EUROPEAN ASTRONOMICAL SOCIETY

NEWSLETTER

Issue 27. June 2004

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EDITORIAL

This year as you know JENAM 2004 will take place in Granada and I hope many of you are coming. The meeting covers a very broad range of subjects and all of us can find an interesting session and a good excuse to visit the beautiful city of Granada. From my experience they have a reputation for organizing excellent meetings. You will find the article about Astronomy in Spain very interesting reminding us how important it is to participate to the JENAMs.

This period European Union is accepting more members. But EAS is still broader, with a larger number of affiliated Societies wishing to work together for the benefit of the whole astronomical community. Under this spirit the president has a lot of important news in his message.

A major change in EAS is the new Executive secretary and home. Michel Dennefeld our web page's editor has already informed you in his last e-mail news-message. Edith Thomas who has been ten years with us has ended her collaboration with our Society. All of us who have collaborated with her express our sincere thanks and wish her all the best for her new plans. On the other hand we welcome Martine Logossou who is taking over Edith's job. The new home is at the Integral Science Data Centre. Please have a good look at the relevant notice of Birgitta Nordstroem, who gives details and the new addresses.

The sceptic's corner is about the current hot topics of dark matter and dark energy as seen by Vincent Icke. AVO is taking shape and becomes a reality for astronomy, with its new tools and development, described by Paolo Padovani. The usual news from astronomical organizations and networks are very interesting as usual. We welcome our astro-particle colleagues, who are represented with the ILIAS network. You will find details about the International Space University.

I regret that we have no contribution from young people. Please encourage your young colleagues to participate. We need fresh ideas and opinions. Are they disappointed or we still keep them away?

Finally I have noticed that the results for the latest RTN calls (February 2004) are public. I think the outcome for astronomy should be much better.

EAS SECRETARIAT HAS MOVED

Since 1994 the secretariat of EAS has been located in Petit-Lancy, Geneva. First at the domicile of European Physical Society and since 1997 at the office of Europhysics Letters (EPL). The offices of EPL moved to Mulhouse in northern France at the end of 2003 and EAS therefore had to find a new host institution and staff for the secretariat.

The Integral Science Data Centre (ISDC) lead by Prof. Thierry Courvoisier has kindly agreed to take on the duties of the secretariat of EAS. The ISDC is affiliated to Geneva Observatory and located nearby.

With a small reception on 19 April 2004 at the ISDC the secretariat was officially handed over to the new staff after the audit of the accounts for 2003 was completed. Our new Executive Secretary, Ms. Martine Logossou, has now taken over the functions for EAS that Ms. Edit Thomas has fulfilled for the past ten years.

We would like to take this opportunity to express our deep appreciation and thanks for the devoted and professional work and that Edit has offered to EAS and we wish her all the best for the future.

At the same time we wish to give Ms. Logossou a warm welcome. The tasks that Ms. Logossou will be responsible for are in short:

- Collect membership fees and maintain the accounts
- Provide financial records for the treasurer and auditors
- Maintain the membership records and mail information to the membership

The new address of EAS' secretariat is:

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c/o Integral Science Data Centre
Chemin d'Ecogia 16
CH-1290 Versoix
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Tel: +41 22 95 09 110
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Birgitta Nordstroem

MESSAGE FROM THE PRESIDENT

On the first of May the European Union welcomed ten new member states. Astronomers are active in all of these, although not all have professional astronomical societies. We at the EAS welcome this development and predict it will lead within a few years to easier cooperation around the Union and more opportunities for our research. These years will be an extraordinarily important period, with much energy going into reorganising the way decisions are made and into planning the future of our science. Recent activities of potential importance in this regard include the following.

Planning Future Large Facilities

The OECD's Global Science Forum is sponsoring a discussion of planning for future large-scale facilities around the world. The goal is to let policy makers everywhere know what plans the global astronomical community has with respect to very large expenditures. Governments realize that coordination of finance and optimising investment will require long lead times, and awareness of what is to come is seen as a first, essential step. The OECD held a first workshop in Munich in December and a second in April in Washington DC USA. Delegations from non-OECD as well as OECD countries attended, consisting of senior programme managers from national ministries, funding agencies or research councils, and one or more senior members of national astronomical communities. In the event the discussions were restricted largely to ground-based facilities because the space agencies declined to participate. The discussion in Munich aimed at providing a census of the science to be attacked in the coming 15-20 years, that in Washington focussed more on the facilities required to carry out that research. The quality of the discussion in both workshops was by all reports high. The issue of developing a global long term Strategic Plan for astronomical facilities, however, was inconclusive. While projects such as the ELT for optical-IR astronomy and SKA for the radio received much attention and are seen as inevitable requirements, there was no consensus on formulating concrete recommendations to governments. Apparently, countries lacking well-developed national decision-making structures would generally welcome an international forum providing recommendations, while those countries and international organizations having established processes have difficulty agreeing to participate in wider discussions until their own priorities have been fixed. Nevertheless, these OECD discussions serve the useful purpose of alerting funding agencies that our community has great plans that will require their active attention in the coming decades.

Sixth Framework Programme

Closer to home, as noted in the previous Newsletter, our community is very actively participating in the EU's Sixth Framework Programme (FP6). Our OPTICON, RadioNET and ILIAS (astroparticle physics) coordination networks have all received substantial funding through the Integrated Infrastructure Initiative programme. In March proposals were also submitted to the Design Studies and Contributions to Capital Costs programme for studies leading to the ELT, SKA and KM3Net (cubic km neutrino telescope in the sea); unfortunately, this programme is oversubscribed by a factor of six and includes such competition as a proposed upgrade of the ESA facility at Kourou to handle Russian launchers.

Seventh Framework Programme

It is also time to look forward to FP7, now scheduled to start in 2007. The main contours of its programme will be decided formally later this year, although the budget will take form only in the course of next year. It now seems nearly certain (that is, barring unforeseen political redirection of policy by the new Commission and Parliament) that the six main funding lines will be the following:

– European Research Council. A new body will be set up to provide funding to individual research projects through peer review of proposals based solely on scientific excellence. This promises to be an exceedingly important development for working astronomers.

– Integrated Projects and Networks of Excellence. This line will be a continuation of the FP6 programme of the same name, with possible minor changes based on the experience gained in FP6.

– Marie Curie Fellowships. These fellowships have been so successful in FP6 that the programme will continue in FP7.

– ERA-Nets. This programme was new in FP6 and aimed to encourage national research councils to coordinate their funding programmes and work toward opening them to nationals of other countries. The intention for FP7 is to extend the goals of the programme as regards integration of activities, where such integration is seen as appropriate.

– Research Infrastructures. The Commission has heard the scientific community's pleas for additional funding for new major research facilities at the European level. Current ideas include a major role for the European Strategic Forum on Research Infrastructures (ESFRI), a committee of experts appointed by member state governments to define the most important needs. ESFRI's recommendations would then be the basis for discussions between the Commission and governments, with the goal of achieving agreements on contributions and on phasing.

– European Technology Platforms. These are forums in which industry, research institutes and governments develop long term R&D plans in areas of technology deemed critical to Europe's future. Examples seem likely to include hydrogen-based energy, very large wafer Si chip production facilities, etc.

