

SKA will enable the generation of radio images of almost every object that can be seen with optical telescopes, as well as many others that remain totally obscured at optical and infrared wavelengths.

The science goals to be addressed with SKA encompass answering questions about the so-called Dark Ages shortly after the Big Bang and the subsequent dawn of the Age of Galaxies, about the large scale structure of the Universe, about how star formation processes evolve throughout the lifetime of the Universe, about the composition of our own galaxy, the Milky Way, and about the multitude of time-variable cosmic objects in the Transient Sky.

SKA has been 'born global'. Astronomical institutes from all over the world, including many from Europe, have joined forces to create the SKA Consortium. An International SKA Steering Committee (ISSC) has been formed. It contains 6 European representatives, and will steer the project through design, funding and construction. Recently, Prof. Richard Schilizzi (formerly of JIVE) was appointed to be the Director of the International SKA Project.

The current timetable for the SKA envisages concept and site selection in 2006/7; requests for international funding shortly afterwards and the start of construction in 2010. First light is planned for 2015.

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## REPORTS FROM MEETINGS

### EUROPEAN ASTRONOMERS AND EXO/ASTROBIOLOGY

From September 16 to 19, 2002, the «2nd European Exo/Astrobiology Conference» was held in the beautiful city of Graz (see [www.graz-astrobiology.oecaw.ac.at/](http://www.graz-astrobiology.oecaw.ac.at/)).

It is the annual meeting of the European Exo/Astrobiology Network Association (EANA). EANA is for exobiology the analogue of the European Astronomical Society. It was founded in late 2001 with bye-laws deposited in France (see <http://www.graz-astrobiology.oecaw.ac.at/EANA-Laws.html>). It will soon have its Website, hosted by ESA.

The scientific programme was extremely rich, from extremophiles to extra-solar planets, including origins of Life and Solar System space missions and projects (to Mars, Titan, Europa, comets...). More than 500 attendees were present from most of the European countries (Austria: 86, Belgium: 4, Bulgaria: 2, Czech Republic: 3, Denmark: 18, France: 61, Germany: 67, Hungary: 12, Ireland: 2, Italy: 80, Portugal: 4, Romania: 5, Russia: 38, Spain: 43, Sweden: 10, Switzerland: 5, The Netherlands: 42, UK: 32).

If I draw the attention of the European astronomers to this meeting, it is because the astronomical community was extremely poorly represented: less than 10% of the attendees were astronomers or planetologists.

The European astronomical community should be aware that exobiology is going to have very important developments in the coming years. It should not miss this opportunity of a new expansion of the field of astronomy/planetology. I would therefore like to encourage European astronomers and planetologists to attend the next European meeting, to be held in Madrid in 2003. I do also encourage them to join the European Exo/Astrobiology Network Association. The membership submission form will soon be available on the (coming) EANA website; in the meantime more information can be found at [www.graz-astrobiology.oecaw.ac.at/eana.html](http://www.graz-astrobiology.oecaw.ac.at/eana.html).

**Jean Schneider**  
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## JENAM 2002

### GALAXY EVOLUTION IN GROUPS AND CLUSTERS

The Workshop «Galaxy Evolution in Groups and Clusters» debated, along two and a half days (5-7 September), the most recent observations and theoretical work concerning the evolution of galaxies in dense environments (groups and clusters).

With 74 registered participants, and welcoming also numerous members coming from other JENAM workshops, the WS-GE hosted high quality presentations: 36 talks, of which 7 invited ones, and 27 posters. A wide range of topics was covered, introduced by the invited reviews: The Evolution of Brightest Cluster Galaxies (C. Collins), Galaxy Luminosity Functions in Different Environments (S. Driver), The Evolution of Galaxies in Rich Clusters (E. Ellingson), Dwarf and Low Surface Brightness Galaxies in Clusters (L. Infante), The Interaction Between Groups and Clusters and its Interplay with the Evolution of the Galaxy Population (R. Nichol), Spectral, Morphological, Chemical and Color Transformations of Galaxies in Clusters (B. Poggianti). On Saturday, at the end of all sessions, H. Yee summarized the main points focused along the workshop.

The large number of participants, the excellence of all presentations and the interesting discussions that followed, sometimes enthusiastically prolonged during coffee breaks, vouch for the dynamism and present interest in this research field, on which at least four other international conferences and workshops took place earlier this year.

Two main factors drive such enthusiasm: on one hand, the recent observational breakthroughs that have allowed exciting new discoveries, especially at high redshift, unveiling the distant Universe and its constituents, precursors of nearby galaxies and clusters. This knowledge is now being used to support the theories of structure formation and evolution at different hierarchical levels. On the other hand, the powerful computational facilities today available make more realistic and detailed numerical simulations possible; the integration of the correct physics, often oversimplified in the past, and the high resolution that can now be achieved are reproducing more faithfully the interactions among galaxies and between galaxies and the intergalactic medium. And such processes

are undoubtedly strongly intervening in, sometimes even dominating, the still scarcely understood evolution of the galactic population in groups and clusters.

