



EUROPEAN ASTRONOMICAL SOCIETY **NEWSLETTER**

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EDITORIAL

Over the past few years the winter issue of the EAS newsletter has been dedicated to reports from the annual EAS meeting. This is also the case in the present issue which includes brief contributions of the convenors of eight Symposia and six Special Sessions that took place during the European Week of Astronomy and Space Science (EWASS) last July. Those of us who did not have the opportunity to attend the meeting and enjoy the white nights of Saint Petersburg can at least get a glimpse of the various scientific activities. Along with the report of the President of the Society, addressed to the participants of EWASS 2011, we include the transcript of the plenary talk of Dr. Roger-Maurice Bonnet who was recipient of the Struve Award.

In the pages of this newsletter we will also have the pleasure to read a long article entitled "Potential Hazards of Near Earth Objects (NEOs) – Truth and Consequences" prepared by Karel A. van der Hucht. This very interesting review quantifies a number of issues related to NEOs and reminds us of the rather grim consequences of collision experiments which involve our planet and massive fast-moving meteors... Two reports of Working Groups set up by the EAS Council also provide useful information on the status of Open Access Publishing in Astronomy and the Future of Space Astronomy. Finally, Jean-Paul Zahn presents a brief perspective on the impact of the first 50 volumes of the EAS Publications Series. This was an initiative that commenced ten years ago and thanks to the hard work of everybody involved under the direction of the Editor in Chief has been a great success. We all hope that in a few years we will have the opportunity to hear again from Jean-Paul, once 100 the volume milestone is reached!

Vassilis Charmandaris
University of Crete, Greece

MESSAGE FROM THE PRESIDENT

EAS councillor Andrey Finkelstein died September 18. Andrey was a dynamic person whom it had been a pleasure to see during our EWASS meeting in Saint Petersburg at the beginning of July. News of his death reached me while we were having an exchange of e-mails following his suggestion that the institute he led become an organisational member of the EAS. This had been one of his very concrete steps to improve

in one move the finances of the Society and the links between his institute and the EAS. I have always enjoyed my meetings with Andrey and appreciated his lively and dynamic way of considering issues and opportunities. His death is a loss for many around him, including the EAS and its council. I want to express our sympathy with all who were close to him. Council is now taking steps to appoint a successor. This will have taken place when you will read these lines. In doing so Council is paying particular attention to maintain and possibly increase our relationship with the large and important Russian astronomical community.

The loss of Andrey Finkelstein came a few weeks after the EWASS meeting in Saint Petersburg. This meeting described elsewhere in this issue of the Newsletter was successful, fruitful and pleasant. It must be noted, however, that a number of members had problems obtaining a visa to travel to Russia and were thus prevented from attending. This had a negative impact on the conduct of the meeting, both scientifically and as the place where the business of the Society is conducted. It will be important in future years that organisers learn from these problems so that such difficulties can be avoided. Scientific progress needs international exchanges. Authorities must be made aware of this and act in such a way that these exchanges can indeed take place.

In Saint Petersburg itself, the EWASS meeting was a major success. The scientific program put together by the Scientific Organising Committee under the leadership of Iossif Papadakis from Crete and the local organisation under the authority of Alexander Stepanov of Saint Petersburg gave rise to well attended sessions and lively discussions in a very constructive framework. Our thanks go to all who have contributed to this success. The warm hospitality of our colleagues in Saint Petersburg made our stay in their city a real pleasure.

The evolution of the EWASS meetings in the coming years will be the subject of discussions at a meeting of the EAS council with the presidents and representatives of the affiliated societies. It is our aim to build on the success of the formerly JENAM, now EWASS meetings in the last years to strive towards a truly pan-European regular set of meetings. These discussions will take place in Rolle on the shores of Lake Geneva at the beginning of February. This meeting will also be the opportunity for exchanges between the EAS, officials of the European Commission and colleagues of ASTRONET.

You will find in this issue a first report of two working groups set up by council to prepare EAS position papers. As discussed in the last Newsletter, once close to being ready these papers will be open for comments by members of the Society before final edition and approval by Council.

As you may see on the organisational members web page (http://eas.unige.ch/member_dir.jsp), efforts to increase the constituency of this class of members continue. You are urged to pursue this also with your institute and with organisations with an interest in or activities related to astronomy in your region. Organisational members are providing an essential

element to the funding of the EAS and thus to the activities that the Society can undertake on your behalf.

As this newsletter will reach you close to the New Year, let me wish all of you a fruitful 2012. I'm convinced that our contribution to society is of immense value, even when the conditions of society around us are hard.

Thierry Courvoisier
President of EAS

NEWS

FROM THE EAS COUNCIL

The EAS Council would like to draw the attention of our members to the 2012 Prizes of the European Astronomical Society.

- The “Tycho Brahe Prize”: in recognition of the development or exploitation of European instruments, or major discoveries based largely on such instruments.
- The “Lodewijk Woltjer Lecture”: to honor astronomers of outstanding scientific distinction.

More information on the statutes and past recipients of the Prizes can be found in the web page of the Society. Both Prizes will be officially awarded in the EWASS 2012 meeting, which will take place in Rome in July 2012.

Due to the unfortunate loss of Andrey M. Finkelstein, his position at the Council of EAS was vacated. During a telecon, which took place on November 27, 2011, the EAS Council approved the nomination of Prof. Juri Poutanen (Finland) as a new member of the Council. Dr. Poutanen is Professor and Chair of the Astronomy Program at the Department of Physics of the University of Oulu. More information on his research background can be found at: <http://cc.oulu.fi/~jpoutane>

Elias Brinks
Secretary of EAS

EWASS 2012

As some of you already know the 2012 European Week of Astronomy and Space Science (EWASS) will take place on July 1-6, 2012 in Rome, Italy. EWASS 2012 is co-organized by the EAS and the Società Astronomica Italiana and it is sponsored by INAF, the Italian National Institute for Astrophysics. All scientific activities will be housed at the excellent facilities of the Pontificia Università Lateranense, which is located at the Piazza di San Giovanni in Laterano, at the center of Rome, just a few blocks from the Colosseum. The Scientific Organizing Committee (SOC) is preparing an exciting program, which already includes a total of nine Symposia and eleven Special Sessions. These are:

EWASS 2012 Symposia

- Molecular gas in high-z galaxies
- The astrochemical universe unveiled with Herschel
- Gas for cosmology in the nearby Universe
- The Galactic Plane reloaded: a brand new Multiwavelength Milky Way from TeV to MHz
- GAIA Research for European Astronomy Training: GREAT Network Science Symposium
- Stellar Populations 55 years after the Vatican Conference
- Theory and observations of Core-Collapse Supernovae: from the explosion mechanism to the building up of the remnant; an update of what is being done in Europe
- The Sun: new tools and ideas in observational solar astrophysics
- Europlanets EPO node

EWASS 2012 Special Sessions

- Cosmic reionization: updating physical scenarios
- Use of gravitational lensing to study distant galaxies
- The picture of galaxy evolution painted with Lyman alpha
- Structure of galaxy disks shaped by secular evolution and environmental processes
- Morphology and kinematics of interacting galaxies
- The European Extremely Large Telescope
- The build up of the red sequence
- ASTRO-H: High-energy Astrophysics with the Next-Generation X-ray Observatory
- Formation and disruption of jets in black-hole binaries and AGNs
- Scientific and technological challenges in the study of Solar System origin
- From solar physics to astrophysics: the Sun as Rosetta stone for understanding astrophysical processes

The individuals participating in the committees who have the task to bring this conference to a success are:

Scientific Organizing Committee

Roberto BUONANNO (SAIt, Italy) (Chair)
Francoise COMBES (Observatoire de Paris, France) (Chair)
Emilio ALFARO (Spanish A&A Society, Spain)
Tanyu BONEV (Observatory of Rozhen, Bulgaria)
Giuseppe BONO (Tor Vergata University, Italy)
Corinne CHARBONNEL (French A&A Society, France)
Emanuele GIALLONGO (OAR-INAF, Italy)
Roberto GILMOZZI (ESO)
Luka POPOVIC (Observatory of Beograd, Serbia)
Somak RAYCHAUDHURY (University of Birmingham, UK)
José Miguel RODRIGUEZ ESPINOSA (Instituto de Astrofísica de Canarias, Spain)
Sabine SCHINDLER (Austrian A&A Society, Austria)
Catherine TURON (Observatory of Paris, France)
Pietro UBERTINI (IASF-INAF, Italy)
Jose VILCHEZ (IAA Granada, Spain)

Local Organizing Committee

Maria Teresa CAPRIA (IASF-INAF, Italy) (Chair)
Ilaria ERMOLLI (OAR-INAF, Italy) (Chair)

Francesco D'ALESSIO (OAR-INAF, Italy)
Maria Rosaria D'ANTONIO (ASDC-ASI, Italy)
Viviana FAFONE (Tor Vergata University, Italy)
Livia GIACOMINI (IFSI-INAF, Italy)
Giuliana GIOBBI (OAR-INAF, Italy)
Giuliano SABATINO (IASF-INAF, Italy)

More information regarding scientific and administrative activities taking place in parallel with EWASS 2012 as well as practical information regarding the registration fees and deadlines will become available in the website of the conference: <http://www.ifs-roma.inaf.it/ewass2012/>

We all look forward to seeing you in Rome.

On behalf of the EAS Council
Mary Kontizas
Univ. of Athens, Greece

VIKTOR AMBARTSUMIAN INTERNATIONAL PRIZE

The “Viktor Ambartsumian Prize”, established in 2010, is one of the important awards in astronomy/astrophysics and related sciences. It is being awarded to outstanding scientists having significant contribution in physical-mathematical sciences from any country and nationality. The Prize totals USD 500,000 and is being awarded once every two years. The first winners of the Prize were M. Mayor, G. Israelian, and N. Santos for “*for their important contribution in the study of relation between planetary systems and their host stars*”.

To apply for the Prize, a nomination of the work of an individual or a group of no more than 3 persons must be submitted to the secretariat of the steering committee. The cash award is being equally shared among the winners, and a diploma, a medal and a certificate are being awarded to each winner. The nomination deadline for the 2012 Viktor Ambartsumian Prize is March 18, 2012. The decisions will be made before July 18, 2012 and the Award ceremony will take place on September 18, 2012.

