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ESA IUE Newsletter No. 46 February 1996

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Editor **M. Barylak**

Published by ESA IUE Observatory
Apartado 50 727
E-28080 Madrid - SPAIN

Telephone +34 1 813 1100
Telex 42555 VILS E
FAX +34 1 813 1139
Internet: iueobs@vilspa.esa.es

OBSERVATORY CONTROLLER'S MESSAGE

W. Wamsteker

ESA IUE Observatory

Since the IUE Project has completely revised its organizational structure, the operational philosophy and the user services for the 19th and Final Episode, it is logical that the current Newsletter is mainly dedicated to the practical implementations of the associated "Hybrid" IUE Operations.

As all of you will know by now, the withdrawal of NASA from the IUE science operations has been utilized by the ESA IUE Project to fully modernize the IUE Project. Of course some units have had to be maintained with their original H/W, since a replacement would have been unrealistic for the two years of the Final IUE Science Program as planned by the Joint IUE Allocation Committee in July last year.

As a consequence of the increased demand for support in the Hybrid's 16 hrs. science operations mode from VILSPA, you will find in this newsletter the presentation of a large number of new science and telescope-operations staff. All these people have run through an extremely rigid training to bring them up to speed in the IUE operations. The success of the operational "Hybrid" mode is not in the last part due to their dedication to the task ahead but also to the senior staff for the enormous efforts done to transfer the knowledge of operations both as known to them and the one adjusted to the new operational configurations.

On February 22, 1996, ESA's Science Programme Committee decided to terminate the IUE operations not later than September 30, 1996, as explained by Prof. R.M. Bonnet (see following page) to the IUE users. This decision was a consequence of the budgetary restrictions imposed on the Science Programme of ESA at the Council of Ministers Level in October 1995.

esa

D.SCI/RMB/db/1176 Paris, 26 February 1996

To: IUE Users

Dear Colleagues,

As was already announced in the Call for Proposals, the actual duration of the 19th and last Episode of IUE Observing was uncertain at the time of issue. Although we have considered all possible options, conditions have changed sufficiently after the financial reductions imposed on the Science Programme of ESA at the last Council of Ministers in October 1995, and a serious review of all activities supported by the Science Programme had to be initiated. As I announced in the December Newsletter, I have requested the Space Science Advisory Committee (SSAC) to review the situation in depth during a workshop which was held in January 1996.

The recommendations of the SSAC included the termination of the IUE Project. This recommendation was presented to the ESA Science Programme Committee (SPC) on 22 February 1996. After extensive consideration, the SPC accepted, with a large majority, the SSAC recommendation not to extend the IUE orbital science operations beyond 30 September 1996. This is not a happy moment, but we are living in times which are becoming more and more difficult. IUE, incidentally, is not the only programme affected by budget reductions. Nearly all other missions of the Horizon 2000 and 2000 Plus Programmes will be affected, either being descoped, delayed or cancelled.

As a consequence of the SPC decision, I have requested the ESA IUE Project Manager to ensure that a proper termination of the IUE Observing Programme will be prepared and implemented. All of those who are currently participating in the 19th Episode of IUE Observing will be contacted as soon as possible about the detailed implications of the SPC decision for the, now curtailed, 19th Episode of IUE Observations.

I would like to thank you at this stage for the continued support you have given to the IUE Project over the years. It is self-evident that the strong participation of the users has been one of the driving forces in the extraordinary success of the IUE Project. I hope that the efforts which are being made by the Project to ensure the completion of the IUE Final Archive will allow this exceptionally successful project to leave for the astronomers a data set of lasting value as a credit to all of those who have, over the years, dedicated their best efforts to the IUE Project.

Yours sincerely,

R.M. Bonnet
Director
Scientific Programme

European Space Agency
Agence spatiale européenne

Headquarters - Siège
8-10 rue Mario-Nikis - F-75738 Paris Cedex 15
Tel (33) 1 53 69 76 54 - Fax (33) 1 53 69 75 60 - Telex ESA 202 746 F

Personnel Changes

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ESA IUE Observatory

Heinz Andernach joined the IUE Observatory as `Resident Astronomer` in February 1995. He received his PhD from Bochum University in 1981. He spent five postdoctoral years at the *MPI für Radioastronomie Bonn* studying the radio continuum of extragalactic sources and galaxy clusters. After a short spell in German space industry (OHB Bremen) he discovered the charm of Latin America, e.g. at the *Instituto Argentino de Radioastronomía* (1987/8) and the *Instituto de Pesquisas Espaciais* (INPE, Brasil, 1988–91) and the (almost latin-american) *Canary Islands* (IAC Tenerife, Spain, 1991–93). In the team of the "Lyon–Meudon Extragalactic Database" at Obs. de Lyon (France, 1993–95) he extended his database experience to the optical domain.

When he is not busy with IUE duties (or cycling back and forth to Vilspa) he works on the realization of a publicly accessible database of radio sources.

In August 1995, **Armin Theissen** joined the IUE team as `Resident Astronomer`. A former research associate at the Observatory at Bonn University, he finished his PhD thesis on "Hot subdwarf stars in binary systems" in October 1994. For his diploma in pysics he studied "Hot Subdwarf Stars in the Halo of the Galaxy".

His hobbies (beside astronomy) are reading, movies and playing guitar (Blues, Jazz, Rock, and loud) or anything which creates and modifies whatever kind of sounds or noises (he would have liked to become a sound engineer). He enjoys Sundays in bed, nights in pubs,...

Lucky **Francisco Javier Marcos Fernandez** got his first job as `IUE S/C controller` here at VILSPA. Having finished his career as Technical Telecommunication Engineer at the *"Universidad Politecnica de Madrid"*, he took up duty starting May, 1995.

He enjoys photography and any kind of outdoor activities. For seeing a good film or listening to Blues concert, you can count him in.

Twenty five year old **Cristina García Miró** got the B. Sc. in Physics (specialty: astrophysics) at the *"Universidad Complutense de Madrid"*. She likes her duties as `IUE S/C controller` because of helping astronomer to do science. She continues studying for her PhD at the *"Laboratorio de Astrofísica Espacial y Física Fundamental (LAEFF)"* concerning "Parsec scales in Active Galactic Nuclei".

Her hobbies, among others, are classical music (especially listening to live concerts), playing the piano, dancing, animals, cinemas and traveling.

Cristina Calderon Riaño holds two degrees; one in Electronics Engineering and the second in Telematics Engineering which she obtained in 1993. Planning to do an air-traffic-controller course, she joined the IUE project as `IUE S/C controller` instead.

She likes flying, traveling and going to the cinema. She has practiced parachuting, skydiving and paragliding and she would like to do ballooning if she continues to survive the other activities.

Another new female `IUE S/C controller` is **Victoria Ester Moll** who finished her studies as Technical Telecommunications Engineer (specialty: radio) in November 1994.

Her hobbies and interests are: music, cinema, reading, swimming, and skiing. She enjoys meeting her friends and doing long walks.

Yet another `IUE S/C controller` is **Santiago Pascual Calviño**. He studied Telecommunications Engineering in the *"Escuela Tecnica Superior de Ingenieros de Telecomunicacion* of the *"Universidad Politecnica de Madrid"* between 1981 and 1987. He has been working for four years in R+D companies in the telecommunication field. In 1992 he received a grant of the Spanish Ministry of Education to carry out research at the *"European Space Research and Technology Centre (ESTEC)"* – the well-known ESA establishment in Noordwijk, The Netherland.

His hobbies are: jogging, music, astronomy and ornithology[1].

[1] study of birds

Francisco Jose Manso Noguerales's first job is being a `IUE S/C controller`. He is still studying Technical Telecommunication Engineering at the *"Universidad Politecnica de Madrid"* and his final project specializes in "Process and System Control".

He enjoys playing football (as goalkeeper) and likes almost all kinds of music especially "Heavy Metal". Other hobbies are sports, cinema and traveling.

Nora Loiseau did her PhD thesis (1984) at the *Instituto Argentino de Radioastronomia*, on the stucture and kinematics of the Small Magellanic Cloud. As a post-doc she worked for 3 years at the *Max-Planck-Institut fuer Radioastronomie* (Bonn, Germany) where she was involved in continuum and CO lines observations of nearby galaxies, done with various radiotelescopes (Effelsberg, the VLA and the Pico Veleta). At the *INPE* (Brazil), she continued studying the molecular gas distribution and kinematics of starburst and active galaxies, with the SEST radiotelescope (La Silla). Before joining IUE as `IUE Resident Astronomer` she worked at the *Instituto Astronomico de Canarias* (Tenerife).

Maria Luisa Garcia Vargas took up duty as `IUE Resident Astronomer` in September, 1995. She finished her studies in Physics in 1987 at the *Universidad Complutense de Madrid*. During the following 8 years, she worked as research assistant at the *Universidad Autonoma de Madrid (UAM)* and the UAM's observatory. In 1989 she received an extraordinary price for her final work in Astrophysics and the *ZONTA Amelia Earhart Fellowship Award* given to qualified women for advanced studies in aerospace-related science and engineering. In 1991 she finished her PhD in Physics. The main topics of her currect research are the theoretical and observational study of stellar populations from normal extragalactic star-forming regions to active galaxies.

Her hobbies are reading, movies, swimming, rafting, and having parties with friends.

On January 15, 1995 **Enrique Solano** joined the `IUE Resident Astronomer` Team. He is well known to the IUE project as he has been working at Vilspa as Image Processing Specialist and as Computer Operator (see ESA IUE Newsletter No. 42, pg. 4, Apr. 1993). He obtained his PhD in the subject of δ Scuti variable stars at the *Universidad Complutense de Madrid.*

He likes sports, especially tennis and football.

Ian Skillen took up the post of IUE Resident Astronomer at VILSPA on 1st September 1995 under an INSA contract. He obtained his PhD in Astrophysics at the University of St Andrews in 1985. After that he worked for periods in the Universities of Leicester, Cambridge and Sydney, pursuing his twin interests of stellar astrophysics and computing.

His main hobbies are music, art and cinema, and collecting old manuscripts and books.

Our new secretary **Carmen Rosales** joined the IUE project in July 1995. She made her diploma in Secretarial Skills in June 1983 at the *"Instituto Femenino Maria del Pilar Ruiz Liñares de Madrid"*. She has over 8 years experience in secretarial duties working for computer companies, in the "Sales Department and Manager Director's Office" and in the "Technical Director Office and Medical Department" of a multinational company in pharmaceutical industries. In 1994 she attended a course on "Management Techniques by Computers" at the *"Centro de Formación en Tecnologías Aplicadas (CEFAT)"* in Madrid (under an Euro-qualification and training program performed by the Spanish Ministry of Employment and the European Community).

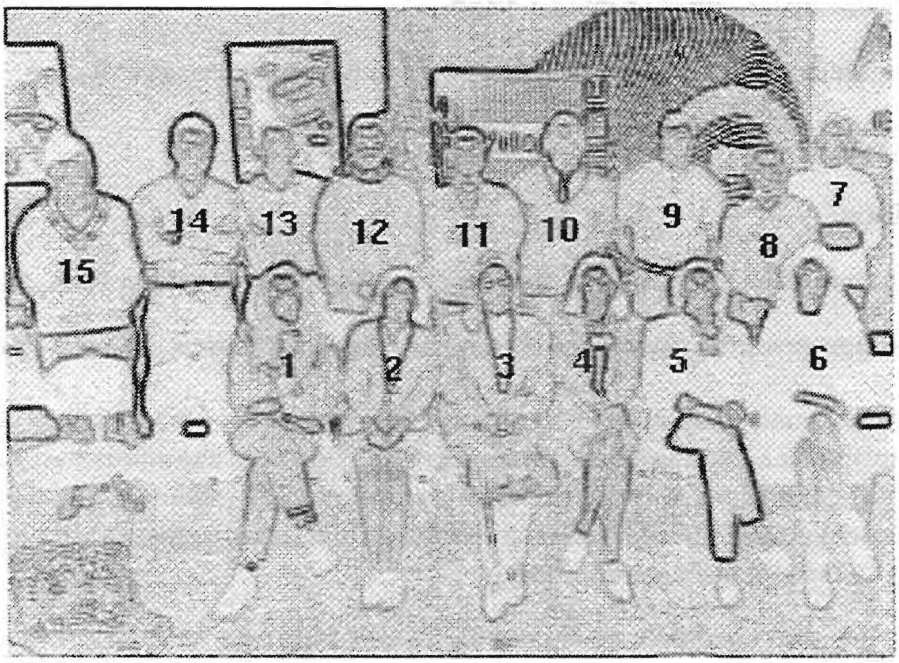
She mostly likes drawing and painting, but also enjoys going to the cinema, trekking and dancing (modern, dancing jazz, ballet, etc.)

