ASTRO(2003)8
Att : Astro(2003)6
Astro(2003)7, rev.1
Astro(2003)5
Annex
Paris, 11th November 2003

EUROPEAN SPACE AGENCY

ASTRONOMY WORKING GROUP

Report of 115th Meeting

held on 7th and 8th April 2003
at ESTEC, Noordwijk

Those present:

Members of the Working Group: C. Turon (Chair)
C. Aerts (on 7/4)
P. Caraveo
J. Cernicharo
P. De Bernardis
C. Done
A. Goobar
T. Henning
R.J. Ivison
J.-P. Kneib
M. McCaughrean (on 7/4)
E. Meurs
D. Queloz
M. van der Klis
Pedro T. P. Viana

(P. Schneider was unable to attend due to teaching in Saas-Fee)

Invited Expert: J. Schmitt (item 5.3.2)

ESA: S. Volonte (Executive Secretary)
J. Clavel, M. Kessler, P. Jakobsen,
F. Jansen, C. Winkler, A. Parmar, G. Pilbratt,
J. Tauber, R. Lo Verde, M. Talevi

The Chair, Catherine Turon, welcomed the group.

1. Adoption of Agenda (ASTRO(2003)5)

The Agenda was **adopted.**
The items were taken in a different order (following availability of Executive staff and members who had to leave for the Berlin conference and the Eddington workshop in Palermo).
The items are, however, reported in the order of the Draft Agenda.

2. Approval of minutes of the previous meeting (ASTRO(2003)4)

The Draft report of the 114th AWG meeting had been sent to the Members prior to the meeting. Members were asked to send their comments by Monday, 14th April.

3. Science Programme update

The Executive, S. Volonte, gave a report on the situation of the science programme. The recent failure of the Ariane 5 ECA launch resulted in the temporary grounding of all the Ariane 5 launches with the consequence of canceling the launch of Rosetta in the January 2003 window and delaying also the launch of SMART 1. The situation was being assessed but it was clear that there would be no launcher for Rosetta before early next year and thus Rosetta could no longer go to comet Wirtanen as planned. New target comets were being looked for with "Churyumov-Gerasimenko" as a likely candidate. A decision as to the new target and the launch date would be known by mid-May.

The Science Programme was facing a serious situation this year and the next due to the financial impact of the delays in the Rosetta and SMART-1 launches and the support provided by ESA to the Herschel and Planck payloads. Reviews were being carried out for the revised cost-at-completion of the Herschel-Planck-Eddington mission group and for the Rosetta and SMART 1 delays. The intention of the Executive was to arrive at a revised implementation plan by mid-May.

S. Volonte further reported on the status of the JWST re-plan process within NASA to constrain the US cost to a financial cap of 1.6 G$. As a result, the NASA project was looking at descoping measures across the board, including NIRspec and MIRI. There was even the threat of canceling MIRI. ESA was fully involved in the process and was protecting as far as possible the interests of the European scientific community. The process would be concluded by June.

S. Volonte also reported on the LISA and Smart 2 situation. Smart 2, now renamed LISA Pathfinder, would carry 2 technology payloads, the European LISA Test Package (LTP) and the NASA provided Disturbance Reduction

System (DRS). The LTP was to be funded by the participating National Agencies. An approach similar to MIRI was being followed to confirm LTP. A Formal Agreement for LTP between ESA and the participating Agencies would have to be approved by SPC at its November 2003 meeting before proceeding with the Implementation phase of Lisa Pathfinder.

In spite of the difficult situation of the programme, the kick-off meeting of the ***VISION 2020 exercise*** was still planned for the end of June/beginning of July. Most of the XPG teams were already known.

Regarding the "Green paper" on ***Space Policy***, the Chair, C. Turon, invited the AWG members to make use of the web consultation (ref. G. Cavallo's and the SSAC&SPC Chairmen's messages to the Science community) to provide their contributions to the exercise to ensure that Space Science be emphasized in the document that R. Bonnet was drafting in preparation for the final consultation meeting with the EU in June2003.

A discussion ensued on the issue of the importance to be given to fundamental space science in the future of the EU policy.

The Chair, C. Turon, took action to request inputs also from the ESA Project Scientists and with the inputs provided by AWG members, she would draft a document to be circulated to the AWG for comment. She would then prepare a final report as the AWG input to the Bonnet document. This process woud be completed by the end of May.

In parallel, M. McCaughrean would participate as AWG representative in a discussion meeting arranged by the EU in Berlin on 8 April and agreed to report back to AWG. The Chair, C. Turon, thanked him for accepting the task and was looking forward to hearing the results from him.

4. ESA participation in JWST

4.1 Status of NASA re-planning process

P. Jakobsen, the Project Scientist, gave a brief report on JWST. For details, see the written report in the attached Annex.
Referring to the re-plan process, he explained that NASA was coming up with a solution to find the money necessary to commit to fly MIRI. He also indicated that NIRSpec was only marginally affected (if at all).

