



The Milky Way Panorama Credit: ESO / S. Brunier

## Newsletter of the Alternative Cosmology Group - June 2018

The *Alternative Cosmology Group* draws its mandate from the *Open Letter to the Scientific Community* to engage scientists in an open exchange of ideas outside the mainstream framework of the Big Bang cosmology. The *ACG Newsletter* seeks to highlight published observational results which seem anomalous in terms of the  $\Lambda$ CDM model. These results, collected in a [centralized resource](#), are accessible to all scientists.

Critical examinations of the scientific methods and investigations used in cosmology are also the subject of the ACG Newsletter, as long as these are supported by empirical data. Purely theoretical work and new cosmologies not yet supported by observations are deferred to future discussions at the next [ACG Conference](#).

If you would like to suggest a paper for review, please send a direct reference to [webmaster@cosmology.info](mailto:webmaster@cosmology.info). Published work with full and open access is preferred. The Newsletter is published irregularly, editor's schedule permitting, and when interesting papers becomes available.

The ACG Newsletter is distributed gratis to our subscribers<sup>1</sup> who receive notifications from the ACG webmaster. You can subscribe to our mailing list at [cosmology.info](http://cosmology.info), join the ACG Forum 'Alternative Cosmology' on *Yahoo! Groups* at [groups.yahoo.com/neo/groups/altcosmology/info#](http://groups.yahoo.com/neo/groups/altcosmology/info#) or follow [@altCosmology](https://twitter.com/altCosmology) on Twitter.

### ACG Editorial

With the publication of this fourth Newsletter in 2018, I think time has come to actively invite observational astrophysicists to join the ranks of the ACG. We need these experts to guide us through hundreds of papers containing clues to an alternative cosmology. Although a few members of the ACG have an extensive knowledge of the available observations, most are new in the field or have a different scientific background. I will be sending invitations to authors of the papers which have been reviewed in the ACG Newsletter. I'll keep you posted on the success of this idea.

The list of reviewed publications starts with a paper highlighting the work of Halton Arp. After over four years of work to convince the referees, Chris Fulton and John Hartnett have published a new analysis of QSO-galaxy associations based on larger sky surveys. Once again, the analysis shows that QSO-galaxy associations seen by Arp decades ago are real! This clearly shows that the redshift of a quasar has an intrinsic component related to the parent galaxy. Arp's interpretation is that the QSO is ejected from the galaxy, but another interpretation would be that the redshift of the QSO is caused by the presence of the galaxy.

Many thanks to Chris Fulton and everyone for the links to interesting papers. I also include some references to older work which is still relevant today. Please keep suggesting interesting papers for review!

*Louis Marmet*, June 18, 2018  
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<sup>1</sup>The ACG currently has a total of 98 followers on the mailing list, the 'Alternative Cosmology' *Yahoo! Group* and Twitter.

## Reviewed Publications

Most of the text given here is quoted and adapted from the original articles.

### **“Physical association and periodicity in quasar families with SDSS and 2MRS”**

C.C. Fulton, H.C. Arp, and J.G. Hartnett,

Astrophys Space Sci (2018) 363:134 <https://doi.org/10.1007/s10509-018-3355-5>, 2018

2018-6-4: On Springer Nature SharedIt <https://rdcu.be/S5Qa>

Using an algorithm developed in an earlier publication (Fulton and Arp, *Astrophys. J.* 754:134, 2012) the authors show with an increased degree of confidence that quasars and galaxies are associated in their position in the sky. They use the Sloan Digital Sky Survey (SDSS) data release 7 (DR7) and the 2MASS (Two Micron All Sky Survey) Redshift Survey (2MRS).

The algorithm detects a quasar family around a parent galaxy using the position of the quasars relative to that of the galaxy, but also uses the redshift of the quasars relative to that of the parent galaxy. It is shown that the Karlsson periodicity appears in quasar redshifts when analyzed relative to the redshift of the parent galaxy (an improvement by more than  $3\sigma$  to  $10\sigma$  is observed in the statistical confidence. When the correlation between the Karlsson periodicity and ordering in the separation between QSO-s and galaxies is included, the signal is boosted by well over  $15\sigma$ !) Thus, the redshift of a quasar has an intrinsic component caused by the parent galaxy at redshift values following the Karlsson formula.

### **“Cosmological-scale coherent orientations of quasar optical polarization vectors in the Planck era Surviving to Galactic dust contamination scenario”**

V. Pelgrims, arXiv:1709.10271, 2017

2017-9-29: <https://arxiv.org/abs/1709.10271>

There is work being done in an attempt to show alignment of quasar light polarization. This alignment occurs at redshifts  $z \sim 1 - 2$  suggesting the presence of correlations in objects or fields on Gpc scales and pointing at missing ingredients to the ‘well accepted’ concordance cosmological model.