For more information pertaining to the nomination eligibility and other details, visit the official webpage at <http://vaprizе.sci.am> or contact the scientific secretary of Viktor Ambartsumian prize committee, Dr. A. M. Mickaelian, at +374-91-195914, or aregmick@aras.am

THE EAS WORKING GROUP ON THE FUTURE OF SPACE ASTRONOMY

by Mike Watson, Univ. of Leicester

The working group was set up in early 2011 under the auspices of the EAS to examine a range of issues relating to the future of space astronomy. The aim of the working group is to assess

the state of space astronomy from an European perspective, compare it to the recent past and evaluate its current status and outlook, noting the widespread concern over the way mission opportunities have been declining. There are clear dangers inherent in this, for example in terms of loss of scientific opportunities and of expertise in the community. Background activities of the group have centred on compiling a comprehensive list of space astronomy missions and carrying out a survey of European institutions involved with space astronomy technology and instrumentation.

This information, coupled with a detailed evaluation of the science priorities for the coming decades, forms the essential backdrop to the group's work. In parallel the group has identified the key issues that need to be addressed to ensure the preservation of Europe's current strengths in space astronomy and has begun the task of formulating a set of realistic recommendations.

The group aims to complete its report by the end of 2011 at which stage it will be published online for EAS members' comment before final presentation of the report to EAS Council in early 2012.

Working Group Members

Mike Watson, University of Leicester, UK (chair)
Jan-Willem den Herder, SRON, NL
Hans Ulrik Nørgaard-Nielsen, DTU, DK
Jean-Paul Kneib, OAMP, F
Roberto Maiolino, INAF-OAR, I
Martin Ward, Durham University, UK
Sergio Volonté, formerly ESA Science Directorate
Marc Audard, ISDC, CH

THE OPEN ACCESS PUBLISHING IN ASTRONOMY

In 2001, researchers initiated a movement that transformed into the today called "Budapest Open Access Initiative" (BOAI). This initiative asks the scientific community to enter a new communication system favored by the possibilities offered by Internet. In most cases, astronomical/astrophysical publications are not remunerated. Scientists need, however, to be considered as owners of their work, and that the influence or importance of their results be duly acknowledged. On one hand, this claim puts forward genuine rights of the scientists, but on the other hand, it establishes an unavoidable dependence with the publishers, who secure the required professional publishing practice and environment enabling high level presentation of the scientific results, their effective dissemination, the access to them and their citation, and carry out the various procedures ensuring the evaluation and valorization of the scientific work at national and international level.

The astronomical scientific activity is publicly funded and its outputs simply given to journals, which in most cases are bought by publicly funded libraries, or publicly funded

researchers themselves. The access to the journals depends, however, on the possibility to pay the required subscriptions, which have kept increasing steadily and substantially since at least three decades. Contrary to what could be expected, the electronic implementation of publications has increased the cost of the subscriptions, while public funding has dwindled regularly. The increasing cleavage between these tendencies entails a decrease of the acquisition power of libraries of such publications and consequently a decreased dissemination of scientific results.

The hampered accessibility to publications and the embargo imposed by the publishers on the newly issued articles, have unleashed the Open Access Initiative (OAI). Although attractive to researchers, this initiative has essentially echoed among the government authorities and public-funding institutions. Since the latter consider that "publicly-funded research results are public good, and as such should remain in the public realm", they immediately urged the researchers to publish in open access journals, and/or deposit their articles in open access repositories. The Open Access Publishing (OAP) demands several implementations to finance the publications. Accordingly, authorities have made statements of principles, but in most cases nothing significant was concretely done to carry out the required changes.

The publication and access to research results are, however, fundamental for the development of the scientific research. Owing to more or less recent debates that revealed some worries about the new conditions for circulation and access to scientific publications, the European Astronomical Society (EAS) has asked for an evaluation of the evolution of the market and general conditions for astronomical scientific publishing in Europe and to discuss the ways to implement the open access to these publications.

To this end, an EAS working group was constituted with astronomers from several European countries that will produce a document on several aspects concerning the OAP in Astronomy. The members of the EAS working group are from Denmark, Italy, France, Germany, the Netherlands, Swiss, Portugal and United Kingdom. This document aims at drawing up the prospects on the OAP in the most frequently used astronomical journals as well as answering some questions raised by this new way of publishing. It will gather all relevant information on the respective business models of journals and their publishing specificities. Since the OAP requires rather large changes in the way of diffusing the scientific results, this report will examine how to get publishing regarded as part of research projects and how to replace the classical subscriptions of journals; it will also discuss policies regarding embargoes and archiving of research results, etc. A first draft addressing these questions has been prepared and will be submitted to all members of the working group and to the astronomical journals for further discussion and completion. It is planned that the report will be ready in the first semester of 2012.

On behalf of the EAS working group: G. Meynet, J.-P. Zahn, J. Zorec

ANDREY M. FINKELSTEIN

The Institute of Applied Astronomy of the Russian Academy of Sciences has suffered a grievous loss: the Institute Director, Honored Scientist of the Russian Federation, professor, Corresponding Member of Russian Astronomical Society (RAS) Andrey M. Finkelstein passed away on September 18, 2011 at the age of 69.



Andrey Finkelstein was widely known in Russia and abroad as one of the leading specialists in the fields of relativistic celestial mechanics, radio astrometry, space geodesy, and very long baseline interferometry. He is one of the founders of a new scientific field – the fundamental positioning, navigation and timing support – which arose in the early 1980s at the junction of astrometry, geodynamics, celestial mechanics, astronomy, and radio engineering.

Andrey Finkelstein's scientific activities began in 1968. After graduating from the Leningrad State University as a specialist in "Theoretical Physics", he joined the Academy of Sciences of the USSR, where he rose from Laboratory Assistant to Director of an academic institution.

In 1986, according to a decree of the USSR Presidium of the Academy of Sciences, Andrey was appointed head of the "Quasar" project and, from 1988, Director of the newly established Institute of Applied Astronomy of the Academy of Sciences of the USSR (now Russian Academy of Sciences). Andrey Finkelstein was a prominent scholar with a wide profile. His research interests ranged from theoretical aspects of relativistic physics and astrometry, to space geodesy and celestial mechanics, to methodological and instrumental problems of very long baseline interferometry. He is the author of 268 scientific papers, five monographs, and fifteen patents.

The main scientific achievements of Andrey Finkelstein are:

- validation of relativistic theories with high-precision measurements;
- relativistic theory for the reduction of VLBI observations; a new method of construction of the celestial coordinate system;
- theory of the influence of the turbulent troposphere on VLBI measurements;
- establishing the "Quasar" VLBI Network at the core of the Russian positioning, navigation, and timing system, providing in excess of 12% of the global amount of radio astrometry and space geodesy data;
- setting up a system for high-precision determination of universal time providing data to various users including GLONASS;
- co-locating the "Quasar" VLBI observatories with various other high-precision space geodetic instruments such as satellite laser ranging (SLR), GNSS systems (GLONASS, GPS, GALILEO), and DORIS;
- pioneering research on the refinement of the international terrestrial and celestial coordinate systems, the determination of the Earth's rotation parameters, the study of the

effects of global tectonics, the study of radio propagation, and mapping of the geodetic radio sources.

For his work on the creation of the "Quasar" network, Andrey Finkelstein was given an award for science and technology by the Government of the Russian Federation. In 1999 he was awarded the honorary title "Honored Scientist of the Russian Federation".

In 2003 Andrey Finkelstein was elected as a Corresponding Member of RAS in the specialty "Astronomy". He was a foreign member of the Royal Swedish Academy of Engineering Science, a member of the Observing Program Committee of the International VLBI Service for Geodesy and Astrometry (IVS), a member of the Directing Board of the European VLBI Network (EVN), a member of the Directing Board of the European Astronomical Society (EAS), and a member the International Astronomical Union (IAU) as well as other international scientific organizations.

Andrey Finkelstein was a member of the editorial boards of domestic and foreign publications, Deputy Chairman of the Scientific Council of RAS on "Positioning Timing, and Navigation Support", Chairman of Section No. 9 "Astrometry, Celestial Mechanics and Applied Astronomy" of the RAS Scientific Council on Astronomy, and a member of the Presidium of the St. Petersburg Scientific Center of RAS. He was also a member of the Chief Designers Board of the GLONASS system and chief designer of the GLONASS fundamental support area.

Andrey Finkelstein paid much attention to training students as head of the Department of Radio Astronomy of Saint Petersburg State Electro-Technical University and as head of the Branch of the Radio Physics Department of Saint Petersburg State Polytechnic University. From his students, twelve – four of which were foreigners – obtained Doktor Nauk (Dr. Hab.) or Kandidat Nauk (PhD) degrees.

The staff members of the Institute of Applied Astronomy RAS express their deepest sympathy to the family and friends of Andrey Finkelstein. His name will live forever in the hearts of his colleagues, students, staff members of the Institute, and all who had contact with this bright, extraordinary, and talented man.

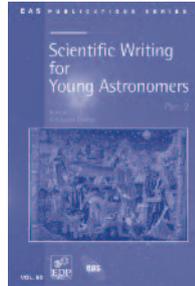
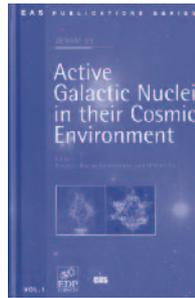
A. V. Ipatov (Deputy Director), S. G. Smolentsev (Deputy Director), N. V. Shuygina (Scientific Secretary)

TEN YEARS OF EAS PUBLICATIONS SERIES

At the JENAM of 2001 in Munich, the Council of the European Astronomical Society decided to launch a publications series dedicated to the proceedings of conferences and colloquia, but also of workshops and of schools. The need for such a series was felt when it appeared difficult to publish the proceedings of mini-symposia held during the yearly JENAMs. And we were aware that many workshops and schools deserved to reach a readership beyond just those who

attended the meeting. After a round of consultations with the major publishers in Europe, EDP Sciences made the best offer in terms of quality and price, and we chose it as partner.

Fifty volumes have since been issued, and the present rate turns around six volumes per year. The cover pages of the first volume, as well as volume 50 which just appeared are presented here. The EAS Publications Series has gained worldwide visibility: it is read in 133 countries and is indexed in the major databases, such as ADS. EDP Sciences has signed a partnership agreement with Cambridge University Press, which will help to broaden our diffusion. Many volumes, such as school proceedings, couldn't have been published in the classical circuit; several of them now serve as textbooks.



Now some practical informations. The organiser of a meeting contacts the scientific editor (Jean-Paul.Zahn@obspm.fr), who after consulting some experts in the field decides whether the planned proceedings are acceptable for publication in the Series. Once the text (in LaTeX) has been delivered to the publisher, the book appears in less than three months. The organiser of the meeting is asked to purchase at least 60 volumes, at 25% discount, to be distributed to the participants; lower prices apply over 100 volumes. The public selling price is presently 60 euros per volume, for 350 pages; EAS members benefit from a rebate of 20%.