4.2 MIRI confirmation status

The Secretary, S. Volonte, provided recent information on the status of the MIRI confirmation process. The issues still to be resolved were the level of participation of Germany (DLR was still unable to raise full funding for the planned German involvement). However, a solution involving the participation of Switzerland was being developed.

A decision would be made in time for the forthcoming SPC meeting of May 2003. Regarding the other participants, the UK and Dutch participations had been fixed whereas in the other Member States, the financial approval process was still on going. In consideration of this complex situation and in anticipation of a future formal agreement between the parties involved, the Executive was requesting all the participating Agencies to provide ESA with a letter of commitment in time for the May SPC meeting. This would then be followed by a multilateral Formal Agreement at the level of the ESA Council.

Items 5. to 8. of the Agenda are summarized in the attached Annex.
They were presented by the respective Project Scientists.

5. Satellites in orbit

5.1 HST (see Annex)
5.2 ISO (see Annex)

5.3 XMM-Newton

5.3.1 Mission status

F. Jansen, the Project scientist, presented a brief status report by means of viewgraphs (see Annex).

5.3.2 Report by chairman of User's Group

By means of a PC presentation, J. Schmitt, Chairman of the XMM-Newton User's group (XMM-UG), reported on the first year of activities of the group. This group had been established as an advisory body to the XMM-Newton project as a replacement for the defunct Science Working Team.

He reported on the significant improvements in data distribution. His presentation concentrated on the past year and on the general achievements of the mission. He emphasized the dissatisfaction of the group regarding the low level of PR effort made by ESA to promote the results obtained by XMM-Newton. He asked the AWG to take an initiative to press ESA to remedy this situation. He then went on presenting goals for the next year and addressed the complementarity of XMM-Newton and Chandra. An agreement had been reached between the two missions according to which a predefined apportionment of time within each one would be devoted to observing proposals selected by the Time Allocation Committee for one mission but more suitably implemented on the other mission. With the aid of various examples, he made a strong case for the extension of mission operations.

J. Schmitt reaffirmed the good, exciting and state of the art Top Science performed by XMM-Newton and therefore recommended on behalf of the User's Group the extension of the mission operations for 2 further years.

Mission extension will be addressed by the AWG at its next meeting. A discussion ensued in which the issue of implementation of large programmes was highlighted together with the difficulties encountered to retrieve big document files. The Chair concluded in emphasizing again the unsatisfactory level of PR effort and insisted that the problem be tackled urgently.

5.4 Integral

5.4.1 Mission status
5.4.2. Science highlights

By means of a PC presentation the Project Scientist, C. Winkler, reported on the status of Integral.

Both the spacecraft and the instruments were working nominally. The commissioning and PV phases had been completed successfully and on schedule. The expected performance was very close to pre-launch predictions. The observing programme was in full swing. First, very exciting scientific data had already been obtained (see Annex for details).

The AO1 programme was being implemented. AO2 was planned to be released on15July 2003 with implementation starting in December 2003.

C.Turon thanked the Integral team for the mission that already appeared as a great success.

6. Projects under development

6.1 Herschel

G. Pilbratt, the Project Scientist, gave a status report, by means of a PC presentation. Details are given in the attached Annex.
He discussed the allocation of observing time and described the various observing programmes. A central issue was the still-to-be-defined "Key Projects" and their access by the wide scientific community. It was still the task of the Herschel Science Working Team to define an appropriate scheme to be eventually endorsed by the AWG.

The Project Scientist took the action to activate the SWG on this very important issue and report back to the AWG with an acceptable scheme.

6.2 Planck

J. Tauber, the Project Scientist, gave a status report by means of a PC presentation. Details of the report are given in the Annex.

6.3 COROT

C. Turon briefed AWG on the present situation of COROT in the context of the on going restructuring of all the CNES programmes and projects. At the time of the AWG meeting, no decision had been made and the mission was still scheduled for a launch in 2005-2006. A final decision to keep or cancel the mission was still to be made by CNES. She recalled the ESA/CNES agreement signed in 2001 making COROT not only a French but also an ESA mission.

As CNES had not maintained ESA informed of the fate of COROT, a letter had been sent by the Director of Science to his CNES counterpart to recall the existing agreement and the need for CNES to fulfil its commitment and implement the mission.

S. Volonte reminded that COROT had been recommended by the AWG and the SSAC in the context of the F2/F3 exercise. He pointed out that ESA was implementing the agreement with CNES and proposed that AWG draft a resolution in support of COROT. It was felt however, that AWG should only deal with the scientific and programmatic importance of COROT for the Science Programme of ESA.

A resolution on COROT was formulated, see document ASTRO(2003)6, attached.

7. Projects in preparation

The following items were introduced by J. Clavel.

7.1 JWST status

No comment (dealt with the day before).

7.2 GAIA

It was agreed that the Project Scientist would present a comprehensive report at the October meeting.

7.3 SMART 2/3

See Annex.