To ensure that these programmes are all successful, the Commission has asked for a doubling of its budget for research, to about € 40 G for the period 2007-2011. Serious budgetary politics are scheduled to begin after the new Commissioners and the new European Parliament are in function in the autumn, hopefully to conclude satisfactorily a year later.

One aspect of the situation will likely receive little press coverage but which may be of great importance to astronomers in the new member states. In less well-developed regions across the Union, the strengthening of scientific training and the development of local and regional research infrastructures are foreseen to occur via the EU's Structural Funds. These are the EU's main instruments for supporting social and economic restructuring across the Union; they account for over a third of the European Union budget. From FP7 the intention is to include strengthening of scientific research capacity in these Funds rather than as part of the programme of Research. On the one hand, this is good news to astronomers in such regions. But on the other, there will be competition from many other sectors of society. So it will be important for astronomers to start early to develop personal contacts with the civil servants and politicians in their region, with a view to ensuring that at least some of those funds get spent on improving the local capacity of doing front-line research in astronomy.

Harvey Butcher

Astrophysical Virtual Observatory

The breathtaking capabilities and ultra-high efficiency of new ground-and space-based observatories have led to a data explosion calling for innovative ways to process, explore, and exploit these data. The Virtual Observatory (VO) is an innovative, evolving system that allows users to interrogate multiple data centres in a seamless and transparent way using new international standards for archiving and data-mining protocols. The VO initiative is a global collaboration of the world's astronomical communities under the auspices of the recently formed International Virtual Observatory Alliance (IVOA).

The Astrophysical Virtual Observatory (AVO) project is conducting a research and demonstration programme on the scientific requirements and technologies necessary to build a VO for European astronomy. The AVO has been jointly funded by the European Commission (under the Fifth Framework Programme [FP5]) with six European organizations participating in a three year Phase-A work programme. The partner organizations are ESO in Munich, ESA, AstroGrid (funded by PPARC as part of the United Kingdom's E-Science programme), the CNRS-supported Centre de Données Astronomiques de Strasbourg (CDS) and TERAPIX astronomical data centre at the Institut d'Astrophysique in Paris, the University Louis Pasteur in Strasbourg, and the Jodrell Bank Observatory of the Victoria University of Manchester. As a coordinated effort, the IVOA partners are holding demonstrations of new VO capabilities on an annual basis.

The AVO recently held a Science Working Group (SWG) meeting and related demonstration on January 27-28 at ESO. The AVO demonstration this year dealt with an extragalactic case on obscured quasars, centred around the Great Observatories Origin Deep Survey (GOODS) public data, and a Galactic scenario on the classification of young stellar objects. New features, compared to last year's demonstration, included: support of spectroscopic data, with direct links between imaging and spectral data of the same sources, seamless and transparent access to scientifically validated products from the ISO and XMM-Newton archives, usage of new standards (Simple Image and Simple Spectrum Access), and new tools (SpecView, Hyper-z, VOPlot, and a cross-matching package).

The extragalactic scenario resulted in the discovery of about 30 new optically faint, obscured quasar candidates, the so-called QSO 2, an improvement of a factor of 4 when compared to the only 9 such sources previously identified in the GOODS fields. The inferred QSO 2 surface density is much larger than current estimates and predictions. A paper describing these results has been accepted by Astronomy & Astrophysics.

The demonstration showed that AVO is already starting to do cutting-edge science by allowing the exploitation of astronomical data beyond the "classical" identification limits. Astronomers are quickly moving beyond the era when source identification was done by taking a spectrum with a telescope, into an era when classification is achieved by using all the multiwavelength information available.

What is next for the AVO? The AVO Phase-A will end October 31, 2005.

The main AVO commitments before then are: to produce a Science Reference Mission, that is a definition of what the AVO should be when fully implemented (Phase B); to complete the definition of its science requirements; to complete the description of the data, archive interoperability and the necessary database technologies needed for a full implementation; and finally, to deliver the last AVO demo in January 2005. Work is well under way in all of these areas.

After Phase-A, the project will move towards the EURO-VO, that is the full-fledged 4-year European VO programme.

We note that the AVO prototype used during the demonstration can be downloaded from the AVO Web site at http://www.euro-vo.org/twiki/bin/view/Avo/SwgDownload

This page also contains detailed instructions on how to reproduce the AVO science demonstration (both the extragalactic and Galactic scenarios). We encourage astronomers to download the prototype, test it, and also use it for their own research! For any problems with the installation and any requests, questions, feedback, and comments you might have please contact the AVO team at twiki@euro-vo.org
(Please note that this is still a prototype: although some components are pretty robust some others are not.)

AVO Home Page: http://www.euro-vo.org/

AVO Science Working Group Meeting 2004: http://www.euro-vo.org/twiki/bin/view/Avo/SwgMeeting04

AVO Prototype Download: http://www.euro-vo.org/twiki/bin/view/Avo/SwgDownload

International Virtual Observatory Alliance: http://www.ivoa.net/

Paolo Padovani, Manager
(Work Area: Science)

What is the International Space University?

In the 1980's, three university students, *Peter H. Diamandis, Todd B. Hawley and Robert D. Richards*, recognized the need to create an institution where graduate students in all disciplines could come together from around the world and prepare future endeavors in space. As a result, *the International Space University (ISU) was founded on April 12, 1987* during a Founding Conference held at the Massachusetts Institute of Technology. The first ISU Summer Session was held at this same university during the summer of 1988. *In 1995, ISU's permanent campus was established in the heart of Europe, Strasbourg, France and the Master of Space Studies program was initiated* in the temporary quarters.

ISU helps to develop *the future leaders of the world space community* by providing *interdisciplinary* educational programs to students and space professionals in an *international, intercultural environment*. ISU offers its students *a unique and comprehensive education* covering all aspects of space programs and enterprises – space science, space engineering, systems engineering, space policy and law, business and management, and space and society. By providing international graduate students and young space professionals both an intensive interdisciplinary curriculum and also the opportunity to solve complex problems together in an intercultural environment, ISU is preparing the future leaders of the emerging global community.

The *international student body* (on average 30 different nations per class are represented), *the involvement of space agencies* as well as *the support of satellite communications and other space related industries worldwide*, make the international dimension available at ISU unique. Students, supported financially either by their employer or through scholarships awarded by ISU, gain substantive knowledge, develop the skills needed to work with people from other cultures, and become a part of an extensive international network that is proving to be increasingly important in implementing international space ventures. Since its founding in 1988, ISU has graduated over *2000 students from 87 countries*.

ISU conducts *three academic programs* at the graduate-level: a two-month *Summer Session Program* (SSP) in various locations around the world, a one-year *Master of Space Studies* (MSS) program and a one-year *Master of Space Management* (MSM) program at the new central campus facility in Strasbourg, France.

ISU's innovative programs, both on and off the Earth, develop and inspire future space leaders. Its worldwide community is a *collaborative network of broadly educated and visionary space professionals*.

ISU and its community are enabling the exploration, development and peaceful use of space for the improvement of life on Earth and the advancement of humanity into space.

More information is available online at www.isunet.edu

Ms. Francesca ZOETE, SSP 03
Development Unit, ISU

SKEPTIC's CORNER

Dark Matter, Dark Energy, Dark Ages

The line between skepticism and cynicism is thin. In astronomy, where typical statistical errors are of the order of 30% and systematic errors are often worse, I find it difficult not to cross that line. So let me be skeptical for a few minutes, while I discuss with you a subject that is, in my opinion, treated in a rather irresponsible way in present-day astronomy: the cosmological constant Λ.

