

# Current Developments at the IUE Data Analysis Center

IUEDAC Staff (CSC)

31 March 1995

## 1 Facility Status

### 1.1 Happy Birthday IUE!!!

On the 26th of January 1995, it was 17 years since IUE was launched.

### 1.2 Recent Staff Changes

Pat Lawton, who oversaw our UNIX support services, will be leaving the project at the end of March to take a position in the Astrophysics Data Facility (ADF). Suzy Crabb will be joining the IUEDAC staff and will be assuming some of Pat's duties. The IUEDAC wishes Pat well in her new endeavors.

### 1.3 IUE Alpha Installed

On August 25, the IUE VAX 8350 was replaced with a multi-user DEC AXP 3000 model 600 (Alpha) workstation. The new workstation contains 128 MB of memory, includes unlimited user licenses for both OpenVMS and IDL, and can access all the printers and disk drives that were previously available. Benchmark tests have verified that the new CPU is roughly 100 times faster than the previous VAX 8350, although disk I/O can be somewhat slower. Disk access will be significantly improved in the near future however, when the existing ethernet connection is replaced with an FDDI fiber optic link.

There are two main changes from a user's point of view. One is that the default editor is now EVE rather than EDT (however, the version of EVE previously accessed by typing "EVE" is no longer supported). Type "EDIT" to invoke EVE. This default may be redefined by the user. The other change is that all executables (e.g., FORTRAN programs) must be recompiled. The IUEDAC IDL software has already been modified to support AXP OpenVMS and user-written IDL programs should not need to be modified unless they call the IDL system variable !version.arch. Contact a member of the IUEDAC staff if any problems are discovered.

### 1.4 Termination of IUE ADS Support

On the 30th of September 1994, NASA funding to support the IUE node of the Astrophysics Data System (ADS) was terminated. As of that date IUEDAC personnel no longer support these services. For those who have found the system useful, an

ADS presence on the World Wide Web has been established. Details on this development can be obtained from Guenther Eichhorn (gei@cfa.harvard.edu). A link to the ADS homepage is provided in the IUEDAC homepage.

### **1.5 Changes in Goddard Security**

During the past few months there have been several reported cases of computer and other equipment disappearing from Goddard offices. As a result, Goddard security has asked employees to lock all rooms after normal business hours, including common areas such as the IUEDAC terminal room. This may mean that IUEDAC visitors will have trouble accessing the IUEDAC terminal room during off-hours, particularly when the VILSPA observing shift occurs during these times. As an additional security measure, keycard readers are expected to be installed on the outside doors to Building 21 which will be locked regularly on weekends, government holidays, and weekdays from 6 pm to 6 am.

Arrangements are being made with Goddard security to have visitor cards available at the main gate for IUE observers and IUEDAC users who may need off-hour access. The IUE project is also looking into the possibility of installing a card reader on the terminal room door which would be compatible with the card reader installed on the outside doors. More information will be distributed once final decisions are made.

### **1.6 New Procedures Available**

There is a new procedure, PLATFORM, available. It isolates some of the node and system dependencies into one procedure. Those sites with Unix or Ultrix like systems that are not specifically supported by the IUEDAC may find it helpful. Please see the platform.txt file for more information.

There is also a program called BOXCAR in our production library which performs customized boxcar extractions of spectra from SILO files. It will also work on IUESIPS line-by-line files. Those who were using this program before should now use the version in the experimental library. The Chebyshev background fitting works properly now, and a bug (wrong default center line for the large aperture in SILO files) was fixed.

### **1.7 Widget Versions of IUE Procedures**

We are beginning to produce widget versions of the procedures in the IUEDAC software library. We would like to announce the availability of the first two of these, called W\_SEARCH and W\_MISDAT. W\_SEARCH is the routine known as SEARCH, which searches the IUE Merged Log, in a widget form. It is now available in the IUE library. Local users can invoke this routine by simply typing WSEARCH.

The other routine we have added to the IUEDAC production library is called W\_MISDAT. This is a widget version of the procedure MISDAT, and it allows users to examining IUE images which have missing or bad quality data. The user can display the raw image if the raw data file is available, otherwise just an overlay is made showing the locations of the imperfect data. See the documentation via the DOC\_LIBRARY routine for further details.

Stay tuned for further developments. Comments on these routines can be directed to any member of the IUEDAC staff.