Departures:

- *Constance LaDous* (RA) left to Sonnenberg Observatory, Königsstuhl, Germany.

We wish her all the best in her new job!

The ESA IUE Observatory team for IUE's last episode



1.-Marisa Vargas; 2.-Rosario González; 3.-Carmen Ramirez; 4.-Carmen Rosales; 5.-Domitilla De-Martino; 6.-Nora Loiseau; 7.-Armin Theissen; 8.-Pedro Garcia Larios; 9.-Norbert Schartel; 10.-Willem Wamsteker; 11.-Pedro Rodriguez; 12.-Michael Barylak; 13.-John Fernley; 13.-Enrique Solana; 14.-Ian Skillen;

IUE Observing Restrictions for the 19th Episode

D. Hermoso

IUE SOS

Here are the power and thermal restrictions for the 19th Episode, valid as of July 15, 1995.

POWER

Normal operating β range, free of constraints during the whole episode:

$$\mathbf{41^\circ < \beta < 102^\circ}$$

See Figure 1 for the power conditions for most common operating conditions.

- Most **known power negative** conditions can be permitted with prior IUE Project approval.
- A maximum of 24 power negative conditions, reaching 22.5 volts on either battery, are allowed during any 12 month period.
- All power neutral situations will be forced into power negative.

THERMAL

Definitions:

1. A temperature is **stable** if there are no glitches in its value for at least 10 minutes.
2. A temperature is **glitching** if there are three glitches within a 10 minute period.

- The thermal balance of the engine valves is achieved by switching off the HAPS heater group #2 i.e. cooling the spacecraft (S/C) down at the lower end of the β range. This heater is the **last** one left for temperature control of the engine valves. Therefore it has been defined as **ESSENTIAL ITEM** and the frequency of switching this heater on/off has to be reduced to a minimum.
- The Sun-side temperatures of the S/C are limited to 90° C. Such values can be reached at β angles between 85° and 110°.
- The engine valves thermal limits can be reached at β angles between 90° and 105°; as well as, between β angles of 28° and 45°.

If any of these limits is exceeded for more than 1 hour, the S/C must be maneuvered to a different β angle to cool down. To cool the S/C down takes between 3 to 5 hours.

The hot On-Board-Computer (OBC) β region is defined as follows:

Month	Lower Limit	Upper Limit
January	65°	85°
February	70°	79°
March to October	no limits apply	no limits apply
November	70°	79°
December	65°	85°

Operations are unrestricted for OBC temperatures less than 54.6° C and DMU less than 26.1° C.

Shadow Season Predictions

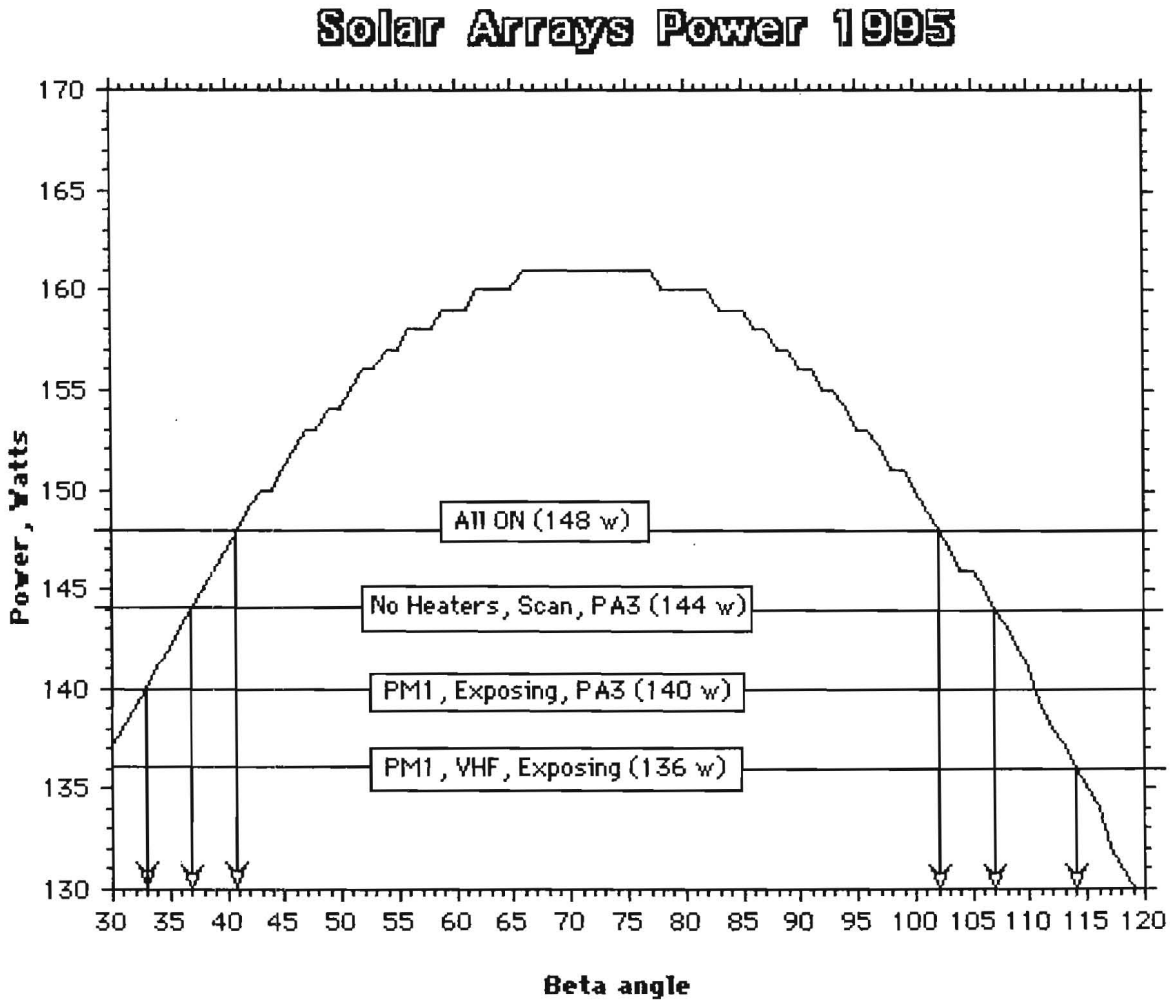
- Eclipse #36: 09 July to 02 August, 1995
  Time of Earliest Penumbra Entry: 02:37z
  Time of Latest Penumbra Exit: 04:02z

- Eclipse #37: 02January to 01 February, 1996
  Time of Earliest Penumbra Entry: 02:13z
  Time of Latest Penumbra Exit: 03:32z

- Eclipse #38: 03 July to 28 July, 1996
  Time of Earliest Penumbra Entry: 02:22z
  Time of Latest Penumbra Exit: 03:45z

- Moon Shadows:
  - 1995:
    24 September from 07:50:27z to 08:19:09z
    25 September from 00:47:29z to 01:03:15z
  - 1996:
    17 March from 08:17:04z to 09:17:58z

- Power constraints on β range for Shadow Seasons:
  Batteries charging: $47° < \beta < 92°$
  Batteries fully charged: $43° < \beta < 100°$


Solar Arrays Power 1995
Power, Watts
170
165
160
155
150
145
140
135
130
All ON (148 w)
No Heaters, Scan, PA3 (144 w)
PM1, Exposing, PA3 (140 w)
PM1, VHF, Exposing (136 w)
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120
Beta angle

IUE Data Processing and Distribution Policies

E. Solano, D. de Martino, J.D. Ponz

ESA IUE Observatory

This article summarizes the standard IUE data processing and delivery policies of the 19th IUE episode. Please remember that the latest information about the 19th IUE episode can be read under the "World Wide Web" (WWW) at:

`http://www.vilspa.esa.es/iue/iue19th.html`

IUE Data Products

- LOW RESOLUTION:

  the low dispersion data are processed by the new processing software known as NEWSIPS (NEW Spectral Image Processing System) which was developed in the context of the IUE Final Archive. Information about its performance can be found via the WWW at:

  `http://www.vilspa.esa.es/iue/IUEFA/manual/chap00/chap00.html`

  The processed data are stored in FITS format and consist of:

  - the raw image (extension `RILO`),
  - the linearized image (extension `LILO`),
  - the resampled spectral image (extension `SILO`) and
  - the extracted and calibrated spectrum (extension `MXLO`).

- HIGH RESOLUTION:

  until NEWSIPS for high dispersion data becomes available, IUESIPS software will be used to process both SWP and LWP data. These data remain in the old IUE guest observer (GO) format and comprise:

  - the raw (extension `RAW`),
  - the photometrically corrected image (extension `PHO`) and
  - the extracted and calibrated spectrum (extension `MEHI`).

IUE Data Delivery

Principal investigators (PIs) will be informed via FAX (i.e. copy of the Hand/Written IUE log) of all observation taken for their programs within 24 hours. The processed data are made available to PIs under both the anonymous FTP account and the WWW data server at

iuearc.vilspa.esa.es
and
http://iuearc.vilspa.esa.es/

respectively, not later than 14 days from the date of observation. The data will be stored there for a period of at least 4 months. It is the responsibility of the PI to retrieve his/her data from that account.

Urgent processing (24hrs) can be requested in very special cases. This needs to be clarified between the PI and the contact RA and has to be approved by the IUE Observatory Manager.

The data available for electronic retrieval are

- the `MEHI` files for high resolution data processed by IUESIPS and
- the `SILO` and `MXLO` FITS files for all low resolution data as processed by NEWSIPS.

In the very special case that the complete output data set (including raw image, etc.) is needed, the PIs will have to notify the contact RAs. The complete data set will then be delivered via normal mail on either EXABYTE or DAT tapes.

For those 19th episode programs which started already in August and September 1995, where low resolution data were still processed by IUESIPS, NEWSIPS re-processing can be requested.

Please note that **no other NEWSIPS re-processing requests** can be made as most of the NEWSIPS data will be available by mid-1996.

How to retrieve 19th Episode data

After processing, data are copied to the distribution area and stored in the subdirectory identified by the program ID. Low resolution data are named as `CAMnnnnn.SILO` and `CAMnnnnn.MXLO` (for instance `SWP43567.SILO` and `SWP43567.MXLO`). High resolution data are named as `CAMnnnnn.MEHI` (for instance, `SWP43568.MEHI`).

For retrieving data via any WWW browser see the article by I. Yurrita, *"A WWW server for IUE's 19th episode data distribution"*, in this newsletter.

The procedure to retrieve data using FTP is:

```
ftp iuearc.vilspa.esa.es
Username: anonymous
Password: Your e-mail address
```

```
ftp$>$ cd pub
ftp$>$ ls
     AAAREAD.ME              this file
     calib                   Calibration files (only needed for SILO)
     iuefiles                Data directory
     iuemidas                IUE context for MIDAS
     maint                   IUE maintenance programmes
ftp$>$ cd iuefiles
ftp$>$ ls
     SA001                   Subdirectory for programme SA001
     SA002                   Subdirectory for programme SA002
     .....
ftp$>$ cd SA001               To move to your subdirectory (for instance, SA001)
ftp$>$ ls                     To list the files
ftp$>$ bin                    To set binary transfer mode
ftp$>$ prompt                 To disable single file confirmation
ftp$>$ mget *                 To retrieve all the files
ftp$>$ quit
```

The current transfer rate results in about 6 minutes for low resolution data and about 15 minutes for high resolution, assuming 1 Kbyte/sec.

How to handle IUE data

Both IUESIPS and NEWSIPS data can be analyzed under MIDAS and IDL.

- MIDAS requires the IUE context, available at `iuearc.vilspa.esa.es`. MIDAS (version 94NOV) has proved to work properly both under Ultrix (version 4.4) and VMS (version 6.2).
- IDL requires the IUERDAF package running on version 2.0. IUERDAF works properly under Ultrix and it is being tested under VMS. This package is available at IUEDAC

How to use the IUE context under MIDAS

This context is enabled with the command `set/context IUE` (see the on-line help for a more detailed explanation of the commands available under this context). Examples of how to read and convert NEWSIPS low resolution and IUESIPS high resolution data in MIDAS format from disk and tape are briefly summarized below.

Example: How to read and work with the 1-D NEWSIPS Low Resolution spectrum (.MXLO) from disk ?

