

CHARA Remote Operations and Data Access

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The CHARA Server

- Located at GSU Data Center
- 4 Virtual Machines:
 - Remote Observing (altair)
 - Data Archive
 - Remote Data Reduction
 - Database Portal



Remote Observing

- Connect to Atlanta machine using VNC+SSH (new 2026A!)
- Atlanta machine connects to mountain using SSH tunnel
- CHARA software is the same as that on the mountain
- We encourage new observers to come out to the mountain!



Connecting to the VNCs

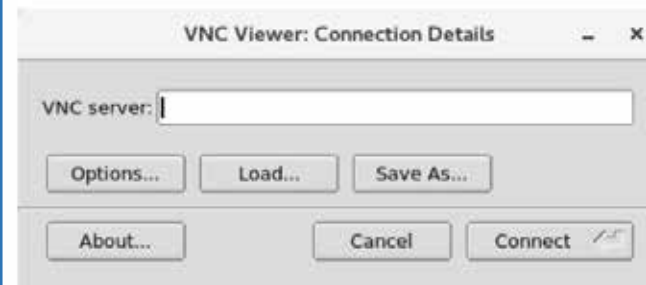
New for 2026A!

GSU blocking VNC ports

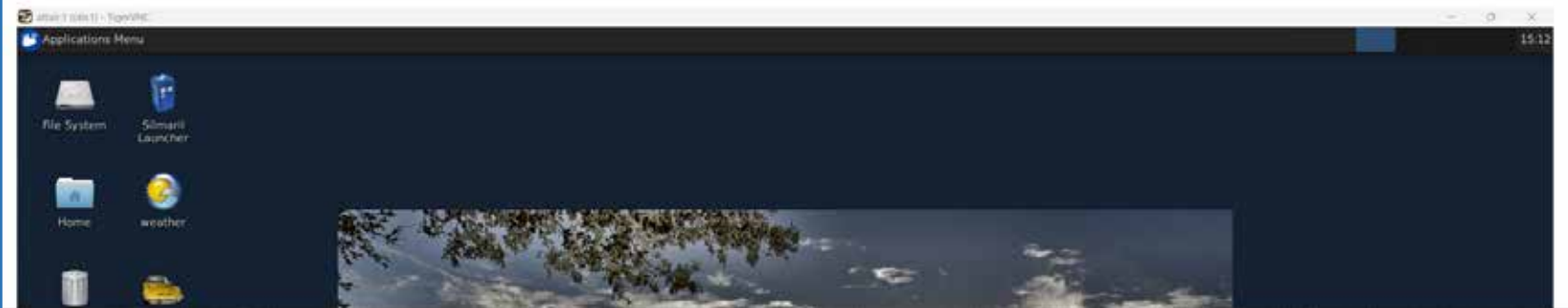
Before connecting to VNC,
create an SSH tunnel

