Monthly Notes of the Alternative Cosmology Group – July 2010

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

Please address all correspondence to MNACG Editor, Hilton Ratcliffe: mnacg_editor@cosmology.info.

The ACG newsletter is distributed gratis to subscribers. Get onto our mailing list without obligation at www.cosmology.info/newsletter. The current newsletter is a review of 1,043 papers published on arXiv under astro-ph, together with 636 under gen-phys, for the month of June, 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), 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). Note that our spam filter rejects slash and colon in the text, so please write web addresses commencing "www".

Readers may note recent changes to the layout and format of the notes. Our appreciation goes to Ian Tresman who wrote that it was confusing in some respects, and suggested some improvements. Hopefully, what follows is more reader-friendly. Please let me know.

I. arXiv

The stringent rules now applied for arXiv candidate papers are impacting ever more seriously on the listing of papers by new authors or on topics that are even slightly off-centre. There is a definite "old boys' club" emerging in the arXiv hierarchy, and this is reinforced by the requirement that any submission be endorsed by approved endorsers *in the specific category in which the paper is to be archived*. Where would an author gain access to such endorsers? At the suggestion of Chuck Gallo,

We would like to appeal to those of you who are approved endorsers to let us have your names, contact details, and categories in which are permitted to endorse. We will display these in a list, and authors trying to get onto arXiv can make direct requests for endorsement to the relevant persons. If you are willing to participate, please send your details to the editor.

II. Prespacetime Journal

We received the following welcome news from Jonathan Dickau, who was an active CCC2 participant and assisted with the production of the CCC2 conference proceedings:

> "*You are invited to submit a paper for an upcoming issue of the Prespacetime Journal with a focus on Cosmology and Gravity. Guest editors for this issue will be Jonathan Dickau, who presented a poster and was on the Large Scale Structure panel at CCC2 in Port Angeles, and Phil Gibbs, who is founder of the alternative academic archive viXra and is an excellent physicist in his own right.*
>
> *"Both review and research papers are acceptable, and both short and moderate length papers (preferably 4-14 pages) will be considered. Full details will be posted on the Prespacetime web-site, in a few days. In addition to papers, the editors would welcome volunteers to review submissions for this issue, especially if there are quite a few.*
>
> *"Note that this journal has a policy of willingness to publish controversial work as-is, along with open peer review (in the same or ensuing issue), for authors who elect this option. However; the editors do reserve the right to require reasonable scholarship in all submissions, to be considered for publication. With that one caveat; I hereby invite you to send your papers and inquiries for the Prespacetime issue on Cosmology and Gravity.*
>
> *"All the Best, Jonathan J. Dickau, Prespacetime Journal*"
>
> web-site: www.prespacetime.com

III. Ejection Theory

1. **Title: Massive runaway stars in the Large Magellanic Cloud**
   Authors: V.V. Gvaramadze, P. Kroupa, J. Pflamm-Altenburg
   arXiv:1006.0225

   Quote: *"The origin of massive field stars in the Large Magellanic Cloud (LMC) has long been an enigma. The recent measurements of large offsets (~100 km/s) between the heliocentric radial velocities of some very massive (O2-type) field stars and the systemic LMC velocity provides a possible explanation of this enigma and suggests that the field stars are runaway stars ejected from their birth places at the very beginning of their parent cluster's dynamical evolution. A straightforward way to prove this explanation is to measure the proper motions of the field stars and to show that they are moving away from one of the nearby star clusters or OB associations. This approach however is complicated by the large distance to the LMC, which makes accurate proper motion measurements difficult. We use an alternative approach for solving the problem, based on the search for bow shocks produced by runaway stars. The geometry of detected bow shocks would allow us to infer the direction of stellar motion and thereby to determine their possible parent clusters."*

IV. MOND

1. **Title: Testing Newtonian gravity in the low acceleration regime with globular clusters: the case of omega Centauri revisited**
   Authors: Riccardo Scarpa, Renato Falomo
   arXiv:1006.4577

   Quote: *"The main conclusion of this work is that strong similarities are emerging between globular clusters and elliptical galaxies, for in both classes of objects the velocity dispersion tends to remain constant at large radii. In the case of galaxies, this is ascribed to the presence of a massive halo of dark matter, something physically unlikely in the*

case of globular clusters. Such similarity, if confirmed, is best explained by a breakdown of Newtonian dynamics below a critical acceleration."

