

ASTRO(2004)15
Att : Astro(2004)9
Astro(2004)10.
Astro(2004)11
Astro(2004)12
Astro(2004)8
ANNEX
Paris, 8th November 2004

EUROPEAN SPACE AGENCY
ASTRONOMY WORKING GROUP

Report of 118th Meeting
held on 13-14 May 2004
at ESA Headquarters, Paris

Those present:

**Members of the
Working Group:**

C. Turon (Chair)
C. Aerts
A. Bazzano
J. Cernicharo
P. De Bernardis
C. Done
A. Goobar
T. Henning
R.J. Ivison
J.P. Kneib
E. Meurs
A. Quirrenbach
P. Schneider
M. van der Klis
P. Viana
W.W. Zeilinger

(Chris Done and Michiel van der Klis were unable to attend)

Invited Experts:

Livio Scarsi
Osvaldo Catalano

ESA:

S. Volonte (Executive Secretary)
The Director of Science: D. Southwood,
and A. Gimenez, J. Clavel, M. Kessler
G. Pilbratt, J. Tauber, P. Jakobsen, H. Olthof

The Chair, Dr. Catherine Turon, welcomed the AWG, the members of the FPAG and the representatives of the EUSO Science Team participating in the joint AWG/FPAG session devoted to the review of the EUSO phase A study results. She invited all the participants around the table to introduce themselves.

1. Adoption of Agenda (ASTRO(2004)8)

With the addition of Astro-E2 in item 11, the Agenda **was adopted.**

2. Approval of report of previous meeting

The draft report of the 116th meeting was approved after some minor corrections. The draft report of the 117th meeting would be circulated to AWG as soon as possible after the meeting. *(NB. The AWG has received the final reports of both meetings in the meantime.)*

3. EUSO Phase A study results

With the aid of a PC, the PI, Livio Scarsi supported by the Instrument Manager, Osvaldo Catalano, made a presentation of the scientific and technical aspects of EUSO. The complete results of the Phase A study were given in a written report circulated to both the AWG and FPAG prior to the meeting.

The presentation by the PI was followed by an open question and answer session with members of the AWG and FPAG. During this session, the evaluation of the independent expert Science Study Team set up to advise ESA on all aspects of EUSO were reported. The funding status of the instrument contributions within the participating member states and the other international partners (NASA, Japan) was reported. Information was given on the status of the on going discussions between the Science and Manned Spaceflight Directorates regarding their potential financial involvement. It appeared that the implementation of EUSO on the ISS would not be cost neutral to the science programme as a substantial contribution from the science budget would be required to cover the cost of specific hardware not provided by the space station. Also the impact of the shuttle situation on the Space Station programme was discussed.

The AWG/FPAG session ended with a closed discussion of the joint group. This was followed by separate discussions within each group, led by designated assessors to arrive at their respective conclusions. Regarding the AWG, two members were charged with drafting a recommendation that would be discussed on the next day of the meeting.

This procedure eventually resulted in the recommendation contained in document ASTRO(2004)9, attached.

4. JWST – NIRSpec Instrument Science Team (IST) membership

By means of a PC presentation, P. Jakobsen, the Project Scientist, reported on the selection process for the NIRSpec IST. In accordance with the JWST Science Management Plan, the process was initiated with the release of the AO for the NIRSpec IST on 17 March 2004. On 26 April 2004, due date for responses, 34 proposals were received from scientists in 8 ESA member states. The proposals were evaluated by a selection committee consisting of designated members of the AWG, ESA JWST Project personnel and additional external scientists representing the ESA JWST user community. The process was carried out by e-mail and teleconference. The committee converged unanimously on a list of candidates which was proposed to the AWG. After some clarification, the AWG unanimously supported the committee's proposal for membership in the NIRSpec Instrument Science Team.

This resulted in the AWG recommendation contained in document ASTRO(2004)10 attached.