Connecting to the Remote Observing Machine

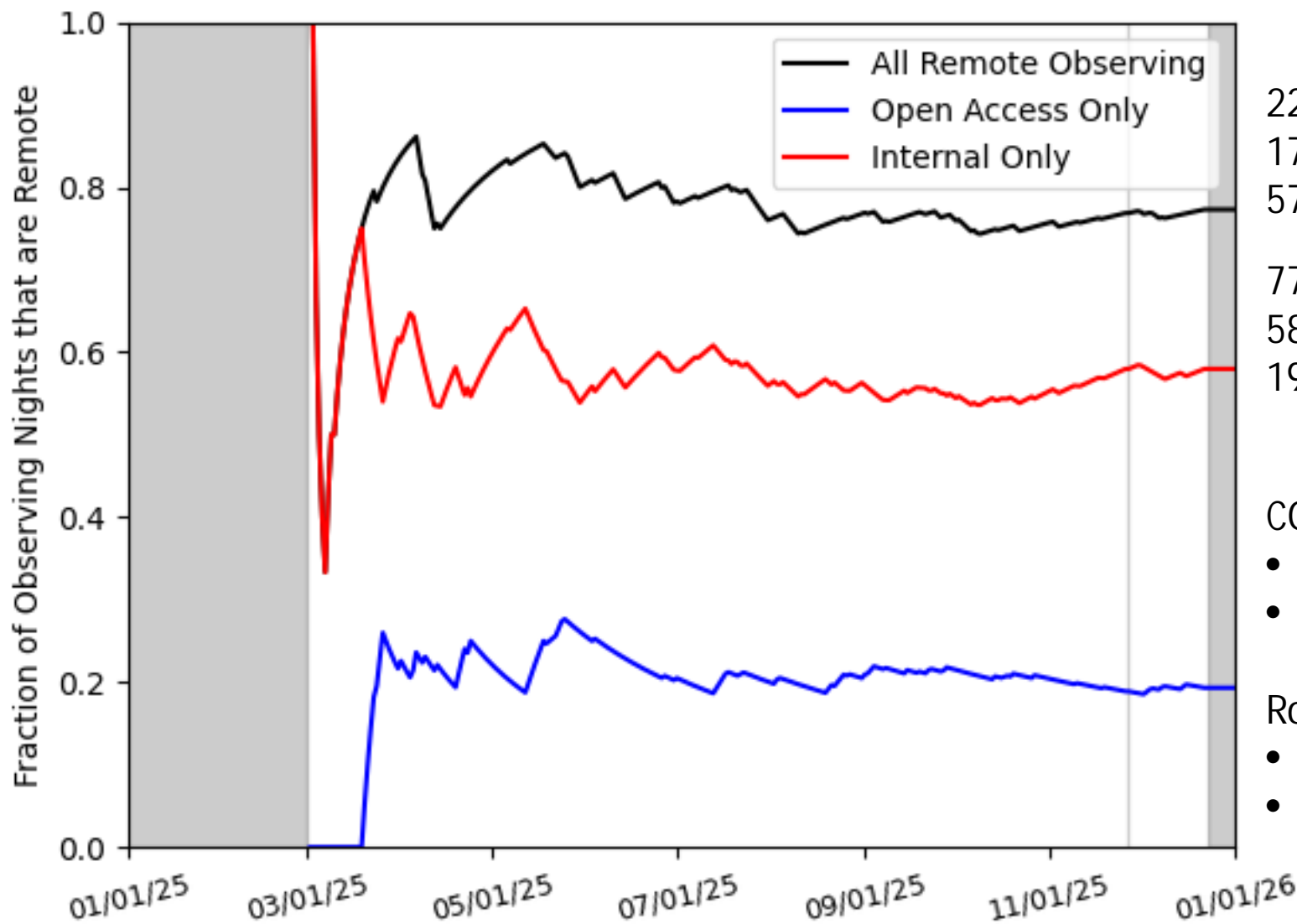
- Download and install a VNC viewer. We recommend tigervnc (<https://tigervnc.org/>) because of the viewers we've tested, it runs the fastest. Others do work, though.
- Initiate an SSH tunnel between your local machine and altair, the CHARA remote observing machine:
 - ```
ssh -p 1031 -L <vnc port>:altair.chara-array.org:<vnc port> <account>@altair.chara-array.org
```
  - The account name and vnc port number will be provided for you before you run.
  - This will open a connection to <account>@altair.chara-array.org. **Do not close this window.** Closing the window will end the SSH tunnel.
  - This allows for a more secure connection than with VNC alone. Any communication software on your local machine makes with the given port will be transmitted via the SSH tunnel to the given port on altair.
- If using tigervnc's viewer, run the vncviewer command. **Make sure you run the vnc viewer on your local machine.** This should open a window that looks like this:



- In the "VNC server" window, enter the address "localhost:<vnc port>"
  - This will have your VNC viewer to communicate with the given port on your local machine, which then gets forwarded to the given port on altair via SSH.