Let me begin by eradicating a tenacious misunderstanding. Einstein called the introduction of Λ "my greatest blunder". What Einstein was referring to, is that he introduced Λ to get a static solution of his equation, so that he failed to *predict* the expansion of the Universe. The ignorant have interpreted this as meaning that there is something fishy, something unphysical about Λ *per se*. But, to the contrary, Λ is perfectly fine as far as physics goes. It occurs on the left hand side of the Einstein Equation,

$$R_{\mu\nu} - (R/2+\Lambda)g_{\mu\nu} = 8\pi G\, T_{\mu\nu}$$

Seen with the eye of contemporary physics, this remarkable formula is constructed as follows. We know that the Universe of our laboratories is symmetric under a Lorentz transformation; that is to say, a Galilei-Huygens transformation that not only specifies invariance under time and space translation, but that also leaves one particular speed – the speed of light c – invariant. Now it is almost trivial to prove that this invariance implies that c is also the highest possible speed. Therefore, *a global symmetry is impossible*. After all, how would the folks at the Andromeda Nebula know that we have just performed a Lorentz boost? They will have to wait two million years to get the news. Thus, *only local symmetries are possible* in a relativistic world. This is incorporated in the usual way: namely, we construct a Lagrangian with the requisite symmetry and then require that its variation along a path is extremal (the Euler-Lagrange formalism). Instead of the global distance recipe for the interval, $s^2 = c^2 t^2 - x^2 - y^2 - z^2$ we get the local (differential) distance in space-time $ds^2 = g_{\mu\nu}\, dx^\mu\, dx^\nu$.

In a local field theory, the field $g_{\mu\nu}$ itself is a dynamical variable. The field is tangible, it is building material. For example, in the case of local quantum field theory, these fields are the coupling bosons, such as the photon and the gluon. The choice of dynamical variables in General Relativity means that space-time is explicitly regarded as real stuff. According to the recipe sketched above, we pick the Ricci curvature R as Lagrangian and get the *Einstein-Hilbert action* for matter-free space-time, automatically including a possible cosmological constant Λ because a scalar multiple of the field $g_{\mu\nu}$, being a dynamical variable, is a legitimate part of the action.

Einstein forged a correspondence with classical mechanics by constructing a tensor from $g_{\mu\nu}$ and its second-order derivatives (the left hand side of the Einstein equation) that has the same transformation properties as the energy-momentum tensor $T_{\mu\nu}$ (the right hand side). The most obvious choice, simply taking T proportional to g, is not sufficient because it would not include Newtonian gravity; in order to obtain that, one must include the second derivatives of g. The term with Λ, which describes the energy density of the vacuum, corresponds to a *surface term* in the classical potential, a boundary condition at infinity. This immediately raises a problem: in a homogeneous isotropic classical universe, the boundary is not properly defined.

The way in which the Einstein Equation couples space-time (on the left) to mass-energy (on the right) is a physical choice; it does not have the mathematical necessity of a gauge theory. It is Einstein's guess, based on correspondence with Newtonian mechanics, and it works very well on large scales: black holes, relativistic stars, the Universe. Einstein's flash of genius was not the left-hand side of his equation, I think. Rather, it was his inclusion of matter in this equation, by remarking upon the analogy with Poisson's Equation.

But this works not at all on small, atomic, quantum-mechanical scales. The hassle is that we are obliged to include the vacuum zero-point energy. That is infinite, or at least very large. The zero-point energy shows up in the form of a finite value of the cosmological constant Λ, which one really should like to be practically zero in order to conform to cosmological observations. Current field theories of known particles require $\Lambda \approx 10^{118}$ in units where the critical Einstein-De Sitter density is 1, which is totally excluded by cosmological observations.

Possibly there is another guess one could make in order to arrive at a theory of space-time, by searching for an expression that corresponds with (say) Schrödinger's Equation instead of Poisson's Equation, but nobody has yet succeeded in doing so.

The term $\Lambda g_{\mu\nu}$ appears as a matter of necessity. Einstein, who started from his peculiar 'equivalence principle', missed this; he had to put it in later, by hand. It remained for De Sitter to show, much to Einstein's dismay, that this equation has interesting non-trivial solutions. One of these, the *De Sitter model*, is an exponentially expanding solution: $a = \exp(t\sqrt{(\Lambda/3)})$. This is perfectly possible, because Λ is not unphysical; you may not leave it out, unless the Universe tells you to. Einstein put Λ in to obtain *static* (albeit unstable) solutions of his equations. Thus, *he failed to predict the expansion of the Universe*, ten years before this was discovered accidentally, as is often the case in astronomy. It is this failure he called "my greatest blunder".

The majority of cosmological observers tell us that the consequences of Λ are approximately equal, numerically, to the consequences of the mean mass density ρ. Even as we, monkeys, climb down from the trees and up to our telescopes, the Universe just happens to be poised between nice and quiet Einstein-De Sitter expansion, and exponential De Sitter explosion. I think that that is a little too much honour for a direct descendant of *Australopithecus africanus*.

And the difficulties only begin here. We can interpret the Λ bit of the Einstein Equation, $\Lambda g_{\mu\nu} = 8\pi G\, T_{\mu\nu}$ as saying: the absolute value of the potential $g_{\mu\nu}$ contributes directly to the motion, with proportionality constant Λ. This is very peculiar: we are accustomed to having only *local derivatives* of the potential play a role. Using the classical analogue, it is as if local motions are determined by boundary conditions at infinity; a problem which, as I noted above, is inherent in the pathological state of boundaries in a homogeneous isotropic universe. We could rule out Λ by *fiat*. But if space-time does not couple to vacuum fluctuations, how come it couples to anything at all?

If we do not force Λ to be zero, our Universe ought to be blowing up in a De Sitter explosion on a time scale of 10^{-34} seconds or so. Accordingly, I do not believe any of the observers who tell me that Λ is of the order of unity. I think that if some dubious observation of a basic constant is 118 powers of 10 smaller than the expected value, then Nature is telling us that that value is zero. But leaving out Λ requires a physical justification. What could that be? It would be tempting to eliminate the zero-point energy by decree. But the observation of the Casimir-Polder effect in the laboratory tells us that the vacuum energy density exists. We must therefore conclude that somehow its influence on the large scale Universe must vanish.

The current fashion is, to admit that the quantum vacuum energy spoils all the fun in the Universe. Therefore, the reigning schoolyard bullies have thrown it out of the game. Instead, they invoke a mysterious form of matter with a negative pressure which, accordingly, is called "dark energy". Remember that, in relativistic kinetic theory, the static term mc^2 contributes the amount ρc^2 to the energy density, whereas the pressure (which is an energy density itself) contributes P, for a total of $\rho c^2 + P$. Now if some process creates particles from a vacuum, we have $\rho c^2 > 0$, but because $\rho c^2 + P = 0$ in a vacuum, we must have $P < 0$, or else our vacuum is not Lorentz invariant.

Has Λ, or this funny dark energy, been observed? Hmmm... remember the lessons of history. Soon after the launch of the Hubble Space Telescope, astronomers started to use the new instrument for settling old scores.

