Multi-wavelength Data Analysis System User's Guide,
Astronomy Data Center,
National Astronomical Observatory of Japan

30th April 2025

Contents

Chapter 1

Introduction

1.1 About the Multi-wavelength Data Analysis System

National Astronomical Observatory of Japan (NAOJ) Astronomy Data Center (ADC) operates the Multi-wavelength Data Analysis System (MDAS) which is an open-use computing system. MDAS is constructed to analyze astronomy data at any wavelength. More than 100 software packages installed in the system support data reduction and analysis of astronomy data observed by various telescopes.

MDAS consists of interactive data analysis servers, MDAS terminals, and its peripherals. Users access an interactive data analysis server with SSH connection and analyze data. MDAS terminals located in the Subaru building open-use room and ALMA building room 101 on the NAOJ Mitaka campus can be used for connecting to an interactive data analysis server.

MDAS is a computing system for "analytic researches of astronomical observation data". For those who want to perform calculations related to the simulation astronomy, please use computing systems operated by Center for Computational Astrophysics (http://www.cfca.nao.ac.jp).

1.2 ADC open-use help desk

ADC open-use help desk operates MDAS and supports users. If you have any questions about MDAS and the open-use rooms, please feel free to contact us.

Place	ADC open-use help desk, 1F South building
Reception time	Mon-Fri 9:30-12:00, 13:00-17:30
E-mail address	consult(at-mark)ana.nao.ac.jp
Extension number	3832

1.3 Information about MDAS

Please refer to the following URLs for information about MDAS.

- MDAS website (https://www.adc.nao.ac.jp/MDAS/mdas_e.html)
- Information from ADC (https://www.adc.nao.ac.jp/cgi-bin/cfw2013/wiki.cgi/adcinfo/MLinfo)
- FAQ (https://www.adc.nao.ac.jp/cgi-bin/cfw/wiki.cgi/FAQ/FAQE)
- System Working Status (https://www.adc.nao.ac.jp/E/server-status/)

Chapter 2

Regulations for use of Data Analysis System

National Astronomical Observatory of Japan Astronomy Data Center Regulations for use of Data Analysis System

(Purpose)

The 1st article
This regulation intends to establish requirements about use of the data analysis system (hereafter "system") in National Astronomical Observatory of Japan Astronomy Data Center (hereafter "center")

(User qualification)

The 2nd article
The person who can use the system (hereafter "user") is a member to whom the following applies:
1. Staff of National Astronomical Observatory of Japan (hereafter NAOJ)
2. Researchers (who graduated from college) of astronomy and the related field
3. The person who is allowed by the center chief in particular

(The kind of use)

The 3rd article
The kind of use of the system is limited to the following.
1. Data processing of astronomy and related fields
2. The study and the work which are permitted by the center chief in particular

(Use application)

The 4th article
The person who would like to use the system has to submit a prescribed application form to the center chief and to receive an approval. When applying person belongs to the research institute outside Japan, the research and educational staff of NAOJ must be a supervisor of the applicant.

(Approval)

The 5th article
1. When the center chief accepts application form of the preceding article and admits to be suitable, he approves it and gives the user a distinction sign (hereafter "user ID") and also gives the group distinction sign (hereafter "group ID") if necessary.
2. The validity of user ID and group ID of the preceding clause is 1 year from approved use starting day. And it is available up until the next March 31.

3. When users hope to use their approved user ID or group ID continuously beyond the next March 31, they must renew the application within the period designated by the center chief.

(The prohibition of user ID diversion)

The 6th article

Users cannot use their user ID for the purpose other than that of application and users cannot allow third party to use their user ID.

(The prohibition of group ID diversion)

The 7th article

Users cannot use their group ID for the purpose other than that of application and users cannot allow third party except for their research group to use the group ID.

(Notification)

The 8th article

When the following has occurred during the validity period of use, users should notify the center chief promptly.

1. Use of system was ended or stopped.
2. Institution or position was changed.

(Revoke of use qualification)

The 9th article

When users do not comply with the regulation of center or use the system except for the approved purpose, the center chief can revoke the use qualification or suspend the use.

(Final report)

The 10th article

When studies that related to the use of system have finished or the validity period of user ID has ended, the center chief may ask users to submit reports on the system use (progress reports).

(The publication of results)

The 11th article

When users make public the results obtained by using the system, they must acknowledge clearly in their papers the use of the system.

(Others)

The 12th article

1. Alteration and abolition of this regulation is executed by the center chief after consultation with the technical committee.
2. In addition to this regulation, the center chief can establish a special bylaw about the system use requirements.

(The rider)

1. This regulation comes into effect on the March 1st 2013.

Chapter 3

How to get an user account

In order to use MDAS, you must submit an application. Those who use MDAS from outside the NAOJ network must also apply for VPN service.

MDAS provides group ID service. If you share data with other users, please submit an application for the group ID service.

3.1 Application for MDAS

An application form of MDAS is on https://www.adc.nao.ac.jp/MDAS/appl/id_e.html. Please refer to regulations for use of MDAS (sea Section 2) before applying. Once the registration process is complete, your account will be informed you by e-mail.