# Remote Observing Stats (2025 Only)



228 Remote Nights  
 171 Internal  
 57 Open Access

77% Remote Nights  
 58% Internal+Remote  
 19% Open Access+Remote

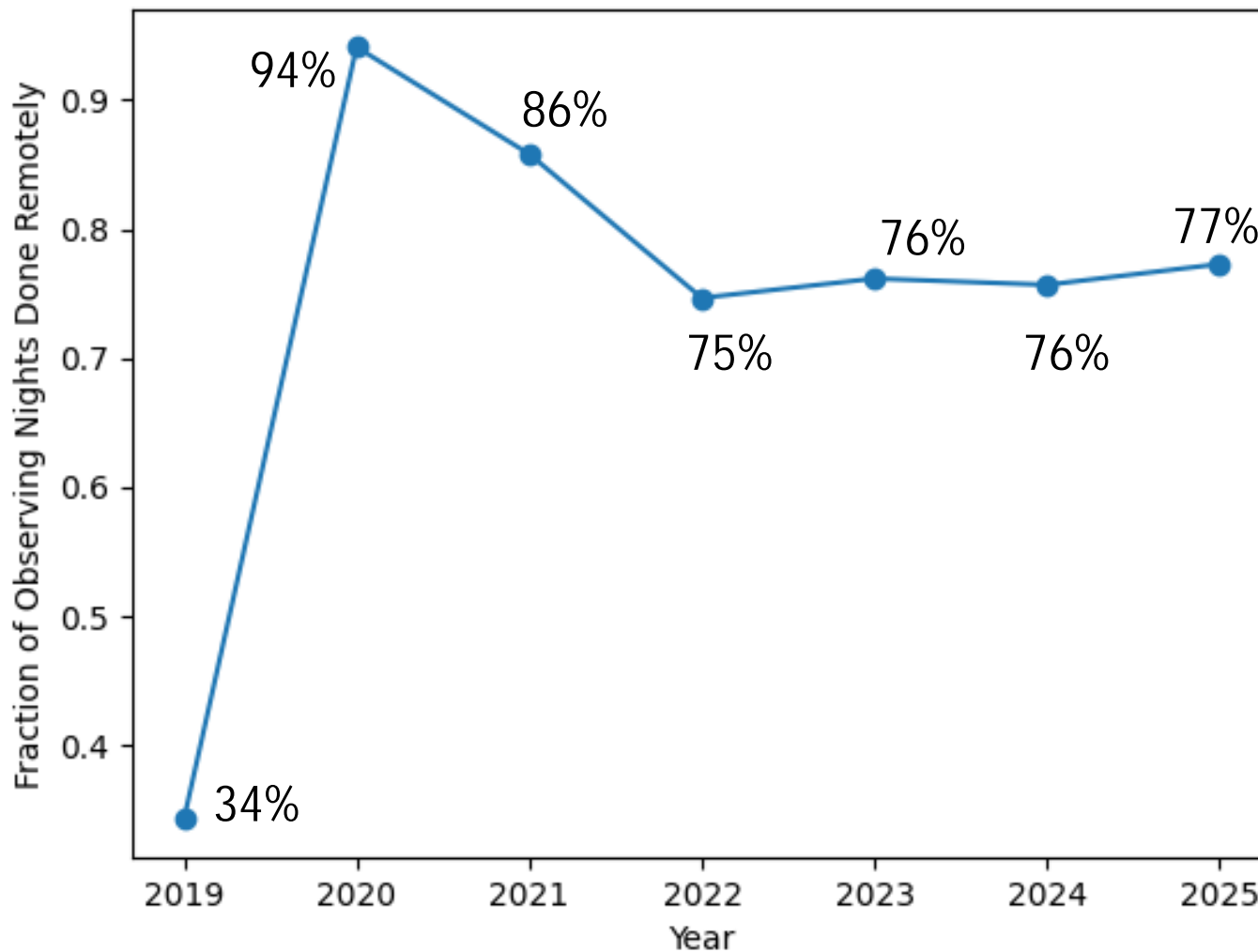
CO2 emissions saved:

- ~50 tons
- Equiv. to 5600 gallons of gas

Rough estimate, assuming:

- 5-night run
- Flight from ATL to LAX

# Remote Observing Stats (2019 – 2025)



1402 Remote Nights  
 1002.5 Internal  
 399.5 Open Access

72% Remote Nights  
 52% Internal+Remote  
 20% Open Access+Remote

CO2 emissions saved:

- ~310 tons
- ~72 gas cars driven for 1 year
- ~1.7 railcars worth of coal
- ~310 acres of forest planted