If you wish to learn more about EAS Publications Series, you are invited to visit our website at www.eas-journal.org. There you will find also the list of the past volumes, and instructions on how to order them.

Jean-Paul Zahn
Scientific Editor

2012 ASTRONOMY SCHOOLS

The following astronomy schools, which will take place in 2012, are likely of interest to some of the members of our Society. Please pass along this information to graduate students of your institute.

- The NAT Lectures on Astrophysics on “Collapsing or Colliding Systems: Solving the Galactic Puzzle”
6-10 February 2012, Sao Paulo, Brazil
<http://sites.google.com/site/natlectures/>
- STFC course on “Exoplanets and their host stars”
12-16 March 2012, St Anne’s College, Oxford, UK
<http://www.physics.ox.ac.uk/EAS12>

- The 42nd Saas-Fee Course on “Dynamics of Young Clusters & Associations”
25-31 March 2012, Villars-sur-Ollon, Switzerland
<http://www.astro.phys.ethz.ch/sf2012/>
- The Nordic-Baltic Research School 2012 on “Observational Stellar Astrophysics in the Era of GAIA and Kepler Space Missions”
July – 11 August 2012, Moletai Astronomical Observatory, Lithuania
<http://mao.tfai.vu.lt/nordicbaltic2012/>

REVIEW ARTICLE

POTENTIAL HAZARDS OF NEAR EARTH OBJECTS (NEOs) – TRUTH AND CONSEQUENCES

by Karel A. van der Hucht, EAS Councilor, SRON National Institute for Space Research, Utrecht

1. Introduction

“It is an unfortunate fact that the Earth is struck by a massive asteroid or comet from time to time, wreaking havoc on its inhabitants. Astronomical observations indicate that an object at least a kilometer in size strikes our planet about once every 700,000 years, with an explosive power equivalent to about ten million times that of the Hiroshima atomic bomb. The recognition and counting of large impact craters on the Earth and the Moon leads to a derived impact rate in agreement with the above. Theoretical studies of the effect of such large explosions indicate that such an event would lead to a global climatic catastrophe which would cause the death of a large fraction of humankind. Such studies have been validated by observations of the aftermath of the impacts on Jupiter in 1994, in which small cometary fragments caused damage spread over four times the area of the Earth. It is well-established that the extinction of the dinosaurs 65 million years ago was caused by a massive impact of a body with a diameter of 10 ± 4 km, and there have been other asteroid and comet impacts since then. While such calamitous events are extremely rare, the consequences are so enormous that the possibility of such events must be taken seriously. ... Recognizing the above situation from multi-disciplinary research carried out over the past 40 years, scientist are now urging that the governments of the world cooperate so that we may determine when the next imminent lethal asteroid or comet is due to strike the Earth within a century or so. This surveillance program is called Spaceguard (Milani et al. 1989, 1990). Unlike the dinosaurs, we are smart enough to spot our potential nemesis coming, and then to shove it out of the way.” ... So far Duncan Steel (adapted from Steel, 1997).

The case made by Steel 14 years ago for kilometer-sized objects is still as valid as ever. In the meantime, the potential hazard of smaller objects has been appreciated. In 1998 the minimum size for potentially hazardous Near Earth Objects

(NEOs) was scaled down from 1 km to 140 m. And in 2008 it was realized that the 1908 Tunguska explosion, which flattened ~2000 km² of forest in Siberia, may have been caused by a NEO with a diameter of only $\sim 40 \pm 10$ m (Boslough & Crawford 2008; Steel 2008). This makes NEO surveys for objects down to 40 m mandatory. The number of NEOs with diameters $D > 40$ m is estimated at $\sim 3,000,000$, of which presently $\sim 2\%$ is known. Ignoring the threat of potentially hazardous NEOs would be putting planet Earth at serious risk. NEOs are the only astronomical objects, apart from the Sun, which are critically relevant to every human being.

2. Definitions and statistics

Of the NEOs we discuss here notably the Near Earth Asteroids (NEAs), because they are ~ 100 times more numerous than Near Earth Comets (NECs).

An asteroid is coined a Near Earth Asteroid (NEA) when its trajectory brings it within 1.3 AU from the Sun and hence within 0.3 AU of the Earth's orbit. The largest NEA known is 1036 Ganymed ($D = 31.7$ km, $P_o = 4.34$ yr).

A NEA is said to be a Potentially Hazardous Asteroid (PHA) when its orbit comes to within 0.05 AU and has, presently, a diameter $D > 140$ m. The largest known PHA is 4179 Toutatis ($D = 4.6 \times 2.4 \times 1.9$ km, $P_o = 4.03$ yr).

Since 1947, the IAU Minor Planet Center (MPC, SAO, Cambridge, MA, USA, <www.cfa.harvard.edu/iau/mpc.html>) is the clearing-house for discovery and orbit determination of comets and asteroids. MPC-determined orbits are verified instantaneously by NEODys (University of Pisa, Italy, <newton.dm.unipi.it/neodys/>) and by SENTRY (JPL, USA, <neo.jpl.nasa.gov/risk/>). Over 95% of all NEO detections have been made by surveys in the USA.

As of 3 November 2011 the census was (see: <neo.jpl.nasa.gov/stats/>): 8331 NEAs, including 1262 PHAs.

- Estimated number of NEAs with $D > 1$ km: 966 ± 45 ;
observed: 830 (86 %), including 151 PHAs.
- Estimated number of NEAs with $D > 140$ m: $\sim 15,000$;
observed 4997 (~ 33 %).
- Estimated number of NEAs with $D > 40$ m: $\sim 300,000$;
observed 7074 (~ 2 %).
- Estimates from Harris (2011)
<cms.dynaweb3.nl/users/esa//docs/11C03_Planetary_Defense/session2.htm>.

Table 3. Some impacts

(See: <www.iau.org/public/nea/>)*

T (yr)	D (asteroid)	crater	D (crater)	E (MT TNT)
65 Myr ago	10 ± 4 km	Chicxulub, Mexico	180 - 300 km	10^8
50 Kyr ago	~ 40 m	Barringer, USA	1.2 km	2.5
1490	meteorite fall	Shani, Chi	-	$\dagger > 10,000$ people
1908	40 ± 10 m	Tunguska, Siberia	[2000 km ²]	10-15
1947	meteorite fall	Sikhote Alin, Russia	1- 26m	
2007	meteorite fall	Carancas, Peru	15 m	
2008 TC3	~ 4 m	Sudan	280 pieces	

* «Near Earth Asteroids (NEAs). A Chronology of Milestones». This IAU web page quotes facts related to NEAs for the period AD 1800 - 2200 from available literature and web sites: discoveries, close encounters within 1 LD (source: JPL), related scientific literature, conferences, and reports.

Table 1. Observed number of NEA fly-bys within 1 Lunar Distance (LD) from Earth

Year	Number	Dimension-range (m)
2001	1	20
2002	2	35 - 80
2003	5	4 - 20
2004	10	5 - 30
2005	3	10 - 15
2006	12	4 - 20
2007	19	3 - 35
2008	22	1 - 35
2009	20	5 - 20
2010	25	4 - 30
2011	27	1 - 35 - 400

A 5-m-sized NEA from the undiscovered population of about 30 million would be expected to pass Earth daily within 1 LD, and one might strike Earth's atmosphere about every two years on average. If a 5-m-sized asteroid were to enter Earth's atmosphere, it would be expected to burn up high in the atmosphere and cause no damage to Earth's surface.

Ref: <www.jpl.nasa.gov/news/news.cfm?release=2010-332>.

Table 2. The eight observed closest NEA fly-bys, within 0.1 Lunar Distance (LD) of Earth

See: <www.iau.org/public/nea/>.

Date	NEA	Size (m)	Distance from the geocenter
8 2004, Mar 18	2004 FH	20	7.71 R_{Earth}
7 2004, Dec 19	2004 YD5	5	5.32 R_{Earth}
6 2008, Oct 20	2008 US	2	4.87 R_{Earth}
5 2009, Nov 6	2009 VA	7	3.21 R_{Earth}
4 2011, Jun 27	2011 MD	9	2.9 R_{Earth}
3 2004, Mar 31	2004 FU162	6	2.03 R_{Earth}
2 2008, Oct 9	2008 TS26	1	1.97 R_{Earth}
1 2011, Feb 4	2011 CQ1	1	1.9 R_{Earth}
0 2008, Oct 6	2008 TC3	3	1.00 R_{Earth}
...			
x 2029, Apr 13	99942 Apophis	270	5.97 R_{Earth}

2008 TC3 was discovered by the Catalina Sky Survey (CSS) 19 hours before disintegrating over the Nubian desert (northern Sudan). Before impact, the international observer community responded with 570 follow-up observations from 27 observers. A systematic search in the Nubian desert located 280 meteorite fragments with a total mass of 3.9 kg.

Table 4. Estimates of approximate average NEA impact intervals and impact energies

(Shapiro, 2010)

Type of event	Characteristic diameter of impacting object (m)	Approximate impact energy (MT)	Approximate average impact interval (yr)
airburst	25	1	200
local scale	50	10	2 000
regional scale	140	300	30 000
continent scale	300	2 000	100 000
< global catastrophe threshold	600	20 000	200 000
possible global catastrophe	1 000	100 000	700 000
> global catastrophe threshold	5 000	10 000 000	30 000 000
mass extinction	10 000	100 000 000	100 000 000

3. Present and future: the international Spaceguard survey

Table 5. The Spaceguard surveys

Ground-based

Spacewatch		<spacewatch.lpl.arizona.edu/>			
0.93 m, 1.8 m	3° FoV	v = 22 mag	USA		1980
Lincoln Near-Earth Asteroid Research (LINEAR)		<www.ll.mit.edu/mission/space/linear/>			
1.0 m	2° FoV	v = 19 mag	USA		1997
Catalina Sky Survey		<www.lpl.arizona.edu/css/index.html>			
0.68 m, 0.5 m, 1.5 m	8.2°, 4.2°, 1.2° FoV	v = 19.5, 19.0, 21.5	USA/Australia		1998
La Sagra Sky Survey		<www.minorplanets.org/OLS/>			
three 45 cm	f/2.8		Spain		2006
Panoramic Survey Telescope And Rapid Response System (Pan-STARRS)		<pan-starrs.ifa.hawaii.edu/public/>			
four 1.8 m	3° FoV	1.4 gigapixel cam	v = 24 mag	USA	2008
Large Synoptic Survey Telescope (LSST, Chile)		<www.lsst.org/lsst>			
8.4 m	3°×3° FoV,	3.2 gigapixel cam	v = 24.5 mag	USA	2016
Asteroid Terrestrial-impact Last Alert System (ATLAS)		<arxiv.org/abs/1011.1028>			
2 x 25 cm 100 km apart		v = 20 mag	USA		?