Of course, because developing novel applications of a new instrument takes time. One of the old chestnuts was the Hubble parameter H. Out came a "monumental" paper that claimed, on the basis of Cepheids observed in two galaxies, that H = 110 km/s.Mpc, which meant that the universe is younger than its oldest star. The paper made headlines, never mind its bizarre implications. But when it comes to interpreting data, and I can choose between saying "we don't quite understand pulsating stars" or saying "the Universe is younger than its oldest star", my old tutor Occam tells me to pick the first alternative. At the time, I predicted that each year these front page newsmakers would quietly remove a few points from their brash number. And so it happened; the present value is 67, well within the error margin of old-fashioned earthbound methods at the time of HST's launching.

People tell me that supernovae of type Ia are such superb standard candles, that they can be used to determine the value of Λ. Hmmm. When it comes to interpreting data, and I can choose between saying "we don't quite understand supernovae" or saying "the Universe is full of mystery stuff with negative pressure", Occam tells me to pick the first.

People tell me that the Silk oscillations visible as a noise pattern on the cosmic microwave background imply that $\Lambda \approx 0.7$, and is in fact equal to the value given by the SNIa *aficionados*. Now I have no doubt that plasma oscillations before the decoupling of radiation and matter are a golden key to the epoch before 370,000 years. But in the early universe the influence of Λ is asymptotically small, as can be seen from the Friedmann equations

$$(da/dt)^2 = (8\pi/3)(G\rho a^2) - kc^2 + \Lambda a^2/3$$

$$d(\rho a^3)/dt + (P/c^2)da^3/dt = 0$$

(By the way, you may see this as an equation that tells you, for a given equation of state $P(\rho)$, what the expansion and the deceleration do; or you may see it as an implicit prescription for $P(\rho)$, to be deduced from observations of a and da/dt. I prefer the latter). For the present form of matter in the Universe, $P \approx 0$, so that ρa^3 = const (mass conservation). Thus, the first equation has the form

$$(da/dt)^2 = M/a - kc^2 + \Lambda a^2/3$$

Therefore, in the limit a -> 0 the first term on the right hand side dominates by a factor a^3 over the third: the early universe is asymptotically of the Einstein-De Sitter type. Not good if you want to measure Λ! Finally, it would seem that our Universe is, in fact, of E-DS type, so that k = 0. This implies that if you observe the expansion a and the deceleration da/dt by any means whatever, every systematic error you make in M contributes to a 'detection' of Λ.

To conclude: before we believe that typically astronomical data (statistical errors of the order of 30% and systematic errors that are worse) tell us the most astonishing things about the nature of the vacuum and the dark matter in the Universe, we need a *dynamical mechanism* that couples spacetime and matter: we desperately need a dynamical theory for the small scale structure of spacetime, instead of that equal sign around which Einstein, with Olympian genius, offhandedly centered his equation. What to do? Where shall we look for a hint? I think that we should start with a question that everyone who gives popular lectures gets, from time to time: *why do we not expand with the Universe?* To rephrase that a bit more physically: why is wavelength redshifted, i.e. couples by means of Einstein's magic equal sign to the evolution of spacetime, while the Compton length remains fixed? If all length scales evolved according to the universal expansion, it would have zero net effect.

Every particle is associated with a length scale, the *de Broglie length* $\lambda_{dB} = h/mv$. When the Universe expands with a factor a, this length increases with the same factor. This is the famous cosmological redshift. But quantum field theory tells us that particles carry another length scale, the Compton length $\lambda_C = h/mc$. If we take Einsteinian cosmology seriously – that is to say, the evolution of the Universe is a change in the scale of space-time itself, and not a motion through static space in the course of time – then we are entirely justified in asking: If the universal expansion changes λ_{dB}, why does it leave λ_C unchanged? When applied to the fundamental gauge particles, this reads: why is the length scale of massless particles redshifted, but the scale of massive particles constant?

Just in case that you think this is a trivial game, please remember that there is currently no theory that describes the cosmic redshift in terms of an actual coupling mechanism between particles and spacetime! And it would definitely have observational consequences; for example, the gravitational lens effect might not be achromatic. You would think that the quantum mechanical description of the cosmic redshift, so very well observed, would be the first thing that people would try to crack. But how? If I knew, I would be partying in Stockholm next year. Or you would, if you knew a better way.

Vincent Icke
Sterrewacht Leiden

ESA

The Planck Mission

In late 1992 the COBE team announced the detection of intrinsic temperature fluctuations in the Cosmic Microwave Background (CMB), observed on the sky at angular scales larger than ~10°, and at a brightness level $\Delta T/T \sim 10^{-5}$. More recently, in February 2003, the WMAP team have announced results on scales of about 13' with a similar sensitivity (see http://lambda.gsfc.nasa.gov for detailed descriptions of both COBE and WMAP). These fluctuations map the spectrum of density fluctuations in the Universe at a very early epoch, and have established the Inflationary Big Bang model of the origin and evolution of the Universe as the theoretical paradigm. However, in spite of the importance of the COBE and WMAP measurements, many fundamental cosmological questions remain open. Building on the pioneering work of COBE and WMAP, the main objective of the Planck mission is to map the fluctuations of the CMB with an accuracy that is set by fundamental astrophysical limits, and that will allow to effectively address these fundamental questions.

Indeed, mapping the fluctuations of the CMB with high angular resolution and high sensitivity would give credible answers to such issues as: the initial conditions for structure evolution, the origin of primordial fluctuations, the type of potential which drove inflation, the existence of topological defects, the nature and amount of dark matter, and the nature of dark energy. Planck will set constraints on theories of particle physics at energies larger than 10^{15} GeV, which cannot be reached by any conceivable experiment on Earth. Finally, the ability to measure to high accuracy the angular power spectrum of the CMB fluctuations will allow the determination of fundamental cosmological parameters such as the density parameter Ω_0, and the Hubble constant H_0, with an uncertainty of order a few percent.

To achieve these objectives, the *observational* goal of the Planck mission is to mount a single space-based experiment which will survey the whole sky with an angular resolution as high as 5', a sensitivity approaching $\Delta T/T \sim 10^{-6}$, and covering a frequency range which is wide enough to encompass and deconvolve all possible foreground sources of emission. The main scientific result of the mission will be an all-sky map of the fluctuations of the CMB. In addition, the sky survey will be used to study in detail the very sources of emission which "contaminate" the cosmological signal, and will result in a wealth of information on the dust and gas in both our own galaxy and extragalactic sources.

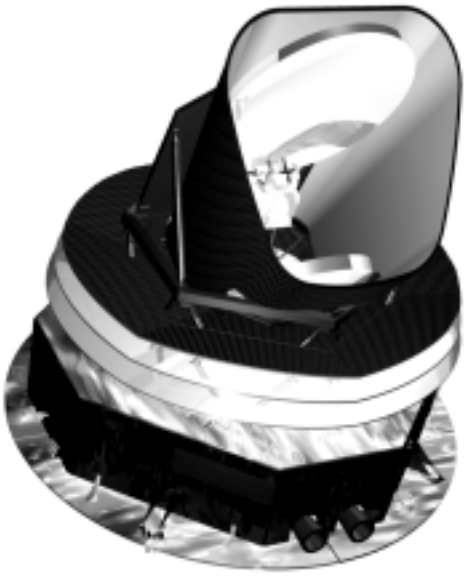

Figure 1. The current configuration of the Planck satellite, as it is being developed by Alcatel Space (France).