# CHARA Atlanta Data Archive



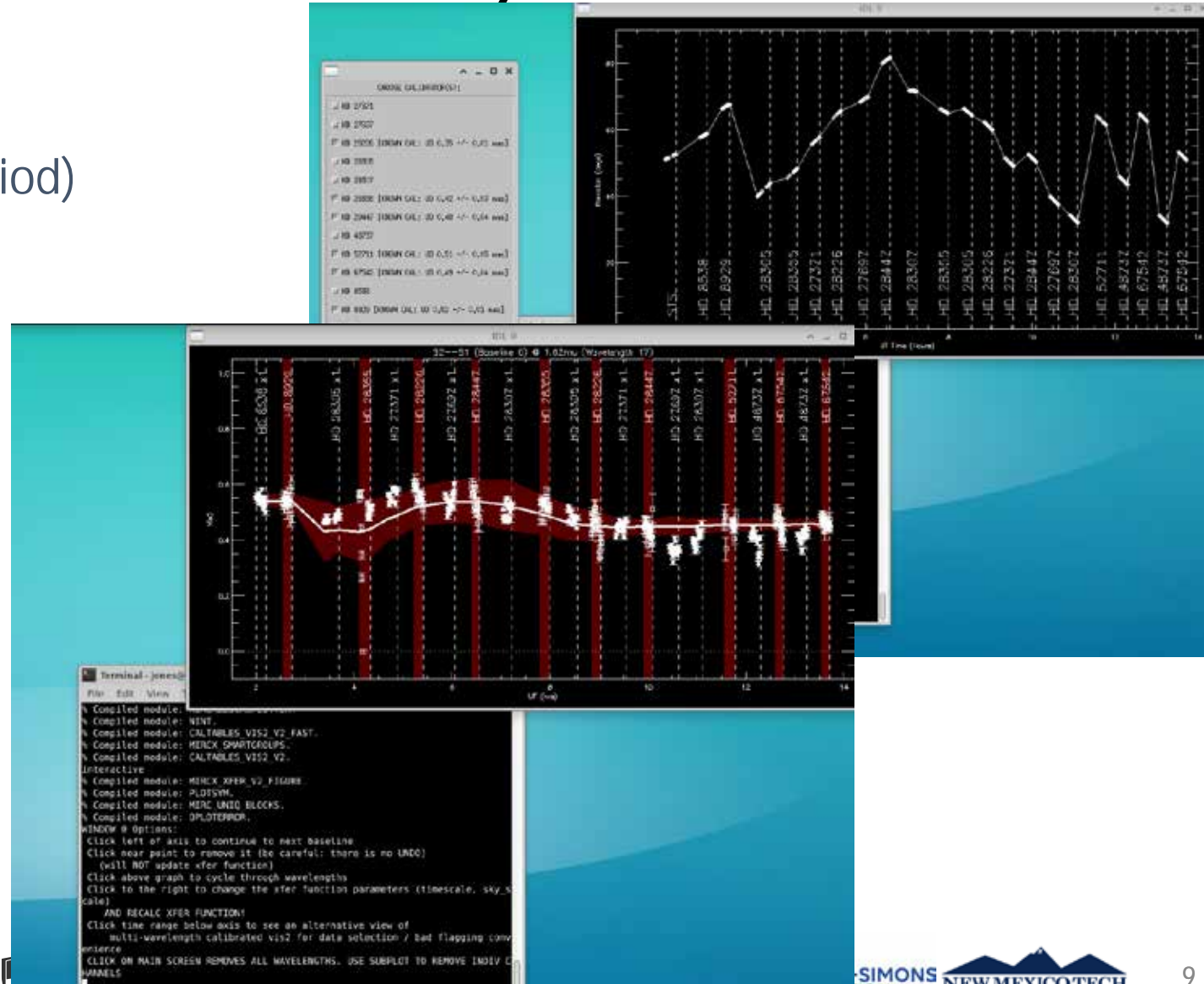
# CHARA Atlanta Data Archive

- | New CHARA Server!
  - | Old server no longer supported by Dell
  - | Improved Stability
  - | More space!
    - | ~400 TB total space
    - | Final 100 TB online soon



# CHARA Data Policy

- All CHARA data are public EXCEPT:
  - New data (18-month proprietary period)
  - Student thesis data
  - Long-term survey data
- Data are accessible on the Remote Data Reduction Machine
- Even if data are public, you should still contact data PIs as a courtesy to see if they wish to be involved in the project



# CHARA Online Database Portal



database.chara-array.org

## CHARA Database Query Form

Select a database:

- All CHARA
- Classic
- CLIMB 1
- CLIMB 2
- FLUOR
- JouFLU
- MIRC
- MIRC-X
- MYSTIC
- PAVO
- VEGA

Submit

## CHARA Database Query Form

Star Name

Enter a target name in any format (e.g., Vega, alpha Lyr, HD 172167, etc.). The webapp will determine the coordinates of the target using a CDS search and will constrain the database to those coordinates.