7.4 Eddington
See Annex.

7.5 Astro-F
See Annex.

8. Ongoing studies

8.1 IRSI-Darwin
See Annex.

8.2 XEUS
See Annex.

8.3 ISS Payloads (Euso, Lobster, Rosita)

S. Volonte reminded how EUSO and LOBSTER had been selected in the context of the F2/F3 exercise for a study of their implementation on the ISS. After both had undergone successfully an assessment study, they were presently in phase A studies, jointly supported by D/MSM & D/SCI. After completion of these activities and positive evaluation by the Science Programme advisory bodies, a decision would have to be made jointly by D/MSM & D/SCI as to their possible implementation. However, the schedule for decision was very uncertain, being driven by the situation resulting from the recent shuttle accident.

Regarding ROSITA, this proposal had been evaluated by the AWG upon invitation by the German Space Agency DLR and had been successfully studied at assessment level. It was presently in phase A study with D/MSM but its future was uncertain.

At the present stage, these payloads could in no way be considered as approved projects either by D/SCI or D/MSM.

9. Communication plan of the Science Programme

R. Lo Verde, Head of the Science Programme Communications Service at ESTEC and his collaborator Monica Talevi, gave a report on the science communications activities.
A new policy had been implemented starting in 2002, to increase the overall public interest in the ESA Science Programme by adopting new ways of promoting its activities according to the principle that “different target audiences have different needs”. R. Lo Verde clarified the objectives regarding the Media and the general Public.

Monica Talevi described the PR aims and activities more in detail and the ways and means of how PR was dealt with by the communication service for the science missions. She described various examples with particular regard to astronomy missions and themes. She stressed the need for support from scientists for efficient accomplishment of the tasks.

Regarding the issue of education, R. Lo Verde stated that the communication service although gravitating around the educational world, was not involved in education. He indicated that at ESA there was a group dealing specifically with educational requests.

A question & answer discussion followed where it emerged that the AWG was concerned at the lack of visibility of important results provided by current ESA missions.

In addition, it was noted that the access by the scientific community to the ESA advisory bodies was unsatisfactory and so was the situation for the advisory bodies regarding access to information and documents essential for fulfilling their task.

AWG felt urgent steps were needed to allow the Science Communication Service to meet the new needs.

A recommendation was formulated on ESA SCI-PR, see document ASTRO(2003)7,rev.1, attached.

10. Any other matter

11. Date and place of next meeting

The next (116th AWG) meeting was planned to be held on 8-9 October at ESA HQ Paris. In the mean time, it was decided that the meeting would still be held on the same dates but in Noordwijk, The Netherlands, in the same time frame as the Plenary meeting of 7 October involving all the science advisory bodies (SSAC and Working Groups).

The following meeting (117th AWG) was foreseen to be held on 15-16 January 2004 at ESA Headquarters.

ANNEX

Project and Study Scientist Reports for AWG #115

28 March 2003

Report compiled, using inputs from Study and Project Scientists by:
- Jean Clavel, Astrophysics Missions Division,
- Martin Kessler, Science Operations & Data Systems Division.

5. Satellites in orbit

5.1 HST: Piero Benvenuti

The Hubble Space Telescope and its suite of new and refurbished Instruments continue to perform very well. However, the loss of the shuttle Columbia is calling into question NASA's schedule to service the HST. The next mission is still planned for November 2004, but no reliable dates will be known for some time.

The deadline for the Cycle 12 Call for Proposals was January 24, 2003. By that date 1052 proposals were received, 19% of which have a European PI. About half of the proposals are requesting the use of the new Advanced Camera for Survey, ACS. The Time Allocation Committee met on March 24-29. The selection results will be communicated in early April and the new Cycle of observations will begin next July.

The introduction of the on-the-fly re-calibration procedures and a major H/W and S/W upgrade in the ST ScI HST Archive, has caused a temporary backlog in the shipment of HST data to the ST-ECF Archive. The backlog was getting critical because the proprietary period of the first GO ACS frames will soon expire. A solution, based on electronic shipment of the data over a high bandwidth connection via ESTEC, was implemented and the backlog is now being cleared. The high bandwidth line was recently installed in ESTEC within the ESAGRID activities, which aim at setting and operating a GRID network among the ESA sites.

The multi-wavelength GOODS data set (which includes ACS, Chandra and XMM-Newton data as well as a large component obtained with the ESO Telescopes), was used as a test case for the first demonstration of the Astrophysical Virtual Observatory (AVO). The successful demo took place at the Jodrell Bank Observatory on January 20-21, 2003. Reports about the AVO demo were published in the Nature and Sky&Telescope magazines.

Science Highlights.