Space-based

WISE / NEO-WISE, in LEO		<wise.ssl.berkeley.edu>			
40 cm	47' FoV	thermal IR		USA	2010
NEOSSat, in LEO		<www.neosnat.ca/>			
15 cm	0°.85 FoV	optical	v = 20 mag	Canada	2012
GAIA, in L2		<www.rssd.esa.int/index.php?project=Gaia>			
two 1.4 × 0.5 m	optical		v = 20 mag	ESA	2013
AsteroidFinder, in LEO		<www.dlr.de/pf/en/desktopdefault.aspx/tabid-174/319_read-18911/>			
30 cm	2°×2° FoV	optical	v = 18.5 mag	Germany	2013
NEO Survey, in Venus-like orbit		<www.lpi.usra.edu/decadal/sbag/topical_wp/RobertFArentz.pdf>			
50 cm	3°.3×3°.3 FoV	IR		USA / International	?

For all surveys applies that, in addition to detecting, tracking and characterization of NEOs, they monitor all variable objects of the sky: the Solar system, variable stars, supernovae, quasars, AGNs.

4. Towards a permanent International NEO Early Warning System

The D > 1000 m target

In 1998 NASA was charged by US Congress to discover within 10 years 90 % of the NEO population with D > 1000 m. Presently, ~86 % of an estimated number of 966 (Harris, 2011) has been discovered.

The D > 140 m target

In 2005 NASA was charged by US Congress to discover within 15 years 90% of the NEO population with D > 140 m. Presently, ~33% of an estimated number of 15,000 NEAs has been discovered.

It is recognized that in order to reach the 140-m detection target before 2020, even the capabilities of Pan-STARRS and LSST will not suffice. Space-based observatories operating in

the thermal infrared appear necessary. Funding of US NEO surveys up to M\$ 350 per year for at least 10 years is being sought (Binzel et al. 2010).

The D > 40 m target

As stated in the last paragraph of Section 1 of this paper, the necessity for surveying NEAs down to 40 m is dictated by the notion that the 1908 Tunguska impactor may have had a diameter of only $\sim 40 \pm 10$ m (Boslough & Crawford 2008; Steel 2008). Presently, $\sim 2\%$ of an estimated number of 300,000 of NEAs with D > 40 m has been discovered.

5. European involvement

As stated above, some 95% of all new NEO discoveries have been made by survey observatories in the U.S.A., notably Spacewatch, the Catalina Sky Survey, LINEAR, NEOWISE and Pan-STARRS. In Europe, only the La Sagra Sky Survey (Spain, <www.minorplanets.org/OLS/>) is contributing substantially to the discovery of NEOs. At some other European observatories, NEO discoveries are being made occasionally, often not in a continuous effort. European observatories, professional as well as amateur, do play a substantial role in follow-up observations of NEOs, crucial for orbit determination. European astronomers do play a substantial role in contributing to scientific papers on the subject. See: <www.iau.org/public/nea/>.

Determining the permanent threat of potentially hazardous Near Earth Objects is a global issue, in which every country runs a risk. Therefore, every country should participate to the degree of its capabilities in contributing, as soon as feasible, to a complete inventory of all potentially hazardous NEOs. Also European countries. That means: making available the required dedicated manpower, using available tools in the northern and southern (ESO!) hemispheres, equipping observatories with the necessary tools when not available yet, and stimulating ESA to join and/or initiate infrared surveys of faint NEOs with space telescopes.

NEOs constitute a clear and present danger. If we don't want to go the way of the dinosaurs, we will need at least an International Early Warning System, using every ground-based and space-based observatory we can mobilize. Though mitigation of hazardous NEOs is not the subject of this paper, finding them early is obviously essential. See: <www.targetneo.org/pdfs/Summ_rpt_LPSC.pdf>.

European astronomers should contribute in making European governments fully aware of the permanent threat of Near Earth Objects (NEOs) to planet Earth. Europe could and should contribute a substantial share in the detection, tracking and characterization of NEOs. Notably ESO and ESA should play a role, to be encouraged by their respective member states.

If we don't want to be bothered by hazardous Near Earth Objects, then we have to do something about them.

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REPORTS FROM EWASS 2011

PRESIDENT'S REPORT

by Thierry J.-L. Courvoisier

The EAS is for now a low budget society. All the work rests on the administration support we get from the office in Geneva and on the shoulders of the council members. I want to start by expressing my, and I hope your, warmest thanks for the work done by these people and in particular to those members of council who move the society forward and to the Editor of our Newsletter.

A society like ours has two options to keep balanced accounts. Either we keep our level of activity low, such that it can be carried out free of charge by the council members or we work towards increasing substantially our income. The first option does simply not allow us to have any reasonable level of presence on the European scene, be it simply because of the absence of a travel budget for council members to attend meetings or establish contacts. If we are serious about being the voice of the European astronomers we have no choice but to follow the second option. This is why we actively seek organisational members for our society. These members are expected to contribute between about 1000 and 10000 Euros per year to the running of the society. To date we managed to attract 7 and we are in discussion with a number of potential candidates.

Members are urged to contribute to this effort by looking with their institutions and with public or private profit or non profit organisations who benefit from a lively astronomical community to see whether they would be ready to come on board. There is no reason for which we could not find a large number and certainly more than 100 organisations in all areas of Europe to join. This will bring our income to a level where we can hire some stable manpower to do some real work for the society.

With the increase of budget we already achieved we could start to increase our level of activity. We did this in several ways. One is the formation of working groups to think about questions of relevance to us or to the society around us and to develop "the view of the Society" on the issues they tackle. Groups on the future of space astronomy (under the leadership of M. Watson of Leicester University), on the astronomical publication (under the leadership of J. Zorec of the Institute of Astronomy of Paris) are formed. We are in discussion about a couple more subjects for which the society should express a clear view. Council has decided that some level of funding would be available for this activity.

We also worked out a process to reach what we mean by "the view from the Society". This goes so that Council sets the mandate of the working groups and approves their membership at the beginning. When the working group is close to the end of its work it will post a draft position paper on the web. This paper will be open for comments by members before a final version is prepared and is then approved by Council and distributed as appropriate. We hope in this way to reach satisfactory consensus. This process will be reviewed when we gain some experience.

In the same direction of increasing our presence on the European scene we took contact with the European commission, who were happy to see us. Following this visit we prepared a response to the call for comments that the commission had opened as a step in preparation for the next European research funding period. You can read this paper in the last issue of our Newsletter. It is clear, however, that we need a much more regular follow up of the EC affairs, one of the tasks of a future EAS person.

As far as contacts go we also started discussions with our colleagues of the EPS. It is interesting to see that they share many of the questions we have. This is not really surprising as both societies are working towards giving a European identity to their communities, which are used to have a stronger national identity.

In the coming months we intend to pursue the dialogues we established. We also intend to take contact with the AAS with whom we have not had many contacts in some time.

You will also have seen that our web pages have improved and I hope that you appreciate this. As part of this effort, the number of job announcements has increased considerably. J. Fernandez is in charge of this, please do let him know of your job opportunities. This applies to positions located in either Western or Eastern institutions.

We started a reflection on the evolution of the EWASS. This was prompted by the success of the meeting we had in Hertfordshire and a subsequent letter from the RAS seeking to see how we could repeat this very positive experience. We have called a new meeting, the second, with the affiliated societies to discuss this issue. Our distant goal, is to get to a truly pan-European yearly meeting. How to move in this direction will be the main topic of this meeting that will take place on the shore of Lake Geneva in the first 2 days of February. The presidents of the national societies have been informed and we hope that they will attend in numbers so that we have as lively a meeting as we had in Leiden.

Finally some members of Council are up for renewal or are moving out of Council next year. We are therefore setting up a nominating committee to plan this step as well as possible. Working within council is a real task, not just a honorary position. We are therefore seeking people with the highest scientific standard, but also ready to invest a non-negligible amount of their time in the service of the institutions. We will announce the composition of the nominating committee through the electronic news, but those of you present here who would like to discuss this, for themselves or for a colleague are invited to contact one of us.

The last year was a very active one for your Council. We have all reasons to expect that the next one will be as intense and welcome all the support we can get from you.

FROM F.J.W. STRUVE TO JAMES WEBB

by Roger-Maurice Bonnet
International Space Science Institute, Switzerland

Dear Professor Stepanov,
Dear Thierry,
Dear friends and colleagues,

It is a great honour to be presented today with the Friedrich-Georg-Wilhelm Struve Award. The award has been given in

the past to an impressive series of scientists and space personalities. Let me quote among many others, my friend Academician Alexander Boyarchuk, Evgueny Mazets and Astronauts Goergy Grechko and Serguei Krikalev. I would like to express my warmest acknowledgments and appreciation to the Pulkovo Observatory for that great honour that allows me to celebrate today the famous scientist and astronomer who has given his name to the award. In the history of science F.G.W. Struve will indeed be remembered as a great astronomer and a promoter of astronomical knowledge.

As several of his contemporaries, he associated his talents in astronomical observation to those of an instrumentalist, which he applied in particular to the field of geodesy, as illustrated by the most ambitious long meridian arc measurement he made between 1816 and 1819 in the framework of the triangulation of Livonia on the Eastern coast of the Baltic Sea. As a space astronomer and an instrumentalist myself, I feel a lot of sympathy for that great scientific personality and for his associating talents in both the development of new techniques and using them for observation, two talents without which astronomy would not exist to the level it has reached today.

My own involvement in science was totally determined by the launch of Sputnik-1 in 1957. That event triggered my passion for space and for astronomy. Since then, my career has been fully devoted to these two great achievements of the last century and particularly to space thanks to two Great Russian engineers and scientists: Serguei Korolev and Mstislav Keldysh, the fathers of space exploration and of space science. A few years ago, we celebrated in this country the 50th anniversary of the historical launch of Sputnik-1, the creation of Serguei Korolev, and this year the 100th anniversary of the birth of Academician M. Keldysh.

Their legacy and that of the Soviet space program cannot be minimized: they have led a true revolution! In the past 50 years, we have extensively travelled through the Solar System; we have landed on the Moon, on Mars, Venus, Titan, and on asteroids. Soon, ESA Rosetta mission will land on the nucleus of a comet and plans are that we will soon explore asteroids and the icy moons of Jupiter and return to the Moon and possibly to Titan. With the “Voyagers” of NASA, we are reaching the limits of the Heliosphere and exploring the virgin territories of deep space, leaving our Solar System behind us and entering the interstellar medium of our Milky Way.