`convert/mxlo SWP32192` *(Note: without extension)*

This command will create a MIDAS table with the extracted spectra as SWP32192L.tbl (for large aperture) and/or SWP32192S.tbl (for small aperture). The tables have the following columns:

```
Col.   1:WAVELENGTH      Unit:ANGSTROM        Format:F10.3  R*8
Col.   2:NET             Unit:FN              Format:E15.5  R*4
Col.   3:BACKGROUND      Unit:FN              Format:E15.5  R*4
Col.   4:SIGMA           Unit:ERG/CM2/S/A     Format:E15.5  R*4
Col.   5:QUALITY         Unit:                Format:I11    I*2
Col.   6:FLUX            Unit:ERG/CM2/S/A     Format:E15.5  R*4
```

The command `plot/mxlo` plots low dispersion NEWSIPS spectra in MIDAS table format. Three options are available:

```
PLOT/MXLO SWP32192L F     To plot flux and sigma spectra
PLOT/MXLO SWP32192L G     To plot gross, flags and background spectra
PLOT/MXLO SWP32192L N     To plot net and quality spectra
```

Example: How to read the NEWSIPS resampled file (.SILO) from disk ?

```
indisk/fits SWP32192.SILO SWP32192
```

This command converts FITS format on disk to standard MIDAS (`.bdf`) format creating the image `SWP32192.bdf` which allows you to use the standard MIDAS commands for images handling.

Example: How to read NEWSIPS data from tape ?

```
intape/fits 1-10 iue tape0
```

This command reads FITS format files from tape and converts them into standard MIDAS format. In the example given above, it will read the first ten images of the tape mounted in the tape unit `tape0` and will create the MIDAS files `iue0001.bdf`, ... on disk.

Example: How to read 1-D IUESIPS High Resolution spectrum (.MEHI) from disk ?

```
indisk/iue SWP55901.MEHI
```

This command reads IUE data in GO format from disk and creates a MIDAS table (`swp55901.tbl`), with the following columns:

```
Col.   1:WAVELENGTH      Unit:ANGSTROM        Format:F8.3   R*4
Col.   2:EPSILON         Unit:UNITLESS        Format:I5     I*4
Col.   3:GROSS           Unit:FN              Format:E12.4  R*4
Col.   4:BACKGROUND      Unit:FN              Format:E12.4  R*4
Col.   5:NET             Unit:FN              Format:E12.4  R*4
Col.   6:RNET            Unit:FN              Format:E12.4  R*4
Col.   7:FLUX            Unit:ERGS/CM2/A      Format:E12.4  R*4
```

```
Col.   8:ORDER          Unit:UNITLESS        Format:I4     I*4
```

```
concatenate/iue swp55901 swp55901c
```

This command reads the MIDAS table `swp55901` and connects the overlapping orders (see the on-line help for a more detailed explanation about the order concatenation). A new table (`swp55901c.tbl`) is created with the following columns:

```
Col.   1:WAVELENGTH     Unit:ANGSTROM        Format:F8.3   R*4
Col.   2:FLUX           Unit:ERG/CM2/A       Format:E12.4  R*4
Col.   3:EPSILON        Unit:UNITLESS        Format:I5     I*4
```

Example: How to read IUESIPS data (RAW/PHO/MEHI files) from tape ?

```
intape/iue 1-10 iue tape0
```

This command reads images in GO format from tape and converts them into MIDAS format on disk. In the example given above, it will read the first ten images of the tape mounted in the tape unit `tape0`. The files will be named by camera and image number. For the RAW/PHO files, a MIDAS image with extension `.raw` or `.pho` will be created. For the MEHI file a MIDAS table (extension `.tbl`) will be created.

How to use IUERDAF for IUE data

Example: How to read the 1-D NEWSIPS Low Resolution spectrum (.MXLO) from disk ?

```
readmx,'SWP32525.MXLO',main,wave,flux,flags,sigma,bckgrd,net
```

This command reads IUE merged extracted spectrum image fits file (.MXLO) and returns the header, wavelength, absolute flux, flags, sigma, background and net flux as IDL variables.

Example: How to read the NEWSIPS resampled file (.SILO) from disk ?

```
readsi,'SWP32525.SILO',main,wave,image,flags
```

This command reads the fits file and returns the header, wavelength, image and flags as IDL variables.

Example: How to read NEWSIPS data (RILO/LILO/SILO/MXLO) from tape ?

No specific IUERDAF software has been developed to convert FITS format files on tape to IUERDAF format files on disk. You have to copy your FITS files on tape to FITS files on disk and work with the commands previously outlined. In addition to the `readmx`, `readsi` commands, there exist two more commands with similar syntax `readri`, `readli` to handle the .RILO and .SILO files.

Example: How to read the 1-D IUESIPS High Dispersion spectrum (MEHI file) from disk ?

```
iuecopy,'SWP55901.MEHI',3,55901,'h',-2
```

This command converts IUE GO format disk files to RDAF-format disk files (e.g. converts .go files to .dat and .lab files). See the on-line help for a more detailed explanation on the parameters of this command.

Example: How to read IUESIPS data (RAW/PHO/MEHI files) from tape ?

The command `iuecopy` is also valid to convert IUE GO format tape files to RDAF-format disk files (see on-line help for a more detailed explanation).

Handling flux calibration and sensitivity degradation files

When working with the SILO files you may need to fully calibrate the extracted spectrum. Inverse sensitivity functions as well as correction factors for both SWP and LWP cameras are stored in the `calib` subdirectory. You are referred to the NEWSIPS Information Manual for information about the derivation of the absolute calibration and the application of time and temperature dependent sensitivity corrections.

Information related to NEWSIPS and IUE Final Archive Project

As mentioned above the NEWSIPS processing manual and general information about the Final Archive project are available on the WWW at:

http://www.vilspa.esa.es/iue

The database of IUE's 19th episode

M. Barylak

ESA IUE Observatory

Introduction

The database for IUE's 19th episode was implemented under a new relational data base management system (RDBMS), namely `ORACLE7`. `ORACLE7` appears to be the most wide-spread used RDBMS of the world and runs on almost any platform i.e. from PCs to minicomputers to mainframes.

For the construction of the **conceptual model** (see Fig. 2) of the IUE database, the Entity-Relationship-diagram methodology was used which eased its translation into a computer data base.

As the data of this new IUE database are being used by many applications (e.g. CDI[2] verification, two image processing systems - IUESIPS and NEWSIPS, data dearchiving, etc.), it is important that the model is well understood and validated.

Apart from making use of the ample facilities available under `ORACLE7`, the system will be based upon `PERL`[3], specifically `ORAPERL` with its built-in interface to `ORACLE7`.

The 19th Episode

The operation of IUE for the 19th episode is carried out mainly at VILSPA ie. all science observations are done at VILSPA for 16 hours a day. Some maintenance tasks are performed by GSFC. This "hybrid" operation was implemented on Oct. 1, 1995. A schematic data flow for the 19th episode is shown in Fig. 1.

IUE images are passed from the TOCS[4] bridge to the nodes V3500/V3600 where the PIF[5] generation and CDI verification takes place under IDL[6]. As NEWSIPS's software is not yet able to process high dispersion images, all high dispersion data are processed by IUESIPS. All low dispersion data are passed to NEWSIPS.

NEWSIPS line-by-line and extracted spectral data are made available under both anonymous FTP and the World Wide Web (WWW) within 14 days from the date of observation

[2]Core Data Item

[3]Practical Extraction and Report Language

[4]Telescope Operator Console System

[5]Process Information File

[6]Interactive Data Language

(see Solano et al., *"IUE Data Processing and Distribution Policies"* and Yurrita, *"A WWW server for IUE's 19th episode* in this newsletter).

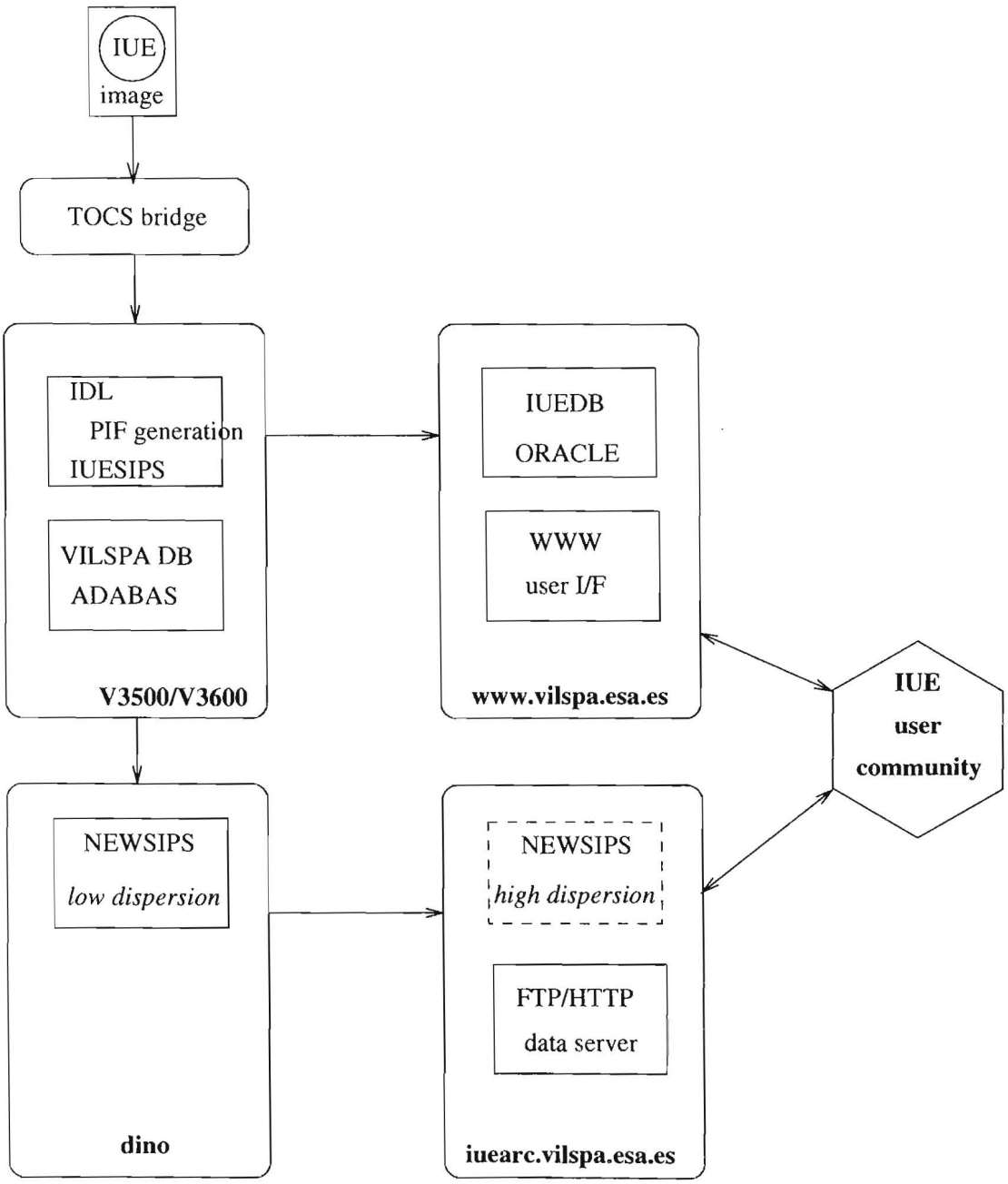


Figure 1: Schematic data-flow diagram of IUE's 19th episode data base.

Recent upgrades to the IUE software under IDL enable the extraction of CDIs from the image headers, present them for verification to the image processing specialists, calculate the dependent CDIs (e.g. Julian date, etc.) and produce the corresponding input PIFs. These PIFs are generated for both low and high dispersion observations and are the primary information source which populates the IUE database of the 19th episode.

The contents of the data base i.e. the IUE observing log of the 19th episode can be addressed as the first ESA ORACLE database to be on-line under WWW at:

`http://www.vilspa.esa.es/iue/iue19th.html`

Database design and analysis

The fundamental phases in database design and analysis are depicted in the following figure:

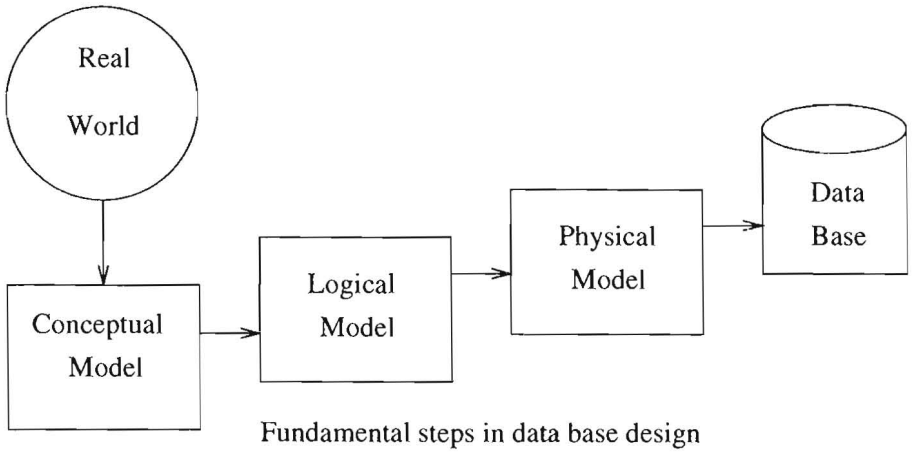


Figure 2.