Following the selection of the NIRSpec IST, the Project Scientist introduced the proposal of the Executive to include an Integral Field Unit (IFU) within the NIRSpec instrument. This additional subsystem would allow to mitigate the operational risks and would also considerably increase the scientific capabilities of the instrument in particular for the study of the dynamics of high red-shift galaxies. Moreover, the IFU would provide a back up mode for the instrument. After discussion on the technical maturity of the IFU and its limited impact on the total instrument cost, the AWG concurred with the proposal of the Executive.

A recommendation on the inclusion of the IFU in the NIRSpec instrument was formulated, see document ASTRO(2004)11 attached.

5. Eddington Phase A study results

With the aid of a PC presentation, the Study Scientist, F. Favata, summarized the history of the Eddington mission and recalled its scientific aims. He then went on reporting on the results of the 2 recently completed industrial phase A studies. Both studies demonstrated the feasibility of meeting the science goals of the mission within the required technical and programmatic constraints. After discussing the scientific validity of the mission if launched in the 2009-2010 time frame, the AWG took note of the report.

6. Status of the Science Programme

6.1 Level of Resources 2006-2010

In a letter sent on 28 April 2004, the Executive asked the working groups and the SSAC to advise the Science Programme on the proposal by the Director General for a possible increase of the Level of Resources (LoR) by about 25% for the year 2006-2010. With the aid of a PC presentation, the AWG Chair, C. Turon, recalled the

priorities identified by the AWG in October 2003 when the programme had been restructured. She also discussed the assessment made by SEPAG (Space Exploration Policy Advisory Group) of the new NASA space exploration initiative and the possible consequences on the ESA Aurora and Science programmes. It was in this context that the AWG was being asked to comment on and assign clear priorities to additional mission options that could be implemented until 2012 thanks to the potential increase in the LoR. The AWG discussed thoroughly mission options technically feasible within the relevant time frame. In line with the conclusions of the 2003 restructuring exercise, the AWG confirmed the Eddington mission as its first priority.

A recommendation on mission priorities for an increased Level of Resources in the 2006-2010 time frame, was formulated, see document ASTRO(2004)12

6.2 Cosmic Vision 2015-2025

On 2 April 2004, a new planning exercise was initiated with a call for ideas to the European Science Community posted on the ESA Science website, with responses due by 1 June. Both the AWG Chair and the Secretary emphasized that the call was for proposals of ideas for scientific themes and not mission concepts, for the long term plan Cosmic Vision 2015-2025. The planning process, with the active involvement of the advisory bodies, and the schedule of the exercise were explained. In the September time frame, an open workshop would take place in Paris involving the ESA advisory structure to report to the wide community on the preliminary results of the consultation and discuss the selected themes. The planning process was foreseen to be completed in time for approval of the new plan by SPC at its February 2005 meeting. The presentation of the plan to the Ministerial Conference was scheduled for May-June 2005.

The AWG took note of the process.

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The Project and Study Scientist Reports (see ANNEX) edited by J. Clavel and M. Kessler, had been circulated to AWG before the meeting. Clarifications were given at the meeting.

7. Satellites in orbit

- 7.1 HST: no issue
- 7.2 ISO: no issue
- 7.3 XMM-Newton: no issue
- 7.4 INTEGRAL: no issue

8. Projects under development

- 8.1 Herschel: no issue
- 8.2 Planck: no issue
- 8.3 Astro-F: no issue
- 8.4 Corot: no issue

9. Projects in preparation and ongoing study

- 9.1 JWST: As NASA had not yet formally agreed to the ESA offer for an Ariane 5 launch, the preparation of the MoU for the JWST collaboration was still on hold.
- 9.2 GAIA: no issue

10. Future Mission Studies

- 10.1 IRSI- Darwin: no issue
- 10.2 XEUS: the Study Scientist, gave a PC presentation of the evolved concept of XEUS based on the development of new, much lighter, X ray optics technology and no longer requires the use of the ISS
- 10.3 ISS payloads (Lobster, Rosita): no issue