By observing the sky from above the Earth’s atmosphere we have accessed all the hidden portions of the electromagnetic spectrum: the UV, the X and the gamma rays (thanks in particular to INTEGRAL to which the Pulkovo Observatory and your ISDC, dear Thierry, have contributed so much), the infrared, and the sub-millimetre wavelengths. We have started exploiting with an enormous amount of success that nearly inexhaustible and inestimable reserve of discoveries and knowledge that is called space astronomy.

Today, space-based astronomy is an integral part of contemporary astronomical research, resting on a set of powerful

operational telescopes developed by major space agencies, encompassing the whole electromagnetic spectrum: e.g. Fermi and Integral at gamma-ray energies, Chandra and XMM-Newton for X-rays, Hubble in the near-ultraviolet, visible and near infrared wavelengths, and Herschel and Planck in the far infrared and sub-millimetre domain. However, I would like to temper my enthusiasm for the potential of these tremendous possibilities and express a concern here that I shared with my friend Johan Bleeker in a recent policy forum published in⁽¹⁾. Part of what follows results from reflections that Isabelle Grenier, Pietro Ubertini, Johan Bleeker and I recently shared in analyzing the future of space astronomy. Let me thank all three here for their illuminating thoughts.

The present golden age of space astronomy based on these large missions may soon come to a rest as several of them are supposed to reach the end of their scientific and technical capabilities, and they may not be replaced. The situation is particularly critical in the high-energy domain as no successors to XMM-Newton, Chandra, Integral and Fermi are in development. Certainly, in the past three to four years, a considerable effort has been made by the scientific community in the formulation of future plans. The most famous among them are the Decadal Surveys of the US National Academy of Science for astronomy and planetary scientific exploration^{(2), (3)}, and also the ESA “Cosmic Vision”⁽⁴⁾ and the Europe-led Astronet “Science Vision for European Astronomy”⁽⁵⁾. Their identified scientific priorities give preference to missions addressing the topics of dark energy, dark matter and exoplanet research, as well as the detection of gravitational waves with the Laser Interferometer for Space Astronomy (LISA) under study at ESA and NASA. In planetary science priority is given to Mars, Jupiter and its satellites as well as Uranus. Unfortunately, none of the identified projects are ready to start soon. Why?

At NASA, the development of the 6.5 m James Webb Space Telescope (JWST) is now blocking the start of all other new large missions. The cost of the successor of Hubble has increased almost tenfold since its start in the mid 1990s and its launch keeps slipping, from the original goal of 2007, to now 2018 or even beyond. These cost overruns cast serious doubts on the feasibility of implementing within the decade the US Decadal Survey priorities, WFIRST, LISA and IXO. Regrettably, within the ESA Cosmic Vision program, no new large mission has been approved in the last ten years. The sad conclusion is that apart from identifying obvious priorities, the US and European surveys will not likely deliver any of these large flagship missions apart from the JWST. These time-consuming and expensive planning exercises may have to be done again if ever, using different approaches and different management schemes. The context is even more sterile that several missions presently foreseen to be developed in cooperation between ESA and NASA are threatened of being abandoned or very substantially descope. That is the case in particular of IXO for which ESA recently announced unexpectedly that cooperation with NASA was no longer considered feasible because of the incompatibility between

the two agencies on schedules and budgets, and for the possible merging into a single project of the NASA WFIRST and the ESA Euclid missions, both aiming at mapping the geometry of the universe and the distribution of dark matter and dark energy. In the planetary science domain, all foreseen missions cannot be developed unless they undergo a drastic descopeing; there also the anticipated scenarios for international cooperation must be drastically revisited because of lack of financial means.

How did that situation develop? All these missions have been designed in the framework of tightly connected international cooperation scenarios and both ESA and NASA programs on big missions are now complexly imbricate with no control mechanism in place for each partner to control the schedule slippage and cost overruns of the other. It seems that the two major space agencies of the world have indeed lost their ability to properly manage their big missions. NASA seems not to have realized that it is not anymore living in the Apollo era when money was flowing in with billions of dollars granted by the government whenever necessary. Unfortunately, JWST does not represent the same political challenge as the landing of Man on the Moon and money is much more scarce and difficult to get from the President and the Congress. As to ESA, it has abandoned many of the approaches that made the success of its Horizon 2000 Program based on design-to-cost, scientific balance and built-in independence from third partners. The Cosmic Vision program has resulted in no mission decided, because all those foreseen were more costly than the available budget, and relied essentially on the good will of another agency, in particular NASA, which unfortunately, as said, is blocked by the JWST present impasse. On both sides of the Atlantic, we witness a lack of management competence, exacerbated by a lack of a common and more global strategic planning.

When the cost of individual missions exceeds annual national space science budgets, a balanced long-term (10-20 years) program should be established that fits into an overall multi-year budget envelope. ESA's Horizon 2000 was a plan to be implemented! It rested on a set of large missions fulfilling the aspirations of the European scientific community in four selected areas of balanced excellence, definitely included in the plan, and not supposed to be abandoned through regular competitive selection processes. The plan was to be fulfilled through the development of specific Cornerstone missions in a period of 20 years after approval by the ESA Council, which was granted in 1985. Flexibility was added to the program through smaller size missions regularly selected in competition, and opened to all domains of space science. Last but certainly not least, the budget allocated to each mission was capped, allowing to maintaining the program scientific balance, and sticking within realistic financial limits fixed a priori. The program was to be implemented fully with European means alone, however some projects were open a posteriori to international cooperation in particular with NASA and all other interested agencies, thereby increasing the scientific scope of the missions.

The full program, and even more (including the re-launch of Cluster), was accomplished in 24 years instead of the 22 foreseen, a very honourable performance, with all Cornerstones launched between 1995 and 2009, all operating flawlessly. Furthermore, twelve medium-size missions, among whom we find Hipparcos, ISO, Giotto, the Huygens probe, Planck, Integral etc, and two small technology missions complemented them. Thanks to that program, Europe acquired a leadership position in Solar-Terrestrial physics, Comet science, X-ray and far infrared astronomy with Herschel, the largest space telescope yet launched, and also in planetary science through Huygens, Mars Express and Venus Express.

The dull situation confronting space astronomy in the near future, forces a profound reflexion on the way big missions ought to be implemented and managed in the future. We do believe that large scale space facilities required for ground breaking astronomy in the coming decades can only be accommodated by global pooling of financial resources and technological expertise. The present "piece meal" individual project approach inevitably leads to an open-ended design, budgeting and scheduling process, to the detriment of the science discipline (the JWST problem might not have arisen in its present magnitude if JWST had been part of a coherent program incorporating other missions, approved and all to be implemented within fixed schedules and budget). The disconnected approach with separate surveys in Europe, the U.S. and elsewhere seems to be no longer viable. Strategic long term planning is needed to establish a science driven roadmap based on global cooperation with clearly identified science priorities and leadership sharing.

Recently, the Committee on Space Research (COSPAR) set up a working group chaired by P. Ubertini that involves representatives of the astronomy community from the main space fairing nations, aiming at establishing such a global program in space astronomy⁽⁶⁾. That exercise will be integrated within a similar one formulated by the IAU for ground based astronomy, and should result in a sort of international road map for contemporary astronomy. We fully support that approach and commend both COSPAR and the IAU for having initiated that exercise.

The implementation of the road map/ global survey for space astronomy will undoubtedly be delicate! It should obviously reside in the space agencies through the establishment of an inter-agency coordination group for large observatory-class facilities and planetary missions. That interagency group would have to agree on the selection established by the scientific community for major flagship missions, contingent on an agreed mission concept, on the development of the necessary technologies, and on a cost-to-completion budget shared and affordable by all parties involved. Such an interagency roadmap should preferably extend over at least two decades given the long lead times for the development and qualification of the key cutting edge technologies.

New resources may also come from new partners that are increasingly demonstrating their capability to become main

players in space science, like Russia, China, India and Brazil. They also have impressive plans for the future, including collaborative ventures with NASA, ESA and JAXA, and need to become involved in discussing priorities for these future interagency roadmaps. Tapping into these new resources would both offer a broader spectrum of competences and talents and open the door to more ambitious projects. It is therefore very important to fully involve these new partners in the planning exercise. After all, they are potential leaders and we must all witness their development with interest as the presently dull economic situation in the main space faring countries may not evolve positively in the future.

Over the past 200 years or so that elapsed since the birth of F. G. W. Struve (1793) and since the launch of Sputnik-1 (1957) astronomers have accessed the most unthinkable extremes of distances, of temperature, of vacuum, of density and gravity, and of time. They have discovered black holes everywhere, water everywhere in the Universe. The frontier of knowledge has constantly been pushed further opening new questions, challenging our ingenuity to observe the unobservable. Today, we are reaching another limit: that of our ability to finance and timely develop the big facilities required for pushing the frontier even further.

It is time for all space agencies to take part in the development of future large astronomy missions that would be included in a global road map established by the world scientific community through their national academies or their equivalent. The JWST example has put in clear evidence the danger of developing scientific ambitions without possessing and mastering the management structures and practices necessary to implement them, placing in real risk of elimination all other missions in the road map. We do hope that this example, as well as my message today will offer a possibility for saving the future of space astronomy through vision and political will, with a clear appreciation that leadership of large space missions should now be globally shared and accepted by all.

Thank you all for your attention. Thank you again Thierry for your help in reading these lines.

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SYMPOSIUM 1: MAGNETIC UNIVERSE

The basic goal of this Symposium was to present the results of observational and theoretical investigations of magnetic field of a wide class of astrophysical objects: from classical magnetic stars in our Galaxy to compact neutron stars and supermassive black holes.

Prof. John Landstreet (University of Western Ontario, Canada) discussed the new very important unambiguous evidence of how the fossil magnetic fields of magnetic Ap stars evolve during the long main sequence phase of evolution. This conclusion is based on a survey of magnetic stars that are members of open clusters. The discovery of relatively rapid evolution, and the strong variation of field evolution time scale with stellar mass is the fundamental result which is not yet understood.

Iosif Romanyuk (Special Astrophysical Observatory of Russian Academy of Sciences, Russia) presented a survey of observational data on the magnetic fields and physical parameters of chemically peculiar stars for the past 15 years.

The main scientific result of this survey is the discovery more complex atmospheric structures in these stars than was considered 15 years ago.