3.2 Application for VPN service

If you are a NAOJ staff, please use NAOJ staff's VPN service. If not, please use MDAS VPN service.

An application form of the NAOJ staff's VPN service is on https://nethelp.mtk.nao.ac.jp/contents/en/node/4 (accessible only from the NAOJ network but inaccessible from MDAS). This VPN service is operated by NAOJ NETWORK SERVICE HELP CENTER. If you have any questions, please contact there.

An application form of the MDAS VPN service is on https://www.adc.nao.ac.jp/MDAS/appl/vpn_e.html. This VPN service is operated by ADC. Once the registration process is complete, instructions on how to use the VPN service will be informed you by e-mail. This VPN service requires installation of anti-virus software on your PC used for the VPN connection. If you have any questions, please contact the ADC open-use help desk (consult(at-mark)ana.nao.ac.jp).

3.3 Application for group ID service

A group ID is issued for a group of users. Files can be shared within the group of users by setting the group ID as a group owner of the files. An application form of the group ID service is on https://www.adc.nao.ac.jp/MDAS/appl/gid_e.html.

Chapter 4

How to use computers

MDAS consists of interactive data analysis servers, MDAS terminals, and its peripherals. In this chapter, we will introduce how to use each computer.

4.1 Interactive data analysis servers

Interactive data analysis servers are computers constructed for reducing and analyzing astronomy data interactively. Each server is accessible from your PC or MDAS terminals with SSH connection.

4.1.1 System configuration

Interactive data analysis servers consist of 8 servers. The details are as follows.

Table 4.1: **Specification of the interactive data analysis servers**

Host name	mana[00-07].ana.nao.ac.jp
Machine	Gigabyte R182 base CMS Custom Server
Number of units	8
OS	Rocky Linux 8.9
CPU	AMD EPYC 7543 2.8 GHz 32 core×2
RAM	DDR4 3200 64 GiB×16

4.1.2 How to log-in

An interactive data analysis server can be logged in from your PC on the NAOJ network or MADS terminals. If you are using from outside the NAOJ network, please establish a VPN connection to the NAOJ network first.

How to establish a VPN connection

NAOJ staff's VPN service Please refer to https://nethelp.mtk.nao.ac.jp/contents/en/node/4 for details (accessible only from the NAOJ network but inaccessible from MDAS).

MDAS VPN service MDAS VPN service requires a VPN client software Cisco Secure Client. Please follow the e-mail sent to you after completing the registration for the VPN service to download and install it. Steps for establishing a VPN connection are as follows.

1. Start Cisco Secure Client on your PC.
2. Enter "adcvpn.ana.nao.ac.jp" and click "connect".

3. Select “MDAS” in the Group selection box, and enter your MDAS account and password into the Username and Password fields, and click “OK”.

Table 4.2: **MDAS VPN host server**

Host name	Group
adcvpn.ana.nao.ac.jp	MDAS

How to login to an interactive data analysis server

You can login to an interactive data analysis server mana[00-07].ana.nao.ac.jp with SSH connection. Please start a terminal emulator on your PC connected to the NAOJ network or MDAS terminals, and use SSH command.

```
Usage
    ssh (-X) <account>@mana[00-07]ana.nao.ac.jp
Option
    -X: For X11 forwarding.
Example
    ssh    noharasn@mana01.ana.nao.ac.jp
    ssh -X noharasn@mana05.ana.nao.ac.jp
```

4.1.3 Disk areas

The following disk areas are available from the interactive data analysis servers.

Table 4.3: **Disk areas available from the interactive data analysis servers**

Area	Mount point	Size	Quota hard limit	Retention period
User home area (NFS)	/home	55 TiB	150 GiB	Until your account is deleted
Large volume work area (Lustre)	/lwk	4329 TiB	30 TiB	Under consideration
Extended disk area (NFS)	/ext_nfs[1-2]	393 TiB	10 TiB	Under consideration
Extended disk area (NFS)	/ext_nfs3	306 TiB	10 TiB	Under consideration

- Before using the large volume work area, please create a directory and store your data under it. We recommend that you create a directory with your account name.
- If your data volume reaches the quota hard limit, application would not work successfully.
- Files exceeding the retention period will be target of the periodic data deletion.

Periodic data deletion Periodic data deletion is under consideration.

Disk quotas MDAS sets disk quotas to limit disk usage for individual users. The maximum usable amount (quota hard limit) varies for each disk space.

Once the user's data volume reaches the quota hard limit, the user cannot write any more data. Please move or delete data before reaching the limit, since various software will no longer function properly.