Start Date

mm/dd/yyyy

End Date

mm/dd/yyyy

Search Distance (degrees)

0.50

The distance from the target star to constrain the database by.

Columns to Display:

Star\_HD  
Object\_Type  
UT\_Date  
UT\_Time  
...

Select Beam Combiner(s):

Classic  
CLIMB 1  
CLIMB 2  
FLUOR  
...

Select PI(s):

25  
Anderson  
Baines  
Baron  
...

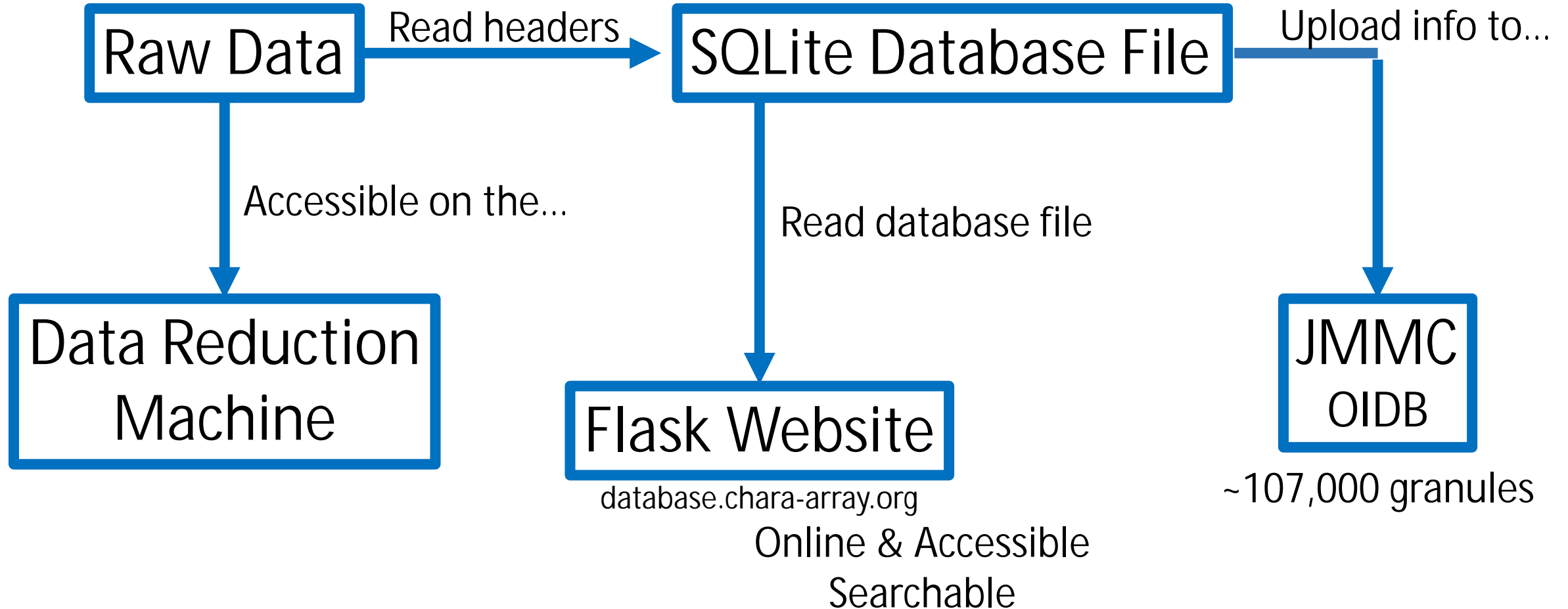
The Primary Investigator as listed in the data headers. NOTE: Sometimes misspellings of PI names occur or filler text is used on testing nights. Many observations do not have a listed PI.