Z. Mikulasek et al (Masaryk University, Czech Republic) presented the result of precise photometric and spectroscopic monitoring of the young hot magnetic chemically peculiar star HD 37776. Authors of this talk discovered unpredicted period changes and the paradox of the spin-down time for the star from magnetic chemically peculiar stellar population.

In the talk presented by R. Yudin, S. Hubrig, M. Pogodin et al there were presented the results of the search for magnetic fields in representative samples of Herbig Ae/Be stars and classical Be-stars, carried out over the last eight years. The spectropolarimetric data were obtained at the ESO with the multi-mode instruments FORS1 and FORS2, installed at the VLT. Among the 28 classical Be stars studied, detections of a magnetic field were achieved in 8 stars.

I. Andronov (Odessa National Martine University, Ukraine) presented in his talk theoretical and observational results of polarization and spectra of cyclotron emission from the accretion process. The results of CHANDRA observations were also interpreted in this review.

The problem of physics of neutron stars has been elucidated in the series of talks presented by N. Ikhsanov (Pulkovo Observatory, Russia), A. Kholtygin (Astronomical Institute of Saint-Petersburg University, Russia), and A. Biryukov (Sternberg Astronomical Institute, Moscow, Russia). The

basic topics, considered in these talks, are: structure of the magnetized accretion flow in the vicinity of neutron star magnetosphere, evolution of isolated neutron stars in our Galaxy, the origin of cyclic components of isolated radio-pulsar spindown.

L. Matveenko (Space Research Institute, Moscow, Russia) presented the very interesting results of studying fine structure of AGN cores in radio emission. He discussed in detail the problem of jets and magnetic fields in the vicinity of supermassive black hole in active galactic nuclei.

In the final talk Yu. Gnedin et al (Pulkovo Observatory, Russia) presented their findings on the determination of magnetic field in a number of AGN from Spectropolarimetric Atlas of Smith et al (2002). Based on those estimates of the magnetic field strength at the last stable orbit and on horizon radius of the central supermassive black hole for a number of AGNs were obtained.

The works presented on the Symposium 1 "Magnetic Universe" are bringing the essential contribution in astronomical investigations and especially in the investigation of magnetic fields of various objects in the Universe.

Yu. Gnedin,
Central Astronomical Observatory at Pulkovo
of Russian Academy of Sciences

SYMPOSIUM 2: PLANETS OF THE SOLAR SYSTEM AND BEYOND

The symposium was divided in six 1.5 hour sessions. During each session a number of review talks were presented by the following individuals:

- The Moon: Sasha Bazilevsky, Yves Langevin
- Inner planets: Igor Mitrophanov, Therese Encrenaz
- Outer planets: Oleg Korablev, Oleg Kuskov
- Small bodies: Maria-Teresa Capria, V. Emel'yanenko
- Exoplanets and planetary cosmogony: Artie Hatzes, Leonid Ksanfomality, Helmut Lammer
- Astrobiology: Athena Coustenis, Alexei Rozanov

The last session on "Astrobiology" was finally merged with the "Exoplanets" session.

Invited reviews, in particular, were given about the SARA/Chandrayaan results on the Moon (S. Barabash), the future Russian program on Moon exploration (M. Marov), the Venus atmosphere as seen by Venus Express (D. Titov), the Martian atmosphere (T. Encrenaz), the giant storm on Saturn (A. Sanchez-Lavega), the mission project to Uranus (Y. Langevin), the results of OSIRIS aboard Rosetta (C. Barbieri and M. Fulchignoni), the composition of the TNOs (M.-A. Barucci), planetesimals around nearby stars (M. Wyatt), the discoveries of the CoRoT mission (A. Hatzes), the astrobiolo-

gical potential of outer satellites (A. Coustenis), and the effect of stellar activity on planetary habitability (H. Lammer). These reviews, as well as the contributed talks, led to vivid discussions in the audience. Approximately 30 to 40 people attended the sessions, with a peak of about 50 people for the exoplanets/astrobiology session. A few speakers, however, could not be present and the program had to be adjusted in real time. About half of the posters were present.

Conveners:

Mikhail Marov (Vernadsky Inst.Geochemistry/Keldysh Appl. Math. Inst. Russia)

Therese Encrenaz (Observatoire de Paris, France)

SYMPOSIUM 3: THE SUN: NEW CHALLENGES

The main topics of the symposium 3 were a) The unusual sunspot minimum - challenge to the solar dynamo theory, b) New observational window: terra-Hertz emission, c) Wavy corona, and d) Space weather agents - initiation, propagation, and forecast. A total of 23 oral reports and 25 posters were presented.

Now and again, the Sun sets new problems before the astronomers. One of such problems is the abnormal behavior of solar activity during the past, 23rd cycle. Even now, it is not clear whether the anomalies have ceased with the beginning of the new cycle 24 or we are still facing a long period of low solar activity. The anomalies in question have manifested themselves in various parameters, such as the sunspots per se, the number and intensity of coronal mass ejections, extraordinary brightness distributions in the corona, solar wind parameters, the persistent big low latitude coronal holes, etc.

Observations in the sub-THz range of large solar flares have revealed a mysterious spectral component increasing with frequency and hence distinct from the microwave component commonly accepted to be produced by gyrosynchrotron (GS) emission from accelerated electrons. Evidently, having a distinct sub-THz component requires either a distinct emission mechanism (compared to the GS one), or different properties of electrons and location, or both. It is interesting to discuss the complete list of possible emission mechanisms.

It is the magnetic field that determines the variations of the coronal brightness. However, the mechanism of the corona heating and, therefore, of the relationship between the corona brightness and magnetic field, is unclear. This is, obviously, due to the fact that there are several heating mechanisms that play different role in different areas (active regions, quiet Sun, coronal holes). So far, it is not clear whether the DC or AC mechanisms prevail in one or another object in the Sun.

Conveners:

Vladimir Obridko (IZMIRAN, Russia)

Katya Georgieva (Academy Sci, Bulgaria)

SYMPOSIUM 4: SOLAR SYSTEM MEASUREMENTS OF THE NEXT DECADE

The Solar System Measurements of the Next Decade session (S4) of EWASS 2011 conference was held over two days from the 7th to 8th July 2011. The organizers of the session were Professor Andrey Finkelstein (Institute of Applied Astronomy of RAS, Russia) and Yaroslav Yatskiv (Main Astronomical Observatory of NAS, Ukraine). A total of 25 participants from 6 countries attended the session. Within two days of the session 19 papers were presented orally and 9 reports were made in the form of poster. All oral reports of Symposium 4 were presented in six sessions each pertaining to a certain subject.

The main subject of the 1st Session was the establishment and realization of celestial reference frames such as ICRF 2, XPM and IAA RAS CRF catalogues. Also the optical, radio, infrared and VLBI data processing results and catalogues comparison was presented and discussed. Determination and analysis of the Earth orientation parameters was the subject of 2nd session. The last session of the first day was devoted to studying the physical parameters and dynamics of comets. The subject of the 4th and 5th sessions dealt with the ephemeris, construction analytical and numerical theories of motion of planets and observations processing. The final session was devoted to observation and study of near-Earth objects.

Conveners:

Andrey Finkelstein, Appl. Astronomy Inst., Russia

Yaroslav Yatskiv, Main Astron. Obs., Ukraine

SYMPOSIUM 5: PHYSICS OF STARS

The JENAM symposium “Physics of Stars” took place on the 5th and 6th July 2011. Its four sessions were all well attended, with a large number of high-quality contributions, including four invited reviews and 9 contributed talks. This symposium had a wide-ranging look at observational and theoretical studies of stars and stellar systems. Several contributions were devoted to accurate determination of fundamental stellar parameters, such as star’s mass, radius, effective temperature, surface gravity, chemical composition. This is particularly crucial to fully exploit the data from the new generation of large ground-based telescopes and future space missions like the GAIA one.

The review of Luca Fossati focused on the progress in interpreting stellar spectra and obtaining stellar parameters and abundances for stars of various spectral types. Guido De Marchi reported the determination of the physical parameters of more than 2000 pre-main-sequence stars from the star forming regions in the Milky Way, the Large Magellanic Cloud, and the Small Magellanic Cloud applying a novel method which combines broad-band V,I photometry with narrow-band H α imaging. A new approach to modeling of the atmosphere of chemically peculiar stars was presented by Denis Shulyak, and one impressive result is the stellar radii derived

using this method. A clear highlight was a presentation by Adriana Valio of the analysis of small variations in the light curve during the eclipse of a star by its planet. Such an analysis allows to study the properties of the spots on the stellar surface, i.e., their sizes, positions, intensities, and lifetimes. The most accurate stellar masses are provided by the studies of binary (multiple) stars. Viktor Orlov reported the measurements of stellar mass for a few multiple systems and also the investigation of their dynamical stability. Having improved the masses, radii, and effective temperatures of both components of the binary star IM Mon, Miloslav Zejda and his co-authors determined its photometric distance and evolutionary age that allowed, in turn, to reach to the distance, age and metallicity information of Ori OB1a sub-group to which IM Mon belongs.

To improve the determination of parameters of the components in an eclipsing binary system including a Wolf-Rayet star, Eleonora Antokhina and her co-workers updated their synthesis model by accounting for the absorption in the expanding stellar wind. The variable stars are excellent laboratories to study the physical processes either occurring at certain stages of stellar evolution or caused by the interaction of a star with its companion or circumstellar medium. Nikolay Samus reported the discovery of hundreds of new variable stars in their work on digitalization of the Moscow stacks of sky photographs. The exotic star VSX J052807.9+725606, with a very strong asymmetry of maxima, wavelength dependence of amplitude, and the shift of the secondary minimum from the phase 0.5, was discovered by Natalia Virnina. The physical processes in close binary stars leading to their observed variability were discussed by Dmitry Bisikalo based on the three-dimensional hydrodynamic and magnetohydrodynamic numerical simulations. The review of Ivan Andronov was devoted to magnetic cataclysmic variable stars and also a new class of «magnetic dwarf novae». Ekaterina Filippova presented the theoretical model of the Classical Nova explosion in the binary system CI Cam in 1998, which allows us to explain the time dependence of the X-ray luminosity and the mean temperature of the heated material during the explosion and gives velocity estimates for the matter ejected from the white dwarf surface. Vladimir Grinin argued that some minima in the UX Ori stars are caused by the dust formed due to the dissipation of the large solid bodies (planetesimals) approaching the star. The hint of existence of either a giant planet or a sub-stellar companion orbiting the T Tau type star V718 Per was found by Olga Barsunova.