### **1.8 IUE Data Reductions in IRAF**

The main purpose of the IUEDAC is to assist users in reduction and analysis of IUE data. Numerous users have asked for assistance in converting IUE data into the FITS format that IRAF requires. We have responded to these requests by creating several IDL procedures that allow users to convert IUE data into IRAF compatible FITS formats. A full description of these routines can be found in the anonymous ftp account on iuesn1, in the file iraf.conv in the pub/manuals subdirectory.

Users can log onto the IUE Alpha via internet, (iue.gsfc.nasa.gov or set host iue) either into their user account or the general RDAFSCRATCH account, whose password can be obtained from any member of the IUEDAC staff. They can use this area to access IDL and the relevant procedures, convert the files to the proper format, and FTP or DECNET copy them back to their home institution for use in IRAF. We will support users in this effort until the files are taken back to their home institution.

### **1.9 Tektronix Terminal Emulation**

Many IUEDAC remote users work from personal computers using commercially available terminal emulation programs. Since remote X-window sessions may be inefficient on multi-user systems such as IUE, staff members generally recommend programs which emulate Tektronix 4010-4015 terminals for those users who want graphics-capability. (If graphics is not required, any DEC VT-xxx emulation or X-window device should suffice.) Currently more than 20 vendors produce terminal emulation programs which can run under DOS, Microsoft Windows and/or Apple computers. A review of these programs was included in the September and October issues of Digital News and Review.

We occasionally receive comments from users regarding problems running specific IUEDAC routines using these emulation programs. Most of the problems seem to deal with the routines which use interactive cursor commands. If any users recommend specific programs, we would be interested in hearing about it, and will make the information available to other users. Also, now that staff members have access to a PC and a Mac, we hope to evaluate some of these products and determine why any problems exist.

### **1.10 Fortran Based NEWSIPS MXLO File Readers**

In response to some user inquiries, we have available for users a beta test version of a fortran program which will read NEWSIPS MXLO files. This program makes use of the FITSIO sub-routines written by Bill Pence of the High Energy Astrophysics Science Archival Research Center (HEASARC). Please contact Dr. Michael Carini for the software and further details.

## 1.11 Updated IUEDAC Software and Documentation Now Available

The VMS version of the IUEDAC software and database files have been updated and are now available for distribution in the IUE Anonymous FTP account. A new version of the VAX VMS installation guide (INSTALL-VAX.TEX) is also available in the same account. Users should be cautioned that the installation procedure required for the new software has changed slightly, primarily because IDL system variables have replaced the use of VMS logicals for describing the IUERDAF account structure. (Note the unix version of the updated IUEDAC software was added to the anonymous ftp account on iuesn1 this month.) Also available in the anonymous ftp account is a newly revised and expanded IUEDAC Users Guide. The 132-page LaTeX document is stored in the file GUIDE.TEX.

## 1.12 Software Changes

For the current software based on IDL v3.0, the entries below describe the major software and data base modifications implemented at the IUEDAC since June 1994

- 01-JUL A new version of SRPLOT was implemented which properly displays nu flag values and includes default settings for displaying NEWSIPS SILO or IUESIPS line-by-line files.
- 01-JUL New routines in the experimental library:
- mgex - a new routine for extracting multiple exposures from low dispersion large aperture images using a Gaussian extraction technique.
  - point, feature, confind (a subroutine of norm) - corrects problems using the IDL cursor command in Tektronix mode.
  - ifitsrd - allows multiple fields and rows to be extracted from FITS binary table files and supports both multi-dimensional and variable length arrays.
- 15-JUL A new version of the MGEX routines was added to the experimental library which forces the widths of the Gaussian at each wavelength to be the same. The new version should allow a more accurate extraction of multiple exposures in the large aperture.
- 03-AUG A new version of nsplot was implemented which allows users to specify titles for the x and y axis. Also, a new routine called delcrrc was added to the experimental library which removes the carriage return carriage control file attribute from vms disk files. This allows certain binary files to be transferred using MultiNet FTP software without the addition of line feed characters at the end of each record. (See the IUEDAC remote users guide for more information.)