A major scientific highlight, based on data taken by a European group lead by A. Vidal-Madjar, was published in the March 13 issue of Nature. The team observed for the first time the atmosphere of an extra-solar planet evaporating into space. The HST ESA Information Centre issued a Science News including a short video animation to illustrate the phenomenon. The News was picked up by a record-breaking number of different media.
(See http://sci.esa.int/hubble/news/index.cfm?aid=31&cid=630&oid=31711)

5.2 Infrared Space Observatory (ISO) active archive phase: Alberto Salama

The ISO Data Centre Active Archive Phase activities continue to run smoothly. The ISO Data Archive is always busy, with 50 to 100 downloads per month, accessing typically 5 to 10% of the product content, with 20 or 30% of usage coming from the USA. Requirements have been consolidated for a new version of the ISO Data Archive (V.6), planned for release in July. This release is devoted to upgrading functionality associated with, and visibility of, the Expert Reduced Data - data reduced systematically "by hand". Projects focussed on reducing data from selected observing modes are underway. A campaign for soliciting reduced data from the community is about to start.

A new approach to the assessment of data quality has been laid down, upgrading from a small set of "technical" quality flags to a well-structured quality report, which often includes a "scientific" assessment. This approach is the same as that foreseen for the XMM-NEWTON Science Archive. Its implementation is foreseen for version 7 of the ISO archive, planned for end 2003.

Work on documentation continues well. The legacy versions of the remaining ISO Handbook volumes (ISOCAM and ISO) are being finalised.

ISO continues to have a significant presence in the refereed literature with more than 950 articles drawing upon ISO data having appeared since late 1996. These papers cover almost all areas of astronomy.

5.3 XMM-Newton: Fred Jansen

XMM-Newton operations continue to run smoothly. Radiation levels around the belts and during the remainder of the orbit have started to increase again. This is a well-known seasonal effect. The recent orbit maintenance manoeuvre and the spring 2003 eclipse season went by without any problems.

The programme completion status is as follows:
Guaranteed time: 96.6 %
AO-1 programme: 93.4 %
AO-2 programme: 37.7 %
Completion of all of the above observing programmes is expected by November 2003. The call for observing proposals for AO-3 was released on March 17, 2003 with a deadline of 12.00 UT on 30 April. The results from the proposal review will be available by mid-July 2003.

During a recent EPIC calibration workshop, the first indications started appearing of a calibration problem with the MOS cameras below 0.5 keV. First results indicate there may be a historical trend of a so far un-understood nature.

Version 2.0 of the XSA (XMM-Newton Science Archive) is expected to be released by mid-April 2003.

The next meeting of the XMM-Newton users group will be held on March 31st-April 1st. The chairman of the users' group will make a report to the AWG on the first year of users group activities at the April 2003 AWG meeting.

Currently, over 2464 observation sequences have been executed and the data for 2368 of these has been shipped.

A target of opportunity observation was triggered by the detection of a hitherto unknown transient (although it has been detected by ASCA in 1994) by Integral. The follow-up observation by XMM-Newton was very successful. The source is clearly variable and has a strongly absorbed X-ray spectrum with a few very strong (Fe) emission lines.

The first images from the deepest XMM-Newton observation ever (1 Msec on the Lockman Hole) are now available. The quality of the observations is such that X-ray spectral diagnostics on some 100 sources is possible.

On February 27, a GRB alert from Integral was received and XMM-Newton decided to follow-up this event. GRB030227 was discovered by INTEGRAL on February 27 at 08:42 UT in the field of view of the IBIS telescope. The notification arrived in VILSPA at 10:00 UT and an observation was immediately approved by the XMM-Newton Project Scientist for execution at the beginning of revolution 590, which was starting at 11:09 UT. The observation was started at 16:39:39.UT for a total of 49 ksec. Already after the first 1000 sec of exposure, two sources were clearly present in the MOS field of view. This sequence of events clearly demonstrates the ability of XMM-Newton to rapidly (< 6 hours) follow-up external triggers.

Some 265 papers have been published in the refereed literature, either directly or indirectly based on XMM-Newton observations

5.4 Integral: Arvind Parmar, Chris Winkler and Rudi Much

The INTEGRAL mission is proceeding smoothly with no loss of redundancy or major concerns. All the instruments are functioning nominally, although only one (of two) JEM-X units is currently being operated until an anomaly is investigated. As reported previously, the PV phase was completed on 17 December 2002, except for the Crab Nebula "standard candle" calibration target. This could not be observed before 2003 February due to solar aspect angle constraints. In parallel to IBIS and both JEM-X units observing the Crab, the first in-orbit SPI annealing cycle was successfully performed. Both goals of the annealing were achieved, namely the cleaning of the detector system from contamination and the annealing of radiation damage in the detector crystals. Following annealing, SPI completed its calibration with dedicated Crab Nebula observations.

Just prior to the Crab observations, IBIS installed an on-board software patch that reduced its telemetry usage by ~15%. The additional free telemetry has been allocated to SPI so that some single event timing information can be provided. However, shortage of telemetry allocation remains an item of concern, especially on fields with many bright sources. JEM-X also updated its onboard software to improve

the onboard background filtering. This was necessary due to the lower HV settings being used, which resulted in too many good events being rejected.