Submit



# CHARA Online Database Portal

Stored on archive machine

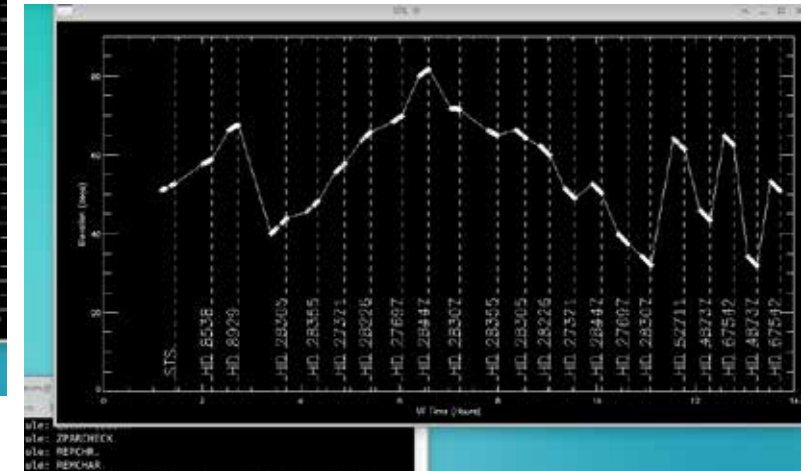
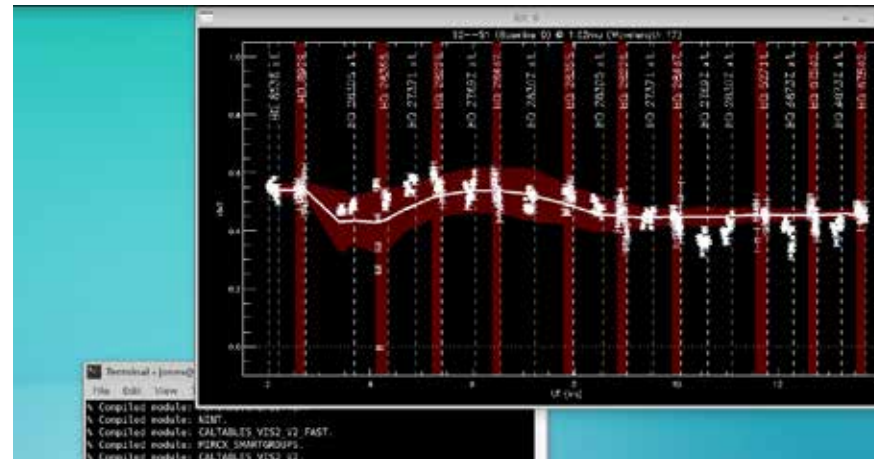
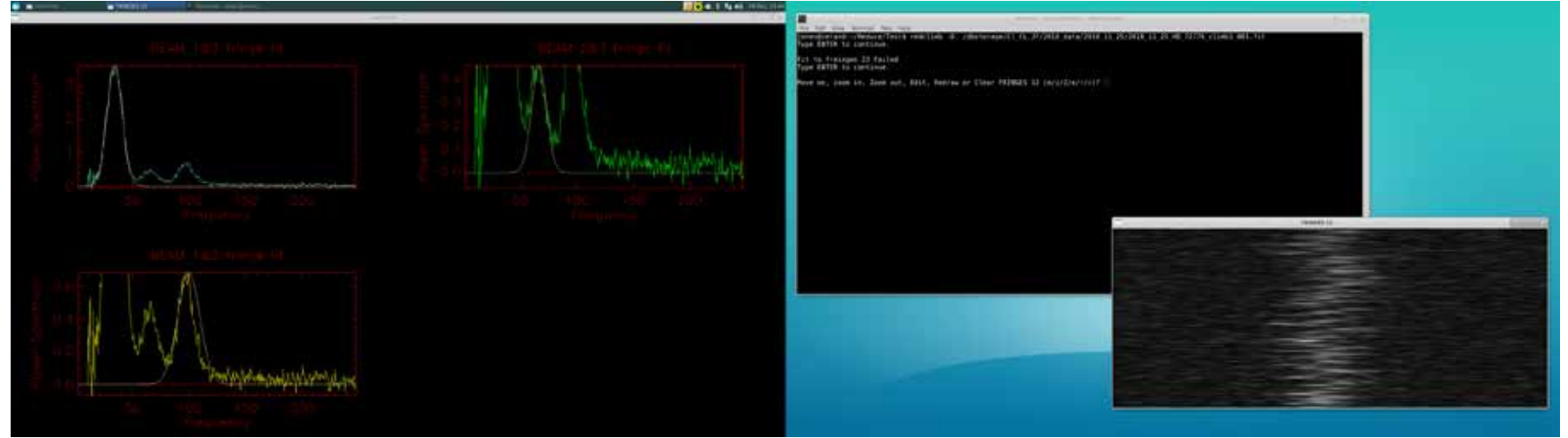




