  $R_{\text{eff}}$ ,  $\sigma_0$  and the mean effective intensity  $\langle I_e \rangle$ . However, we predict a tilt between the observed and the MOND fundamental planes.”

## VIII. Method

### 1. Title: The moment of truth for WIMP Dark Matter

**Authors:** [Gianfranco Bertone](#)  
[arXiv:1011.3532](#)

Quote: “We know that dark matter constitutes 85% of all the matter in the Universe, but we do not know of what it is made. Amongst the many Dark Matter candidates proposed, WIMPs (weakly interacting massive particles) occupy a special place, as they arise naturally from well motivated extensions of the standard model of particle physics. With the advent of the Large Hadron Collider at CERN, and a new generation of astroparticle experiments, the moment of truth has come for WIMPs: either we will discover them in the next five to ten years, or we will witness the inevitable decline of WIMP paradigm.”

2. **Title: Comment on "Biases in the Quasar Mass-Luminosity Plane"**

**Authors:** [Charles Steinhardt](#), [Martin Elvis](#)

[arXiv:1011.6381](#)

Quote: *"The key conclusion that quasar accretion rates are time-dependent yet synchronized in host galaxies with quite different properties cannot be explained merely by a mass-dependent bias in black hole mass estimation. Instead a coincidence between mass- and time-dependent biases is required. The detailed quasar  $M-L$  distribution, and our interpretation of that distribution in an effort to build physical models, would be affected by solely mass-dependent biases, so it is important to continue to improve our understanding of virial mass estimation. If motion in the broad-line region is not predominantly virial, the technique may well need to be discarded rather than patched. However, Rafiee & Hall do not claim statistically significant deviations from virial masses, nor do their new calibrations remove either this sub-Eddington behavior or other puzzling limits on quasar accretion."*

**IX. Titles of the month**

1. **Title: Holographic Non-Gaussianity**

Authors: [Paul McFadden](#), [Kostas Skenderis](#)

[aarXiv:1011.0452](#)