- 12-AUG A new version of ISFIND was implemented which corrects a bug in handling search tolerances. Also, a new version of NSPLOT was implemented which corrects a problem with plot titles.
- 19-AUG New versions of 104 procedures were implemented today from the experimental library. Most of the changes should be transparent to the user and basically involve truncating subroutine names for compatibility with DOS systems, and modifying some existing routines to use the routine PLATFORM to obtain various system-related information. PLATFORM also includes support for AXP OpenVMS, an operating system used on Alpha workstations.
- 22-AUG A new routine called STDSTARS was implemented which allows users to search a newly created catalog of IUE standard star spectra. The standard star spectra are those described by Wu et al in IUE Newsletter No. 22 and 43 and are available online at the IUEDAC.
- 02-SEP A new version of GETPRO was implemented which allows 30 (rather than 10) libraries to be searched.
- 06-SEP A new version of NEWCALIB was added which properly calibrates trailed and double-aperture NEWSIPS data extracted with GEX.
- 08-SEP The IUE merged observing log was updated. Goddard entries through August 23rd (GMT day 235) are included. Changes were also made to the merged log, the FES catalog, and several database procedures to display the standard Julian date rather than the Modified Julian date.
- 09-SEP A new version of STPAR was implemented which reads double precision, complex, and all commentary FITS keyword values. The added support for double precision values will allow the IUEDAC FITS routines to extract the new Julian date keywords.
- 04-OCT New versions of ISVIEW and ISPRINT were implemented which will automatically create a separate disk file of database search criteria when a user requests search results be written to disk.
- 06-OCT The following routines were added to the experimental library:  
 IDBPRINT - speeds up database searches  
 IDBXVAL - " " " "  
 CON\\_SAV - includes support for fields transferred using MultiNet block mode
- 06-OCT The following routines were transferred from the experimental library to the standard production library:  
 ADDICOM - new FITS-related routine, CHKFITS - result=3 added,

CONVERT - image file bug fix, DELCRCC - new routine,  
FITSCON - multi-dim. array support, IFITSRD - more capabilities,  
IFITSWRT - bug fixes, IUE3DRD - more capabilities,  
IUEREAD - reads iuesips & newsips files, MFIT - new mgex subroutine,  
READ\\_DATA - fes bug fix, SAVFITS - resampling bug fix,  
TGAUSS - new mgex subroutine, VECFITS - new FITS routine,  
WFIT - more capabilities (mgex related), W\\_OK - new widget routine

- 17-OCT A new version of IUEPRECESS was added to the experimental library which defaults to the FK5 system (i.e., J2000.0) rather than the (optional) FK4 system (i.e., B1950.0) for precessing coordinates.
- 21-OCT Changes were made to the implemented versions of SEARCH (allows more than 1 append using option 23) and W\\_SEARCH (expanded documentation). The experimental version of IDBPRINT was also updated to use longword integer variables.
- 01-NOV New versions of CURESTR and NEWCALIB were added to the experimental library to support the analysis of LWP low dispersion NEWSIPS data.
- 02-NOV New versions of JULDATE (allows seconds to be included in input vector), and DATECONV (improved date format conversion) were implemented.
- 04-NOV The experimental versions of IDBPRINT and IDBXVAL (which allow faster formatting of database search results) were implemented. Also a new routine called MULDIRFF was implemented which will eventually allow database files to be stored (and searched) in multiple directories.
- 07-NOV New database routines have been implemented which use an IUEDAC-defined IDL system variable (i.e. !iuer) instead of VMS logical assignments for locating IUEDAC database directories.
- 08-NOV The latest (as yet unpublished) Kurucz models are now available on IUE. Type DOC\\_LIBRARY,'KURUCZ91' for information on a menu-driven search routine. See also KURGET and KURGET1.
- 21-NOV A new version of IUESPEC was added to the experimental library which uses more informative error messages, allows version numbers for vms input files, and does not abort when extensions are specified with the input file name.
- 21-NOV Experimental versions now exist for IUEDAC programs in which the system logicals and environment variables were replaced by IDL system variables. The changes should be transparent to users.
- 21-NOV The IUE merged log was updated. Goddard entries through Nov. 10th

are included.