The results from the Crab observation are still being analysed and will be presented at the Mission Performance Verification Review on 2003 May 19/20. Preliminary indications are that the performance of the payload is in line with, or close to, that stated in the AO-1 documentation.

The INTEGRAL ground segment is continuing to work well. However, a large number of short telemetry gaps are still being experienced from the Goldstone station. The cause is now understood and tests of alternative transmission methods are planned for this month. The INTEGRAL short-term plan can be found under http://astro.estec.esa.nl/Integral/isoc/ and is presently available up to one month in advance. Currently the galactic centre region is visible and most of the observations are galactic centre deep exposures and galactic plane scan arcs (parts of the core programme). In addition, open time observations of Aquila X-1 (ToO), GRS 1915+105 (priority A), Perseus cluster (pri C), Centaurus A (pri A), XTE J1720-338 (ToO), 4U1630-47 (ToO), and the Coma Cluster (pri A) have been performed. All the ToO observations were part of the approved programme. It was necessary to schedule a priority C observation during an interval when the MOC was not available due to maintenance activities and INTEGRAL was controlled directly from the Redu ground station.

As planned, the INTEGRAL real-time science telemetry are being forwarded to the Integral Science Data Centre (ISDC) within a few seconds where it is checked for the presence of gamma-ray bursts or other transient activity. A total of four confirmed gamma-ray bursts have been detected within the fields of view of the gamma-ray instruments in approximately four months of operations. Probably the most interesting of these is GRB 030227. The GCN (Gamma-ray burst community network) circular was issued within 0.5 hours of the burst. Optical follow-up observations detected a fading counterpart. An observation with XMM-Newton (IAUC 8087), which started 8 hours after the GRB also detected a fading counterpart and provided a high quality spectrum.

A number of new transient high-energy sources have been detected by INTEGRAL. The first of these was IGR J16318-4848 (IAUC 8063) -a bright source in IBIS- and which reveals a highly absorbed, line-rich, spectrum in an XMM-Newton follow-up observation a few days after the INTEGRAL discovery. Subsequently, IGR J16320-4751 and IGR J19140+098 were discovered during open time observations (IAUC 8070 and 8088), and IGR J16358-4726 during GCDE observations (IAUC 8097).

Data from observations performed between 18 and 29 December 2002 have been made publicly available on the ISDC web site. The first release of the ISDC data analysis software is expected at the end of March. This release will include test data (some Crab observations), and installation guides etc. It is planned to ship the first data and processed products to observers in early April – following a go-ahead from the Integral Science Working Team.

6. Projects under development

6.1 Herschel: Göran Pilbratt

*Science instruments***.** All three (PACS, SPIRE, HIFI) Herschel instruments are continuing struggling to keep to their schedules. The next major review cycle (the IHDR - Instrument Hardware Design Review) will take place in May (PACS), July (HIFI) and September (SPIRE).

Spacecraft. The industrial work - like the instruments before it – is now showing clear signs of schedule stress. The Project team are working together with industry to identify the most efficient way forward without affecting the launch date.

*Telescope***.** The entire first batch of 12 primary mirror segments (24 are required in total, 12 for the FM and 12 for the FS) has been manufactured in Boostec. Brazing to join them together to form a monolithic mirror is planned for April, after which first grinding in Boostec and then polishing in Opteon will take place.

Ground segment. The problems re SPIRE and HIFI ICC funding have been addressed in a number of meetings. One potential solution could involve ESA/RSSD taking a larger role in the provision of interactive analysis (IA) data processing software to ensure easy community access to Herschel data. There is as yet no conclusion, but there are actions laid out intending to generate one on a timescale of a couple of months.

6.2 Planck: Jan Tauber

Payload:
- Reflectors: the hardware development is nominal. A review of the testing means and facilities will take place in early April.

- LFI instrument: the Italian funding for the de-scoped LFI instrument (without the 100 GHz channel) seems to be finally agreed by ASI and industry. The contract with Laben was formally approved by the ASI council at its meeting of 25 March. A new funding uncertainty has emerged however, related to the ASI funding of Italian institutes; this covers mostly the Data Processing activities, but also some (minor) hardware elements. It is reported that ASI has not provided any funds for over a year. They will review the institute funding situation at the next Council meeting in one month's time; until then LFI institute activities are severely slowed down (e.g. no travel). Technical (industrial) activities have resumed in the past month, with the formation of a Joint (LFI, Laben, ESA, Alcatel) Engineering Team. As noted previously, the LFI development schedule can no longer support a Qualification Model, and a proto-flight approach is foreseen instead, with all the attendant risks, not only on LFI but also on HFI and ESA. The overall development schedule for LFI is still uncertain; Laben has accepted the delivery date required by ESA as a goal only. The details of the development approach and schedule will be available after the Baseline Design Review, now planned end-April or early May.