The disk quotas for the user home area and extended disk area can be displayed with the following commad.

```
Usage
    quota -vsw
Example
    quota -vsw

    Disk quotas for user noharasn (uid 77777):
    Filesystem                 space  quota  limit  grace  files  quota  limit  grace
    192.168.20.19:/export/home   88G     0K   150G            10      0      0
    133.40.131.103:/ext_nfs2      0K  9216G 10240G             0      0      0
    133.40.131.103:/ext_nfs1      0K  9216G 10240G             0      0      0
    133.40.131.103:/ext_nfs3      0K  9216G 10240G             0      0      0
```

The disk quotas for the large volume work area can be displayed with the following command,

```
Usage
    lfs quota -hu <account> /lwk
Example
    lfs quota -hu noharasn /lwk

    Disk quotas for usr noharasn (uid 77777):
    Filesystem  used  quota  limit  grace  files  quota  limit  grace
    /lwk          8T     0k    30T      -      2      0      0      -
    uid 77777 is using default block quota setting
    uid 77777 is using default file quota setting
```

where the space and used represent used volume and the limit represents the quota hard limit.

4.1.4 Network access control

Access (i.e. ssh, scp, or rsync) from the interactive data analysis servers to devices on the NAOJ network is not permitted for security measures. In order to download data on MDAS, please execute commands such as scp or rsync on your PC. The following is an example of user noharasn downloading the /lwk/noharasn/ directory to noharasn's PC.

```
Example
    scp -rvp noharasn@mana01.ana.nao.ac.jp:/lwk/noharasn/ ~/Desktop/
```

4.2 MDAS terminals

MDAS terminals are computers for SSH connection to the interactive data analysis servers. The large volume work area (/lwk) and extended disk area (/ext_nfs[1-3]) are mounted, allowing data to be efficiently downloaded to the terminal.

4.2.1 System configuration

MDAS terminals consist of 10 computers located in the Subaru building open-use room and 10 computers located in the ALMA building room 101.

Table 4.4: **Specification of the MDAS terminals (desktop PC)**

Host name	sbt[01-05], alt[01-05]
Machine	DELL Precision 3650
Number of units	10
OS	Rocky Linux 9
CPU	Intel Xeon E5 W-1950 3.3 GHz 6 core
RAM	DDR4-3200 16 GB

Table 4.5: **Specification of the MDAS terminals (compact PC)**

Host name	sbt[06-10], alt[06-10]
Machine	Minisforum UM580B
Number of units	10
OS	Rocky Linux 9
CPU	AMD Ryzen 7 5800H 3.2 GHz 8 core
RAM	DDR4-3200 DIMM 16 GB

4.2.2 How to log-in

An MDAS account is required to use MDAS terminals. Enter your MDAS account and password into fields on the display in order to login.

4.2.3 Disk spaces

The following disk areas are available from MDAS terminals.

Table 4.6: **Disk areas available from MDAS terminals**

Area	Mount point	Size	Quota hard limit	Retention period
Large volume work area (Lustre)	/lwk	4329 TiB	30 TiB/	Under consideration
Extended disk area (NFS)	/ext_nfs[1-2]	393 TiB	10 TiB	Under consideration
Extended disk area (NFS)	/ext_nfs3	306 TiB	10 TiB	Under consideration

- In MDAS terminals, user home directories are created for each terminal. User home area (NFS) accessible from interactive data analysis servers are not mounted.
- Before using the large volume work area, please create a directory and store your data under it. We recommend that you create a directory with your account name.
  with your account name under the area.
- If your data volume reaches the quota hard limit, application would not work properly (refer to Section 4.1.3 (Disk quotas) for details).
- Files exceeding the retention period will be target of the periodic data deletion (refer to Section 4.1.3 (Periodic data deletion) for details).

4.2.4 Network access control

SSH connection to the MDAS terminals is not permitted for security measures. Access (i.e. ssh, scp, or rsync) from MDAS terminals to devices on the NAOJ network is not permitted, either.

Chapter 5

MDAS software configuration

The following are lists of software installed into servers explicitly. Please contact the developer for more information on how to use each software. Please execute an environment setting command before starting the software if the command exists.

5.1 Software configuration of the interactive data analysis servers

Table 5.1: **Web browsers**

Software	Version	Notes
Firefox		update as necessary
Google Chrome		update as necessary

Table 5.2: **Unix shells**

Software	Version	Notes
GNU Bash	4.4.20	
ksh	93u+ 2012-08-01	
tcsh	6.20.00	
zsh	5.5.1	

Table 5.3: **Utilities**

Software	Version	Notes
ftp	0.17	
git-lfs	3.4.1	
GNU Patch	2.7.6	
GNU Screen	4.06.02	
GNU Wget	1.19.5	
less	530	
lftp	4.8.4	
rsync	3.1.3	
TigerVNC	1.13.1	
tmux	2.7-3	
tree	1.7.0	
XTerm	331	

Table 5.4: **Data compression**

Software	**Version**	**Notes**
bzip2	1.0.6	
GNU Gzip	1.9	
GNU Tar	1.30	
LZ4	1.8.3	
XZ Utils	5.2.4	

Table 5.5: **Word processing**

Software	**Version**	**Notes**
Ghostscript	9.27f	
GNU emacs	26.1	
GNU enscript	1.6.6	
gv	3.7.4	
LibreOffice	6.4.7.2	
Network Kanji Filter (nkf)	2.1.4	
Pandoc	2.0.6	
TeX Live	2024	
XEmacs	21.5.34	