The presented contributions, mainly based on optical researches, were complemented with results obtained in the infrared, radio and X-rays.

More than giving definite answers to the presently open questions, the workshop granted a splendid opportunity for specialists and young researchers to gather and interact, presenting and debating the numerous new results in the area and discussing the definition of the strategies to tackle in the future that will allow to better understand the evolution of galaxies.

Catarina Lobo

### HUNTING THE COSMOLOGICAL PARAMETERS WITH PRECISION COSMOLOGY

The last few years saw the development of a plethora of experiments and surveys probing the cosmological parameters. The Cosmic Microwave Background (CMB), the Supernovae (SN) searches and galaxy cluster data, namely via X-rays and Sunyaev-Zel'dovich effect, are among the most prolific giving detailed information about the geometry, age and structure formation of the Universe. The program of the WS-HCP workshop was aimed at highlighting the scientific achievements and to discuss the new environment of «precision cosmology» within these three probes. The objective was to analyse different observational strategies, common problems namely foregrounds, and to assess the impact of observational uncertainties in the determination of key cosmological parameters which describe the primordial universe and the large scale structure formation mechanism.

In the workshop about 40 astronomers participated and 25 talks were given during three days in a relaxed and jovial atmosphere, which was ideal to ignite vivid discussion and to stir interactions between the participants.

The first day of the meeting was dedicated to supernovae data. The debate included a number of important issues. Among them were interesting discussions on physical mechanisms and models of star explosions, studies of the variation of colour and magnitude of supernovae Ia with redshift, and discussions on their use as standard candles. Another exciting subject of debate was the impact of future supernovae projects, like the supernovae observatory satellite SNAP, and their importance to constraint cosmological parameters.

The last two days of the workshop were dedicated to the CMB and large scale structure studies. Concerning the CMB the main subjects in debate were constraints on cosmological parameters from present data, the observation of CMB polarization, Galactic CMB foregrounds, and the new strategies for observing the CMB using: polarisation sensitive bolometers, interferometric arrays for detailed SZ measurements and multi-frequency channel observations, such as the ARCHEOPS experiment and the future all-sky survey to be done by the Planck satellite mission (ESA, 2007).

The discussions on large-scale structure included presentations about the observational properties of galaxy clusters and their theoretical modelling involving both analytical methods and hydrodynamical N-body simulations. Constraints on cosmological parameters using recent cluster X-ray observations from Chandra and XMM satellites were also presented. Concerning extra-galactic cartography, results from the local universe were discussed, like the distribution of super-clusters, and methods to be used with the VLT and the Planck and Herschel (ESA, 2007) satellites. The latest results from the 2dF galaxy redshift survey were also debated.

Antonio da Silva (LAOMP),  
Domingos Barbosa (CENTRA IST)

### VARYING FUNDAMENTAL CONSTANTS

The workshop on The Cosmology of Extra Dimensions and Varying Fundamental Constants, which was part of JENAM 2002, was held at the Physics Department of the University of Porto (FCUP) from the 3rd to the 5th of September 2002. It was attended by about 110 participants, of which 70 were officially registered in the VFC workshop, while the others came from the rest of the JENAM workshops. There were also a few science correspondents from the press.

During the 3 days of the scientific programme, 8 Invited Reviews and 31 Oral Communications were presented. The speakers came from 11 different European countries, as well as from Argentina, Australia, Canada, Japan and the U.S.A. Nine of the speakers were Ph.D. students.

The workshop brought together string theorists, particle physicists, theoretical and observational cosmologists, relativists and observational astrophysicists. It was generally agreed that this inter-disciplinarity was the greatest strength of the workshop, since it provided people coming into this very new topic, from the various different backgrounds with an opportunity to understand each other's language and thereby gain a more solid understanding of it.

The overall aim of the workshop was to discuss the current theoretical motivations for the existence of additional space-time dimensions, and to confront these expectations with existing or upcoming observational and experimental tests. The interaction between specialists in different areas was quite fruitful, and a number of outstanding issues were identified, which are likely to become the main paths of research to be explored in this area in the coming years.

It was clear that in any theory with extra spacetime dimensions new interactions will naturally arise which will violate the Equivalence Principle at some level. This type of test is, therefore, the most sensitive probe of new physics beyond the standard model. One unavoidable consequence of these violations are spacetime variations of the 'fundamental constants' of nature which we can directly measure (but which are, in fact, only 'effective' quantities in these models). Astrophysical and cosmological tests of these effects are much more promising than laboratory or particle accelerator tests.