Conveners:

Lyudmila Mashonkina, Institute of Astronomy, RAS, Russia

Anatol Cherepashchuk, Moscow State University, Russia

SYMPOSIUM 6: COMBINED RADIO/X-RAYS APPROACHES TO RELATIVISTIC ASTROPHYSICS

Relativistic sources of high-energy radiation are characterized by non-thermal processes giving rise to emission that spans many decades in photon energy. This warrants the pursue of multi-wavelength studies of all sources of this

family. Historically, Radio and X-ray astronomy have been the two observational pillars upon which large part of relativistic astrophysics has been built. During the Symposium, we discussed major recent advancements and future prospects in relativistic astrophysics with a strong emphasis on combined radio/X-ray approaches.

The first two sessions were dedicated to the study of galactic compact objects. Many presentations emphasized the importance of well-coordinated multi-wavelength observational campaigns on galactic transients (J. Miller-Jones, A. Pellizzoni). The role (and the robustness) of the observed correlation between radio and X-ray emission in galactic black holes and neutron stars was discussed at length (E. Gallo, R. Fender). Among its applications, particular interest was raised by the possibility of using it to understand the role of black holes spin in the still not well understood mechanisms of jet production and jet/disc coupling in micro-quasars (and AGN).

New theoretical models that could describe such mechanisms were discussed during the third session. The focus was on MHD simulations (C. Fragile), analytical models of twisted discs (P. Ivanov) as well as on heuristic models for the rapid multi-wavelength variability of discs and jets (A. Veledina). We closed the first day with a summary of the physics of AGN jets as derived from X-ray imaging of powerful radio galaxies (M. Birkinshaw).

Extragalactic astronomy was the main focus of the second day of the symposium. To begin session 4, A. Merloni gave an overview of the cosmological evolution of radio and X-ray selected AGN, while E. Blanton and S. Randall presented detailed studies of AGN feedback in action as observed in radio galaxies at the center of the hot X-ray atmospheres of galaxy clusters. Finally, R. Morganti presented a study of the crucial relationship between radio jets and gas outflows in radio galaxies, and spelled out the rich implications of such a relationship for our understanding of AGN feedback.

The last session was devoted to the synergies between AGN surveys in various wavebands. We began with a review by R. Mushotzky of the many important results from the Swift/BAT surveys of AGN in the local Universe, followed by two talks focused on the study of low-luminosity radio AGN (F. Panessa, F. De Gasperin).

The highest redshift Universe and the deepest radio and X-ray surveys of AGN were instead the topic of M. Brusa's review and M. Bonzini's talk.

The issue of AGN feedback resurfaced again in the presentations of B. Vijaysarathy and D. Evans, who both emphasized the key role of simultaneous X-ray and radio coverage, as well as in the final presentation by D. Worrall, which stimulated an interesting discussion on which is, from the point of view of its feedback effect on the host galaxies, the energetically dominant AGN population.

In this case, as in all other session, participation was active and lively, discussions were animated and the audience was left

with a general feeling of a scientific field rich in exciting new data and challenging open questions. Last but not least, the organizers are proud to report the successful outcome of «remote» session, during which one presentation was given via internet from Australia, with people in the audience able to listen and ask question to the speaker on the other side of the planet.

Conveners:

Elena Gallo, Univ. of Michigan, USA

Andrea Merloni, MPE, Garching, Germany

SYMPOSIUM 8: STATUS AND PROSPECTS IN HIGH-ENERGY & PARTICLE ASTROPHYSICS ACROSS THE ELECTROMAGNETIC SPECTRUM

The Symposium was co-chaired by Pietro Ubertini (IASF - Rome) and Andrei Bykov (Ioffe Institute, St. Petersburg) and it addressed the following topics: Gamma Ray Bursts – AGNs Clusters of galaxies – Galactic sources of non-thermal emission – Supernova remnants and pulsar wind nebulae – Cosmic Rays of Ultra-high energies. During the symposium it became evident that most energetic cosmic objects radiate non-thermal emission that is observed in various bands from radio to gamma-rays with most modern ground based and space-borne observatories. Being confronted with advanced quantitative models of these objects the high-resolution observational data obtained with XMM-Newton, Chandra, INTEGRAL, Suzaku, Swift, Fermi, AGILE, H.E.S.S., MAGIC etc. allow us to understand the nature of extreme energy release processes, reveal the mechanisms of particle acceleration up to the UHECR energies observed by Pierre Auger Observatory and to extend our understanding of the fundamental properties of matter and radiation under extreme conditions of energetic flows and strong radiation fields. Perspectives of the future missions proposed for ESA Cosmic Vision program, as well as the ground based projects like CTA, LOFAR and the extension of Pierre Auger Observatory were discussed. The symposium gathered about 60 scientists working in the high energy astrophysics domain.

Lively discussion was at a round table on the perspectives of future space-born missions for high-energy & particle astrophysics convened by W.Hermsen.

Conveners:

Pietro Ubertini, IASF–Rome, Italy

Andrei Bykov, Ioffe Institute, St. Petersburg, Russia

SYMPOSIUM 9: GALAXY EVOLUTION: THE KEY FOR GALAXY FORMATION

The basic physics of galaxy formation and evolution is one of the most important questions in Astrophysics and Cosmology that is still actively debated. Among the variety of models, the

most popular theories are based on the hierarchical merging in the CDM framework. The bulk of galaxy populations would peak at $z \sim 1$, requiring several Gyrs of evolution time-scale to produced the galaxy masses observed locally. However the deepest observations discovering massive elliptical galaxies, supermassive black holes and huge HD/H2 molecular clouds at the extreme depth of the universe (up to $z = 6$) question some of these models. In fact, to reach so high masses at such early epochs, populations need less than one Gyr of mass accumulation time-scale. Simultaneously, splendid numerical simulations based on models of Cold Dark Matter, Warm Dark Matter, and many others aim to reproduce the collapse of massive haloes, dominated by dark matter and star formation from a minor fraction of baryonic matter. All are tentatively trying to find the physics keys at all extragalactic and cosmological scales, with contradictory tracers.

Session 9 was a success animated by the contributions of about 30 speakers, young and senior, and various topics of galaxy evolution were presented. The attendance was large, the conference room was full even at 8pm and subjects were a subtle mixing of merging evidence and passive evolution of massive galaxies. Interesting developments were presented on topics such as universe-box models, spectral evolution models, early versus late type galaxies, the connection between starburst and AGN, the collapse of dark mass halos, the core-cusp problem and the appearance of super massive black holes. The new observational results of Herschel and Planck were discussed and while waiting for ALMA in the near future, results from some of the famous deep surveys (VVDS, COSMOS, SDSS, GAMA for merging rates and the ongoing VIPERS), which trace evolution up to the reionization of the universe, were also presented. For their quality, we decided to provide most presentations in the ftp site:

ftp://ftp.iap.fr/pub/from_users/rocca/incoming/JENAM2011_Session9/

We also want to thank the EAS and the organizers of the high level EWASS/JENAM2011 in the fascinating St-Petersburg.

Conveners:

Brigitte Rocca-Volmerange, IAP, France

Andrey Doroshkevich, Astro Space Center, Russia

SPECIAL SESSION 1: CLOSE BINARIES WITH COMPACT COMPONENTS

In the frame of EWASS-2011, European Week of Astronomy and Space Science we held the Special Session 1 (SPS1) entitled "Close Binaries with Compact Objects". The Session consisted of 3 blocks, each of 1.5 hours and took place on July 4, the first working day of JENAM-2011. The presented contributions included 4 invited talks, 8 regular talks and 9 posters. There were 9 nationalities presented, including: Russia, USA, Germany, Poland, Czech Republic, Spain, Serbia, Bulgaria, and Finland. Due to high interest of

the contributors but the limited time of the Session a significant portion of the presentations was moved to the poster session.

The invited talks covered all the main topics of SPS1. Academician Anatol Cherepashchuk (SAI MSU, Russia) presented a talk on close binaries with black holes. A talk of Prof. Yuri Poutanen (University of Oulu, Finland) was focused on close binaries containing neutron stars. Prof. Edward Sion (Villanova University, USA) told the audience about white dwarfs in close binaries and accretion onto them. And Dr. Thorsten Nagel (Institut für Astronomie und Astrophysik, Germany) delivered a talk on processes of radiative transfer in accretion disks of close binaries. Regular talks covered most of the modern results and achievements (theoretical and observational) in investigations of close binaries with compact objects. The complete list of the speakers and titles of the talks and posters are available via the internet (<http://jenam2011.org/conf/submission/program/>).

The high scientific level of the Session allowed us not only to fix modern state of the problem but also discuss the main direction of future investigations of close binaries with compact objects. SPS1 drew increased attention and interest. Each talk caused extensive discussions and many questions asked. There were many participants from the other Sessions and Symposia of EWASS-2011.

On behalf of the participants of SPS1 we can conclude that the Session turned to be successful, very interesting and fruitful. We think it is useful to hold similar sessions focused on the problem of investigations of close binaries with compact objects in the frame of future JENAM meetings.

Conveners of SPS1:

Dmitry Bisikalo, Institute of Astronomy of the RAS, Russia

Klaus Werner, Institut für Astronomie und Astrophysik, Germany

SPECIAL SESSION 2: MASSIVE STARS FORMATION

This special session was devoted to discussions of the main achievements and future directions of the research in the field of massive star formation. The duration of the session was 4.5 hours. The final program included several invited talks (Henrik Beuther, Riccardo Cesaroni, Ian Palous), 8 oral contributions and 5 posters (most of them were briefly presented during the oral session). Unfortunately some of the expected participants could not come, in particular due to the visa problems.

Nevertheless, the presented talks and posters covered a wide range of relevant topics: theoretical aspects of high mass star formation, surveys of high mass star forming regions at various wavelengths, triggered star formation, studies of disks and outflows, infrared dark clouds, chemistry, modeling of molecular emission, etc. Many new interesting results, both

observational and theoretical were reported. Important data are obtained with various instruments including the newest ones, in particular the Herschel space observatory.

Conveners of SPS2:

Igor Zinchenko, Appl. Phys. Inst., Russia
Malcolm Walmsley, Arcetri Astrophys. Obs., Italy

SPECIAL SESSION 3: SCIENCE WITH VIRTUAL OBSERVATORY

The Special Session 3 (SPS3) of the Joint European and National Astronomy Meeting 2011 (JENAM-2011) was devoted to Science with the Virtual Observatory (VO). It was organized in frame of the ongoing program of dissemination of VO developments and results among the astronomical community being held at all recent major astronomical meetings, like the IAU General Assemblies and JENAMs. The VO is a collection of interoperating data and software to form a research environment in which complex research programs can be conducted. VO projects worldwide are now moving from the development of infrastructure into the operations era. The International Virtual Observatory Alliance (IVOA) has begun to focus its efforts in this area by assisting in the creation of scientific sessions at major international meetings, developing science use cases, identifying urgently-needed services, and suggesting paths for implementation of these services in close collaboration with the IVOA. The key topics of the SPS3 were: modern astronomical data resources, VO tools / instruments / data mining / data analysis, results of VO scientific applications, interaction between VO community and other astronomers, and the future of VO.