Probably the most widespread technique of data analysis is that proposed by Chen in 1976 called **entity-relationship (E-R)** model. In the E-R model, the real world is represented by entities and by relationships between entities. For the IUE database the final version of the E-R model is given in the Fig. 2. This E-R diagram represents the **conceptual model** of the IUE database for the 19th episode. Steps followed, once the entities and their relationships were defined, were:

1. establish the key attributes for each entity
2. complete each entity with all the attributes
3. normalize all entities (at least to third normal form)
4. ensure all events and operations are supported by the model

The next step in the database design, as indicated above, was converting this model into a logical model. The known logical models of databases are:

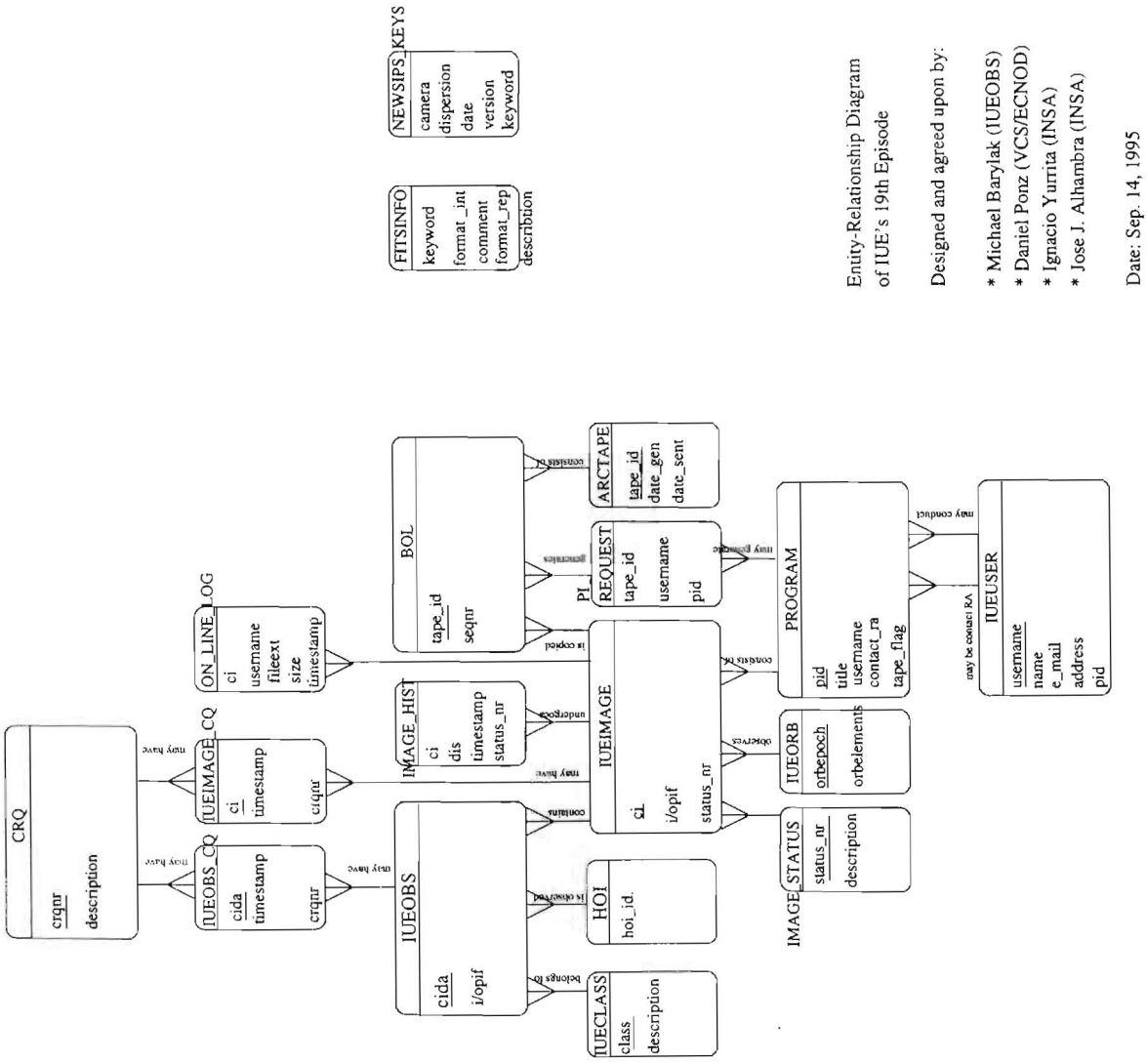
- hierarchical
- network
- **relational**
- object oriented

The **logical model** of the ORACLE7 database is **relational**. And the advantage of following the fundamental steps of database design and development is that the E-R diagram can very easily be translated into the relational model by the following simple rules:

- entities become tables
- attributes become columns
- relationships become foreign keys

The **physical model** describes how "ORACLE7 manages physical data storage along with the optimal physical database layouts for any number of disks. These layouts will be the result of understanding the ways in which various database files operate and interact." (K. Loney, 1994, *Oracle DBA Handbook*).

The installation of ORACLE7 at VILSPA has been described by F. Marcelo (*Installation of Oracle Version 7 at Vilspa*, TN/5020-00/FM/940221).



A WWW server for IUE 19th episode data distribution

I. Yurrita

INSA, VCS

Abstract

The present article describes the dedicated WWW[7] server built at VILSPA for the IUE 19th episode data distribution.

Introduction

This server was built to provide an easy and comfortable access to IUE data of the 19th episode via the WWW. We realized the lack of flexibility of the FTP system (for both the user and the system administrator). Therefore, and using our experience in WWW servers[8], we built a system with some value-added features.

The following services are provided at present:

- IUE 19th episode data distribution (user observation programs).
- IUE 19th episode data distribution (calibration data, used internally).

You can access the IUE data server server home page at the following URL[9]:

`http://iuearc.vilspa.esa.es/`

There are plans to extend this server to allow a similar access to the data of the Final Archive.

The server. A user's view

Registration

The ESA IUE data server is intended to be used by registered users only. To register is, thus, the first operation an archive user has to do. This is done only once, except if a user forgets his username. There is no need to register again if only the password has been forgotten.

The register is kept to contact users should a problem occur (i.e. we monitor the problems, but we also have to know who was affected). The register is also used to build meaningful statistical information.

[7]World Wide Web

[8]This server is part of the Villafranca Satellite Tracking Station WWW system

[9]Universal Resource Location

Retrieving data files

Once registered, users can browse the different data areas ordered by program id. If a user knows in advance which IUE observations he/she wishes to retrieve, it is also possible to access them by providing an image list.

The images can be retrieved either in packed format (i.e. `tar`) or individually. The packed format is provided with several compression schemes. Selective filtering is also available to narrow down the retrieval selection (e.g. only SILO files, only SWP files, etc.).

The server. A webmaster's view

The server implements the following features:

- User registration and authentication. Problem solving and accurate access statistics are built from this information.
- Single image or multi-image download, allowing several compression schemes to save network bandwidth.
- All the browsing and file information is updated dynamically as soon as images are processed.
- Feedback and help capabilities at any point.
- Support for virtual storage areas.
- Consistent look and feel.
- The server is built to grow easily in order to add other file services in the future.

IUEFA Project

D. de Martino, J.D. Ponz, E. Solano

ESA IUE Observatory

Introduction

The generation of the Final Archive has been progressing along last year as a background activity, in addition to the developments required to change IUE operations for the 19th episode.

This report describes the status of the project, indicating the main development activities currently in progress, together with the short-term plans.

Project Status

The archive production pipeline has been optimized in two ways:

1. Ingestion of input raw images is done from optical disks, available on-line, instead of using tapes, and
2. A distributed production environment has been implemented, so that two workstations are used for archive production and two different nodes are used for production and quality control of the images observed daily.

With this optimized environment, the average production rate is now 400 images per week, in addition to other activities required to process and distribute daily observations. The bottleneck is the quality control applied to the production.

For practical reasons, re-processing of low-dispersion archive data for cameras SWP and LWP has been divided into several batches. The status of each set is described below:

Set-1 : Spectra collected before January 1990. These data have been processed and are being written into optical disks.

Set-2 : Spectra collected during the period January 1990 until March 1993. These spectra are being re-processed.

Set-3 : Spectra collected during the period March 1993 until October 1995. Data collected during this period are in the preparatory phase, i.e., input parameters required for processing are being collected and will be verified during the first months of this year.

Set-4 : Observations done after October 1995. These data are being processed within the new operational scenario of the 19th episode, and are being distributed to users via networks or tapes. Before entering these data into the archive, a new re-processing is foreseen, to take into account new absolute flux calibration due to changes in the instrument sensitivity.

Future activities

There are two main tasks foreseen for the near future:

- Completion of high dispersion code: The software is currently being developed at GSFC. Villafranca is in charge of the determination of the ripple correction algorithm and the absolute flux calibration.

  These activities are under development, to be accomplished around mid-1996.

- Data distribution: Requirements for the on-line data distribution have been defined. The distribution system is structured in three levels: a Principal Center, repository of the master archive version, a set of National Hosts containing access catalogue and selected data sets, and an unlimited number of End User Nodes. The technology is based on the WWW architecture.

  A prototype has been defined to distribute internally the data and will be used to distribute observations of the 19th episode (see Yurrita, *"A WWW server for IUE 19th episode data distribution"*, in this newsletter).

  The actual implementation will be done in two phases, first low-dispersion spectra, then high-dispersion data. The first phase, to distribute low-dispersion data from the Principal Center will be available around mid-1996.

  Temporarily, until data is available on-line, data requests can be made via the WWW at the IUE page `http://www.vilspa.esa.es/iue/iue.html` or can alternatively be addressed via e-mail to the account `dbra@vilspa.esa.es`.

SAX-IUE coordination

Prof. Dr. K.S. de Boer

Chairman of J-IUEAC

The Joint IUE Allocation Committee (J-IUEAC) and the IUE observatory would like to draw your attention to the importance of the simultaneous operations of IUE and SAX as *"active coordination of observations could significantly enhance the scientific return of IUE as well as SAX observations."*

SAX stands for "Satellite per Astronomia a raggi X", Italian spelling of "X-Ray Astronomy Satellite" and is an Italian/Dutch satellite devoted to systematic, integrated and comprehensive studies of galactic and extragalactic X-ray sources in the energy band 0.1 - 200 keV; the observational goal to be addressed is to continue and expand upon previous spectral and timing observations of celestial sources in those areas for which the existing information is missing or inadequate and will remain uncovered in the foreseeable future.[10]

The following procedures for the implementation of such coordination are suggested:

1. IUE Principal Investigators (PIs) with targets approved both in IUE and SAX will be suggested to request a time allocation revision for IUE in view of the planned SAX observations.

2. The AGN area has actually an approved proposal in the IUE Allocation (SQ101) but a revision of targets and allocation can be requested in view of the SAX Allocation.