Planck was selected in late 1996 as the third Medium-Sized Mission (M3) of ESA's Horizon 2000 Scientific Programme, and is now part of its "Cosmic Vision" Programme. At the time of its selection, Planck was called COBRAS/SAMBA; after the mission was approved, it was renamed in honour of the German scientist Max Planck (1858-1947), Nobel Prize for Physics in 1918. Planck will be launched together with ESA's Herschel Far-Infrared and Submillimetre Space Observatory in February of 2007.

As all of ESA's space science projects, Planck is being developed in partnership with industry and the scientific community. ESA's prime contractor for both Herschel and Planck spacecraft (Alcatel Space – France) has advanced very far in the development programme, with qualification models of the satellite being delivered later this year for test.

The Planck payload consists of a 1.5 meter offset telescope, whose focal plane is shared by clusters of detectors in 9 frequency bands covering the range 30 to 900 GHz. The three lowest frequency bands (up to ~70 GHz)consist of HEMT-based receivers actively cooled to ~20 K by a H_2 sorption cooler. The higher frequency bands consist of arrays of bolometers cooled to ~100 mK; the H_2 sorption cooler provides precooling for a Joule-Thomson 4 K stage, to which a dilution refrigerator is coupled.

In early 1999, ESA selected two Consortia of scientific institutes to provide the two Planck instruments: the Low Frequency Instrument will be developed and delivered to ESA by a Consortium led by Reno Mandolesi of

the Istituto di Astrofisica Spaziale e Fisica Cosmica (CNR) in Bologna (Italy); similarly, the High Frequency Instrument will be provided to ESA by a Consortium led by Jean-Loup Puget of the Institut d'Astrophysique Spatiale (CNRS) in Orsay (France). More than forty European institutes, and some from the USA, are collaborating on the development, testing, and operation of these instruments, as well as the ensuing data analysis and exploitation.

The two PI teams will also man and operate two Data Processing Centres, which will process and monitor the data during operations, and reduce the final data set into the science products of the mission. All-sky maps in 9 frequency bands will be made publicly available one year after completion of the mission, as well as a first generation set of maps of the CMB, Sunyaev-Zeldovich effect, dust, free-free, and synchrotron emission. The time series of observations (after calibration and position reconstruction) will also be made available as an ESA on-line archive.

In early 2000, ESA and the Danish Space Research Institute (DSRI,Copenhagen) signed an Agreement for the provision of the two reflectors that constitute the Planck telescope. DSRI leads a Consortium of Danish institutes, and together with ESA has subcontracted the development of the Planck reflectors to Astrium GmbH (Friedrichshafen), who are manufacturing the reflectors using state-of-the-art carbon fibre technology.

A view of the current design of Planck is shown in Figure 1.

References: More information is available at http://www.rssd.esa.int/Planck

Jan A. Tauber, on behalf of the Planck community

ESO

Paranal Observatory – 5th anniversary

Paranal Observatory celebrated its fifth anniversary of operations in April 2004. In those five years the VLT has produced a remarkably wide range of front-line scientific results, from planetary systems to the most distant objects in the Universe, and much more can be expected in the coming years. Its suite of ten first-generation instruments is almost completed; seven are currently in operation, and the most recent to start commissioning is the VLT Imager and Spectrometer in the InfraRed (VISIR). Three second generation instruments have been selected and started, two more are under study. The two first generation VLTI instruments, MIDI and AMBER, are in Paranal, with AMBER still under commissioning. MIDI has already made the first 10 micron interferometric observation of an extragalactic object (NGC 1068). In a very important recent development, the VLTI was opened to the entire community for regular observations – the first such facility in the world. The first of the four 1.8-m diameter VLTI Auxiliary Telescopes saw "first light" in January this year.

The two observatories Paranal and La Silla are presently being reorganized into one, a development which should bring important synergies and efficiencies. At La Silla, all observations are now conducted from a single control facility. The HARPS instrument on the 3.6-m telescope has begun routine science operations, and its first extrasolar planet detection has already been achieved. The SEST mm-wave telescope has been closed and staff transferred to the new 12-m APEX submm telescope which is currently under test at the 5000-m altitude Chajnantor site.

A groundbreaking ceremony for the Atacama Large Millimeter Array (ALMA) took place in November 2003 at the site of its operations facility located between Chajnantor and the town of San Pedro de Atacama. All the necessary negotiations with Chile for the project were completed last year. Japan's ALMA budget was approved in December 2003, and discussions on its participation are proceeding. Work on all aspects of the project is well underway, from the site development to the antennas and all systems. Meanwhile, a variety of design studies continue for the next-generation extremely large optical/infrared telescope. Details on these and other ESO developments can be found at http://www.eso.org

The growth and development of ESO continues to attract new member states, and Finland, with its strong astronomical and technical expertise in many areas, is now the latest. The Finland-ESO agreement was signed in February, and Finland will formally join on 1 July 2004, becoming the eleventh member state of ESO.

Peter Shaver

News from EU networks

RadioNet swings into action

In the previous issue of the EAS Newsletter I reported on the successful conclusion of the EC FP6 RadioNet proposal: funding was awarded at a level of ~12.4M over five years. The contract was signed between the RadioNet consortium and the EC before Christmas 2003 and RadioNet became active on 1 January 2004.

The RadioNet consortium has been active in the first few months of the project. The three Joint Research Activi-

ties, ALBUS (interferometric software); PHAROS (focal plane phased arrays) and AMSTAR (mm-wave technology) have all had their kick-off meetings and have been refining their work programmes. They have also been hiring staff to do the work. We expect to see significant progress in the coming months.

The European radio facilities have opened up their Trans National Access programmes. Several groups have already received funding to perform observations and to make data reduction trips. The facilities involved are the European VLBI Network (EVN); MERLIN; IRAM (both Plateau de Bure and Pico Veleta); WSRT; JCMT; Effelsberg and the Onsala 20m telescope.

The networking activities have also started work with several RadioNet-funded meetings already behind us. Two meetings of note were the Zwolle workshop on Astronomical Molecules held in February and the EVN Technical Operations Group workshop in Wettzell, Germany held in April. In addition, the RadioNet Board had a very successful first meeting at the IAC in Tenerife in March. The location of this meeting was deliberate and was aimed at promoting increased collaboration and cooperation with our optical/IR colleagues.

A RadioNet web-site has been established (http://www.radionet-eu.org).

This is the main interface of the community with RadioNet, for instance it contains the RadioNet Events page. A web-manager has been appointed and will work at ASTRON in the Netherlands, he will develop this web-page further.

Philip Diamond (pdiamond@jb.man.ac.uk)
University of Manchester
RadioNet Coordinator

OPTICON

The original FP5 OPTICON programme ended on February 29th 2004 after a very sucessful four years of activity. Final reports are now in the hands of the European Commission and our attention is turning to our new FP6 programme. A major highlight of our final year, apart from the sucess in winning an major FP6 contract, was the submission of a large ELT design study proposal beautifully crafted by Philippe Dierickx and based on input from many people in the OPTICON ELT Working Group. Although our partner AVO proposal for an I3 was rejected, further submissions to obtain funds in support of the AVO are being made for later FP6 calls. In the meantime OPTICON will continue to support the AVO networking effort.