11. Any other matter

- 11.1 Astro-E2: Astro-E2 will be Japan's fifth X-ray astronomy satellite of ISAS/JAXA, due to be launched in early 2005. Following a month of check-out and a 6 month interval when the data belong exclusively to the Astro-E2 SWG, a Guest Investigator programme will commence and ISAS/JAXA have kindly offered about 6% of the portion of observing time reserved to the Japanese community for joint participation of European astronomers. In coordination with ISAS/JAXA, ESA will release on 18 May 2004, an AO for European observing proposals in this programme. This AO will close on 13 August. ESA will set up a European Time Allocation Committee for the purpose. The selected proposals will be sent to JAXA for merging with the Japanese programme.
- 11.2 SPICA: ISAS/JAXA are studying their future IR mission, SPICA, after Astro-F. The secretary informed the AWG that ESA had been approached to see whether there would be interest in a future collaboration on this mission which should be launched in the 2015 time frame.

11.3 Science communication: with the aid of a PC presentation, this issue was discussed again by J.-P. Kneib. The Chair encouraged J.-P. Kneib to continue his investigation on the situation of the ESA Science communication and report back at the September AWG meeting when an appropriate recommendation would be formulated.

12. Date and place of next meetings

It was agreed to hold the next meeting, entirely devoted to the evaluation of the Cosmic Vision proposals, at ESA HQ in the time frame between 28 June and 2 July, the final date was to be decided by e-mail.

(NB. The meeting was eventually held on 29-30 June)

The autumn meeting was confirmed for **27-28 September** (starting at 14.00 hrs on the 27th) **but at ESTEC, Noordwijk.**

ASTRO(2004)9
Paris, 14th May 2004

EUROPEAN SPACE AGENCY

ASTRONOMY WORKING GROUP

Recommendation on the EUSO phase A study results

At its 118th meeting held on 13-14 May 2004 at ESA Headquarters, Paris, the Astronomy Working Group (AWG) was presented with the results of the phase A study of the EUSO project carried out under the joint responsibility of the Science and Manned Space Flight Programmes.

The AWG recognizes the importance of the science goals of EUSO. The possible evidence from ground based experiments of the violation of the Greisen-Zatsepic-Kuzmin (GZK) cut-off in the propagation of cosmic-rays is intriguing and provides a potential sign of new physics. Likewise, identifying the nature and direction of the highest energy particles that reach the Earth could give new insights into the astrophysical acceleration processes. Nevertheless, the AWG is concerned about the likely impact of ongoing and forthcoming ground based experiments on the field, in particular regarding the reality of the violation of the GZK limit, which may render the EUSO implementation premature.

The AWG acknowledges the significant effort and progress made by the EUSO collaboration on these issues. However, the AWG is not in a position to include EUSO among its top priorities, also given the present status of the level of resources of the Science Programme and the uncertain programmatic context of the International Space Station. ***The AWG therefore cannot recommend moving the project into Phase B at the present time.***

EUROPEAN SPACE AGENCY

ASTRONOMY WORKING GROUP

Recommendation on the selection of the NIRSpec Instrument Science Team

At its 118th meeting held on 13-14 May 2004 at ESA Headquarters Paris, the Astronomy Working Group (AWG) was briefed on the selection process for 6 European members of the NIRSpec Instrument Science Team (IST) for the James Webb Space Telescope (JWST).

The selection process was based upon the terms of the JWST Science Management Plan to ensure a good complement of scientific expertise and an appropriate balance of instrumentation experience (hardware and software) within the IST. The selection committee chaired by the JWST Project Scientist consisted of 2 AWG members, 2 members of the European JWST community and 2 ESA representatives.

In total, 34 applications were received by ESA in response to the Announcement of Opportunity for membership in the NIRSpec IST issued on 17th March 2004. The AWG was impressed by the large number and the high quality of the applications.