- 23-NOV Following experimental routines were implemented:
- IUESPEC - improved error messages, allows extensions & version numbers in input file name
  - NEWCALIB - includes NEWSIPS LWP low dispersion calibrations and corrections for read gain
  - IFITSWRT - properly removes any blank lines after END keyword
  - IUEPRECESS - defaults to FK5 rather than FK4 system
  - CON\\_SAV - supports Multinet block mode
  - CURESTR - allows IUEDAC routines to process LWP low dispersion NEWSIPS data
- 23-NOV The IUEJRNL and ALIAS database tables have been updated. IUE images referenced in papers published in 1985 have been included.
- 09-DEC A new routine called BOXCAR is available in the experimental library which allows users to extract fluxes from either IUESIPS ELBL or NEWSIPS SILO files using a boxcar slit extraction.
- 30-DEC New experimental routines:
- READMX - runs slightly faster than implemented version
  - READSI - runs slightly faster & nu flag output array is optional
  - BBDRAW - allows printouts of plots & replaces iueplot with nsplot
  - NSPLOT - minor changes to simplify calling from other programs
  - IUEPROG - searches database table of IUE program IDs
  - GFILTER - applies a Gaussian filter to vectors or arrays
- 27-Jan Almost all of the experimental library routines have now been implemented. Most of the ~100 new programs include changes for improving software portability and should not impact users. Included in the implementation however is a new version of SEARCH which allows users to submit NEWSIPS reprocessing requests.
- 30-Jan Minor errors were corrected in the implemented versions of IUEFX, STPAR, and BS\\_INOUT.
- 03-Feb Faster versions of the FITS reading routines IFITSRD, IUE3DRD, IUEATRD, and IUEARRD have been added to the experimental library
- 07-FEB New experimental routines:
- LORFIT - lorentzian distribution function (compatible with WFIT)
  - PFIT - power law function (compatible with WFIT)
  - STDSFILE - standard star database search routine
  - RDSTDS - extracts corrected fluxes from online standard star spectra
  - BINS - new keyword for writing results to a disk file

WEIGHT - more flexible weighting using nu flags

14-FEB New versions of the FITS reading routines IFITSRD and IUE3DRD have been added to the experimental library which allow reading multiple rows of a FITS binary table extension containing variable length array fields.

## 2 New Services, Available and Planned

### 2.1 IUE and the World Wide Web(WWW)

We are proud to announce the availability of two new IUE homepages on the WEB: an IUE project homepage ([http://iuesn1.gsfc.nasa.gov/iue/iue\\_homepage.html](http://iuesn1.gsfc.nasa.gov/iue/iue_homepage.html)) and an IUE telescope operations homepage ([http://iuesn1.gsfc.nasa.gov/iue/iuetoc\\_homepage.html](http://iuesn1.gsfc.nasa.gov/iue/iuetoc_homepage.html)). The project homepage includes general project information and links to some nice IUE related images, while the operations homepage provides details of IUE operations, monthly skymaps, etc.

Direct any questions or comments about these homepages to Mr. James Caplinger ([caplinger@iuesoc.gsfc.nasa.gov](mailto:caplinger@iuesoc.gsfc.nasa.gov)) (project homepage) or Mr. Andrew Groebner ([groebner@iuesoc.gsfc.nasa.gov](mailto:groebner@iuesoc.gsfc.nasa.gov)) (operations homepage). Questions or comments concerning IUE's presence on the WWW can also be sent to Dr. Michael Carini ([carini@iuedac.gsfc.nasa.gov](mailto:carini@iuedac.gsfc.nasa.gov)).

### 2.2 Search the IUE Merged Observing Log via the World Wide Web

The IUE Merged Observing Log may now be searched via the WWW. This service is provided as a joint effort of the IUEDAC and Astrophysics Data Facility (ADF). The information obtained from the Hyper-Text Markup Language (HTML) forms is used with many of the same IDL database procedures that SEARCH and W\_SEARCH use; therefore, searches on only non-indexed and non-sorted fields - such as object name - will be as "painful" as always. The URL is:

[http://banzao.gsfc.nasa.gov/IUE/search/IUE\\_search\\_menu.html](http://banzao.gsfc.nasa.gov/IUE/search/IUE_search_menu.html)  
or it is available via a link on the IUEDAC homepage. If you have any problems or suggestions, please contact the IUEDAC staff.

### 2.3 PR Images Now Available in GIF Format

Many of the Public Relation images formerly available only in PostScript format are now also available in gif format. Please see the README file in the pub/images subdirectory of [iuesn1.gsfc.nasa.gov](http://iuesn1.gsfc.nasa.gov)'s anonymous ftp account for further information. A WWW browser of these GIF images will be made available in the near future.