As reported in the last newsletter OPTICON was awarded up to 19.2 million Euro in the first selection of Integrated Infrastructure Initiatives. Contract negotiations took place over the winter and the FP6 programme is now well underway, with a start date of 1 January 2004. A full list of activiites was given in the last newsletter and further details and contact information for each project can be found at the OPTICON website, which retains the old adress but has been greatly improved to meet international web standards.

The first meeting of the full OPTICON board took place in Ghent, Belgium in April. At this meeting it was agreed that the over-arching long-term objective of the OPTICON programme is the better integration of European Astronomy in order to make an extremely large telescope a reality as quickly as possible. This is to be achieved via the programme of activities now in place under the the FP6 contract. All six of the Joint Research Activities have had their initial meetings and progress in getting the detailed work underway was reported in Ghent. Many of the presentations made to the board are available on the OPTICON web-site.

The trans-national access programme is well underway and already seems to be exceeding expectations. EAS members will recall that the OPTICON telescope network comprises 4 solar and 18 optical-infrared telescopes around the world which are now fully open for trans-national access. Applications are made through the normal telescope proceedures (not through OPTICON) and qualifying astronomers who are awarded time based on the normal peer review process may be able to receive travel grants to support their observing runs. The trans-national access programme is administered by a special OPTICON office at the IAC in Tenerife under the leadership of Jesus Burgos. Full details of the programme, including lists of telescopes and proposal deadlines, can be accessed via a special webpage at www.otri.iac.es/opticon/ which is also linked from the main OPTICON page.

The FP6 programme supports a number of networking activities and many of these are also already quite active as the programme transistions from FP5 to FP6. The interferometry network had a major meeting in Nice in January, the Telescope Directors met in Tenerife in January and plan to meet again in November at the Observatoire de Haut Provence. The ELT working group, as part of its FP5 activity, held a science working group meeting in Marseilles in November 2003. About 50 people particpated and made significant progress on developing the ELT science case document. The group also meet in Berlin in May 2004 and a further meeting is planned for November 2004. Contact the

OPTICON sponsored ELT scientist Isobel Hook at imh@astro.ox.ac.uk for details. Go to the OPTICON networking page and follow the ELT links for further information.

Finally, the project was sad to see the departure of Karen Disney, who had assisted us as OPTICON secretary for much of the FP5 programme but we welcome her replacement in Cambridge, Suzanne Howard. John Davies in Edinburgh remains project scientist and he is now aided by one of the UKATC's Project Assistants, Saskia Brierly.

The next partners meeting will be held in Grenoble in October. As always more information can be obtained from www.astro-opticon.org or by contacting the project scientist, John Davies (jkd@roe.ac.uk) or the chairman Gerry Gilmore (gil@ast.cam.ac.uk)

John Davies, project scientist

Participants gathered in front of the Hôtel-Dieu, in the Vieux Port region of Marseille.

ILIAS

ILIAS is an Integrated Infrastructure Initiative (Contract number: RII3-CT-2003-506222) that has pulled together Europe's leading Astroparticle Physics programmes with the aim of improving the existing infrastructures in the field, and organising the scientific community to prepare for the future.

ILIAS has 20 contractors gathering more than 70 laboratories from 12 countries. In addition, around 70 further institutions, from 19 countries will contribute to the activities of ILIAS.

ILIAS will focus on two key areas in the field of Astroparticle Physics.

i) Physics in deep underground laboratories

A large portion of the ILIAS activities will take place in at least one of the four European deep underground laboratories: Laboratori Nazionale del Gran Sasso (LNGS, Italy); Laboratoire Souterrain de Modane (LSM, France); Laboratorio Subterraneo de Canfranc (LSC, Spain); and Boulby Laboratory of the Institute for Underground Sciences (IUS, Great-Britain). Within ILIAS, a rapidly increasing number of users will benefit from dedicated experimental underground areas and various technical facilities. To that end, ILIAS coordinates the operations via one transnational access activity, three networks and two joint research activities (low background techniques, direct dark matter detection, and double Δ decay).

ii) Gravitational wave detection

For the technological challenges of this rapidly growing field, a network is designed to structure the activities using the two large European interferometers and the three resonant cryogenic detectors, complemented by a joint research activity focusing on the fundamental thermal noise mechanisms.

Supporting those activities, a theoretical astroparticle physics network will initiate cooperative theoretical projects, improve links with experiments, and help define future projects.

ILIAS aims to help coordinate and enhance all infrastructures of the Astroparticle Physics community in Europe, with management going far beyond the frame of the present EU contract. The new structuring will favour exchanges on the numerous questions common to the relevant communities, greatly enhancing its organisation and efficiency, and helping to guarantee its long term sustainability and competitiveness.

For more information, see: http://appec.in2p3.fr/

Contact:
Bijan Saghai, ILIAS co-ordinator (bsaghai@cea.fr)

Bijan Saghai, ILIAS coordinator

ANNOUNCEMENTS

IAU WG PDPP: New Issue of Newsletter SCAN-IT

The IAU Working Group for the Preservation and Digitization of Photographic Plates (PDPP) has recently issued a new version of its Newsletter, SCAN-IT. The document can be accessed as zipped PDF or PS at http://www.lizardhollow.net/

This issue carries updates on plate digitizing and archiving activities completed or underway, and discussions on the merits of different types of scanning equipment, both custom-built and commercial. It also invites suggestions for research which will become possible when data spanning 70-100 years become widely available, and asks for references to similar archival research already reported in the literature.

Your interest and your support are invaluable to the groups who are currently attempting to bring this heritage of unrepeatable data back into the modern world.

Elizabeth Griffin (elizabeth.griffin@nrc.gc.ca)
Chair, PDPP

Affiliated Societies

Astronomy in Spain

Last year we celebrated the 250th anniversary of the foundation of the oldest astronomical centre in Spain, the Royal Observatory of the Army in San Fernando, Andalusia. The origin of modern astronomy is thus similarly distant in time in Spain as in the European countries with the longest astronomical tradition. Yet, science and technology has never been very cultivated in Spain compared to arts and humanities. Only a few Spanish astronomers can be named whose most important merit is to have kept astronomy alive in our country despite the common lack of support and sparse government aid. Fortunately, however, this somewhat bleak situation dramatically changed with the arrival of democracy in Spain in 1975.

In the last thirty years, the number of Spanish astronomers has grown by two orders of magnitude. There are now about 500 astronomers working in Spanish centres with permanent positions, contracts, or fellowships. This number represents 13 astronomers per million inhabitants, a figure that begins to approximate to the situation in other European countries. Among these astronomers, 350 hold doctorates – 235 with permanent positions and 115 with temporary ones – and 150 are PhD students with fellowships or administrative contracts. Half of them are staff at universities, and the other half at national research centres such as the Instituto de Astrofísica de Canarias (IAC) or the Instituto de Astrofísica de Andalucía (IAA). These two institutions, together with the Observatorio Astronómico Nacional (OAN) and the astronomy departments of the universities of Barcelona, Madrid (Complutense and Autónoma), and Valencia, employ 80% of all Spanish astronomers. They spend a similar fraction of the total amount of Spanish public funds shared by the two National Programs dedicated to Astronomy and Astrophysics and Space, and cover the same fraction of the whole of Spanish astronomical production. The distribution of Spanish astronomers between theorists (45%) and observers (50%) is quite a typical one. There is only a slight shortage of instrumentalists (5%), although a big effort is currently being made to correct this trend. Finally, the fraction of astronomers working in the different fields of modern astronomy and using the several techniques available to explore the various wavelength ranges are also very similar to those found in other European countries.