2. **Title: A non--relativistic approach to extended Newtonian gravity: tests and predictions across astrophysical scales**
Authors: S. Mendoza, X. Hernandez, J.C. Hidalgo, T. Bernal
arXiv:1006.5037

Quote: *"This yields a generalised gravitational equilibrium relation valid for all astrophysical systems. In particular, we show that the fundamental plane of elliptical galaxies, the Newtonian virial equilibrium, the Tully-Fisher relation and the scalings observed in local dwarf spheroidal galaxies, are nothing but particular cases of that relation when applied to the appropriate mass-length scales. Also, an operational equivalence to MOND and a working prescription for the construction of N-body codes in any modified non-relativistic gravitation theory are given. We discuss the implications of this approach for a modified theory of gravity and emphasise the advantages of working with the force instead of the dynamical part in the formulation of a gravitational theory."*

V. Plasma Cosmology

1. **Title: Parsec-scale Faraday Rotation Measures from General Relativistic MHD Simulations of Active Galactic Nuclei Jets**
Authors: Avery E. Broderick , Jonathan C. McKinney
arXiv:1006.5015

Quote: *"However, critical to efforts to probe the Faraday screen will be resolving the transverse jet structure. Therefore, the RMs of radio cores may not be reliable indicators of the properties of the rotating medium. Finally, we are able to constrain the particle content of the jet, finding that at pc-scales AGN jets are electromagnetically dominated, with roughly 2% of the commoving energy in nonthermal leptons and much less in baryons."*

VI. CMBR anomalies

1. **Title: Lambda-CDM and the WMAP power spectrum beam profile sensitivity**
Authors: Utane Sawangwit, Tom Shanks
arXiv:1006.1270

Quote: *"We first discuss the sensitivity of the WMAP CMB power spectrum to systematic errors by calculating the raw CMB power spectrum from WMAP data. We find that the power spectrum is surprisingly sensitive to the WMAP radiometer beam profile even at the position of the first acoustic peak on ~1 degree scales. Although the WMAP beam profile core is only 12.6arcmin FWHM at W, there is a long power-law tail to the beam due to side-lobes and this causes significant effects even at the first peak position. We then test the form of the beam-profile used by the WMAP team which is based on observations of Jupiter. We stacked radio source beam profiles as observed in each WMAP band and found that they showed a wider profile in Q, V, W than the Jupiter profile. We have now checked that this is not due to any Eddington or other bias in our sample by showing that the same results are obtained when radio sources are selected at 1.4GHz and that our methods retrieve the Jupiter beam when it is employed in simulations. Finally, we show that the uncertainty in the WMAP beam profile allows the position as well as the amplitude of the first peak to be changed and how this could allow simpler cosmologies than standard Lambda-CDM to fit the CMB data."*

2. **Title: Large-Angle Anomalies in the Microwave Background**

Authors: Emory F. Bunn
arXiv:1006.2084

Quote: *"Several claims have been made of anomalies in the large-angle properties of the cosmic microwave background anisotropy as measured by WMAP. In most cases, the statistical significance of these anomalies is hard or even impossible to assess, due to the fact that the statistics used to quantify the anomalies were chosen a*

posteriori. On the other hand, the possibility of detecting new physics on the largest observable scales is so exciting that, in my opinion, it is worthwhile to examine the claims carefully. I will focus on three particular claims: the lack of large-angle power, the north-south power asymmetry, and multipole alignments. In all cases, the problem of a posteriori statistics can best be solved by finding a new data set that probes similar physical scales to the large-angle CMB. This is a difficult task, but there are some possible routes to achieving it."