## 2.4 Anonymous FTP Now available on IUE

The IUE project now supports an anonymous ftp account on node IUE. The account is accessible using either ftp or DECnet commands such as COPY, DIR, etc. The account currently contains the VMS version of the IUEDAC IDL software stored as VMS BACKUP files, and the IUE public relation images stored in postscript and GIF format. A readme file stored in the top directory describes the current account structure. A readme.txt file also exists in the iuedac subdirectory which describes the BACKUP files containing the IUEDAC programs and how to restore them. Note that users accessing the VMS BACKUP files using FTP should have the MultiNet implementation of the FTP software on their local computer. If not, then DECnet commands should be used to access these files. Note that MultiNet is not required for accessing other files in this account.

If you ftp to IUE (128.183.57.58), specify "anonymous" for the username and give your e-mail address for the password. To obtain the IUEDAC IDL software, cd to iuedac. Be sure to specify "TYPE BACKUP" before GETting any of the .BCK files. To access the postscript files, cd to iuedac.images and transfer the files in binary mode. A readme.txt file in the images subdirectory will describe the contents of the postscript files.

To access the account via DECnet you do not need to login to IUE. Just use the standard DECnet commands and the following syntax for the accessing the account: IUE::IUE\$DKB0:[ANONYMOUS.IUEDAC]filename The DIR, COPY, and TYPE commands will all work when the file name(s) are specified in this manner. For example, to read the top level readme file, type:

```
TYPE IUE::IUE$DKB0:[ANONYMOUS]readme.;1
```

To read the readme.txt file in the iuedac subdirectory, type:

```
TYPE IUE::IUE$DKB0:[ANONYMOUS.IUEDAC]readme.txt
```

To copy all the BACKUP files back to your home institution, type:

```
COPY IUE::IUE$DKB0:[ANONYMOUS.IUEDAC]*.BCK *
```

Users down-loading the IUEDAC IDL software are requested to fill out a registration form. A copy is contained in the file register.txt in the iuedac subdirectory along with directions for e-mailing it back to the IUEDAC staff.

## 2.5 How to Obtain the IUEDAC Software Package

**VMS** - Copies of the IUEDAC IDL-based software package in VMS backup save sets are now available from the project. The most recent versions of the software can be provided on a 9-track magtape and are also now available on disk for electronic transfer from the anonymous FTP account described above.

**UNIX** - The software package for UNIX (SunOS) and ULTRIX systems are available through the network via anonymous ftp or on 1/4" cartridges and 9-track tapes. To transfer the files (sun\_\*.tar.Z), via anonymous ftp, use the following commands:

- ftp iuesn1.gsfc.nasa.gov (128.183.57.16)
- login - anonymous
- password - username@host

- cd pub/software
- get README
- get DOC
- get INSTALL
- get REGISTER
- binary
- mget sun\*.Z (or mget ultrix\*.Z)
- bye

These files are intended to be unpacked in the installation directory using the "uncompress" and "tar xvf" commands. More complete installation instructions can be found in the file INSTALL. Introductory documentation on the IUEDAC procedures can be found in the file DOC. If you retrieve the software via anonymous ftp or from IUEBCK, please send us the Registration form via e-mail. A copy of this Registration form can also be found in IUE Newsletter #51.

Feel free to contact Randy Thompson (rthompson@iuedac.gsfc.nasa.gov), the IUEDAC Manager for additional assistance with your installation of the IUEDAC software.

## 2.6 Database Updates and Availability

In addition to the IUE Merged Observing Log, the IUEDAC has several other databases available. These include the IUE FES catalog, the IUE Reference Database (a listing of refereed journal articles pertaining to IUE data), IUE Standard Stars (information and spectra contained in the IUE Ultraviolet Spectral Atlas published by Wu et al in IUE Newsletter #22 and #43), IUE Observing Programs table (listing of approved proposal titles and authors), the Kelly and Palumbo line list, and the Kurucz 1979 models. A complete description of these databases may be found in the article *Databases at the IUEDAC* in this newsletter.