SPS3 took place on July 5, 2011 and lasted one full day (three mini-sessions). Some 20 scientists participated from Russia, France, Canada, Spain, Italy, Serbia, Ukraine, Lithuania, and Armenia. 15 talks (including 10 invited ones) and 6 posters were presented. Several talks were given on the organization of databases/archives and the VO, as well as software developments. Severin Gaudet (Canada) presented a talk showing how VO technologies can be used to access CADC collections. Pierre Le Sidaner (Obs. de Paris /VO-Paris) told about the Virtual Atomic and Molecular Data Centre. Sebastien Derriere (CDS, France) presented the new CDS services in the VO era. Mark Allen (CDS, France) gave a talk “Going beyond coordinate searches in the VO”. Oleg Malkov (Russia) presented cross catalog matching with VO and parameterization of stars. Riccardo Smareglia presented VODKA and showed how VO-tools can be useful for data mining science. Areg Mickaelian (Armenia) gave a review on the large astronomical surveys, archives and databases. Their plate archives and newly created Serbian and Ukrainian VOs presented Vojislava Protitch-Benisek (Serbia) and Irina Vavilova (Ukraine), respectively (as well as several posters related to such subjects). Several talks were devoted to the use of VO tools for search and studies of astronomical objects, such as talks by

Igor Chilingarian (Russia/France, “Extragalactic science with the Virtual Observatory”), Ivan Zolotukhin (Russia, “Galactic science with the Virtual Observatory”), Deborah Baines (Spain, “Science with the VO: Spectroscopic studies of pre-main sequence stars”), Eduardo Martin (Spain, “Discoveries of ultracool subdwarfs with VO tools”), and Olga Zhelenkova (Russia, “Multifrequency Study of Radio Sources of the RCR Catalogue with the Virtual Observatory Tools”). The Proceedings of this session will be published in the journal “*Baltic Astronomy*”. For more information, please visit the JENAM-2011 SPS3 webpage at <http://www.inasan.ru/eng/conferences/jenam2011/sps3.html>.

Conveners of SPS3:

Oleg Malkov, Institute of Astronomy, Moscow, Russia
Areg Mickaelian, Byurakan Astrophys. Obs., Armenia
Christophe Arviset, ESA, Spain

SPECIAL SESSION 4: WHAT POWERS AXPS AND SGRs?

Anomalous X-ray Pulsars (AXPs) and Soft Gamma-ray Repeaters (SGRs) are young neutron stars that have X-ray luminosities much larger than their rates of rotational-energy loss. It is generally believed that these neutron stars have super-strong magnetic-dipole fields (10^{14} - 10^{15} G, and for this reason they are called “magnetars”), because it is assumed that the emitted radiation is due to magnetic-dipole energy loss. Another reason for invoking super-strong magnetic fields in these sources is the fact that they exhibit large and giant bursts, with super-Eddington luminosities, which are difficult to explain in any other way.

While the large and giant bursts are very likely of magnetic origin, the steady-state and transient luminosities of AXPs and SGRs need not be. Accretion from a fall-back disk can easily explain them.

The Session included two review talks, summarizing the two alternative pictures, and six contributed talks. The magnetar picture was presented by Prof. Feryal Ozel and the accretion picture by Prof. Joachim Trümper. The contributed talks discussed a possible cyclotron resonant scattering feature in the persistent X-ray emission of AXPs (W. Hermsen), the evolution of SGR 0418+5729 (U. Ertan), an electric circuit model for high-frequency QPOs in magnetars (A. Stepanov), spectral modeling of supernova fallback disks (K. Werner), evidence for accretional power in the persistent emission of AXPs and SGRs (N. Kylafis), and a possible relation of Gamma-ray Bursts and SGRs (A. Meszaros). As expected, none of the two pictures got a significant lead with this Session. The encouraging outcome of the Session was that the two opposing pictures seem to have one common characteristic. SGR 0418+5729 has an inferred dipole magnetic field of $< 7 \times 10^{12}$ G. Ozel showed that its low-energy spectrum requires a multipole field of the order of 10^{14} G. Thus, the dipole component may be of normal strength (10^{12} - 10^{13} G)

while the multipole component may be two orders of magnitude larger. This is exactly what the accretion picture invokes.

Conveners of SPS4:

Nick Kylafis, Univ. of Crete, Greece
Joachim Trumper, MPE, Germany

SPECIAL SESSION 5: MINOR MERGING AS A DRIVER OF GALAXY EVOLUTION

The Special Session of JENAM-2011 no. 5 “Minor merging as a driver of galaxy evolution” included 5 invited reviews and 7 short contributed talks; 8 poster contributions were also exposed. The goal of the Special Session no. 5 was to organize a meeting between observers and theoreticians to clarify the impact of minor mergers onto formation and evolution of galaxies. This goal has been achieved successfully: present views on minor merging coming from numerical simulations in the framework of the concordant LCDM cosmological model as well as a set of observational signatures of minor merging over various morphological types of galaxies have been discussed.

Carlton Baugh (Durham, UK), a well-known specialist in cosmological simulations, has told that minor merging builds about 50 per cent of stellar mass in spheroids less massive than 10^{11} solar masses; for the most massive spheroids major merging is predicted to be more important. However, this fraction is model-dependent: the competing German team’s (MPA) simulations give about 80% mass provided by minor merging for the spheroids in the same mass interval. This model approach has been supported by observational data presented by Carlos Lopez San Juan (Marseille, France) who determines the minor merger rate to be below that of major mergers everywhere within the redshift of 1. Paola di Matteo (Paris, France) has shown a more detailed simulation of the minor merging impact onto the large-scale galactic disks; it reveals very interesting diagnostic methods which allow to state whether minor merging shapes the present-day disk galaxies. Alexei Moiseev (SAO, Russia) has reviewed such spectacular observational signatures of (possible) minor merging as inner and outer gaseous polar rings; the former phenomenon seems to be much more frequent than thought currently. The contributed talk by Carmen Eliche-Moral (Madrid, Spain) has complemented the list of minor merging signatures by circumnuclear stellar disks, which are also very frequent in early-type disk and spheroidal galaxies.

Observational approaches to the search of the minor merging signatures have been reviewed by Pierre-Alain Duc (Saclay, France) and Raffaella Morganti (ASTRON & Groningen, Netherlands) who are undertaking now extensive deep surveys, correspondingly, of the faint tidal structures and neutral hydrogen in early-type galaxies. Preliminary results of the surveys have already revealed that these minor-merger signatures are very common in nearby regular early-type

galaxies. The contributed talk by Ivana Ebrova (Prague, Czech Republic) was devoted to demonstrate how faint outer shell structures may be used to characterize minor merger events, and Anjali Varghese (Strasbourg, France) has proposed to use the stellar streams resulting from minor merger remnants to measure galactic dark halo characteristics. Natalia Sotnikova (St. Petersburg, Russia) and Igor Chilingarian (Strasbourg, France & Moscow, Russia) have presented interesting examples of particular galaxies, Malin 1 and NGC 7217, which have obviously suffered minor merging. Annelies Cloet-Osselaer (Ghent, Belgium) has reported her early attempts to ‘form’ dwarf galaxies by merging.

Conveners of SPS5:

Olga Sil’chenko, Sternberg Astron. Inst., Russia
Francoise Combes, Obs. de Paris, France

SPECIAL SESSION 9: AMATEUR AND PROFESSIONAL ASTRONOMERS IN EUROPE

One of really *special* events of the St. Petersburg meeting was its Special Session No. 9, “Amateur and Professional Astronomers in Europe”. Its principal point was already formulated in the announcement: “Amateur astronomy attracts people for several reasons, one of them being just the beauty of the sky. However, astronomy remains one of the very few fields of today’s science where contribution from amateurs really helpful for professionals is still possible. Amateur astronomers discover new variable stars (including cataclysmic variables, Novae and Supernovae), monitor thousands of stars. They also discover comets, minor planets, play a major role in meteor astronomy”. Fortunately, a number of amateurs found a possibility to attend JENAM. It was also good that the LOC changed its original plans to hold this session away from the main conference site, which made it easier for interested participants of other JENAM Symposia and Sessions to take part in SPS-9. However, the session was scheduled for the last JENAM day, parallel to many other conference events, and the attendance of SPS-9 was not very large. Especially worrying is very low attendance by Russian professional astronomers, a fact showing necessity for the Euro-Asian Astronomical Society to reconsider organization of interaction between professional and amateur astronomers in Russian Federation.

The program of the SPS was very diverse. As expected, variable stars, a traditional field of real *scientific* successes of amateurs, belonged to main subjects. Anton Paschke (Switzerland) presented the story of his work in the field, with 50 years of successful observations at different observatories on different continents. Ivan Andronov, Natalya Virmina (Ukraine), Zdenek Mikulasek (Czech Republic) provided professional advise on variable-star observations, reductions, modeling. Nikolay Samus (Russia) described possibilities provided by the “Peremennye Zvezdy/Variable Stars” electronic journal for publishing results obtained by amateurs. Lubos Brat (Czech Republic) addressed a field adjacent to

variable-star research: professional and amateur observations of exoplanet transits.

More general aspects of professional–amateur cooperation were covered by Jean-Luc Dighaye (Germany/Belgium), who presented an overview of the forms of such cooperation, and by Pedro Russo (the Netherlands/Portugal), who described the work on creating a web platform specially devoted to ProAm collaboration. Tibor Hegedus (Hungary) made an exciting talk on the rich history of professional-amateur cooperation in his country, already extending over several centuries. Giancarlo Tomezzoli (Germany/Italy) presented an interesting amateur project on radio observations of meteors. Milos Zejda (Czech Republic) described possibilities of binary-star research using very small instruments (called by him “nanotelescopes”).

The short, one-day session could not cover all possible fields of amateur-professional cooperation in European astronomy but clearly demonstrated that amateur and professional astronomers should meet and discuss their problems more often. We see the same sky and equally feel happy and excited at this sight!

Conveners of SPS9:

Nikolai Samus, (Euro-Asian Astron. Soc.)

Pedro Russo (IAU)

J.-L. Dighaye (EAS)

Vladimir Surdin, Sternberg Astron. Inst. Russia

Ivan Andronov, U. Odessa, Ukraine

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