The scientific production of Spanish astronomers has also increased at a similar rate. As reported in the ISI Essential Science Indicators, this currently amounts to 5.67% of the total world astronomical production.

Internationally, this places Spain among the 8 most productive countries in publishing articles on astrophysics, with a total of 4,906 papers, in the period from 1993 to 2003, in journals included in the SCI, and 50,023 citations. The impact (citations per paper) of this production has also grown from 2.84 in the period 1981-1984 to 7.26 in the period 1998-2002. This is close to the average impact of astronomical papers worldwide (7.72). In fact, if we limit the statistics to the papers published in the highest ranked journals, then the relative impact of astronomical papers with a Spanish first author is even slightly higher (by 2.5%) than the average.

What has enabled this spectacular change in such a short period of time? Most crucially, a decisive policy was followed by the Spanish Administration during the eighties to support the development of science by means of an intense fellowship programme and the creation of numerous permanent positions in public research centres and universities. This factor was very effective in encouraging young Spanish researchers to go abroad to complete their training and to work within experienced international groups before returning to Spain. But this is not the whole story. A similar development has taken place in Spain in the majority of scientific fields. However, the progress experienced by astronomy has been particularly marked, as is reflected by the fact that this profession has reached the highest world share of science papers, 5.67% as previously mentioned, quite a far cry from the average among all scientific fields (equal to 2.95%). What also undoubtedly played a decisive role in the development of Spanish astronomy were the international agreements on co-operation in this field signed by Spain with other European countries in the nineteen-eighties. This led to Spanish astronomers gaining good access to first-class observing facilities in Spanish territory. More importantly, it allowed the Spanish astronomical community, more than any other scientific field, to be permanently in touch with foreign researches, which opened Spanish astronomy definitely and more markedly to international science. This favourable situation provided important feedback in the general policy of Spanish governmental support to science: in view of the good trend shown by astronomy, different administrations adopted special measures affecting the field. A clear example of this fact is GRANTECAN, a 10 m telescope currently in an advanced state of construction which, together with the oceanographic ship Hespérides, represents the biggest public expenditure in scientific infrastructure ever made in Spain.

But all this effort would hardly have attained the desired results if Spanish astronomers had not managed to take good advantage of the opportunity offered to them. Thus, we must outline here the great job done by all of these people individually, particularly the youngest generations, which have permanently transmitted to the whole community their enthusiasm to reach new goals. In doing so, they have greatly contributed to raising the level of Spanish astronomy. But it is also fair to recognise here the collective work done by their professional association, the Spanish Astronomical Society (SEA). The SEA, currently with 443 members, was founded in 1992, just after the EAS to which it is affiliated. It is therefore a very young society, which is not surprising given the youth of the new Spanish astronomy as a whole. But probably because of that it is also very active. During its short lifetime it has played a crucial role, indeed, in keeping the Spanish astronomy relatively balanced, despite its rapid development, in both the labour and scientific aspects. This has been done by promoting a sound discussion among the Spanish astronomers with the aim of establishing common strategic objectives and by pressing the Administration to develop adequate policies to achieve them.

One of the most important objectives pursued by the SEA since its foundation concerns the entry of Spain in the ESO. Despite the considerable effort carried out by the Spanish Administration for the development of astronomy in Spain, ESO remains the only large European scientific organisation of which Spain is not a member. The SEA has always been very conscious of the great strategic importance involved in Spain's ESO membership. Indeed, Spain's membership should play a role for the future of Spanish astronomy on a par with the role played by the agreements signed in the nineteen-eighties and which were highly instrumental for its present development. For this reason, the SEA has been urging the Spanish Government in this direction. There is good news in this respect, since negotiations with ESO for the entrance of Spain in 2006 started last March and the new socialist government has maintained this objective. Additionally, the SEA has also played an important role in criticising the public budget and human resources dedicated to science in Spain and in controlling the procedures employed by the Administration in regard to this aim. Indeed, the general great progress performed in Spain in science and technology in the last few years should not conceal the fact that total public investment in this field is only 0.96% of Spanish GDP, one of the lowest in the EU. In addition, the number of research positions, in particular in astronomy, should still double in order to reach the value found in other countries of the EU. With this aim, the SEA has promoted the recent foundation of the Spanish Scientific Society Confederation (COSCE), which we hope will be crucial in the future development

of science in our country, as well as in promoting the interest of Spanish society towards science and technology.

The 2004 Joint European and National Astronomical Meeting will take place next September in Granada, a city generally acknowledged to be a true jewel of Spanish Moorish art. This will be an unprecedented opportunity to further the good relations between the SEA and the EAS and, in a more general way, those between Spanish and European astronomers. The scientific programme proposed by the SOC is open, for the first time in the history of the JENAMs, to all fields of astronomy. Finally, the social events prepared by the LOC, made up of astronomers of the IAA, have been carefully chosen so as to guarantee that all those attending experience a worthwhile meeting. We strongly encourage those of you who have not yet registered to do so quickly. And we look forward to seeing all of you soon in Granada!

Eduard Salvador-Solé
President of the SEA

New approved Astronomy Networks by EC

In the web page of the EU (EC-Marie Curie Actions)

http://europa.eu.int/comm/research/fp6/mariecurie-actions/opportunities/proposals_en.html

we can see that among the astronomy/astrophysics projects, the following projects will be invited to enter into negotiations very soon:

Molecular Universe (512302) and JETSET (005592). On the reserve list (so possible funding if sufficient funds are made available) it is SUPERCOSM (512172).

A rather poor success rate for astronomy.

APOLOGY

I like to apologize to Cataline Olah, who' s name was missed as author of one of the reports of JENAM2003 in the last issue No. 26 of the EAS Newsletter. She organized a very successful session on "active stars" and wrote the relevant report. However I am sorry to say that due to a mysterious reason (not unusual in printing) her name at the end disappeared. Although there is no way to repair this error, I believe she has no hard feelings.