The information on the IUE Standard Stars library, previously only available for VMS systems, is now in a database, STDSTARS. The database files for Unix and Ultrix systems are in iuesn1.gsfc.nasa.gov's anonymous ftp account in the pub/software subdirectory. They are named sun\_stdstars\_db.tar.Z and ultrix\_stdstars\_db.tar.Z respectively. They should be installed using the \*\_mergedlog.tar.Z installation instructions. There is also a user interface similar to SEARCH called STDSTARS.

A modified version of the IUEDAC IDL procedure HFIX has been run on all the IUE Standard Star spectra that the IUEDAC keeps on line. The program added the ITF flag, exposure time, and the THDA sensitivity correction flag to allow IUESPEC to be run without the user being prompted for this information. Note the LWR degradation flag was turned off so users could run RBSENSCOR after IUESPEC. The sun\_stdstars.tar.Z and ultrix\_stdstars.tar.Z files in the pub/software subdirectory of iuesn1.gsfc.nasa.gov's anonymous ftp account now contains these corrected files.

IUELOG now includes the Final Archive processing date. The fields 'nproc\_date' and 'nprocjdate' give the date in day-month-year and Julian date formats respectively. The IUESIPS processing date fields, 'proc\_date' and 'procjdate', have been renamed to 'iproc\_date' and 'iprocjdate' respectively.

The new Final Archive Status Flag (field fa\_status in IUELOG) of '1' (image chosen for processing on ALPHAs) has been added to the code and documentation.

### 3 Communicating with the IUEDAC

#### 3.1 IUEDAC Access

Personnel at the IUEDAC can be contacted in any of a number of ways. We are committed to providing analysis tools, the training to use them and to make the analysis of IUE data as productive as possible. We remain ready to help solve problems related to the software we provide and we continue to work on our package to improve its quality and expand its usefulness. Let us know what we can do to improve the package, or to help you use it more effectively.

Electronic Mail - Internet: name@IUEDAC.GSFC.NASA.GOV  
DECNet : IUEDAC::name or 16074::name  
(staff members are listed  
at the end of the article)

Remote Login - You need to have a local account on the IUE computer. If you need one, please call Randy Thompson (IUEDAC Manager) at (301) 286-8800. To do searches or retrieve data you can access one of the IUE accounts such as IUEORDER (call for the password).

Modem: (301) 286-9000 (1200, 2400 baud)  
(301) 286-4000 (9600 baud)  
Enter Number: LASP

local> C IUE

Call back lines are also available at 1200 and 2400 baud rates.

TELNET 128.183.57.58

SET HOST IUE or SET HOST 15378

File Transfer - FTP 128.183.57.58  
(enter your IUE account name and password)  
Note that the if you want to transfer binary files (e.g., .DAT, .LAB, or .SAV), you need to specify 'binary' and run CON\\_RDAF if transferring files across different platforms.

VMS DCL command Copy (from IUE to you local computer)  
COPY 15378 'name password'::disk:[name]file.ext \*.\*

(disk e.g., IUE\$USER1)

In case you have questions please send e-mail to Randy Thompson. If you need more detailed information we can send you the IUEDAC Remote Users Guide.

### 3.2 The Current IUEDAC Staff

Should you have any questions, problems or suggestions concerning the services or products available at the IUEDAC, feel free to contact any of the personnel listed below.

| Function                      | Name                              | Preferred E-mail Address  | Phone                        |
|-------------------------------|-----------------------------------|---|------------------------------|
| Supervisor                    | Dr. Tom Meylan                    | IUEDAC::MEYLAN<br>meylan@iuedac.gsfc.nasa.gov                             | 301-286-7762<br>301-794-1471 |
| Manager                       | Mr. Randy Thompson                | IUEDAC::RTHOMPSON<br>rthompson@iuedac.gsfc.nasa.gov                       | 301-286-8800                 |
| Astronomer                    | Dr. Michael Carini                | IUEDAC::CARINI<br>carini@iuedac.gsfc.nasa.gov                             | 301-286-7762                 |
| Database Support<br>Assistant | Ms. Suzy Crabb<br>Ms. Lyla Taylor | crabb@iuedac.gsfc.nasa.gov<br>IUEDAC::STAFF<br>staff@iuedac.gsfc.nasa.gov | 301-286-5103<br>301-286-3938 |
| Assistant                     | Ms. Ruth Bradley                  | IUEDAC::STAFF<br>staff@iuedac.gsfc.nasa.gov                               | 301-286-8060                 |