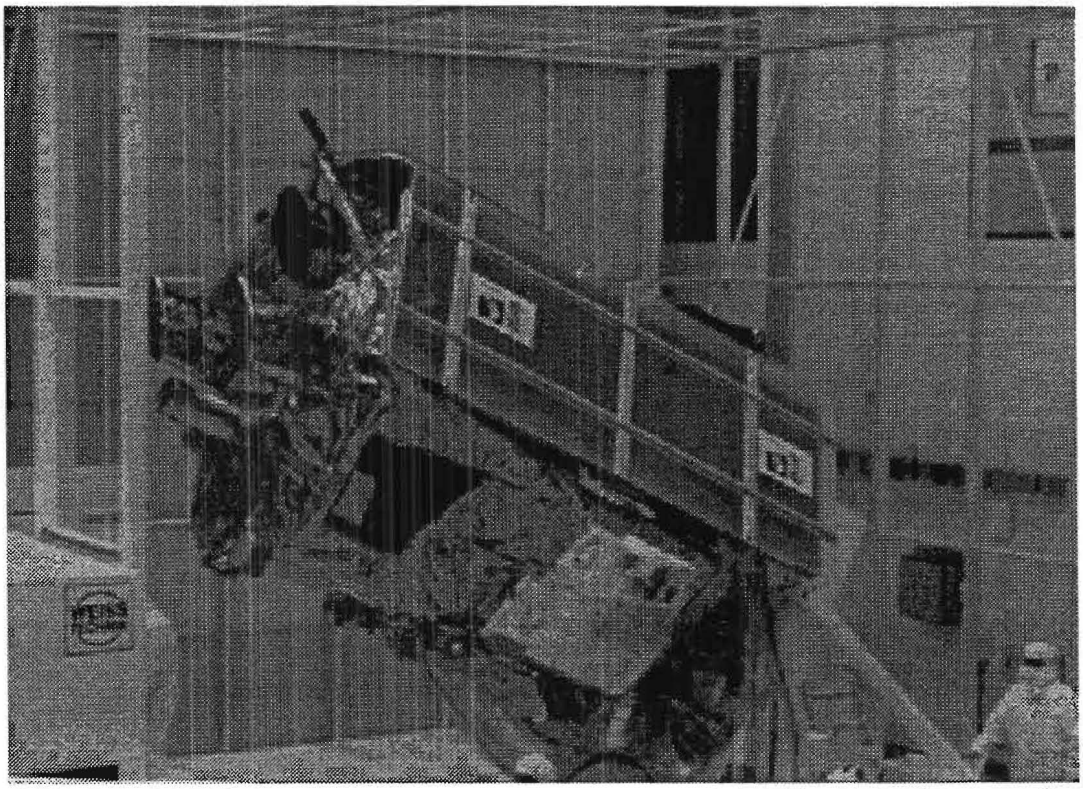
3. All proposals approved for SAX open time which indicate the desire to obtain coordinated observations with IUE are requested to supply target information and proposal abstract to the IUE Observatory together with a request for possible IUE time allocation.

4. All these three inputs will be considered by the J-IUEAC and we will inform SAX and the involved PIs of the decision of the J-IUEAC in a timely way so as to allow adequate scheduling of approved IUE Observations, if feasible.

Please note that this somewhat unusual approach was adopted in view of the associated boundary conditions (final IUE call; uncertainties in SAX programs, etc. ...), but the above assures that we will not have left unique observational opportunities unused which might not be available in the near future. The proposed scheme has been evaluated with the ESA IUE Observatory and it does not seem to present major problems in the case that the IUE Project is extended to overlap with the first year of SAX observations. As you are aware, even though the current planning foresees operations of IUE until the end of 1997, funding approval has only been given until September 1996.

[10]Please see `http://astro.estec.esa.nl/SA-general/Research/Sax/sax.html`

Of course a considerable fraction of the SAX Core program will be carried out early in the SAX mission. For those programmes the above procedure cannot be applied in full since it would limit the availability of IUE time to a restricted community (i.e. those pertaining to participating Agencies in the SAX project). For the previously mentioned IUE program SQ 101 this should not be a problem, since here a clear choice has been expressed by the J-IUEAC. However any other studies in the Core Program will have no other solution than to attempt to set up a collaboration with IUE PIs with approved proposals in the same area of research. Any revision request by these PIs in view of the SAX availability will be taken into consideration by the J-IUEAC.



IUE plumbing: "Bent-pipe Operations"

M. Barylak

ESA IUE Observatory[11]

Introduction

The 3-Agency cooperating in the IUE Project, ESA, NASA and PPARC, have agreed to both, the reconfiguration of the IUE ground operations and the redistribution of science-operation responsibilities for the 19th episode.

In coordination with ESOC/COM, VILSPA has designed a new configuration and built the required equipment to operate the IUE satellite from VILSPA via GSFC and vice versa. The modified ground system (called TOCTM[12]) has been installed at both VILSPA and GSFC.

COM has also implemented its part in ESOC and configured the VILSPA & GSFC nodes, so that the ground system was ready to start the extended operations as of 1 October 1995.

IUE Communications and bent-pipe operations

The new IUE communication system consists of :

- Raw TLM[13] (40 Ksymb/s[14]) using a 64 kbps[15] comms link (VILSPA $\leftrightarrow$ GSFC IUE)
- Raw TLM (< 40 Ksymb/s) using a 48 kbps comms link (GSFC IUE $\leftrightarrow$ VILSPA)
- ISLU[16] #1 using a 9.6 kbps link (VILSPA $\leftrightarrow$ GSFC IUE)
- ISLU #2 using a 9.6 kbps link (VILSPA $\leftrightarrow$ GSFC IUE via ESOC)
- IUE VOICE using a 9.6 kbps link (VILSPA $\leftrightarrow$ EOSC) and an 8 kbps link (ESOC $\leftrightarrow$ GSFC IUE)
- TOCS[17] using X.21 over a 64 kbps link or 48 kbps link (VILSPA $\leftrightarrow$ GSFC IUE)

---

[11] from reports by V. Claros, J. Poblet and C. Topham (INSA/COM)
[12] Telescope Operator Console/Telemetry
[13] Telemetry
[14] symbols per second
[15] kilo bits per seconds
[16] IUE/Interface Switching Logic Unit
[17] Telescope Operator Console System

In August '95, the eastward maneuver performed by NASA, placed the IUE satellite in a position where it could be seen from VILSPA for at least 16 hours per day but located the satellite in the highest radiation part of the orbit. This forced ESA to re-negotiate with NASA the use of the Wallops ground station during 8 hours when the satellite is out of the radiation belt, that is, when it cannot be seen from VILSPA. Consequently, VILSPA performs 8 hours/day of science operations locally and 8 hours/day remotely via GSFC/Wallops. This new scenario was nick-named **"bent-pipe operations"**.

Bent-pipe operations require better back-up capabilities at both sides of the Atlantic, therefore a second communication line was installed.

The current IUE communications enable the following *"modi operandi"*:

- VILSPA local operations (8 hours daily):

  In this configuration, no data link to GSFC is required except a voice link (via ESOC). In case of a failure at VILSPA, a prime or back-up command/telemetry (ISLU) circuit must be available.

- Bent-pipe VILSPA operations via GSFC using the Wallops Station (8 hours daily):

  In this configuration, communications for remote GSFC computer operations (ISLU), voice coordination and reception of science data (TOCS) are required i.e. two 64 kbps link, voice coordination circuit and command/telemetry prime (ISLU #1) and secondary (ISLU #2) circuits.

- VILSPA operations in failure situations (emergency cross support):

  Due to the above explained scenario, a second line has been installed (an ISDN connection is currently being evaluated by COM). Thus the new revision of the IUE communications provides the following enhancements:

  - Raw telemetry can be send bidirectionally with the installation of the TOCTM units at both VILSPA and GSFC.

    In this configuration VILSPA can receive Wallops raw telemetry and feed it into the VILSPA ground computer system in order to display maneuvering parameters (analog) and raw images which cannot be seen via ISLU.

    VILSPA can also send raw telemetry to GSFC in case of a VILSPA ground-computer system failure, obtain processed data from GSFC, and monitor the satellite while Wallops S-band system gets ready to support IUE operations (command system can be prepared in 15 minutes but S-Band systems takes about 1 hour).

  - A second science (TOCS) router and a second TOCS computer (provided by NASA at GSFC) have been included in this updated configuration.

  - Finally, a PSTN[18] modem allowing an emergency by-pass of the GSFC node has also been included, thus allowing continuing ISLU operations. The GSFC node was a single point failure as it routed both prime and secondary ISLU circuits.

[18] Public Switched Telephone Network

Prediction of Background Radiation During IUE Observations

H. Andernach and C. la Dous

ESA IUE Observatory

The Background:

The background radiation we measure in the IUE cameras consists of two components:

- phosphorescence in the detectors
  which amounts to 5 - 10 DN/hour, and
- Cherenkov radiation from high-energy electrons entering the UV converter section of the cameras during exposure, producing additional phosphorescence.

The strength of this second component, besides increasing with the length of the exposure, depends on the radiation field the Satellite is passing through and is particularly high during passage through the Van Allen Belt. This passage used to coincide with the old US2 shift (right before the VILSPA shift), but at times of particularly high radiation also the US1 shift was occasionally affected; the VILSPA shift normally was unaffected in any case. During times of high radiation the background radiation in the IUE cameras strongly limits the length of useful exposures (see below).

Until 1991 there was a 'Flux Particle Monitor' (FPM) on board the IUE which measured the strength of the background radiation (in Volts), thus giving an indication on how long an exposure could be without saturating the spectrum (see below for more details). In 1991 this device ceased to function so that no direct information on the strength of the radiation has been available since.

A reasonably accurate substitute is provided by the >2MeV electron flux measurements of the GOES-7 Satellite whose data for the last 72 hours are kept on the WWW under

http://www.sel.bldrdoc.gov/electron_flux.html

(see Figure 1). The daily maximum seen by GOES-7 can be converted in an approximate maximum as experienced by IUE using:

$$FPM[V] \simeq (0.7 * log_{10}(GOES\_flux)) - 0.2$$

which then in turn translates into the following background levels at times of maximum radiation:

$$DN/hour = c * 10^{FPM[V]} \quad (1)$$

$$= c * 10^{(0.7*log_{10}(GOES\_flux))-0.2} \quad (2)$$

where c = 1.0 for SWP and c = 1.35 for LWP.

In Practical Terms:

In the IUE hybrid mode the passage through the Van Allen Belt will take place during the USMS (old US2) shift when (in general) no science observations will be performed so that normally the time of maximum radiation lies way outside the time when spectra are being taken, so that there should not be a problem. Only at times of high radiation (maximum GOES-7 flux significantly above some 1000 electrons/cm2-s-sr) caution ought to be taken during the second half of the VILSPA B shift (old US1); and at specially bad occasions the entire orbit can be affected (see Fig. 2)

Based on past experiences, a reasonable rule of thumb seems to be (see Figure 1):

- if the maximum reading of GOES-7 during the past 24 hours (last relative maximum) does not exceed 1000 electrons/cm2-s-sr, there ought to be no problems concerning the background level during the entire period of science operations; including 16-hour exposures ought to be safe;
- if the last maximum reading is between 1000 and 5000 electrons/cm2-s-sr, exposures longer than some 4 hours should be avoided before H/O, while no constraints ought be necessary for the remaining part of the shift;
- if the last maximum reading is significantly above this limit, exposures longer than some 4 hours should be avoided during the entire shift, while only short exposures should be taken during the last hours before H/O.

As the GOES-7 and IUE Satellites have somewhat different orbits (i.e. encounter the area of maximum particle radiation at somewhat different times each day, so that at times IUE meets the highest flux level hours before GOES-7 does), there is no point in continuously checking the FPM-level. On the other hand the average daily flux level normally does not vary dramatically from one day to the next, so that extrapolation by one day is likely to provide a reasonable idea of whether the radiation might cause problems or not. Thus, for daily operations

- each RA starting duty should check the GOES-page on WWW (address see above), record readings in the special log sheet provided (Appendix 1) and make a colour printout[19]; if the radiation field is expected to be particularly high, the observing plan has to be adjusted correspondingly.
- As an additional precaution, if you are concerned about the background during a long exposure, serendipity spectra of 2 hours duration should be taken in the other camera; when evaluating the result, keep in mind that the background keeps adding up and that it acts in somewhat different ways on the two cameras.

[19]click on 'Save As'-button at the bottom of the WWW-page; in the new window select 'Postscript' on the 'Plain Text'-button, define a destination file name and click 'OK'. Once outside WWW, send this file to printer 'tpx', for example with the command `lpr -Ptpx <filename>`. If the latter doesn't work, use `ghostview <filename>`, click on 'File', then 'Print' and specify 'tpx' for the printer.

- In order to get some kind of cosmic weather forecast, the RA on training will check two further WWW-pages:

  http://www.sel.noaa.gov/today.html

  giving a general idea of what solar activity is to be expected during the next 2 days (see Appendix 2), and

  http://www.sel.noaa.gov/forecast.html

  providing more detailed information (this latter page also is available in printed form on the notice board outside DH's office) (see Appendix 3).

Thus, if problems are expected, a note to this effect must be included in the training report and the constraints on exposure times should be taken into account when prepating upcoming observations.

Beyond US Science Operations....

R. Arquilla, M.T. Carini

Goddard Space Flight Center

On 30 September, 1995, the US Science operations team turned over IUE science operations to the ESA ground station at Villafranca. The ESA/PPRC IUE team will conduct 19th episode science operations from Villafranca for 16 hours a day. During the remaining 8 hours a skeleton IUE OCC crew monitors the spacecraft. US guest observers are encouraged to interface directly with VILSPA staff concerning their 19th episode programs. VILSPA maintains a WWW homepage dedicated to the 19th epsiode which can be found at `http://www.vilspa.esa.es/iue/iue19th.html`. However, the NASA IUE project is also maintaining a limited level of guest investigator support. Dr. Richard Arquilla (arquilla@iuedac.gsfc.nasa. gov), who served as the IUE science operations supervisor and an IUE resident astronomer for over 9 years, is now acting as a contact point for 19th episode guest observers. However, we are encouraging IUE observers to contact the VILSPA staff member assigned to their program if at all possible.

