

REPORT ON THE RADIONET3 NETWORKING ACTIVITY

TITLE: Synergistic Science with Euclid and the Square Kilometre Array

DATE: 15/09/2013-18/09/2013

TIME: (WHOLE DAY)

LOCATION: OXFORD, UK

MEETING WEBPAGE <http://euclidska.physics.ox.ac.uk>

HOST INSTITUTE: OXFORD

PARTICIPANTS NO: 105

REPORT:

1. Programme of the meeting

Monday Sept 16, 2013

Overview (Chair: Matt Jarvis)

08:45-09:00	Welcome	
09:00-09:40	Phil Diamond	SKA Overview (Invited)
09:40-10:20	Rene Laureijs	Euclid Overview (Invited)
10:20-10:50	Coffee Break	
10:50-11:30	Robert Braun	Science with the SKA (Invited)
11:30-12:10	Yannick Mellier	Science with Euclid (Invited)
12:10-12:40	Tony Tyson	LSST (Invited)
12:40-13:40	Lunch	

Cosmology I (Chair: Bob Nichol)

13:40-14:10	Jo Dunkley	The Current state of Cosmology (Invited)
14:10-14:40	Filipe Abdalla	Cosmology with the SKA (Invited)
14:40-15:10	Gigi Guzzo	Cosmology with Euclid (Invited)
15:10-15:40	Coffee Break	
15:40-16:00	Gong-Bo Zhao	What can we learn about the cosmic acceleration using SKA+Euclid?
16:00-16:20	Leon Koopmans	Probing dark-matter physics using 100,000+ strong gravitational lenses from Euclid & SKA
16:20-16:40	Boris Hauessler	Megamorph for Euclid and the SKA
16:40-17:00	David Bacon	Advantages of combining SKA continuum and Euclid surveys for cosmology
17:00-17:20	Michael Brown	Prospects for joint weak lensing studies with the SKA and Euclid surveys
17:20-17:40	Rachel Webster	Direct Shear Measurement
17:40-18:00	Patrice Okouma	How Flat is Our Universe Really?

Tuesday Sept 17, 2013

Other Facilities and Techniques (Chair: Lister Staveley-Smith)

09:00-09:30	Isobel Hook	E-ELT (Invited)
09:30-09:50	Huub Rottgering	LOFAR and Cosmology
09:50-10:10	Steve Torchinsky	Results from EMBRACE@Nancay: An Ultra Wide Field of View Prototype for SKA
10:10-10:30	Martin Meyer	Surveying the HI Universe with SKA Pathfinders
10:30-11:00	Coffee Break	

11:00-11:20	Michele Cirasuolo	MOONS: a new multi-object spectrograph for the VLT
11:20-11:40	Nicolas Clerc	Cosmology with the eROSITA all-sky survey of galaxy clusters
11:40-12:00	Jason McEwen	Sparsity, Euclid and the SKA
12:00-12:20	Kim McAlpine	Cross-matching radio and optical datasets in the era of the SKA and Euclid
12:20-12:40	Sandro Bardelli	Cross-correlating Euclid with SKA Pathfinders

Galaxy Clusters (Chair: Isabella Prandoni)

14:00-14:30	Nabilia Aghanim	Galaxy Clusters (Invited)
14:30-14:50	Jochen Weller	Cosmology with Galaxy Clusters from Euclid
14:50-15:05	Claudio Gomes	The Layzer-Irvine equation and cosmic structure formation
15:05-15:20	Vincent Bouillot	Extreme pairwise velocities of galaxy clusters as a cosmological probe
15:20-15:50	Coffee Break	

Simulations and Legacy Science (Chair: Mark Cropper)

15:50-16:20	Carlton Baugh	Simulations for Euclid and the SKA (Invited)
16:20-16:40	Stephen Fine	Reverberation mapping with Euclid/SKA
16:40-17:00	Garrelt Mellema	Finding QSOs using the redshifted 21cm signal
17:00-17:20	Katie Mack	Insights into dark matter particle physics at high redshift
17:20-17:40	Avery Meiksin	IR and Radio Signatures of PopIII Supernovae
19:00-22:00	Conference Dinner	

Wednesday Sept 18, 2013

Galaxy Evolution (Chair: Huub Rottgering)

09.00-09.30	Matt Jarvis	Galaxy Evolution with the SKA (Invited)
09.30-10.00	Jarle Brinchmann	Galaxy Evolution with Euclid (Invited)
10.00-10.15	Simon Driver	The independent evolution of bulges and discs
10.15-10.30	Ivan Baldry	Dwarf Galaxies in the Local Cosmological Volume
10.30-10.45	Dan Smith	The far-infrared radio correlation in the Herschel ATLAS
10.45-11.15	Coffee Break	
11:15-11:30	Jonathan Zwart	The star-formation history of mass-selected galaxies from the VIDEO survey
11.30-11.45	Isaac Roseboom	Cosmic star formation as seen in the radio via parametric stacking
11.45-12:00	Mattia Vaccari	The FIR/SMM Luminosity Function and the Obscured Star Formation History of the Universe : Results from the HerMES Survey and Prospects for Euclid/SKA Studies
12.00-12.15	Stephen Curran	Complete Ionisation of the Neutral Gas in High Redshift Active Galaxies