- HFI instrument: the development is largely nominal, although the schedule is slipping slightly. Following the LFI de-scope, a study has been made by HFI and JPL of the possibility that the currently foreseen spider-web Bolometers at 100 GHz be replaced with polarisation-sensitive ones (PSB) on the FM. This replacement would safeguard the polarisation capability at 100 GHz. It is technically feasible, and the cost impact is relatively low; however, NASA has to fund it, and it will not commit before the end of April. Until then, HFI is safeguarding the manufacturing team from dispersal.

- The 20 K sorption cooler to be delivered by NASA/JPL (which actually serves as a cooler for both LFI and HFI) will undergo a formal review on 27-28 March.

Spacecraft: the schedule remains a critical aspect of the development; however, it still shows it possible to meet the launch date (February 2007), assuming nominal instrument delivery dates.

Ground Segment: progress is nominal.

Science: The WMAP first-year data have been released. Possibly the most interesting aspect of the results is the detection of a very early re-ionisation epoch. If this measurement survives further scrutiny, it enhances the case of Planck significantly, as it makes the polarised CMB "B-mode" signal much more likely to be detected (by Planck).

6.3 COROT: Fabio Favata

The complete CNES program is under review, and projects have been "prioritised". COROT comes around the middle of the list, and, not being at the top, is a potential candidate for either delay or cancellation. Apparently a decision regarding COROT's future will be taken at the "Comité des Directeurs" meeting which will take place in CNES on April 30. ESA D/SCI has sent a formal letter of support for COROT to the appropriate level in CNES.

7. Projects in preparation

7.1 JWST: Peter Jakobsen

Following SPC approval, progress on the European side of JWST remains steady:

The definition of the NIRSpec instrument continues according to schedule. Delta Definition Studies aimed at carrying the two Astrium and Alcatel consortia forward to the mid-summer release of the competitive ITT for the Implementation Phase have been initiated. The Implementation Phase for NIRSpec is planned to start at the end of this year.

Good progress is also being made on securing support for the European Consortium that will provide the Optics Module for MIRI. Letters of intent have been received from all interested Member States and final commitments are expected at the May SPC meeting. The instrument definition is also progressing well with the Final

Presentation of the joint EC/JPL/NASA MIRI Pre-B Confirmation Study having recently been held.

There is, however, still some uncertainty on the US side of the project: as a part of its ongoing "Re-plan" of JWST, NASA HQ has imposed a financial cap of 1.6 G$ for the total US cost of the mission and a non-negotiable launch date of August 2011. However, the spending profile guidelines issued by NASA HQ for the years 2005-2008 are not consistent with the JWST mission as presently envisaged meeting this launch date.

As a step toward solving this problem, the JWST Science Working Group (SWG) has agreed to reduce the collecting area of the primary mirror from 29 to 25 m^2. Nonetheless NASA HQ is also insisting that the instruments de-scope in order to save US funds. Since NIRSpec is primarily ESA funded, it has been relatively immune to this pressure. While the same is true for the ESA Member State-provided MIRI Optics Module, the MIRI instrument is presently at risk, with NASA claiming that it is not able to fully fund its part of the instrument. The solution presently being pursued by the SWG is to re-integrate the Canadian-provided Fine Guidance Sensor into NIRCam in order to free up US resources for MIRI. Whether this solution is sufficient to meet the NASA HQ constraints will be known by early May at the latest.

7.2 GAIA: Michael Perryman

Excellent progress has continued in two main areas.

On the technological side, all major technology development activities identified during the earlier "concept and technology study'" are now underway. The goal is to have, by the end of 2004, a detailed understanding and control of all of the "critical" technologies required for building and operating GAIA. These contracts include two parallel major industrial "System level technical assistance and definition study" contracts, aiming to further consolidate the overall design of the payload and spacecraft and supervising, from a system viewpoint, all of the other technology development activities. A key task is to generate a single System Requirements Document to be used as a basis for the Phase B2 design. Other activities include contracts to assess the feasibility of the CCD/focal plane assembly; the silicon-carbide mirror and structures; the payload data handling electronics; ground verification and calibration; phased array antenna; sunshield; and radial velocity spectrometer optimisation. All contracts are proceeding satisfactorily. If they continue to run smoothly, GAIA would be in a position to enter Phase B2 (implementation phase) at the beginning of 2005, with a launch feasible at the end of 2009, or early 2010. Activities in ESTEC remain focused on such a launch date.

On the scientific side, the design of a prototype data analysis system for GAIA, now two years into development, has continued to progress steadily. Already this system is capable of ingesting rather detailed simulated satellite data, and running simplified algorithms representative of the required reduction system (object matching, instrument calibration, attitude solution, and source parameter determination). By mid-2003, the goal is to have a system in place capable of reducing some 2.5 Tbytes of raw data, representing simulated observations for 1 million stars observed over 5

years. From mid-2003, the scientific community, through the GAIA working groups, will start to submit structured algorithms to carry the development of this complex data analysis system further. A 2-day workshop will be held in Barcelona 8-9 April, to discuss detailed interfaces.