In this paper, an attempt is made to find correlations between the polarization of the quasars at optical wavelengths and the polarization of the thermal dust at 353 GHz. The goal is to show that the quasar polarization is not affected by galactic dust or other intergalactic medium. However, the results show “evidence for a  $\sim 5\sigma$  deviation from uniformity of the distribution of the relative angles [...] the polarization vectors appear to be more likely perpendicular. This indicates a possible [sic] contamination of the quasar optical polarization data by Galactic thermal dust.” It seems that  $5\sigma$  is not convincing enough when it comes to invalidate some measurements. The author adds “We additionally found significant correlations ( $\sim 4\sigma$ ) between the relative angles and the polarization ratio [...] this effectively indicates a contamination of the quasar optical polarization data by the Galactic dust...”

This would invalidate earlier work such as Pelgrims and Hutsemékers “Evidence for the alignment of quasar radio polarizations with large quasar group axes,” *A&A* 590, A53 (2016), or another paper by Hutsemékers and Lamy, “Confirmation of the existence of coherent orientations of quasar polarization vectors on cosmological scales,” *Astronomy and Astrophysics*, v.367, p.381-387 (2001) <http://adsabs.harvard.edu/abs/2001A%26A...367..381H> which did not discuss possible contamination of the polarization signal and does not offer much confidence in their statement “the interpretation of this orientation effect remains puzzling”.

The paper by Pelgrims is on arXiv but I could not find it in *A&A* or in any other refereed journal.

### “Small-Scale Challenges to the $\Lambda$ CDM Paradigm”

J.S. Bullock and M. Boylan-Kolchin, Annual Review of Astronomy and Astrophysics 55, No. 1, pp. 343-387 (2017)  
<https://doi.org/10.1146/annurev-astro-091916-055313>  
2017-9-29: [arXiv:1707.04256](https://arxiv.org/abs/1707.04256)

The dark energy plus cold dark matter ( $\Lambda$ CDM) cosmological model has been a demonstrably successful framework for predicting and explaining the large-scale structure of the Universe and its evolution with time. Yet on length scales smaller than  $\sim 1$  Mpc and mass scales smaller than  $\sim 10^{11}M_{\odot}$ , the theory faces a number of challenges. Examples are: the observed cores of many dark matter-dominated galaxies are both less dense and less cuspy than naïvely predicted in  $\Lambda$ CDM; and the number of small galaxies and dwarf satellites in the Local Group is also far below the predicted count of low-mass dark matter halos and subhalos within similar volumes. These issues underlie the most well-documented problems with  $\Lambda$ CDM: Cusp/Core, Missing Satellites, and Too-Big-to-Fail.

Future surveys to discover faint, distant dwarf galaxies and to precisely measure their masses and density structure hold promising avenues for testing possible solutions to the small-scale challenges going forward. Observational programs to constrain or discover and characterize the number of truly dark low-mass halos are among the most important, and achievable, goals in this field over the next decade. These efforts will either further verify the  $\Lambda$ CDM paradigm or demand a substantial revision in our understanding of the nature of dark matter.

### “Cosmological test with the QSO Hubble diagram”

M. López-Corredoira, F. Melia, E. Lusso, G. Risaliti, Int. J. Mod. Phys. D 25, 1650060 (2016)  
<https://doi.org/10.1142/S0218271816500607>  
2016-3: [arXiv:1602.06743](https://arxiv.org/abs/1602.06743)

This paper gives an excellent comparison between different cosmologies and a Hubble diagram (HD) constructed in the redshift range  $0 < z < 6.5$  from quasar data. Nine cosmological models are considered, three of which are static. This is an important analysis to consider when considering possible alternative cosmologies.

The fact that the QSO distribution extends well beyond the supernova range ( $z < 1.8$ ) provides us with an important complementary diagnostic whose significantly greater leverage in  $z$  can impose tighter constraints on the distance versus redshift relationship. We find that four models (Einstein-de Sitter, the Milne universe, the Static Universe with simple tired light, and the Static universe with plasma tired light [*Ari Brynjolfsson's model*]) are excluded at the  $> 99\%$  confidence level. The Quasi-Steady State Model [*Narlikar and Burbidge*] is excluded at  $> 95\%$  confidence level.

The remaining four models ( $\Lambda$ CDM/wCDM, the  $R_h = ct$  Universe, the Friedmann open universe, and a Static universe with a linear Hubble law) all pass the test. However, only  $\Lambda$ CDM/wCDM and  $R_h = ct$  also pass the Alcock-Paczyński test. But whereas an optimization of parameters in  $\Lambda$ CDM/wCDM creates some tension with their concordance values, the  $R_h = ct$  Universe has the advantage of fitting the QSO and Alcock-Paczyński data without any free parameters.