Table 5.6: **Video and image processing**

Software	**Version**	**Notes**
GNOME Document Viewer (evince)	3.28.4	
GNU Dia	0.97.3	
GNU Image Manipulation Program (gimp)	2.8.16	
ImageMagick	6.9.12	
Netpbm	10.82.0	
Tgif	4.2.5	
Xfig	3.2.7b	

Table 5.7: **Programming languages**

Software	**Version**	**Notes**
GNU Awk	4.2.2	

GNU C compiler (gcc)	8.5.0	
GNU C++ compiler (g++)	8.5.0	
GNU Debuger (gdb)	8.2-20	
GNU Fortran compiler (gfortran)	8.5.0	
GNU Make	4.2.1	
GNU sed	4.5	
Intel oneAPI	2024.1	Environment setting command: oneapi_init (only bash)
MPICH	4.1.1	Environment setting command: mpich_init
OpenJDK	1.8.0, 22.0.1	
Perl	5.26.3	
Perl Compatible Regular Expressions (PCRE2)	10.32	
PHP	7.2.24	
Python	3.11.7	Details: Section 5.2 Python
Modules for Python3.11		
Astropy	6.1.0	
acstools	3.7.2	A module of stscipython
calcos	3.5.1	A module of stscipython
costools	1.2.6	A module of stscipython
Cython	3.0.10	
DrizzlePac	3.7.1.1	A module of stscipython
fitsblender	0.4.4	A module of stscipython
healpy	1.17.1	
IPython	8.24.0	
Jupyter Notebook	7.2.0	Details Section 5.2 Jupyter Notebook
Matplotlib	3.9.0	
MPDAF	3.6	
nictools	1.1.5	A module of stscipython
Numpy	1.23.5	
pandas	2.2.2	
PyRAF	2.2.2	
pysynphot	2.0.0	A module of stscipython
scipy	1.10.1	
stistools	1.4.4	A module of stscipython
stsci.imagestats	1.8.3	A module of stscipython
stsci.tools	4.1.0	A module of stscipython
wfc3tools	1.5.0	A module of stscipython
wfpc2tools	1.0.5	A module of stscipython
R	4.4.1	Exec cmd: /usr/local/R/4.4.1/bin/R
Ruby	2.5.9	
Tcl	8.6.8	
Tk	8.6.8	

Table 5.8: **Astronomy and science**

Software	Version	Notes
Astrometry.net	0.96	
CARTA	5.1 beta1	Notes: Section 5.2 CARTA
	4.1, 5.1 beta1	
CASA	6.6.5(Python3.10)	Exec cmd.: casa
	6.5.4(pipeline), 6.6.1(pipeline), 6.6.3(Python3.8), 6.6.4(Python3.8), 6.6.4(Python3.10), 6.6.5(Python3.10)	Details: Section 5.2 CASA
CFITSIO/FITSIO	4.4.0	
DisPerSE	0.9.25	
Fv	5.5.2	
Gnuplot	6.0.1	
HEALPix Facility	3.82	Environment setting command: healpix_init (only bash)
HEAsoft	6.33.2	Environment setting command: heainit
hscPipe	8.5.3	Environment setting command: setup-hscpipe (only bash). Details: Section 5.2 hscPipe
IDL	9.0.0	29 licenses available. Details: Section 5.2 IDL
IDL Astronomy User's Library	22-Sep-2022	
IRAF	2.18	
jskycat	3.0.1	
Karma	2.7	
Mathematica	14.0.0	
MCSMDP	1.1.2	
MCSRED2	2020-08-15	A package of IRAF
MIRIAD (Binary dist.)	20241025	Environment setting command: mirenv
Montage	6.0	
NewStar	20171120	Details: Section 5.2 NewStar
NOSTAR	20120528	
Pgplot/Cpgplot	5.2	
SAOImageDS9	8.6b2	
SDFRED	1.4.1, 2.0.1	Details: Section 5.2 SDFRED
SExtractor	2.25.0	
SM	2.4.43	
SWarp	2.41.5	
VLT Instrument Pipelines	2024-08-28	Version is the date installed
WCSTools	3.9.7	
X11IRAF	2.1	
XPA	2.1.20	

5.2 Details for each software

1. AIPS
2. CARTA
3. hscPipe

4. IDL
5. Jupyter Notebook
6. NEWSTAR
7. pLaTeX
8. Python
9. xdvi

AIPS

How to install If you want to use AIPS, you have to install AIPS by youself. In the old MDAS, AIPS was installed on the system. However, the policy was changed because only 8 AIPS IDs were available per user.