Having heard the report presented by the committee's chair and considering the committee's unanimous proposal for membership, ***the AWG recommends unanimously that the following candidates be appointed as members of the NIRSpec Instrument Science Team for an initial term of 3 years:***

| | |
|-------------------|-------------------|
| Arribas, Santiago | (IAC, Tenerife) |
| Bunker, Andrew J. | (Exeter) |
| Charlot, Stephane | (IAP Paris) |
| Franx, Marijn | (Leiden) |
| Maiolino, Roberto | (Arcetri) |
| Rix, Hans-Walter | (MPIA Heidelberg) |

The proposed team provides a broad spread of expertise as well as a mix of experience with both more senior and more junior scientists as demonstrated below by the summary CV's of the recommended candidates.

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Santiago Arribas

PhD IAC (1987)

Senior Scientist, Instituto de Astrofísica de Canarias Santiago

Santiago Arribas is an experienced instrumentalist and observer, having been PI for a number of multi-object and integral field spectrographs for ground-based use. He also has extensive experience in operating space instrumentation, having sought leave from IAC to spend a term as an ESA staff member at STScI (finishing mid-2005) where he serves as Instrument Scientist for NICMOS. As a member of the initial ESA NIRSpec Study Team since 1998, he led several key trade-off studies aimed at optimizing the present design of NIRSpec. Arribas' main scientific interests concern the internal structure, formation and evolution of galaxies.

Andrew Bunker

PhD Oxford (1996)

Lecturer, Exeter University

Andrew Bunker has made significant contributions to mapping the history of star formation and chemical evolution, and the nature of high redshift galaxies. Although primarily an observer, experienced with both instrument development and data reduction, Bunker also has a solid astrophysical grounding and is an expert in exploiting astrophysical diagnostics such as nebular emission line spectroscopy. He also has extensive interest and experience in integral field spectroscopy, an area in which he currently leads several large ground based programmes.

Stephane Charlot

PhD U Paris (1992)

Staff Scientist, Institut d'Astrophysique, Paris

Stephane Charlot is recognized internationally as a world leader in the field of spectral synthesis of galaxies. In collaboration with Bruzual he has developed and maintains the state-of-the-art stellar population synthesis package that has become the de facto reference standard for interpreting galaxy spectra. This package is continually being updated to include the most recent and accurate stellar evolution tracks and most up-to-date template stellar spectra. Lately Charlot has also expanded the code to treat nebular emission lines, a diagnostic of vital interest to planning the exploratory surveys foreseen for NIRSpec.

Marijn Franx

PhD U Leiden (1988)
Professor, Leiden Observatory

Marijn Franx is an acknowledged authority in the general field of galaxy evolution and formation with extensive observing experience using both the largest ground facilities and HST. Although primarily an observer, Franx is at heart a generalist who is well-grounded in instrumentation, data reduction and astrophysical theory and interpretation. He is also an authority on measuring the masses and kinematics of galaxies, the techniques of which one hopes to apply to the much higher redshifts accessible to NIRSpec. Franx is also leading or involved in a number of on-going deep galaxy surveys using VLT and HST.

Roberto Maiolino

PhD U Florence (1995)
Associate Astronomer, Arcetri Astrophysical Observatory, Florence

Roberto Maiolino is noted for his high redshift observational work. Maiolino has extensive experience with near-IR instrumentation and spectroscopic data reduction - and takes a special interest in instrument characterization and calibration, two challenging areas that will require particular attention on NIRSpec. Maiolino's scientific interests and expertise is in the area of the high redshift universe, with emphasis on dust, supernovae and AGN activity in galaxies - interests that nicely complement the expertises of other IST members.

Hans-Walter Rix

PhD U Arizona (1991)
Director, Max-Planck-Institut für Astronomie, Heidelberg

Rix is an internationally recognized authority in observational cosmology. Rix is also also a generalist, being comfortable with both instrumentation, data reduction and astrophysical theory and interpretation. Although not primarily a hardware builder, Rix has been closely associated with a number of NIRSpec's predecessors in the form of early ground based near-IR spectrographs that were made possible by the availability of the first near-IR detector arrays. Rix is also leading or involved in several on-going deep galaxy surveys (including the Sloan Survey) using VLT and other ground based facilities - experience that will be of great value in designing the surveys to be carried out with NIRSpec.