The end of US science operations does not mean the end of the NASA IUE project. Work continues on the final archive and the IUEDAC continues to provide users with expert advice and assistance on the reduction and analysis of IUE data. We will continue to update users on the status of the IUE final archive and the IUEDAC via this newsletter[20].

Editorial Note:
this information was extracted from the `IUEDAC Electronic Newsletter`.

```
**************************************************************************
     This is an electronic newsletter edited by the IUE Data Analysis
Center (IUEDAC) intended to inform the numerous remote and local users
of the IUEDAC software of recent software updates and project changes.

    The IUEDAC newsletter and other items of interest about IUE can be
found in the IUEDAC World Wide Web homepage at

        http://iuewww.gsfc.nasa.gov/iuedac/iuedac_homepage.html

Users can follow the links to information on IUE telescope operations
and the IUE project, as well as to other interesting and useful
astronomical sites.
**************************************************************************
```

[20]If you want your name to be added to, deleted from, or changed on our distribution list, please send us e-mail to news@iuedac.gsfc.nasa.gov or send a postcard to: IUE Data Analysis Center (IUEDAC), IUE Observatory/Code 684.9, NASA-GSFC Greenbelt, MD 20771

Some IUE Highlights

Yoji Kondo

Goddard Space Flight Center

International Ultraviolet Explorer (IUE)

- The 45-cm telescope was launched on 26 January 1978 as a 3-way collaborative project among NASA, ESA and British SRC (now PPARC). IUE, the only geosynchronous satellite observatory capable of observing continuously 24 hours daily, has been operated from Goddard and ESA Madrid Station.
- Spectrophotometry at high (0.1-0.3A) and low (6-7A) resolutions between 1100 and 3200 Åwith a dynamical range of 22 magnitudes, from -1.5 to 21st magnitude.
- Over 100,000 ultraviolet spectra have been obtained with IUE and are available through the Goddard Data Analysis Facility.
- Total publications in refereed journals from IUE observations stood at 3041 articles at the end of 1994 – the largest number for any satellite observatory thus far. (List available.) In 1994 alone, 232 refereed papers were published.
- Over 2000 guest observers from all corners of the world, in- cluding astronomers from such diverse places as South America, China, India, Russia and Africa, have used IUE.
- By 1990, in U.S.A. alone, at least 107 Ph.D. and 11 Master's degree theses were written using IUE results. (List available.) A comparable number of Ph.D. theses were written with IUE data in Europe. Well in excess of 200 Ph.D.s worldwide have been trained. Undergraduate and high school* students have also been trained with IUE. [*One received Ph.D. from Harvard and another from Wisconsin.]
- IUE has been – and still is – used as a central facility in most multiwavelength observations. Multiwavelength observation is an important modern approach in astrophysical research. In fact, the forthcoming XTE is counting on the continued availability of IUE – not to mention some HST observers.
- IUE Science Operations will be transferred entirely to ESA after 1 October 1995. NASA will continue to provide limited satellite operation support. U.S. astronomers will be equal partners with Europeans in the continued use of IUE.
- Scientific highlights include the discovery or a significantly improved understanding of: galactic halos, super-bubbles, stellar chromospheres, active galactic nuclei including quasars, stellar winds and mass loss, evolutionary processes in interacting binaries, the local interstellar medium, cataclysmic variables, protoplanetary system candidates, supernovae including SN1987A, synoptic studies of solar system objects, such as Io torus, and compositions of cometary comae and tails.

- In 1988, in its tenth anniversary year, IUE was honored by the U.S. Presidential Award for Design Excellence.

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IUE RECOGNITION CEREMONY - 11AM - FRIDAY 29 SEPTEMBER 1995

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In recognition of 17 years and 8 months of extraordinary service to the astronomical community and the successful efforts to streamline ground operations, Drs. Joe Rothenberg, Director of the Goddard Space Flight Center, Daniel W. Weedman, Director of the Astrophysics Division at NASA, and Yoji Kondo, IUE Project Scientist, will acknowledge the unique role of this first All-Guest-Observatory satellite facility in a formal ceremony of appreciation. We at NASA hope that you can join us in person to acknowledge this special achievement. The proceedings will be held at Goddard Space Flight Center (the home of IUE), Building 21 Room 183, on Friday, 29 September 1995 at 11 am.

The International Ultraviolet Explorer (IUE) project "keeps on going" in the continuing spirit of the little satellite that could. The project has reconfigured its science and satellite operations to reduce costs. On 30 September 1995, the US IUE team will turn over science operations to the ESA ground station at Villafranca, where the ESA/PPARC teams will continue to conduct astronomical observations on behalf of the international astronomical community. The US team will provide streamlined support for satellite operations and will continue their task to complete the IUE Final Archive that contains over 100,000 ultraviolet spectra.

If you plan to be with us for this event, please send us a quick message by email so we can plan for your attendance. If you cannot be with us in person, you are cordially invited to send your messages expressing your sentiments for a job more-than-well done to the following electronic mail address:

iueops@iuesoc.gsfc.nasa.gov

Parking IUE

Norbert Schartel

ESA IUE Observatory

In the nineteenth episode of IUE, it's observing time is restricted to 16 hours of science operation from VILSPA. For the remaining 8 hours, the IUE spacecraft will be parked at a bright star, hereafter called 'parking star'. This star is chosen at Vilspa depending on the conditions (power reserves, temperature, etc.) of the spacecraft (S/C) at the end of the observations. S/C Handover to GSFC will be performed on the last target observed at VILSPA. GSFC is responsible for the maneuver to the parking star, it's acquisition, and S/C tracking. At the end of the GSFC shift, GSFC will maneuver to either a bright offset star or the first bright target of the next VILSPA shift and handover is performed on this star.

In order to ensure a safe parking for 8 hours, several constraints have to be considered, i.e. Power positive regions, Earth or Moon occultations, antenna nulls, hot β-angle ranges, etc. Given the orbit of the spacecraft, not one star fulfils all these conditions for the entire year. Therefore, the use of different parking stars at different epochs of the year is necessary.

All parking stars are bright enough to be acquired easily. They are located at positions at which no occultations by the Earth or the Moon will occur. Although antenna angles have been calculted in advance, it is not possible to calculate them accurately for a long time in advance. Therefore, it is important to re-check the antenna angles for the chosen parking star.

List of approved IUE 19th episode proposals and their contact RAs

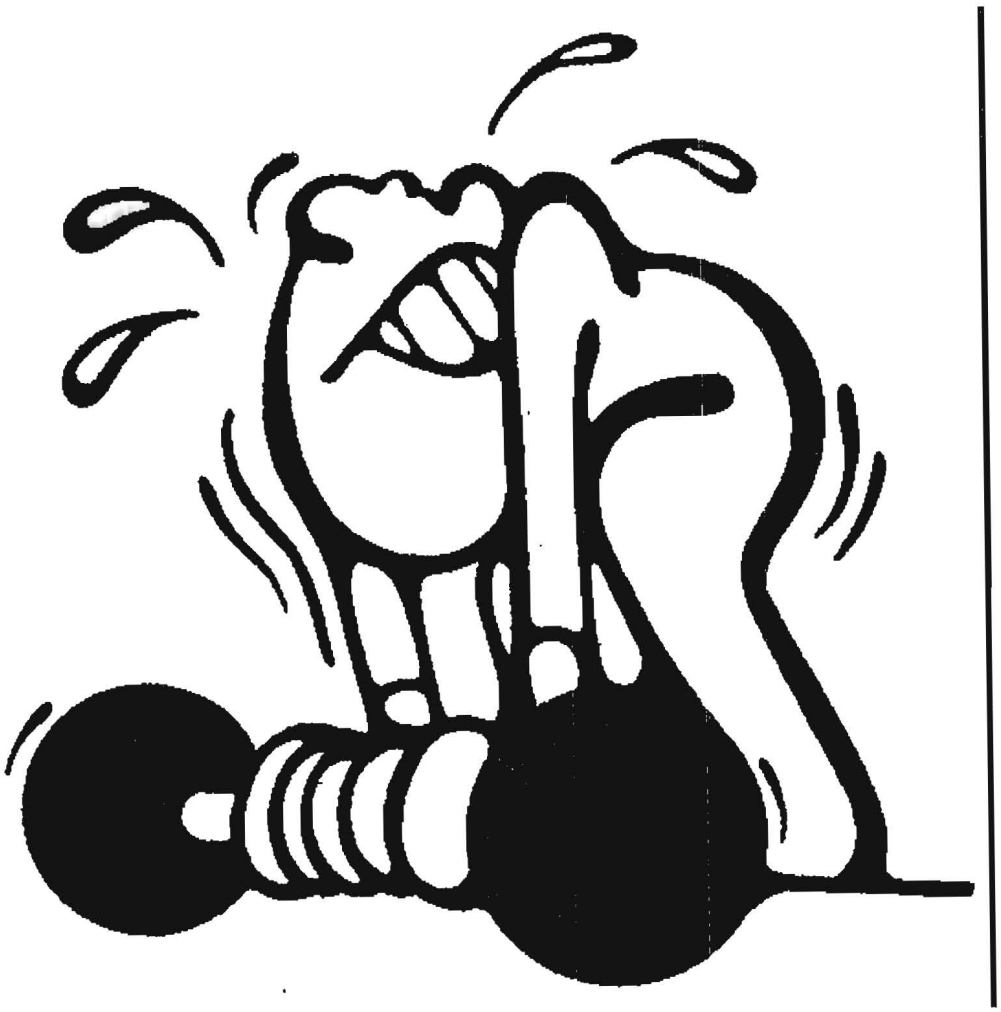
19th Episode: 1995 - 1997

Final IUE Science Program

TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
Is BK Lyn (PG 0917+342) the first nova-like below the period gap?	F.A. Ringwald	SI001	MGV M^a-Luisa Garcia Vargas	9.5
UV observations of selected EUV Late-type Objects	J.G. Doyle	SC002	MGV M^a-Luisa Garcia Vargas	65
Binaries: How Wide ?	N.R. Evans	SC003	MGV M^a-Luisa Garcia Vargas	32
UV Spectrophotometry of Magnetic Cp and Am Stars	S.J. Adelman	SA004	MGV M^a-Luisa Garcia Vargas	16
Elemental abundances of Hg-Mn Stars HR1094 and HR7775 and A0 IV Normal Star γ Gem	S.J. Adelman	SA005	MGV M^a-Luisa Garcia Vargas	32
Ultraviolet spectrophotometry of δ Scuti star ρ Pup	R. Monier	SC006	MGV M^a-Luisa Garcia Vargas	16
Analyzing blue stars in NGC 6752	S. Moehle	SA007	MGV M^a-Luisa Garcia Vargas	104
Understanding the outburst stage of the symbiotic system CH Cyg	A. Skopal	SI008	MGV M^a-Luisa Garcia Vargas	10
UV spectroscopy study of symbiotic stars	C.B. Pereira	SI009	MGV M^a-Luisa Garcia Vargas	10
Accretion in the SW Sex Stars	D.W. Hoard	SI010	MGV M^a-Luisa Garcia Vargas	22
Ly-α satellite absorption in metal-poor Horizontal-Branch star spectra	K.S. de Boer	SA012	MGV M^a-Luisa Garcia Vargas	28
Search for rapid UV Spectroscopic Variability in PN nuclei	L. Bianchi	SA013	MGV M^a-Luisa Garcia Vargas	48
UV-spectrophotometry of the double-shell planetary nebula LoTr4 and its very hot central star	T. Rauch	SA014	MGV M^a-Luisa Garcia Vargas	29
Phase resolved multiwavelength spectrophotometry of RV Tauri stars	R. Monier	SC015	MGV M^a-Luisa Garcia Vargas	24
The Most Massive Binaries	D.J. Stickland	SI016	MGV M^a-Luisa Garcia Vargas	48

TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
X-ray and "O VI sequence" Planetary Nebulae	W.A. Feibelman	SA017	PMR Pedro Rodriguez Pascual	16
Variable Planetary Nebulae	W.A. Feibelman	SA018	PMR Pedro Rodriguez Pascual	32
A Search for the Site of Multiwavelength Variability in γ Cas	M.A. Smith	SA019	PMR Pedro Rodriguez Pascual	35
Monitoring the Accretion during the Supercycle of V1159 Ori	P. Szkody	SI020	PMR Pedro Rodriguez Pascual	154
International AGN Watch: Reverberation Mapping of the Broad-Line Region in Markarian 335	B.M. Peterson	SQ021	PMR Pedro Rodriguez Pascual	720
Ultraviolet Study of Non-eclipsing Algol Systems	P. Koubsky	SI022	PMR Pedro Rodriguez Pascual	20
Continuity of Monitoring Observations of α Ori and α Her	M.A. Smith	SC025	PMR Pedro Rodriguez Pascual	48
IUE monitoring of Symbiotic Stars experiencing outbursts: Z Andromeda and BF Cygni	T. Fernandez-Castro	SI027	PMR Pedro Rodriguez Pascual	40
Stellar Winds in A-type Supergiants	E. Verdugo	SA028	PMR Pedro Rodriguez Pascual	20
Spectroscopy of hot white dwarfs: Constraining diffusion theory	S. Dreizler	SA029	PMR Pedro Rodriguez Pascual	45
Variability of the unique system CQ Dra	D. de Martino	SI030	PMR Pedro Rodriguez Pascual	16
Multi-frequency monitoring of Oe/X-ray binary X Per	D. de Martino	SI031	PMR Pedro Rodriguez Pascual	20
Coordinated X-ray and UV Doppler Images of AR Lacertae	F.M. Walter	SC032	PMR Pedro Rodriguez Pascual	96

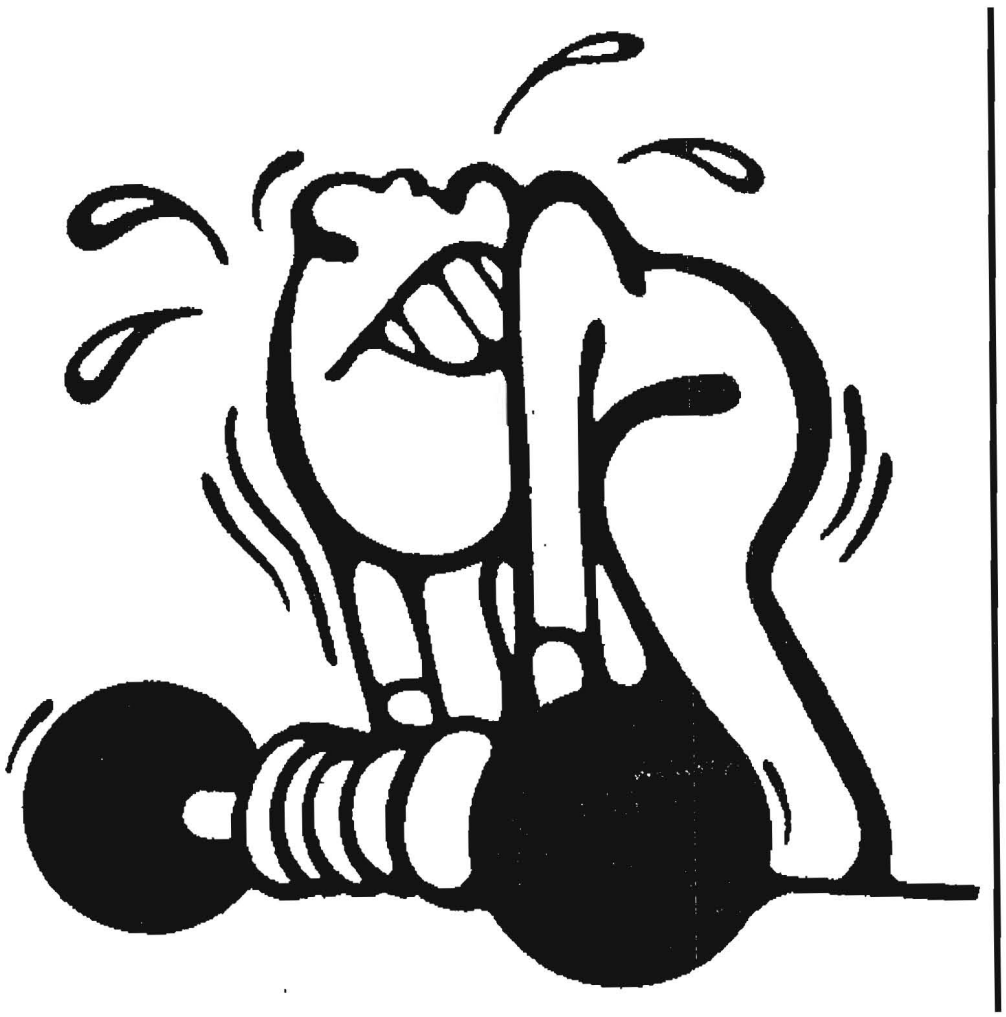
TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
UV orbital variations in Intermediate Polars	D. de Martino	SI033	CH Rosario Gonzalez-Riestra	62
Search of the nature of long term mass accretion variations in Polars	D. de Martino	SI035	CH Rosario Gonzalez-Riestra	65
International AGN watch: The Variable Broad Line Radio Galaxy 3C 390.3	P.T. O'Brien	SQ037	CH Rosario Gonzalez-Riestra	280
UV Spectroscopy of helium-rich subdwarf B stars	C.S. Jeffery	SA038	CH Rosario Gonzalez-Riestra	32
Multi-frequency Observations of W Comae	K. Mannheim	SQ039	CH Rosario Gonzalez-Riestra	15
A search for more transparent lines of sight to bright high redshift quasars	D. Reimers	SQ040	CH Rosario Gonzalez-Riestra	300



TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
UV-spectrophotometry of the extreme helium star HD 160641	T. Rauch	SA041	PEL Pedro Elósegui	21
Probing the structure of Wolf-Rayet winds	C. Lloyd	SA042	PEL Pedro Elósegui	28
Flux-Flux and Flux-rotation correlations in late-type giants	B. Montesinos	SC043	PEL Pedro Elósegui	112
Re-Observing the First Hours of SN1987A: Final Epoch	A. Crotts	SE044	PEL Pedro Elósegui	17
The VV Cep binary KQ Pup: a key for understanding the physics of wind accretion	M. Friedjung	SC046	PEL Pedro Elósegui	22
The new activity phase of the symbiotic star AG Dra	R. Viotti	SI047	PEL Pedro Elósegui	20
IUE Mid-UV Spectroscopy of the Galilean Satellites: Examination of Decade Length Temporal Changes and Support of the Galileo Mission	D.L. Domingue	SS048	PEL Pedro Elósegui	100
Long-term Monitoring of and Rapid Variations in the Interacting Binary VV Cephei	W.H. Bauer	SC049	PEL Pedro Elósegui	60
The radius of the pulsating helium star LSS3184	C.S. Jeffery	SA050	PEL Pedro Elósegui	18
Chromospheres and Li abundances of strong Li K giants	R. de la Reza	SC051	PEL Pedro Elósegui	8
Ultraviolet spectrophotometry of the radially pulsating extreme Helium Star V652 Her (BD+133224)	A.E. Lynas Gray	SA052	PEL Pedro Elósegui	16
Spatially-Resolved UV Spectra of Shocked Interstellar Clouds	W.P. Blair	SM053	PEL Pedro Elósegui	152
IUE Observations of the late stages of Novae in the LMC	R. Gonzalez Riestra	SI054	PEL Pedro Elósegui	104

TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
UV-spectrophotometry of the extremely hot H-rich central star of the planetary nebula Lo17	T. Rauch	SA055	DDM Domitilla De Martino	10.5
The nearby BHB stars as probes of the galactic halo	C. Cacciari	SA056	DDM Domitilla De Martino	20
α Boo stars in young open clusters	M. Gerbaldi	SA058	DDM Domitilla De Martino	64
UV spectroscopy of new, ROSAT-discovered AM Her systems	B.T. Gaensicke	SI059	DDM Domitilla De Martino	16
Multiwavelength observations of the shell phases of η Carinae and of its nebula	R. Viotti	SA060	DDM Domitilla De Martino	8
The nature of the long-term variability of AM Herculis	B.T. Gaensicke	SI062	DDM Domitilla De Martino	148
X-ray transients as Targets of Opportunity	C. Shrader	SI063	DDM Domitilla De Martino	80
Disentangling composite spectra of hot subdwarfs with cool companions	A. Theissen	SA064	DDM Domitilla De Martino	32
Variability of the central star of the Planetary Nebula LMC N66	M. Pena	SI065	DDM Domitilla De Martino	16
Very hot DA white dwarfs from the Hamburg-Quasar Survey	S. Jordan	SA066	DDM Domitilla De Martino	34
Wind Structure of Red Giants in Symbiotic Systems	W. Schmutz	SI067	DDM Domitilla De Martino	60
Calibration of convective efficiency by UV observations of a double degenerate	S. Jordan	SA068	DDM Domitilla De Martino	21

TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
The chemical evolution of hot hydrogen-rich central stars of Planetary Nebulae	R. Napiwotzki	SA069	JAF John Fernley	100
Analyzing UV bright stars in globular clusters	S. Moehler	SA070	JAF John Fernley	70
Testing the emission conditions of selected filaments in the Vela Supernova Remnant	F. Bocchino	SM071	JAF John Fernley	32
FG SGE, a unique case of Post-AGB evolution	B. Montesinos	SC072	JAF John Fernley	16
The origin of carbon in comets	M.C. Festou	SS074	JAF John Fernley	ToO
A high signal-to-noise echelle survey of H-rich white dwarfs	M.A. Barstow	SA075	JAF John Fernley	144



TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
A Multi-Wavelength Study of the Quiescent and Flaring Activity of the Algol System RZ Cas	H. Duerbeck	SI077	HJA Heinz Andernach	18
UV Flux distributions and terminal velocities in Galactic, Cluster B8-A0 Supergiants	K.A. Venn	SA078	HJA Heinz Andernach	24
Observations of a new eclipsing dwarf nova HS 1804+6753	T.R. Marsh	SI079	HJA Heinz Andernach	16
Multifrequency Spectra of Blazars During Outbursts	J.R. Webb	SQ080	HJA Heinz Andernach	160
A Continuing Search for Hot White Dwarf Companions to Normal Stars	M.R. Burleigh	SA081	HJA Heinz Andernach	55
Observational constraints on the ionization structure and velocity low in γ Vel	W. Schmutz	SA082	HJA Heinz Andernach	96
Long-term variability in the spectra of single magnetic white dwarfs	I. Bues	SC083	HJA Heinz Andernach	24
Search for emissions of PAH, S2 and parent molecules in comet Honda-Mrkos-Pajdusakova	G. Moreels	SS084	HJA Heinz Andernach	16
Discrete Absorption Components and the Be Star Phenomenon	H.F. Henrichs	SA085	HJA Heinz Andernach	2
Stellar wind variability and magnetic fields in O stars	H.F. Henrichs	SA086	HJA Heinz Andernach	168
Wind Modulation in β Cep Stars	H.F. Henrichs	SA087	HJA Heinz Andernach	32
Getting accurate model independent measures of the A and F stars (A multiwavelength approach)	R. Monier	SA089	HJA Heinz Andernach	40
Coordinated IUE and XTE Monitoring of Active Galactic Nuclei	R. Edelson	SQ090	HJA Heinz Andernach	125
The Evolution of Boundary Layers in Herbig Ae/Be Stars	F. Bruhweiler	SA091	HJA Heinz Andernach	24

TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
Multifrequency Observations of the Blazars: Mkn 421 and 3C 273	F.C. Bruhweiler	SQ092	NLL Nora Loiseau	84
Short-Term Wind Variability in the Be Star ω Ori	G.J. Peters	SA093	NLL Nora Loiseau	144
A study of the Circumstellar Material in UX Mon, a System with Grazing Incidence Mass Transfer	G.J. Peters	SI094	NLL Nora Loiseau	32
IUE Observations of Post-AGB stars which show spectrum variations	M. Parthasarathy	SA095	NLL Nora Loiseau	16
Study of the long term spectral variation of AG Carinae and its nebula	R. Viotti	SA097	NLL Nora Loiseau	26
Study of X-ray bright quasars	N. Schartel	SQ098	NLL Nora Loiseau	150
Violent accretion events in AGN	K. Beuermann	SQ099	NLL Nora Loiseau	61
Variable CS extinction of HR4049 and HD213985	C. Waelkens	SI100	NLL Nora Loiseau	40
The UV to soft X-ray "Big Bump" in Seyfert Galaxies: IUE-SAX simultaneous observations	L. Piro	SQ101	NLL Nora Loiseau	44
Physical and thermal structure of the accretion flow onto T Tauri stars	A.I. Gomez de Castro	SC102	NLL Nora Loiseau	40
UV monitoring of the Recurrent Nova RS Oph in quiescence	R. Gonzalez-Riestra	SI103	NLL Nora Loiseau	52
Temperature of White Dwarfs, in Quiescent Dwarf Novae	B.J.M. Hassall	SI104	NLL Nora Loiseau	50
Flux-limited sample and flare studies of new EUV-selected dMe stars	G.E. Bromage	SC105	NLL Nora Loiseau	72

TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
Nonradial Pulsation and Mass Loss in Persei	D.R. Gies	SA106	ESM Enrique Solano	120
Highly interacting massive binaries	H. Drechsel	SI107	ESM Enrique Solano	13
The Incidence and Origin of Rotational Modulation of OB-Star Winds	D. Massa	SI108	ESM Enrique Solano	270
The Chemical Compositions of Three Fundamental O9-B0 Standards	G.J. Peters	SA109	ESM Enrique Solano	28
Duplicity among A-F Supergiant Calibrators	D.M. Peterson	SA111	ESM Enrique Solano	16
IUE Observations of 2 UV-Bright Seyferts	I.M. George	SQ113	ESM Enrique Solano	16
The UV-Bright Stars of Globular Clusters	W. Landsman	SA114	ESM Enrique Solano	32
Probing the Circumstellar Grains in Herbig Ae/Be Star Disks: Coordinated IUE and ISO observations	C.A. Grady	SA115	ESM Enrique Solano	80
Linking impulsive and gradual phases of RS CVn Flares: XTE, EUVE, IUE, and Radio observations of HR1099	A. Brown	SC116	ESM Enrique Solano	48
The changing wind structure and eruption in the Small Magellanic Cloud WR System HD5980	G. Koenigsberger	SA117	ESM Enrique Solano	128
Completion of IUE Jovian studies, first year	T.A. Livengood	SS118	ESM Enrique Solano	512
Completion of IUE Jovian studies, second year	R. Prange	SS119	ESM Enrique Solano	320
Simultaneous UV and TeV Gamma Ray Monitoring of the Blazar Markarian 421	D.R.H. Johnson	SQ120	ESM Enrique Solano	77.5

TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
Last UV/IUE extinction curve of molecular clouds and cirrus clouds	M.L. Prevot	SM121	ATH Armin Theissen	12
Do early A stars emit X-rays?	R. Freire Ferrero	SA123	ATH Armin Theissen	32
Activity in an EUV-selected sample of fast-rotating late-type stars	G.E. Bromage	SC124	ATH Armin Theissen	60
Mapping of Chrosmospheric Active Regions on UX Ari	O. Engvold	SC125	ATH Armin Theissen	8
Outstanding TAUVEX sources	N. Brosch	SA126	ATH Armin Theissen	ToO
Study of GX 301-2 and other two massive X-ray binaries	A.J. Castro-Tirado	SI127	ATH Armin Theissen	15
Comets and Related Objects as Targets of Opportunity	M.F. A'Hearn	SS129	ATH Armin Theissen	ToO
The secrets of T Pyx, a recurrent Nova with a long-awaited outburst	P.L. Selvelli	SI131	ATH Armin Theissen	64
Ultraviolet Observations of Field Horizontal-Branch Stars	A.G. D. Philip	SA132	ATH Armin Theissen	16
Eclipsing Binaries in the Magellanic Clouds: Laboratories for Stellar Structure and Evolution	E.F. Guinan	SA133	ATH Armin Theissen	80
A search for high redshift QSOs unobscured by Lyman limit system	S. Freidman	SQ134	ATH Armin Theissen	160
Supernova Spectroscopy	G. Sonneborn	SI135	ATH Armin Theissen	ToO
Target-of-Opportunity Observations of Novae	J. Krautter	SI136	ATH Armin Theissen	ToO

TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
Far UV monitoring of Pleione	V. Doazan	SA138	WJI Ian Skillen	28
Nature of the extraordinary short timescale variations in the wind of V 603 AQL detected with HST	M. Friedjung	SI139	WJI Ian Skillen	8
Stellar wind variability in the WC star HD 192103 (WC8)	A.J. Willis	SA140	WJI Ian Skillen	168
Understanding Blazar Continuum Emission	J.E. Pesce	SQ141	WJI Ian Skillen	16
A Systematic Ly-α study of Metal Poor Starburst Galaxies	D. Valls-Gabaud	SE142	WJI Ian Skillen	48
Intense multiwavelength monitoring of Gamma-Ray loud Blazars	G. Ghisellini	SQ144	WJI Ian Skillen	156
Long term spectroscopic monitoring of the LBV HD 5980	P.A. Crowther	SA145	WJI Ian Skillen	24
Stellar wind variability in the WN star HD96548 (WN8)	A.J. Willis	SA146	WJI Ian Skillen	80
Dissipation of Herbig Ae/Be envelopes near the Main Sequence	H.R.E. Tjin A Djie	SA148	WJI Ian Skillen	38
Monitoring of the spectral variations in the circumstellar disk of β Pictoris	M. Deleuil	SM150	WJI Ian Skillen	18
Interstellar gas in the fields of globular clusters	B. Bates	SM151	WJI Ian Skillen	48
Chromosphere and transition region of the X-ray sources	L. Pastori	SC152	WJI Ian Skillen	
Probing the relativistic jet structure of PKS 2155-304 through multiwavelength variability	L. Maraschi	SQ153	WJI Ian Skillen	288
Symbiotic novae	H. Nussbaumer	SI154	WJI Ian Skillen	45
X-ray luminous IRAS galaxies: a link between starbursts and Seyfert Galaxies	J.M. Mas Hesse	SQ155	WJI Ian Skillen	110

TITLE	APPLICANTS	PGM-ID	...@vilspa.esa.es CONTACT RA	Alloc. (hours)
An investigation of the blue sequence in the young LMC cluster NGC 1850	V. Caloi	SA156	NRS Norbert Schartel	120
Initial mass function and extinction in blue compact galaxies	J.M. Mass Hesse	SE157	NRS Norbert Schartel	48
Detection of accretion on Herbig Ae/Fe stars	P.F.C. Blondel	SA158	NRS Norbert Schartel	32
Follow-up study of EUV Transient ALEXIS J1114+43 (AR UMa)	D. Roussel Dupre	SI160	NRS Norbert Schartel	32
Ultraviolet observations of NGC4151 simultaneous with XTE and OSSE	G.A. Reichert	SQ161	NRS Norbert Schartel	32
Monitoring Mk509: The origin of the Reprocessor	K.M. Leighly	SQ162	NRS Norbert Schartel	36
UV Variability of the Quasar 3C 273	T. Courvoisier	SQ164	NRS Norbert Schartel	50
Monitoring of Long Period Eclipsing Systems	R.E. Stencel	SC165	NRS Norbert Schartel	16
Probing Coronal Flare Energetics: Coordinated IUE, XTE, and EUVE Observations of Nearby Flare Stars	M. Gagne	SC166	NRS Norbert Schartel	24
η Car Complex: the Structure and Outbursts. A Multi-Wavelength Campaign	D.G. Currie	SM167	NRS Norbert Schartel	56
ToO Observations of Tremendous Outburst Amplitude Dwarf Nova (TOADs)	S.B. Howell	SI168	NRS Norbert Schartel	64
Multiwavelength Accretion Studies of AM Herculis Stars	S.B. Howell	SI169	NRS Norbert Schartel	37
Mapping OH Emission in the Magnetosphere of Saturn	M.C. Festou	SS170	NRS Norbert Schartel	56

Teleworking for IUE

M. Barylak

ESA IUE Observatory

Introduction

Over 10 years ago, we started to have our first modem connections and remote queries to the IUE Merged Log of Observations were made possible. Today, the modem speed is more than tenfold then the one used 10 years ago and "better" communication protocols[21] support almost simultaneously telnet, FTP, e-mail, HTTP, etc. This, in fact, gives rise to the same questions we had 10 years ago – e.g. would it be possible to work at/from home?

Informal arrangements were made then and today - now the IUE project has one **formal teleworker**. His respond to what he thinks about teleworking was:

> *... working at home results in me spending a minimum of 14hrs.in front of the screen per day (no breaks like going to & from VILSPA etc.) ...*
>
> *I could rabbit on for pages how, due to teleworking, poverty stares me in the eye...*
>
> *In passing I hear that after a lot of noise implying that teleworking the greatest thing since the sliced bread, and how it's going to change working patterns drastically, the FT[22] says the expected stampede into it hasn't materialised. Furthermore, some companies who embraced this new wave are finding it has more limitations than foreseen.*

Telework defined

Since various years, the developments in information and telecommunication technology have and are inducing profound changes in our society which experts call the "Digital Revolution" or the beginning of an "Information Society". This revolution will modify the way we organize work as much as did the "Industrial Revolution" back in the XVIII and XIX centuries.

In an Information Society, the majority of tasks is not related with physical objects but with information processing. Nowadays and due to the "communication super-highways", information is location independent. This location independence is the key factor that we can tele-work.

Experts say, that "tele-work, working at-a-distance, is enabled by telecommunications, but fundamentally it is a management and organizational issue inspired by the perception of the many advantages and cost savings in **moving work to people rather than people to work.**" (Andrew Page and David Brain, 1992).

A formal definition of **telework** might read (Gray et al., 1994):

[21] e.g. the Point-to-Point Protocol (PPP) which enables TCP/IP connections over serial point-to-point links.
[22] Financial Times

"Teleworking or "telecommuting"[23] is a flexible way of organizing work without the need of the physical present of the worker at his work place during important parts of his working hours. The professional activity of teleworking implies the frequent use of electronic information processing techniques and the extensive use of telecommunication equipment (e.g. telephone, answering machine, fax, networked computers, and other advanced telecomms services such as ISDN[24], voice mail, audio and video conferencing, call diversion, mobile telephony, etc...)"

What are the **advantages** of telework?

- For the company:
  - cost savings (subcontracting entire operations to areas of lower costs and more dedicated or more reliable workers),
  - improving staff retention,
  - sourcing of high quality staff (without requiring them to move house),
  - savings on office (and parking) space,
  - savings on the increasing costs of commuting and business travel,
  - more effective use of time and increasing productivity
- For the employees:
  - more flexible working arrangements,
  - higher working morale (teleworker's morale and performance improves since they manage their own time, arrange their own schedules, and tend to work, not by the clock, but rather until the job gets done)
- For the general public:
  - reduction in pollution levels
  - lower energy consumption
  - reduction of traffic congestions

Telework in EUROPE

Many studies on telework have been conducted in Europe,[25] where the focus has mainly been on employment, organizational or social aspects or on the potential of telework to address specific issues such as rural re-development.

In the USA, mainly environmental and traffic demand management aspects of telework have been considered, and a separate focus placed upon the economic significance of networking

[23] coined by Jack Nilles of JALA International, considered to be the father of teleworking

[24] Integrated Services Digital Network

[25] see, e.g. `http://www.agora.stm.it/ectf/tw95indx.html`

and teletrade. Developing countries and some European regions have focused on telework as a means to attract work into their local economies.

The **Bangemann** report *"Europe and the global information society"*, is a summary of recommendations and an action plan, which was unanimously adopted by the European Council at its meeting in Corfu. This report lists the following ten applications:

1. TELEWORKING - more jobs, new jobs, for a mobile society
2. DISTANCE LEARNING - life long learning for a changing society
3. A NETWORK for Universities and Research Centres - networking Europe's brain power
4. TELEMATIC SERVICES for SMEs[26]
5. ROAD TRAFFIC MANAGEMENT - electronic roads for better quality of life
6. AIR TRAFFIC CONTROL - an electronic airway for Europe
7. HEALTHCARE NETWORKS - less costly and more effective healthcare systems for Europe's citizens
8. ELECTRONIC TENDERING - more effective administration at lower cost
9. TRANS-EUROPEAN PUBLIC ADMINISTRATION NETWORK
10. CITY INFORMATION HIGHWAYS - bringing the information society into the home

The aim of the teleworking recommendation is to have 2% of "white collar workers" by the end of 1996 and 10 million teleworking jobs by the year 2000.

Conclusions

The IUE projects counts with one formal teleworker and many informal ones (- aren't you yourself a teleworker when you collaborate with colleagues over networked computers, make queries to remote observing logs or copy science data to your home/institute computer ?).

Maybe in the not too far future we all will be formal teleworkers and maybe we as humans will someday live in a "Society of Knowledge" evolved from the up-coming "Information Society". And how is life going to be when this "Society of Knowledge" turns into a "Society of Wisdom",... but this may be just two fatal steps ahead of reality.

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- Page, Andrew; Brain, David: 1992, *Teleworking: A Common Sense Management Tool*, European Community Telework Forum (ECTF).

[26]Small and Medium Enterprises