The following is the instructions for installing AIPS 31DEC23. Note that the dependencies XTerm and ncurses-compat-libs are installed on the system.

```
How to install
    rm ~/.AIPSRC*
    mkdir ~/AIPS
    cd ~/AIPS
    wget http://www.aips.nrao.edu/31DEC23/install.pl
    chmod +x install.pl
    ./install.pl -n (Enter "MDAS" on Screen 5, and press Enter for everything else)
    echo "AIPStv*useSharedMemory: 0" >> ~/.Xdefaults

How to start
    source ~/AIPS/LOGIN.SH
    AIPSROOT.DEFINE (Execute only the first time)
        The current directory is /home/account/AIPS
        -- is this what you want to be AIPS_ROOT?  (y/n) y
    aips tv=local
```

CASA

How to start The default path of CASA is set to the latest version basically. Please execute a following line to start old versions.

【6.6.3】 /usr/local/casa/casa-6.6.3-22-py3.8.el8/bin/casa
【6.5.4(pipeline)】 /usr/local/casa/casa-6.5.4-9-pipeline-2023.1.0.124/bin/casa
【6.6.1(pipeline)】 /usr/local/casa/casa-6.6.1-17-pipeline-2024.1.0.8/bin/casa
【6.6.4(Python3.8)】 /usr/local/casa/casa-6.6.4-34-py3.8.el8/bin/casa
【6.6.4(Python3.10)】/usr/local/casa/casa-6.6.4-34-py3.10.el8/bin/casa
【6.6.5(Python3.10)】/usr/local/casa/casa-6.6.5-31-py3.10.el8/bin/casa

- CASA 6.6.4(Python 3.10) does not have a task wvrgcal.

Information from East Asia ALMA Regional Center (EA ARC) Note that due to the OS upgrade (Rocky Linux 8), CASA version compatible to OS is limited to CASA 6.5.4-9(Python3.8), which is used for the ALMA Cycle 10, or later. Please also refer the following page to check the compatibility between the OS version and CASA version.

- https://casadocs.readthedocs.io/en/stable/notebooks/introduction.html#Compatibility

Data obtained after May 10, 2021 (later part of ALMA Cycle 7) and the former data sets which were processed with the pipeline can be reconstructed using CASA 6.5.4-9(Python3.8). Please refer the link below for further information. Note that manually calibrated MS data sets require same CASA version used for the QA2. Please refer further information in the following page.

- https://almascience.nao.ac.jp/processing/science-pipeline

QA2 report tells us whether the calibration has been done by pipeline and manual processing. Please refer following document for how to check the QA2 report.

- https://almascience.nao.ac.jp/documents-and-tools/cycle10/alma-qa2-data-products-for-cycle-10

In addition, East Asia ALMA Regional Center (EA ARC) offers to deliver the calibrated MS data. With this service, you will be able to access older data sets (data taken before ALMA Cycle 7) stored in the ALMA archive. Please use the template in the following page to submit your request to the ALMA Helpdesk, if necessary. Depends on the demand from users, it may take some time to deliver the calibrated data set.

- https://www2.nao.ac.jp/~eaarc/DATARED/support_data_reduction_en.html

The mpicasa command cannot be executed on /lwk The mpicasa command of CASA cannot be executed properly on /lwk (Luster file system) at March, 2025. The prospects for resolving the issue are currently uncertain.

CARTA

How to start Please follow the steps below when you use CARTA 2.0 or later. It may not be started by the carta command alone.

1. Start the CARTA with following options. The URL of the CARTA (CARTA is accessible at http://...) should be desplayed.

```
Example
    carta --no_browser --host $HOSTNAME
```

2. Start a web browser on your PC and access the URL of the CARTA.

The default path of CARTA is set to the latest version basically. If you want to use old versions, please execute following lines.

【4.0】/usr/local/carta/carta-v4.1.0-x86_64.AppImage

How to stop Please execute Ctrl+C on the terminal emulator where CARTA was launched to terminate the carta_backend process.

- When CARTA is started using the "&" operator for background execution, the process continues to remain, so we have modified the method to start it in the foreground (2025-02-05).

hscPipe

How to use See the following links for for more information on how to use hscPipe.

- HSC pipeline manual (https://hsc.mtk.nao.ac.jp/pipedoc/pipedoc_8_e/index.html)
  - Machine environment for hscPipe8 (https://hsc.mtk.nao.ac.jp/pipedoc/pipedoc_8_e/install_env_e/env.html#env)
  - hscPipe Tutorial (https://hsc.mtk.nao.ac.jp/pipedoc/pipedoc_8_e/tutorial_e/index.html#tutorial)

IDL

Cannot start (1) Forced termination of IDL could damaged its configuration files and prevent starting IDL. You could fix the problem with the following operation, but the IDL environments will be initialized.

```
Example
    mv ~/IDLWorkspace ~/IDLWorkspace.old
    mv ~/.idl ~/.idl.old
```

Cannot start (2) If you change your shell after you logging into MDAS, you cannot start IDL because you cannot read IDL configuration files. Please exec a following command when you change a login shell.

```
Usage
    modify_userinfo -s <shell>
Example
    modify_userinfo -s tcsh
```

Jupyter Notebook

When you start the jupyter notebook with –no-browser option on a interactive data analysis server and use the notebook from your PC on the NAOJ network, we strongly recommend to use the SSH port forwarding because the communication between your PC and the server is not encrypted.

When using MDAS vpn service, SSH port forwarding is not required because the communication is encrypted.