Future IAU meetings

IAU Colloquium No. 198
Near-Field Cosmology with Dwarf Elliptical Galaxies
13-18 March 2005, Les Diablerets, Switzerland
Contact: Helmut Jerjen <jerjen@mso.anu.edu.au>

IAU Colloquium No. 199
Probing Galaxies through Quasar Absorption Lines
14-18 March 2005, Shanghai, China
Contact: Brice Ménard <menard@ias.edu>

IAU Symposium No. 227
Massive Star Birth: A Crossroads of Astrophysics
15-19 May 2005, Catania, Sicily, Italia
Contact: Peter S. Conti <pconti@jila.colorado.edu>

IAU Symposium No. 228
From Lithium to Uranium:
Elemental Tracers of Early Cosmic Evolution
16-20 May 2005, Paris, France
Contact: Vanessa Hill <vanessa.hill@obspm.fr>

9th Asian-Pacific Regional IAU Meeting (APRIM-2005)
26-29 July 2005, Nusa Dua, Bali, Indonesia
Contact: Premana W. Premadi <premadi@as.itb.ac.id>

IAU Symposium No. 229
Asteroids, Comets, Meteors - ACM 2005
8-12 August 2005, Rio de Janeiro, Brasil
Contact: Daniela Lazzaro <lazzaro@on.br>

IAU Symposium No. 230
Populations of High-Energy Sources in Galaxies
15-19 August 2005, Dublin, Ireland
Contact: Evert J.A. Meurs
<ejam@halley.dunsink.dias.ie>

IAU Symposium No. 231
Astrochemistry throughout the Universe:
Recent Successes and Current Challenges
29 August - 2 September 2005, Monterey, CA, USA
Contact: Eric Herbst <herbst@mps.ohio-state.edu>

IAU Colloquium No.200
Direct Imaging of Exoplanets: Science and Techniques
3-7 October 2005, Nice, France
Contact: Claude Aime <claude.aime@unice.fr>

IAU Symposium No. 232
Scientific Requirements for
Extremely Large Telescopes (ELTs)
31 October - 4 November 2005, Cape Town, South Africa
Contact: Michel Dennefeld <dennefel@iap.fr>

Karel A. van der Hucht, IAU AGS

WHO IS WHO IN EAS

MARY KONTIZAS

Editor of the EAS Newsletter (1997-today)

Education

1. BSc., 1969, Mathematics, University of Athens, Greece.
2. PhD., 1973-1977, Astrophysics, University of Edinburgh.

1978-1979
Post-Doc, Haute Provence Observatory, Radial Velocities.

1980-1981
Post-Doc,Trieste Observatory, High Resolution Spectroscopy.

International collaboration

Trieste Observatory (invited professor), University of Edinburgh, NASA/Goddard Space Flight Centre (Invited investigator, 1989-1990), Imperial College, UK, CDS Université Louis Pasteur (invited professor).

Permanent Position

Ass. Professor, Dpt of Physics, National and Kapodistrian University of Athens

Membership

International Astronomical Union since 1979.

Founding Member of the European Astronomical Society and of the Greek Astronomical Society

Activities

a) Editor of the NEWSLETTER of EAS, 1997-

b) Member of the Council of the EAS (1997-2001)

c) Member of Science Working Group for the creation of the Virtual Astrophysical Observatory (Funded by the EU – phase A)

d) Evaluator of national and EU projects

e) Member of the SOC of several International Conferences

Main Topics of my Previous and Current Research

- Radial velocities of supergiants, Ultraviolet Line Variability in O-type stars.
- Observed Dynamical properties and shapes of star clusters in the nearby galaxies.
- The star cluster system of the LMC.
- Spectral Classification of stars in the Magellanic Clouds.
- UV studies of single and double globular clusters in galaxies.
- Star formation regions in the nearby galaxies.
- Metallicity and Age evolution of the Magellanic Clouds.
- AVO, CDS "Science tests with archive data and tools".

Educational activities

I teach various undergraduate and post-graduate courses of astrophysics.

I have been so far supervisor (PhD thesis) for 12 students (9 completed)

I participated in the planning and organization of the laboratory of astrophysics for the Physics Dpt of the Univ. of Athens.

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Joint European and National Astronomical Meeting for 2004

JENAM – 2004

13th European Meeting for Astronomy and Astrophysics

13-17 September, 2004, Granada, Spain

Second Announcement

The many scales in the Universe

This is the second announcement and a call for papers for this year Joint European and National Astronomical Meeting, ***"The many scales in the Universe"***, to be held in Granada (Spain) from 13 through 17 September, 2004, organized by the European Astronomical Society and the Spanish Astronomical Society and hosted by the Instituto de Astrofísica de Andalucía (CSIC).

Encompassing **all branches of astronomy** from theory to observations, instrumentation, and public outreach, the conference is structured into six parallel sessions:

- Roads to cosmology
- The life of galaxies
- Your favourite stars and their environments
- The Sun and planetary systems
- Real and virtual instruments
- Teaching and communicating astronomy (with simultaneous translation to and from Spanish).

Five plenary sessions, covering topics from the first five parallel sessions, will include invited speakers who are talking about subjects of general interest. Exhibits by large astronomical or astronomy-related organizations, the scientific press, industries with interests in astronomy, and science museums and planetariums will a have a place as well. During the conference, a job market will be organized where potential employers and candidates seeking a position can meet and contact directly. Business meetings of the two organizing societies will take place also during the week.

Please visit our continuously updated web pages (http://www.iaa.es/jenam2004) and browse the scientific rationales and the proposed invited speakers for each parallel session, and all current relevant information to the meeting. A Registration Form (including parallel session choice, abstract submission utilities, financial support requests, and accommodation reservation) is also available over there. Abstracts should be sent in LaTeX typescript before 31 May.

1. Scientific Organizing Committee - SOC — E. Alfaro (Granada, *co-ordinator*), G. Bernabéu (Alicante), H. Butcher (Dwingeloo, *co-chair*), M. Castellanos (Madrid), R. Domínguez Tenreiro (Madrid), F. Figueras (Barcelona), M.A. Gómez-Flechoso (Madrid), J. Gorgas (Madrid), B. Gustaffson (Upsala), A. Herrero (La Laguna), V. Martínez (Valencia), V. Martínez Pillet (La Laguna), J.M. Rodríguez Espinosa (La Laguna), E. Salvador (Barcelona, *co-chair*), A. Sánchez Lavega (Bilbao), J. Silk (Oxford), M. Stavinschy (Bucarest), N. Thomas (Bern), J.C. del Toro Iniesta (Granada).

2. Local Organizing Committee - LOC — A. Alberdi, E. Alfaro, I. Bustamante, C. Cano Cortés (*secretary*), B. Cantero, L. Lara, S. López de Lacalle, A.C. López Jiménez, F. Rendón, J.F. Rodríguez Gómez, J. Ruedas, J.C. del Toro Iniesta (*chair*).

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JENAM 2004

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Web site: http://www.iaa.es/jenam2004/

3. Conference Venue — The meeting will take place in Granada's Palacio de Congresos (Conventions Centre) where halls will be allocated for both plenary and parallel sessions; small seminar rooms for executive meetings of the organizing societies have also been booked in within the premises. The facilities include enough additional room for posters, for commercial (scientific press, technology companies, etc.) or organizational (ESO, ESA, OPTICON, RadioNET, etc.) exhibitors and for coffee breaks. A small cafeteria will also be available throughout the conference hours. Granada can be reached by plain from Madrid and Barcelona airports; the Málaga international airport is 75 min far from Granada by car (buses are also available). Please contact our secretary, Ms. C. Cano (jenam2004@viajeseci.es), if you need any help for transportation. Visa may be required for citizens from some countries. Please make sure that you fulfil the eventual requirements. If you need some help, do not hesitate in contacting the LOC.

4. Accommodation — Lodging of all classes will be available. Please check our Web pages.

5. Social Events — The foreseen social events are listed on the Web pages.

6. Financial assistance — The registration fee can be waived upon request totally or partially to a number of participants who may need special support. Those participants will be kindly required to present a communication. Following our tradition, the Sociedad Española de Astronomía (SEA) will cover the registration fee of its Junior members. Details will be specified soon on the Web site and on the next EAS newsletter.

7. Registration fee — Please check the information on our Web page.