A major symposium aiming to present the results of this phase of the GAIA activities to the community is planned in Paris in October 2004.

Although FAME was cancelled by NASA in January 2002, and DIVA by DLR in January 2003, a NASA proposal for SMEX funding is now being considered, essentially to purchase DIVA from Astrium-D. If successful, launch would be targeted for 2008-2009.

7.3 SMART-2/3: Malcolm Fridlund

Following the cancellation of the Darwin Technology Package (DTP) on-board SMART-2, the decision was taken to study a SMART-3 mission dedicated to the in-orbit demonstration of the technology required by Darwin. A work plan has been established for the assessment and definition phases. There are three alternatives:

- Essentially flying the previously envisaged DTP on either two or three spacecrafts.
- Using three spacecrafts, with one beam combiner and two telescope units (0.3 – 0.4 m mirrors) to carry out Michelson interferometry in space. The wavelength range, 1-4 _m, requires only simple passive cooling of the optics.
- As the previous one, but with *nulling* interferometry in the 3-4 _m wavelength range. This would require more sophisticated passive cooling but would verify nulling and achromatic phase shifting in space. The technology would be demonstrated through spectroscopic observations of known “hot Jupiters”, which is a strong scientific case in itself.

Cost will off course be a decisive factor. A study contract with Alcatel is currently in progress to better scope the second of the three options. This study will be completed soon, with a final presentation of the results at ESTEC on 17 April 2003.

7.4 Eddington: Fabio Favata

The Invitation to Tender (ITT) to the industry for the competitive definition phase is currently open, with proposals due by April 4. The contract for CCD prototyping is finally about to start, with a kick-off meeting with industry planned for April 7. Dedicated Eddington engineering support was allocated within the Herschel-Planck project structure.

The organization of the 2nd Eddington workshop (April 9-11 in Palermo Italy) is proceedings well, with over 140 participants registered thus far. There is significant interest from the Media, and a press conference is being organized.

The Science Management Plan was unanimously approved by the SPC on Feb. 25/26. Several delegations explicitly mentioned the open data policy as a positive aspect of Eddington.

The Announcements of Opportunity for both the Eddington Science Team and the Eddington Payload Consortium are being prepared. It is planned to release the Call for Letters of Intent in the first week of April.

7.5 ASTRO-F: Martin Kessler

The top-level documents concerning requirements and implementation plans for the use of the Kiruna ground station for ASTRO-F tracking support have been agreed and signed off by all parties (ESA/Science, ESA/ESOC and ISAS). Activities are proceeding as planned.

Detailed interactions continue from VILSPA with ISAS regarding pointing reconstruction and planning for distribution of observing time to the ESA astronomical community. An overall implementation plan is about to be issued. A request for software support from industry for the pointing reconstruction task has been issued with a contracting company expected to be selected by early May.

8. Ongoing Studies

8.1 IRSI-Darwin: Malcolm Fridlund

With the exception of one member, the whole Terrestrial Exoplanet Science Advisory Team (TE-SAT) has now been appointed. It will hold its first meeting in May. According to the ESA/NASA agreement on the Darwin/TPF collaboration, the study scientists and study managers from the two agencies sit in both study teams. Further, ESA designated two TE-SAT members [Liseau (S) and Röttgering (NL)] to participate in the NASA TPF science team activities. The NASA representatives on the TE-SAT will be B. Danchi (Goddard) and J. Lunine (U of Arizona).

The preparation for the 2004 – 2006 Technology Research Programme (TRP) activities is underway. The Darwin TRP proposal is ambitious and includes the development of a test facility for cryogenic interferometers.

The competitive ITT for the definition study of the Ground-based European Nulling Interferometer Experiment (GENIE) has been completed with the selection of two technologically and scientifically excellent proposals. The contracts will be kicked off in June 2003.

The GENIE Science Study team is currently being appointed. It will have eight members selected from the community, four appointed by ESA, and four by ESO. The team composition will be announced soon.

The preparation for the Heidelberg conference “Toward other Earths” is progressing well, with 152 participants registered so far.

8.2 XEUS: Arvind Parmar

The XEUS Instrument Working Group (IWG) met at ESTEC on March 3-4. The IWG is finalising their report on the focal plane layout. This will be used as an input for the XEUS system study. The report will contain detailed descriptions of the core wide field and narrow field imagers as well as shorter chapters on the proposed auxiliary instruments. These cover fast timing, polarimetry, hard X-ray imaging and an extension to the wide field imager.

8.3 ISS payloads (EUSO, Lobster, Rosita): Arvind Parmar & Jean Clavel

EUSO:
The phase-A study with Alenia has been extended to include the accommodation of an atmospheric sensing LIDAR and will now not be completed until the 3rd quarter of 2003 (previously the 2nd quarter). A mid-term instrument design review, led by SCI-A personnel, was conducted in conjunction with the third meeting of the Science Study Team. The final report is being prepared. The major concerns were on the lack of detailed science requirements and their translation into instrument requirements, the LIDAR requirements and the maturity of its design, the mass and power budgets overruns, the thermal environment of the focal plane and the design of the telescope shutter.