How to use the SSH port forwarding

1. Start the jupyter notebook on a interactive data analysis server with –no-browser option. The URL of the notebook (http://localhost:8888/?token=...) should be displayed.

   ```
   Example
       jupyter notebook --no-browser
   ```

2. Execute SSH connection on your PC .

   ```
   Usage
       ssh -L <port>:localhost:<port> <account>@<server>
   Notes
       port  : Enter the port number appeared in the URL of the notebook.
       server: Specify the server you executed the "jupyter notebook --no-browser".
   Example
       ssh -L 8888:localhost:8888 noharasn@mana03.ana.nao.ac.jp
   ```

3. Start a web browser on your PC and access the URL of the notebook.

NEWSTAR

How to start Start the NewStar and JNewstar in your directory created on the large volume work area /lwk. It does not start successfuly in the user home area /home.

Can't start NEWSTAR If there are files such as nsmmmlock, mmm*, pops*, AIPS*, and ttt* with size 0 in a directory where the NewStar is started, please delete them. These files are temporary files that remain when NEWSTAR is forsibly terminated. If these files remain, the logwin window could not be displayed when you start NEWSTAR, or "AIPS can't start" could be displayed when you push the "ok" button in the login window.

pLaTeX

Compilation error In some cases, pLaTex could not compile EUC-JP LaTeX files. The default character code of the LaTeX installed in MDAS is UTF-8, so when compilling an EUC-JP LaTeX file, please specify -kanji option.

```
Example
    platex -kanji=euc foo.tex
```

Python

About modules Only Python 3.11 modules are maintained. Please note that we do not maintain modules for versions installed by default in the OS or versions installed through software dependencies.

SDFRED

How to start SDFRED The default path of the SDFRED is the latest version. If you want to use SDFRED 1.4.1, please use commands under /usr/local/subaru/sdfred20100528/bin.

xdvi

Text garbling Files compiled in EUC-JP could be garbled when using xdvi. Please use -kanji option when compilling EUC-JP files.

```
Example
    platex -kanji=euc foo.tex
```

5.3 If the software you want to use is not installed

If the software you want to use is not installed on the interactive analysis servers, please install it yourself or ask the ADC open-use help desk (consult(at-mark)ana.nao.ac.jp) to install it on the system.

5.3.1 Software that can be installed by normal users

Please install the software by yourself in your MDAS personal directory (Example: /home/noharasn/). For software that is likely to be used by a large number of users, please ask the ADC open-use help desk to install it on the system.

5.3.2 Software that requires root permissions for installation

Please ask the ADC open-use help desk to install it on the system.

Chapter 6

Original commands

6.1 How to use the original commands

The following original commands are available on MDAS.

Table 6.1: **List of original commands**

Command	Outline
userinfo	Display user information
modify_userinfo	Modify user information

6.1.1 lpall

The lpall command makes it easy to print single and double-sided PS, PDF and text files. Removed description because it is not installed (2024-07-22).

6.1.2 userinfo

The userinfo command displays the current login shell(default shell is bash), registered e-mail address, and name (GECOS). This command requires your MDAS password.

```
usage
    userinfo
Example
    userinfo
    Enter LDAP Password:

    gecos         : nohara sin'nosuke
    loginshell    : /bin/bash
    mail          : sin'nosuke.nohara@nao.ac.jp
    homeDirectory : /home/noharasn
```

6.1.3 modify_userinfo

The modify_userinfo command can be used to modify your MDAS password, registered e-mail address, and current login shell.

```
Usage
    modify_userinfo -h|-p|-m <e-mail_address>|-s <shell>
Option
    -h: Display help message and exit
    -p: Modify the password
    -m: Modify the e-mail address
    -s: Modify the current login shell. The following shells are available:
        /bin/bash
        /bin/ksh
        /bin/tcsh
        /bin/zsh
```

Note that the password must be a string of at least 12 characters that is a combination of at least two of the following: lowercase letters, uppercase letters, numbers, and symbols. If you need to reset your password due to forgotten password, please contact us (consult(at-mark)ana.nao.ac.jp).

Chapter 7

How to use peripherals

This section introduces the peripherals available on MDAS.

7.1 Network printers

7.1.1 List of network printers

There are network printers (Fujifilm ApeosPrint C5240) in the South building open-use room B, Subaru building open-use room, and ALMA building room 101. A4-size print outs can be made from the interactive data analysis servers.

Table 7.1: **List of network printers**

Host name	IP address	Place
nwp-m1.ana.nao.ac.jp	133.40.130.137	South building open-use room B
nwp-sb.ana.nao.ac.jp	133.40.130.139	Subaru building open-use room
nwp-al.ana.nao.ac.jp	133.40.130.140	ALMA building room 101

7.1.2 How to use the network printers from the interactive data analysis servers

Data can be output from a interactive data analysis server to a printer(Table 7.1).

Chapter 8

How to use the open-use rooms

8.1 About the open-use rooms

There are the open-use rooms in the South building and Subaru building on the NAOJ Mitaka campus. Users can analyze astronomy data using computers and make posters using large-format printers. Every afternoon from Monday to Friday, an operator is in the South building open-use room and supports users.