3. **Title: Measuring Coherent Motions in the Universe**
   Authors: Yong-Seon Song , Cristiano G. Sabiu, Issha Kayo, Robert C. Nichol
   arXiv:1006.4630

   Quote: *"We can convert the units of these sigma v measurements to 270^{+40}{−41} km/s and 320^{+41}{−41} km/s respectively(assuming a LCDM universe), which are much lower than that expected based on recent low redshift (z < 0.2) measurements of the peculiar velocity field (or "bulk flows"), i.e., we would have predicted motions of ' 600 km/s over our redshift range (0.16 < z < 0.47) to be consistent with these local measurements. One possible explanation for such a large discrepancy is that our Galaxy is located in unusually over, or under, dense region of the Universe."*

VII. Method

1. **Title: Astronomy 3.0 Style**

   Authors: Alberto Accomazzi
   arXiv:1006.0670

   Quote: *"Over the next decade we will witness the development of a new infrastructure in support of data-intensive scientific research, which includes Astronomy. This new networked environment will offer both challenges and opportunities to our community and has the potential to transform the way data are described, curated and preserved. Based on the lessons learned during the development and management of the ADS, a case is made for adopting the emerging technologies and practices of the Semantic Web to support the way Astronomy research will be conducted. Examples of how small, incremental steps can, in the aggregate, make a significant difference in the provision and repurposing of astronomical data are provided."*

2. **Title: A Very Special Case, a Brief Comment About the Michelson / Morley Experiment**

   Authors: Roald C. Maximo

   viXra:1006.0017
   Quote: *"Very often, in the history of science, amazingly simple phenomena, when initially misunderstood, may become laden with prejudice and somewhat mystical connotations and, since then, are passed on from generation to generation for no better reason then magister dixit. One example already discussed here has been stellar aberration."*

3. **Title: Detector of Aether Operating on Transverse Doppler Effect**

   Authors: V.V.Demjanov

   viXra:1006.0002

4. **Title: Effects of cosmological model assumptions on galaxy redshift survey measurements**

   Authors: Lado Samushia *et al*

   arXiv:1006.0609
   Quote: *"Using representative assumptions for the parameters of the "Euclid" survey in order to provide a baseline future experiment, we show how the derived constraints change due to different model assumptions. We argue that even the assumption of a Friedman-Robertson-Walker (FRW) space-time is sufficient to reduce the importance of the coupling to a significant degree. Taking this idea further, we consider how the data would actually be analysed and argue that we should not expect to be able to simultaneously constrain multiple deviations from the standard*

Lambda CDM model. We therefore consider different possible ways in which the Universe could deviate from the Lambda CDM model, and show how the coupling between geometrical constraints and structure growth affects the measurement of such deviations."

5. **Title: Two Theories of Special Relativity ?**

   Authors: Elemer E. Rosinger

   arXiv:1006.2994

   Quote: *"In this paper it is shown that the respective boundedness condition is closely related to a Principle of Transformation Increment Ratio Limitation, or in short, PTIRL, which has an obvious physical meaning. It is also shown that PTIRL is not a stronger assumption than that of the mentioned boundedness in [3]. Of interest is the fact that, by formulating PTIRL as a physical axiom, the possibility is opened up for the acceptance, or on the contrary, rejection of this physical axiom PTIRL, thus leading to two possible theories of Special Relativity. And to add further likelihood to such a possibility, the rejection of PTIRL leads easily to effects which involve unlimited time and/or space intervals, thus are not accessible to usual experimentation for the verification of their validity, or otherwise."*

VIII. Titles of the month

1. **Title: What PhD students really want**

   Authors: Minnie Mao

   arXiv:1006.4421

   Quote: *"The road to becoming an astronomer is exciting, but often fraught with danger and conflicting messages. A PhD student is inundated with catch-phrases such as "publish or perish" and "it's not about the quantity, but the quality of work". How do we know which advice to follow? How can we publish copious amounts of quality work in only three years so as to maximize our success in the future? How do we even know what "good quality" really is? With only a short time to prepare ourselves for the big wide world of Astronomy, what is the best way for a PhD student to maximize their research and ultimately maximize their success as a real astronomer? The PhD students of today are the astronomers of tomorrow, but their journey depends on a positive work environment in which they can thrive and improve. Here I present the results of a survey of current PhD students on how they believe they can maximize their success in science. I find that PhD students in Australia expect to write more papers during their PhD than is expected by their supervisors, but that they are generally happy with the quality of their supervision. Above all, students love telescopes, and hands-on observations are an important part of acquiring the knowledge and culture necessary to becoming a real astronomer."*

2. **Title: Cosmology seeking friendship with sterile neutrinos**
   Authors: Jan Hamann, Steen Hannestad, Georg G. Raffelt, Irene Tamborra, Yvonne Y.Y. Wong

   arXiv:1006.5276