

2019 Sagan Summer Workshop
Astrobiology for Astronomers
July 15-19, 2019

HANDS-ON SESSIONS

The hands-on session software is installed on Amazon Web Services (AWS). Each participant has their own AWS instance; it is accessed through an X terminal (see Setup document).

Some **simple commands** you may need:

ssh -Y user@remote_host	log in to the AWS instance (type “logout” to log out)	
	[This will give you a basic login with X11 forwarding; somewhat different ssh options are required for the hands-on sessions; see on the next pages.]	
cd directory	change to a certain directory	
cd ..	change to one directory level up	
cd	change to your home directory	
mkdir directory	create a new directory	
pwd	print the working directory	
ls	list files (“ls -l” or “ll” provides a more detailed list)	} for these, you can use “*” as a wildcard (e.g. “ls *.txt”)
cp filename new_filename	copy a file to a new file	
mv filename new_filename	rename file to a new name	
mv filename directory/.	move a file to a different directory	
rm filename	remove a file (note you will not be asked to confirm)	
rm -r folder	remove a folder and all its files	
Control + c	terminate a program (that is not responding)	

To **transfer files** to/from your local computer:

- to copy files from a local computer to AWS:
scp filename user@remote_host:directory/
(for home directory, use “~/”)
- to copy files from AWS to a local computer:
scp user@remote_host:directory/filename .
(the “.” can be replaced with a different name if the file should be renamed)
- to copy a whole folder from AWS to a local computer:
scp -r user@remote_host:directory/ .
(the “.” can be replaced with a different name if the folder should be renamed)

Network:

To find your computer’s IP address, go to: <https://whatismyipaddress.com/>

(Note that you are only allowed to connect to the AWS instances from Caltech IP addresses; before you can connect from other IP addresses, they have to be added manually to a list of allowed connections.)

EXO EARTH FINDER

Windows users:

1. Start Xming by double-clicking on the config.xlaunch file you saved during the Xming configuration (alternatively, go to the Xming installation directory and double click on Xming.exe, selecting the options as described in the Set-Up document).
Note: Xming runs in the background; no windows will open.
2. Start PuTTY by double-clicking on putty.exe
 - a. Select "Sagan Workshop" in "Saved Sessions" (previously configured)
 - b. Select "Load"
 - c. Select "Open"
3. In the terminal window, enter your AWS username and password.

Mac users:

1. Open Terminal
2. In the local terminal window, enter

```
ssh -L 8888:localhost:8888 workshop_usr@remote_host
```

(where remote_host is the IP address of your AWS instance)
3. Enter your password

All users:

4. Type
 - a. `source activate ExoEarthFinder`
 - b. `jupyter notebook --no-browser`
5. Copy the URL shown on the screen and paste it to a browser running locally on your computer.
6. Start the Jupyter notebook by clicking on the ipynb file in the "ExoEarthFinder" directory.
7. To run the cells of the Jupyter notebook, type Shift + Enter.
8. When you are done:
 - a. Close the browser window with the Jupyter notebook.
 - b. In the browser window with the file list, select the ipynb file and click on "Shutdown", then close that browser window.
 - c. In the Terminal window where you started the Jupyter notebook, type Control + c twice.

EXOPLEX

Windows users:

1. Start Xming by double-clicking on the config.xlaunch file you saved during the Xming configuration (alternatively, go to the Xming installation directory and double click on Xming.exe, selecting the options as described in the Set-Up document).
Note: Xming runs in the background; no windows will open.
2. Start PuTTY by double-clicking on putty.exe
 - a. Select “Sagan Workshop” in “Saved Sessions” (previously configured)
 - b. Select “Load”
 - c. Select “Open”
3. In the terminal window, enter your AWS username and password.

Mac users:

1. Open Terminal
2. In the local terminal window, enter

```
ssh -Y -L 8888:localhost:8888 workshop_usr@remote_host
```

(where remote_host is the IP address of your AWS instance)
3. Enter your password

All users:

4. Type

```
source activate ExoPlex
```
5. To run ExoPlex, go the “ExoPlex/Examples” subdirectory and type, e.g.,

```
python example_by_mass.py
```

(see on the next page on how to edit the Python scripts)
6. To plot using the Jupyter notebook, open a new terminal window (see steps 2-3):
 - a. Type

```
jupyter notebook --no-browser
```
 - b. Copy the URL shown on the screen and paste it to a browser running locally on your computer.
 - c. Start the Jupyter notebook by clicking on the ipynb file in the “ExoPlex/Examples” directory.
 - d. To run the cells of the Jupyter notebook, type Shift + Enter.
 - e. When you are done:
 - i. Close the browser window with the Jupyter notebook.
 - ii. In the browser window with the file list, select the ipynb file and click on “Shutdown”, then close that browser window.
 - iii. In the Terminal window where you started the Jupyter notebook, type Control + c twice.

To run ExoPlex, you will have to edit the Python scripts before running them.

There are two **text editors** available: nano and emacs.

Nano commands:

nano filename	open file in nano
Control + o	save the file
Control + k	delete the current line (to undo, press Control + u)
Control + a	move to the beginning of a line
Control + e	move to the end of a line
Control + v	move one page down
Control + y	move one page up
Control + _	move to a specific line
Control + w	do a forward search for a string (enter the string after pressing Control + w; to keep searching press Esc + w)
Control + x	exit nano

Emacs commands:

emacs -nw filename	open file in Emacs (no-windows version)
Control + x, Control + s	save the file
Control + k	delete the current line (to undo, press Control + y)
Control + a	move to the beginning of a line
Control + e	move to the end of a line
Control + v	move one page down
Esc + v	move one page up
Esc + g, Esc +g	move to a specific line
Control + s	do a forward search for a string (enter the string after pressing Control + s, then repeat Control + s to keep searching); press Enter to end the search
Control + r	do a backward search for a string (usage similar to Control + s)
Control + x, Control + c	exit emacs