Note that ADC also manages computers and printers in the ALMA building room 101, but the room is owned by the NAOJ Chile observatory. You need to get permission from the NAOJ Chile observatory before entering the room. Please ask the NAOJ Chile observatory if you have any question about the room 101.

Table 8.1: **List of the open-use rooms**

	South building open-use room A and B	**Subaru building open-use room**
Place	2F, South building	1F, Subaru building
Extension number	3578	3505
Opening hours of operator desk	At 13:00 - 17:00 from Monday to Friday	
Usable machines	Open-use linux terminals (13 units), open-use computers (4 units), A4 printers (1 unit), Large-format printers (2 units)	MDAS terminals(5 units), Open-use PCs (3 units), A4 printer (1 unit), Large-format printer (1 unit)

- Please refer to Section 4.2 for details on how to use the MDAS terminals.

8.2 Open-use linux terminals

Open-use linux terminals are computers for SSH connection to the interactive data analysis servers and light processing.

8.2.1 System configuration

Open-use linux terminals consist of 13 computers located in the South building open-use room A.

Table 8.2: **Specification of the open-use linux terminals**

Host name	new-r[01-13]
Machine	HP Z4 G4 Workstation

Number of units	13
OS	AlmaLinux 8
CPU	Intel Xeon W-2123 3.6 GHz 4 core
RAM	16 GB

8.2.2 Software configuration

Table 8.3: **Software configuration of the open-use linux terminals**

Software	**Version**	**Notes**
Anaconda3	2019.07	
Fv	5.5	
GNU C compiler (gcc)	8.5.0	
GNU emacs	26.1	
Gnuplot	5.2.4	
Google Chrome		update as necessary
IRAF	2.16.1	
Jupyter Notebook	6.0.0	
Python	2.7,3.7	
Modules for Python3.7		
Astropy	3.2.1	
Ipython	7.6.1	
Matplotlib	3.1.0	
nose	1.3.7	
Numpy	1.16.4	
PyRAF	2.1.15	
Urwid	2.0.1	
SAOImageDS9	8.6	
Tcl/Tk	8.6.8	
X11IRAF	2.0beta	

8.2.3 How to login

The login instruction is in the room.

8.2.4 Disk areas

The following disk areas are available on the open-use linux terminals.

Table 8.4: **Disk areas available on the open-use linux terminals**

Area	Mount point	Size	Quota hard limit	Retention period
Local disk space	/home	1.8TiB	–	–

8.2.5 Usage notes

- SSH connection to the open-use linux terminals is not permitted for security measures.
- It is prohibited to use more than one computer by one user simultaneously.

8.3 How to use open-use PCs

There are open-use PCs in the South building open-use room B and Subaru building open-use room. Windows and Macintosh PCs are available for creating and printing posters. No application is required for use.

8.3.1 System configuration

Table 8.5: **List of the open-use PCs in the South building open-use room B**

Host	Machine	OS	CPU	RAM
mnwin1	EPSON Endeavor MR8400	Windows	Intel Core i5-12600K	32GB
mnwin2	EPSON Endeavor MR8100	Windows	Intel Core i7-8700K	64GB
mnmac1	Apple iMac 2020	macOS	Intel Core i5 3.1GHz	32GB
mnmac2	Apple iMac 2017	macOS	Intel Core i7 4.2GHz	64GB

Table 8.6: **List of open-use PCs in the Subaru building open-use room**

Host	Machine	OS	CPU	RAM
sbwin1	EPSON Endeavor Pro5700-M	Windows	Intel Core i7-6700K	32GB
sbwin2	EPSON Endeavor MR7300	Windows	Intel Core i7-9700K	32GB
sbmac1	Apple iMac Retina	OSX El Capitan	Intel Core i7 4.0GHz	32GB

- mnwin2 and mnmac2 are set to English.

8.3.2 Software configuration

The Adobe Creative Cloud is installed in the open-use PCs in the South building open-use room B and Illustrator, Photoshop, etc. are available.

8.3.3 How to use

The open-use PCs are always logged in by user kyoudou. Note that you should delete your files on the open-use PC after use.

8.4 Printers and scanners

There are A4 network printers, large-format printers, and scanners in the South building open-use room B, and the Subaru building open-use room. No application is required for use.

8.4.1 System configuration

Table 8.7: **List of printers**

South building open-use room B			
Host	**IP address**	**Format**	**Printer**
nwp-m1.ana.nao.ac.jp	133.40.130.137	A3	Fujifilm ApeosPrint C5240
lfp-m1	—	Large-format	EPSON SC-P8550D
lfp-m2	—	Large-format	EPSON SC-P1005PS
lfp-m3	—	Large-format	EPSON SC-P8550D
Subaru building open-use room			
Host	**IP address**	**Format**	**Printer**
nwp-sb.ana.nao.ac.jp	133.40.130.139	A4	Fujifilm ApeosPrint C5240

Table 8.8: **List of scanners**

Place	**Machine**	**Max. available paper**	**Connected PC**
South building open-use room B	EPSON DS-70000	A3	mnwin1
Subaru open-use room	Fujitsu ScanSnap iX500	A4	sbwin1

- Large-format printers are available only from the open-use PCs.
- The lfp-m2 is a printer for cloth paper only.