### “The ‘writing on the cosmic wall’: Is there a straightforward explanation of the cosmic microwave background?”

H.J. Fahr and J.H. Zörnchen, Annalen der Physik, vol. 18, no. 1011, pp. 699721, (2009)  
<https://doi.org/10.1002/andp.200910365>  
2009-10-22: <http://nautil.us/issue/15/turbulence/do-we-have-the-big-bang-theory-all-wrong>

The Cosmic Microwave Background (CMB) is taken today as reflecting the thermodynamical state of the universe at these early cosmic times. The question raised in this article is whether this standard interpretation of the CMB phenomenon is solid and unequivocal enough to support the standard cosmological claims. The author shows that in many details the standard explanation is not straightforward but allows for important alternatives which seriously should be looked at.

Arguments for a vanishing cosmic curvature ( $k = 0$ ) are shown to be weak, and, contrary to the usual claim, the light distance to the recombination horizon is in fact strongly model-biased. The author also discusses that the effective Planck temperature in the dipolar CMB structure depends on wavelength, *even inverting the dipole maximum orientation in the Wien branch*.<sup>2</sup> In addition, unexpected properties of the lowest CMB multipoles could mean that we are at least partly seeing an unquantifiable foreground hiding the cosmological background.

At the end of this article, an alternative explanation of the CMB is explored where stellar photons are thermalized into the CMB radiation. The process is only described as a “thermalization is via photon-photon wave-wave coupling” with a momentum diffusion coefficient. It so happens that the number of cosmic photons over cosmic baryons would for the present universe just come out correctly to explain the CMB with such a thermalization.

### “Astronomical redshifts of highly ionized regions”

Peter M. Hansen, *Astrophysics and Space Science*, Vol. 352, Issue 1, pp. 235-244, July 2014

<http://link.springer.com/article/10.1007%2Fs10509-014-1910-2>

2014-7: <http://arxiv.org/abs/1301.1705>

This paper identifies intrinsic redshifts based on an investigation of the so-called Broad Line Region in galaxies. The results suggest that some contribution to the redshift is intrinsic as it is related to plasma properties in highly ionized regions of Active Galactic Nuclei. (See Fulton *et al.* above.)

### “Planck reveals an almost perfect Universe”

ESA, [http://www.esa.int/Our\\_Activities/Space\\_Science/Planck/Planck\\_reveals\\_an\\_almost\\_perfect\\_Universe](http://www.esa.int/Our_Activities/Space_Science/Planck/Planck_reveals_an_almost_perfect_Universe)

2013-3-21:

... too perfect! Reading this article, one would think this measurement would have forced astrophysicists to abandon the Big Bang theory. One even admits that the foundations of the theory are ‘weak’!

Acquired by ESA’s Planck space telescope, the most detailed map ever created of the cosmic microwave background - the relic radiation from the Big Bang - was released revealing the existence of *features that challenge the foundations of our current understanding of the Universe*.

Because precision of Planck’s map is so high, it made it possible to reveal some peculiar *unexplained features that may well require new physics to be understood*. One of the most surprising findings is that *the fluctuations in the CMB temperatures at large angular scales do not match those predicted by the standard model* - their signals are not as strong as expected from the smaller scale structure revealed by Planck. Another is *an asymmetry in the average temperatures on opposite hemispheres of the sky*. *This runs counter to the prediction made by the standard model that the Universe should be broadly similar in any direction we look*. Furthermore, a cold spot extends over a patch of sky that is much larger than expected.

The asymmetry and the cold spot had already been hinted at with Planck’s predecessor, NASA’s WMAP mission, but *were largely ignored because of lingering doubts about their cosmic origin*. “The fact that Planck has made such a significant detection of these anomalies erases any doubts about their reality; it can no longer be said that they are artefacts of the measurements.” says Paolo Natoli of the University of Ferrara, Italy. “Imagine investigating the foundations of a house and finding that parts of them are weak. You might not know whether the weaknesses will eventually topple the house, but you’d probably start looking for ways to reinforce it pretty quickly all the same,” adds François Bouchet of the Institut d’Astrophysique de Paris.

Finally, the Planck data also set a new value for the Hubble constant. *At 67.15 km/s/Mpc, this is significantly less than the current standard value in astronomy*. The data imply that the age of the Universe is 13.82 billion years.

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<sup>2</sup>This claim by Fahr and Zönnchen is very surprising to me... If true, this would mean the dipole seen in the CMB would be interpreted differently at different wavelengths!