Subject to ESA approving the development of EUSO, NASA has approved a contribution to the mission of $31 million (2002 EC) for the total cost of the Fresnel lens optics. This contribution will be lead by Dr. J. Adams of the MSFC in Huntsville (see NASA press release c03-h on March 20, 2003).

LOBSTER:
The LOBSTER-ISS Phase-A study has been delayed slightly and is now expected to finish in September, rather than the summer as originally planned. The only item of concern currently is the protection of the micro-channel plate optics during astronaut EVA. The NASA/GSFC X-ray group, responsible for procuring part of the proportional counter detectors, have decided not to submit a proposal for funding to the next round of the Explorer program in 2003 May in anticipation of Space Station delays resulting from the shuttle loss.

ROSITA:
The ESA pre-phase A study demonstrated that Rosita could be accommodated on the Columbus External Payload Facility (CEPF) and fulfil its science objectives. There are unlikely to be any free locations on the CEPF before 2009, or possibly later, depending on the delay caused by the loss of Columbia. Since part of the proposed instrument is a re-flight of that on Abrixas and therefore in a good state of readiness, the Rosita PI (Hasinger) has requested that ESA consider earlier ISS accommodation scenarios using alternative locations.

ASTRO(2003)6
Paris, 9th April 2003

EUROPEAN SPACE AGENCY

ASTRONOMY WORKING GROUP

Recommendation on COROT

The Astronomy Working Group (AWG) at its 115th meeting held on 7-8 April 2003 at ESTEC, Noordwijk (NL), took note of the Review of the scientific programmes within CNES.

The AWG reaffirms the pioneering aspect and high scientific interest of the COROT mission in the way of telluric planet finding and asteroseismology, as already expressed in its previous recommendation, ASTRO(2000)19.

A formal agreement was signed between ESA and CNES in June 2001, whereby ESA contributes to COROT telescope optics and the use of test facilities. In addition, 25 Co-I groups in laboratories from 9 countries are providing other substantial contributions to the project.

The AWG therefore asks the Executive to reaffirm with CNES the importance of the timely implementation of the COROT mission within the agreed 2005 timeframe

ASTRO(2003)7, rev.1
Paris, 8th April 2003

EUROPEAN SPACE AGENCY

ASTRONOMY WORKING GROUP

Recommendation on Communication

At the 115th meeting held on 7-8 April 2003 in ESTEC, the Astronomy Working Group (AWG) was briefed on the "Communication activities within ESA's Science Programme" with special emphasis on its new approach based on "themes".

While recognizing the efforts made by the Communication Office, as well as the considerable public relations potential of the "themes" approach, the AWG expressed concern on the lack of visibility of outstanding results recently obtained by ESA missions now in operation.

In view of the growing importance of public support to secure adequate funding for basic science, and because of the interest of the general public for astronomical results, the AWG urges the Executive to increase their efforts to heighten the visibility of the world-class results obtained by ESA space science missions.

To facilitate the interaction between the scientific community and the Communication Office, the AWG recommends that efforts be made to implement the approach of "theme specialists" in charge of publicizing the results from past, ongoing and future ESA space science missions.

ASTRO(2003)5
Paris, 28th March 2003

EUROPEAN SPACE AGENCY

ASTRONOMY WORKING GROUP

115th Meeting

to be held on
7th and 8th April 2003
at
ESTEC, Noordwijk, The Netherlands,
in Room "Copernicus",
commencing at 14:00 hrs on the 7th.

DRAFT AGENDA

1. Adoption of Agenda (ASTRO(2003)5)

2. Approval of minutes of the previous meeting (ASTRO(2003)4)

3. Science Programme update

4. ESA participation in JWST
   - 4.1 Status of NASA re-planning process
   - 4.2 MIRI confirmation status

5. Satellites in orbit
   - 5.1 HST
   - 5.2 ISO active archive phase
   - 5.3 XMM-Newton
     - 5.3.1 Mission status
     - 5.3.2 Report by chairman of User's Group
   - 5.4 Integral
     - 5.4.1 Mission status
     - 5.4.2 Science highlights

6. Projects under development
   - 6.1 Herschel
   - 6.2 Planck
   - 6.3 COROT

7. Projects in preparation
   - 7.1 JWST status
   - 7.2 GAIA
   - 7.3 SMART 2/3
   - 7.4 Eddington
   - 7.5 Astro-F

8. Ongoing studies
   8.1 IRSI-Darwin
   8.2 XEUS
   8.3 ISS payloads (EUSO, Lobster, Rosita)

9. Communication plan of the Science Programme

10. Any other matters

11. Date and place of next meetings

NB. The meeting is foreseen to end at 13.00 hrs