ASTRO(2004)11
Paris, 14th May 2004

EUROPEAN SPACE AGENCY

ASTRONOMY WORKING GROUP

Recommendation on the Integral Field Unit for the NIRSpec instrument

The Astronomy Working Group (AWG), at its 118th meeting held on 13-14 May 2004 at ESA Headquarters, Paris, heard the proposal of the Executive presented by the JWST Project Scientist (Peter Jakobsen) to include an Integral Field Unit (IFU) within the NIRSpec instrument.

The IFU module would considerably increase the scientific capability of the NIRSpec instrument, in particular for the study of the dynamics of high redshift galaxies. In addition the IFU would allow to mitigate the operational risk of the instrument by providing a backup acquisition mode for spectroscopy.

Taking into account the reduced impact on the cost of NIRSpec compared to the considerable benefits of the implementation of the IFU, *the AWG unanimously recommends that this module be included in the instrument.*

EUROPEAN SPACE AGENCY

ASTRONOMY WORKING GROUP

Recommendation on the Level of Resources 2006-2010

At its 118th meeting held on 13-14 May 2004 at ESA Headquarters, Paris, the Astronomy Working Group (AWG) discussed the draft document “Level of Resources 2006-2010” of the Executive proposing to increase the level of resources of the Science Programme by about 25% in 3 years starting in 2007. The AWG enthusiastically supports the proposed strengthening of the ESA Science Programme. Major milestones in astrophysics in the coming decades will be the detection and characterization of Earth-like planets and life elsewhere, as well as the identification of dark matter and energy.

The AWG reconfirms the scientific excellence of the astronomy component of the present science programme. It will continue to open unique opportunities for the European astronomy community to major scientific breakthroughs.

In line with ASTRO(2003)13 on the reconstruction of the Cosmic Vision Programme, the AWG confirms unanimously the recommendation of an early implementation of the GAIA mission within the constraints of the present programme.

Within an increase of the level of resources as proposed by the Executive, *the AWG unanimously recommends the implementation of the Eddington mission as the highest priority*. This mission will detect and characterize exo-planets, including Earth-like planets, and will achieve major progress in our fundamental understanding of stars. The results of the industrial definition studies as reported at the meeting, have confirmed that Eddington is technically mature and within the budgetary envelope of a Flexi mission and can be implemented in a timely manner.

The AWG also strongly recommends SMART-3 as the most important stepping stone towards space interferometry (Darwin) and, possibly, X ray spectroscopy (XEUS). This will allow Europe to keep its strong position in the field of extra-solar planetary science and to lead the required technology development for precision formation flying and nulling interferometry.

ASTRO(2004)8
Paris, 28th April 2004

EUROPEAN SPACE AGENCY
ASTRONOMY WORKING GROUP

118th Meeting

to be held on
13-14 may 2004

*(starting at 14.00 hrs on the 13th
and foreseen to end at 17.00 hrs on the 14th)*

at ESA Headquarters, Paris
(Room 137)

Draft AGENDA

13th May (14.00 hrs)

1. Adoption of Agenda (ASTRO(2004)8)
2. Approval of reports of previous meetings (ASTRO(2004)6 & 7)
3. EUSO Phase A study results
4. JWST – NIRSpec Science Team membership
5. Eddington Phase A study results

14th May (09.00 hrs)

6. Status of Science Programme
 - 6.1 Level of Resources 2006-2010
 - 6.2 Cosmic Vision 2015-2025
7. Satellites in orbit
 - 7.1 HST
 - 7.2 ISO
 - 7.3 XMM-Newton
 - 7.4 INTEGRAL

8. Projects under development
 - 8.1 Herschel
 - 8.2 Planck
 - 8.3 Astro-F
 - 8.4 Corot
9. Projects in preparation and ongoing Study
 - 9.1 JWST
 - 9.2 GAIA
10. Future Mission Studies
 - 10.1 IRSI-Darwin
 - 10.2 XEUS
 - 10.3 ISS payloads (Lobster, Rosita)
11. Any other matter
12. Date and place of next meeting(s)

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