12:15-12:30	Matt Prescott	Evolution of 325-MHz Radio Luminosity Function
12:30-13:30	Lunch	

Cosmology II (Chair: Tom Kitching)

13:30-14:00	Mario Santos	Cosmology on Ultra-large scales (Invited)
14.00-14.20	Stefano Camera	Cosmology as a Tool for Testing the Law of Gravity
14:20-14:40	Tessa Baker	Testing Gravity with the Growth of Structure - the Efficient Way
14.40-14.55	Carlos Martins	Precision consistency tests of LambdaCDM
14.55-15.10	Phil Bull	Cosmology on the largest scales: peculiar velocities and joint analysis of complex datasets
15.25-15.50	Francoise Combes	Conference Summary (Invited)
15.50-16.30		The Future - Discussion

2. Scientific Summary

The main goal of the conference was to bring together the communities involved in the ESA's Euclid Space mission and the Square Kilometre Array and to initiate collaborations and joint workshops between the respective groups to find scientific synergies, particular in cosmology and galaxy formation. All speakers were requested to highlight how data from both facilities could increase the scientific impact of their work, and the vast majority of speakers did this. In particular, in the cosmology sessions it was clear that having multiple tracers of the large-scale structure could be used to overcome the limitation of cosmic variance, at least for the parts of the surveys conducted over the same areas of the sky. Furthermore, one of the key aspects of combining data from the two facilities would be that the systematics in each experiment could essentially be cross-correlated away, as you would not expect their to be intrinsic correlations in the systematics of two distinct facilities operating at completely different wavelengths.

Another intriguing possibility along these lines is that weak lensing analyses may benefit significantly from having both radio and optical data. Particularly, the radio offers a deterministic PSF/beam and many spatial modes depending on the baseline distribution of the SKA. The colour-dependency of the PSF should also be much easier to determine than in the optical. On the other hand, Euclid would have many more galaxies but suffers from these uncertainties. The combination of the two would therefore go a long way to reducing the impact of these issues.

On the galaxy evolution side it was clear that tracing how the atomic gas (in HI) converts to molecular gas and finally stars is a key issue and what that can only be solved by combining data from the radio (SKA), mm (ALMA) and optical/near-infrared facilities (e.g. Euclid). Thus, again many synergies were explored and particular attention was paid to the use of kinematical information. On the radio continuum side, it is clear that redshifts are required over large swathes of sky for some purposes, and over deep 10s of square degree pointings for others. Euclid will deliver >1 million spectroscopic redshifts in the so-called redshift desert, which are extremely difficult to measure from ground based facilities. This will be a fantastic resource for radio continuum science.

In a discussion sessions at the end of the meeting, led by Bob Nichol, it was decided that a small group would begin organizing joint workshops in the scientific areas discussed in the meeting. The first one of these should be held in 2014.

All of the talks are linked on the web page for a reference source and in order to push the science synergies forward.

In terms of the geographical distribution of attendees, we had people from all over the world, including 22 from South Africa, 9 from Australia and also several people from France, Germany, The Netherlands, Italy, Switzerland, Portugal, Norway, Sweden, Taiwan and the UK. We also had representatives from the SKA and ESA. 32 of the participants were female, and around 40 per cent of the attendees were either PhD students or young postdoctoral reseaechers.

3. Attendance list (incl. participant names, affiliation and country) signed by the participants and confirmed by the organizer

Highlighted participants were invited speakers.

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Matt Jarvis (SOC member and Chair of the LOC)

4. Financial Report / RadioNet3 contribution

The RadioNet3 funding amounted to 2000 Euros, and it was used to subsidise the travel and accommodation costs of a number of the invited speakers from within Europe. As our funding came from a number of sources we did not allocate the RadioNet3 funding to specific people but rather used it in conjunction with other funding to enable us to attract many good invited speakers.

The invited speakers for whom we allocated funding were:

Rene Laureijs (ESA)
Yannick Mellier (France)
Tony Tyson (USA)
Filipe Abdalla (UK)
Gigi Guzzo (Italy)
Nabila Aghanim (France)
Carlton Baugh (UK)
Jarle Brinchmann (Netherlands)

We also obtained funding from the SKA and STFC and the registration cost was set at £125 with most of the budget spent on the invited guests and lunch/drinks during the conference.

5. Conference Proceedings and Web page

All talks from the conference can be found at the conference website at <http://euclidska.physics.ox.ac.uk/schedule.html>