# Remote Data Reduction

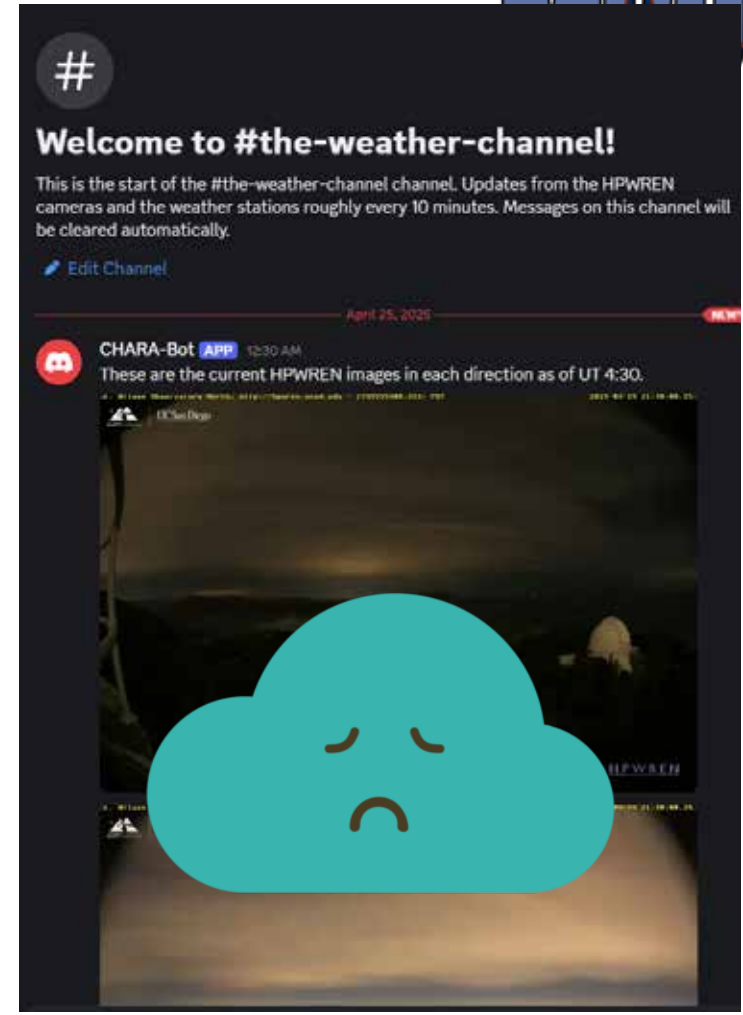
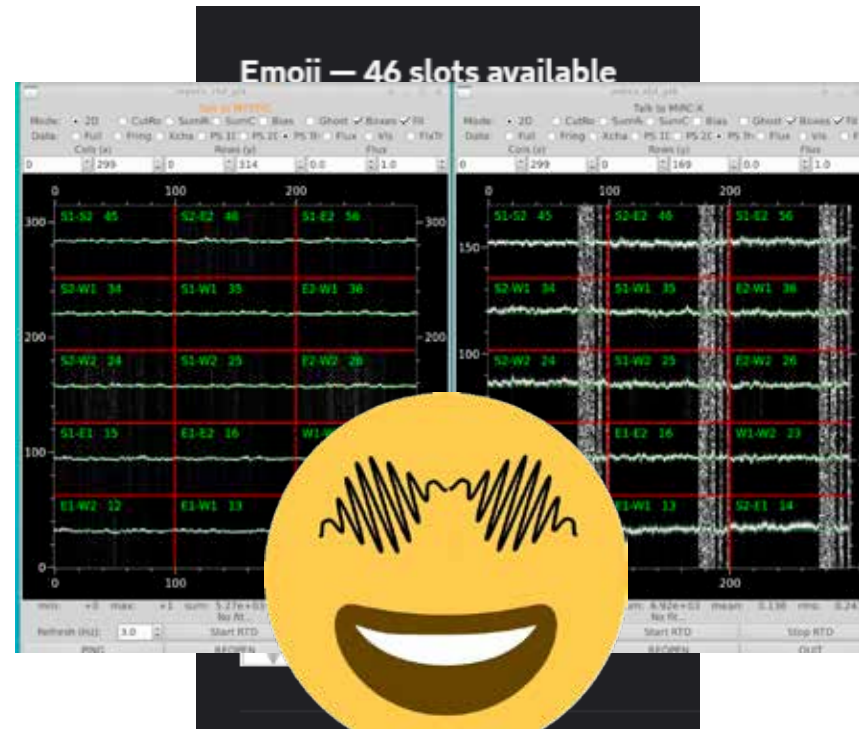
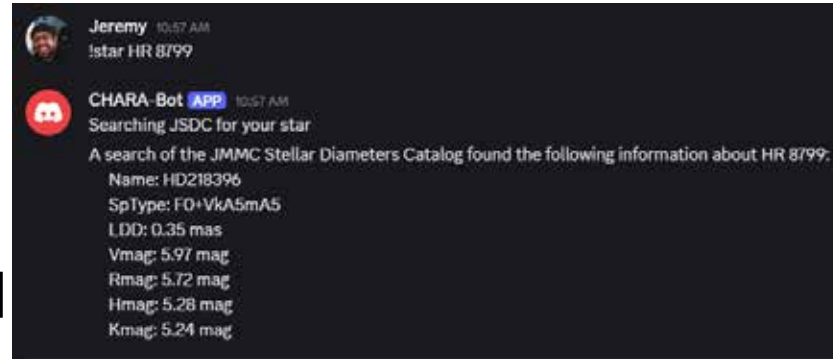
Current Reduction Codes:

- MIRC-X/MYSTIC
- Classic/CLIMB
- PAVO
- SPICA

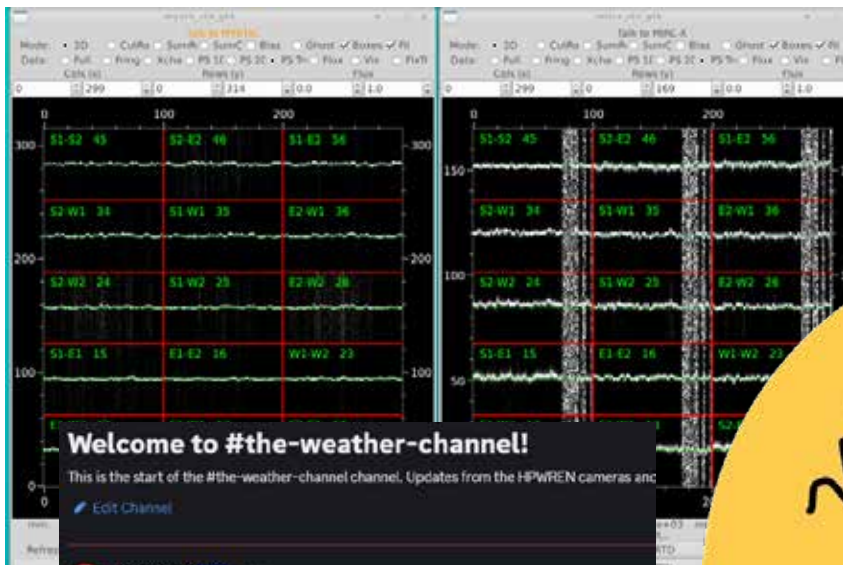


# CHARA Discord Bot

- Reads logs from wavefront sensor and weather server
- Helpful notices at start, mid and end of night
- Can print various reports
- the-weather-channel
- bot-spam channel



# CHARA Remote Operations



### CHARA Database Query Form

Select a database:

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- CLIMB 1
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- JouFLU
- MIRC
- MIRC-X
- MYSTIC
- PAVO
- VEGA



**Welcome to #the-weather-channel!**  
 This is the start of the #the-weather-channel channel. Updates from the HPWREN cameras and