8.4.2 How to use the network printers

A4 network printers are available from your PC on the NAOJ network or the open-use PCs. Printer driver must be installed for use from your PC. Please refer to the help of each application you are using for printing instruction.

How to install a network printer driver

Following URL is a link to the network printer driver. Please install the driver according to instructions on the link.

- Driver: https://www.fujifilm.com/fb/download/eng/aprt/c5240

About printer supplies

Printer supplies such as papers and toners are prepared near the network printer. Operators exchange supplies with new ones, but in the case that operators are absence, you have to exchange the supplies yourself. After exchanging supplies, please fill in a form in the record book near the network printer.

8.4.3 How to use large-format printers

Large-format printers are available from each open-use PC. Please bring a USB stick containing printed data. Use from your PC is prohibited. Super A0 and Super B0 plain paper rolles, glossy paper rolls, and cloth paper rolls are available. When using the printers, please fill in the log book near the printers.

For specific instructions, please refer to the instruction manuals provided in front of each open-use PC.

About printer supplies

Printer supplies such as papers and toners are prepared near the large-format printers. Operators exchange supplies with new ones, but in the case that operators are absence, you have to exchange the supplies. After exchanging supplies, please fill in a form in the record book near the large-format printers.

8.4.4 Scanners

Each scanner is connected to a open-use PC with Japanese text setting. If you want to use scanners, please contact an operator.

8.5 Network connection

The NAOJ network and the Internet are available in the NAOJ Mitaka campus. You can use wireless LAN to connect your PC to both networks in the open-use rooms.

8.5.1 NAOJ network

Only the NAOJ staffs can connect their own PCs to the NAOJ network. Please refer to a website of the NAOJ NETWORK SERVICE HELP CENTER (https://nethelp.mtk.nao.ac.jp/contents/) for details (accessible only from the NAOJ network but inaccessible from MDAS).

The open-use linux terminals, MDAS terminals, and open-use PCs are connected to the NAOJ network but access to some of NAOJ servers is restricted for security measures.

8.5.2 Internet

Anyone can use it. The SSID of the Wi-Fi is “naoj-open”. Please ask NAOJ staffs for the password or see the digital information signage in each building. The password is updated once a week.

Update history

2025-04-30	Added CARTA 5.0 beta1 (Sec. 5.1).
2025-03-13	Changed printer for cloth paper only from lfp-m3 to lfp-m2.
2025-03-03	Updated the model of lfp-m1 and lfp-m3 from SC-P10050PS to SC-P8550D (Sec. 8.4.1). Added the mpicasa command cannot be executed on /lwk (5.2).
2025-02-14	Rivised the number of MDAS terminals (compact PC) in the ALMA building room 101 from 3 to 5.
2025-02-05	Modified how to start carta (Sec. 5.2).
2024-12-24	Added tmux (Sec. 5.1). Updated information of the open-use linux terminals (Sec. 8.2).
2024-12-17	Added MIRIAD (Sec. 5.1).
2024-11-27	Added Astrometry.net, GNU Dia, Montage, modules of stsci_python, Tgif (Sec. 5.1).
2024-10-16	Added CASA 6.6.1, jskycat, Karma, SWarp (Sec. 5.1).
2024-10-07	Added CASA 6.6.5, MCSMDP, R, SDFRED (Sec. 5.1).
2024-09-06	Added VLT Instrument Pipelines (Sec. 5.1).
2024-08-21	Added MPDAF (Sec. 5.1).
2024-07-24	Added how to display disk quotas (Sec. 4.1.3). Added Mathematica (Sec. 5.1). Removed description of the lpall command because it is not installed (Sec. 6.1.1, 7.1.2).
2024-07-11	Added XTerm (Sec. 5.1). Updated SAOImageDS9 from 8.5 to 8.6b2 (Sec. 5.1). Added how to install AIPS (Sec. 5.2). Added how to use hscPipe (Sec. 5.2). Revised how to start NewStar (5.2).
2024-07-04	Corrected typo. Added that the website of the NAOJ NETWORK SERVICE HELP CENTER cannot be accessed from MDAS (Sec. 3.1.2, 4.2.1, 8.5.1). Fixed an usege of the large volume work area (Sec. 4.1.3, 4.2.3). Fixed software versions (Sec. 5.2). Deleted the versions of Firefox and Goolge Chrome (Sec. 5.1). Added environment command setup-hscpipe, heainit, healpix_init, oneapi_init, and mpich_init (Sec 5.2). Fixed how to start carta (Sec. 5.2). Deleted the option -v of the modify_userinfo command (Sec. 6.1.3). Added that the open-use linux terminals are suspended (Sec. 8.2). Revised text (Sec. 8.5).
2024-07-04	First edition.