Boosting your Productivity with VSCode and SSH on remote machines

Python Coffee | IA PUC

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Exchanging cryptographic keys with a remote machine

Configuring your .ssh/config file

Generate an SSH Key Pair

On your local machine run

```
ssh-keygen -t rsa
```

This creates two files

- `~/.ssh/id_rsa` (this is a private key, keep it safe)
- `~/.ssh/id_resa.pub` (this is the public key, the one you share with others)

Configuring your .ssh/config file

Copy the Public Key to the Remote Server

We now send the public key to the remote server with

```
ssh-copy-id -i ~/.ssh/id_rsa.pub user@remote_host
```

This appends your public key to ~/.ssh/authorized_keys on the server.

Using an alias for the remote machine

Using an alias for the remote machine

Configure the ~/.ssh/config File

Now we we open (or create) the file with

```
nano ~/.ssh/config
```

And fill the following information ->

`myserver` is an alias for the server

`remote_host_or_ip` is the direction (e.g. machinename.astro.puc.cl)

ForwardX11 allows streaming graphical interfaces or windows

```
Host myserver
    HostName remote_host_or_ip
    User your_username
    ForwardX11 yes
```

You can add as many hosts as you want appending them to the .ssh/config file

Using an alias for the remote machine

Test the Connection

Now you can connect simply by:

```
ssh myserver
```

You can add multiple servers in the same ~/.ssh/config with different Host aliases.

For example ->

```
Host workserver
    HostName work.example.com
    User workuser
Host cluster
    HostName cluster.example.edu
    User hpcuser
```

Setting up VSCode

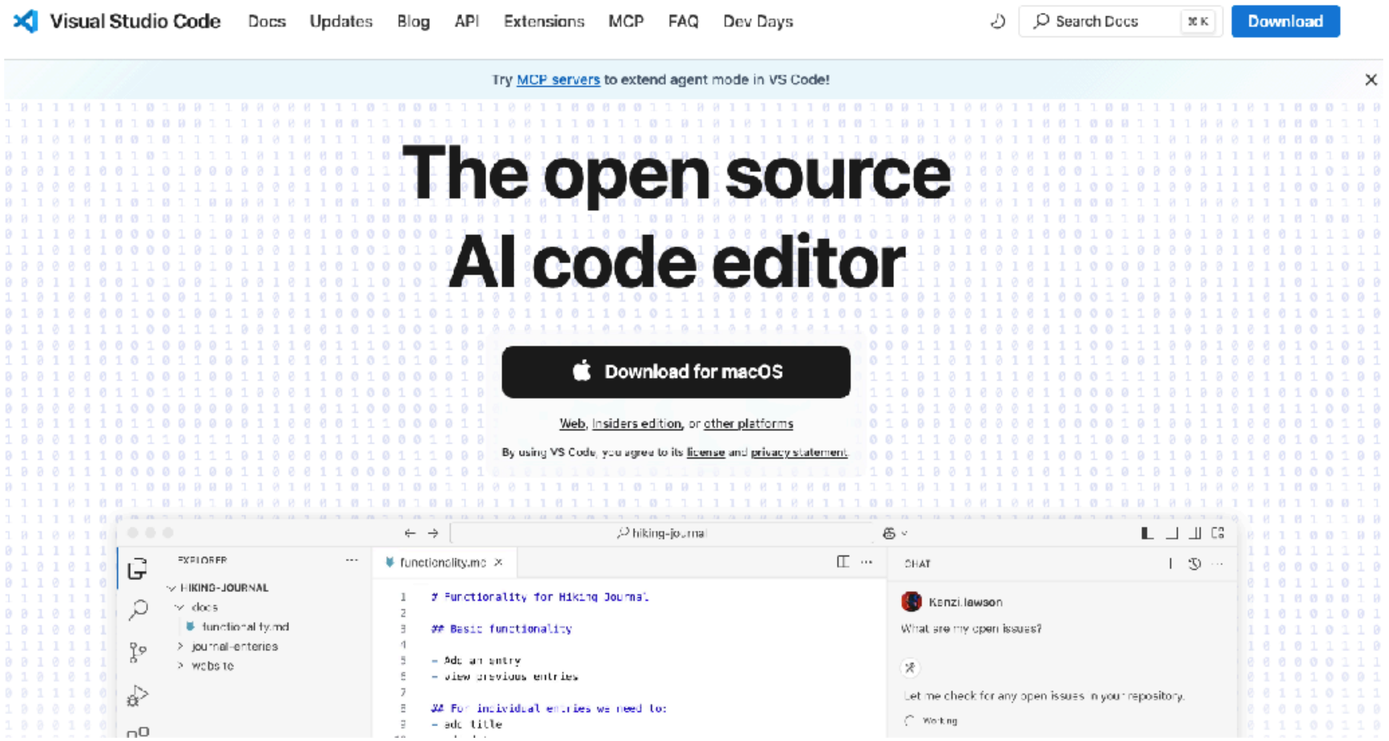
Setting up VSCode

Download

Download VSCode from here

https://code.visualstudio.com/

And install it

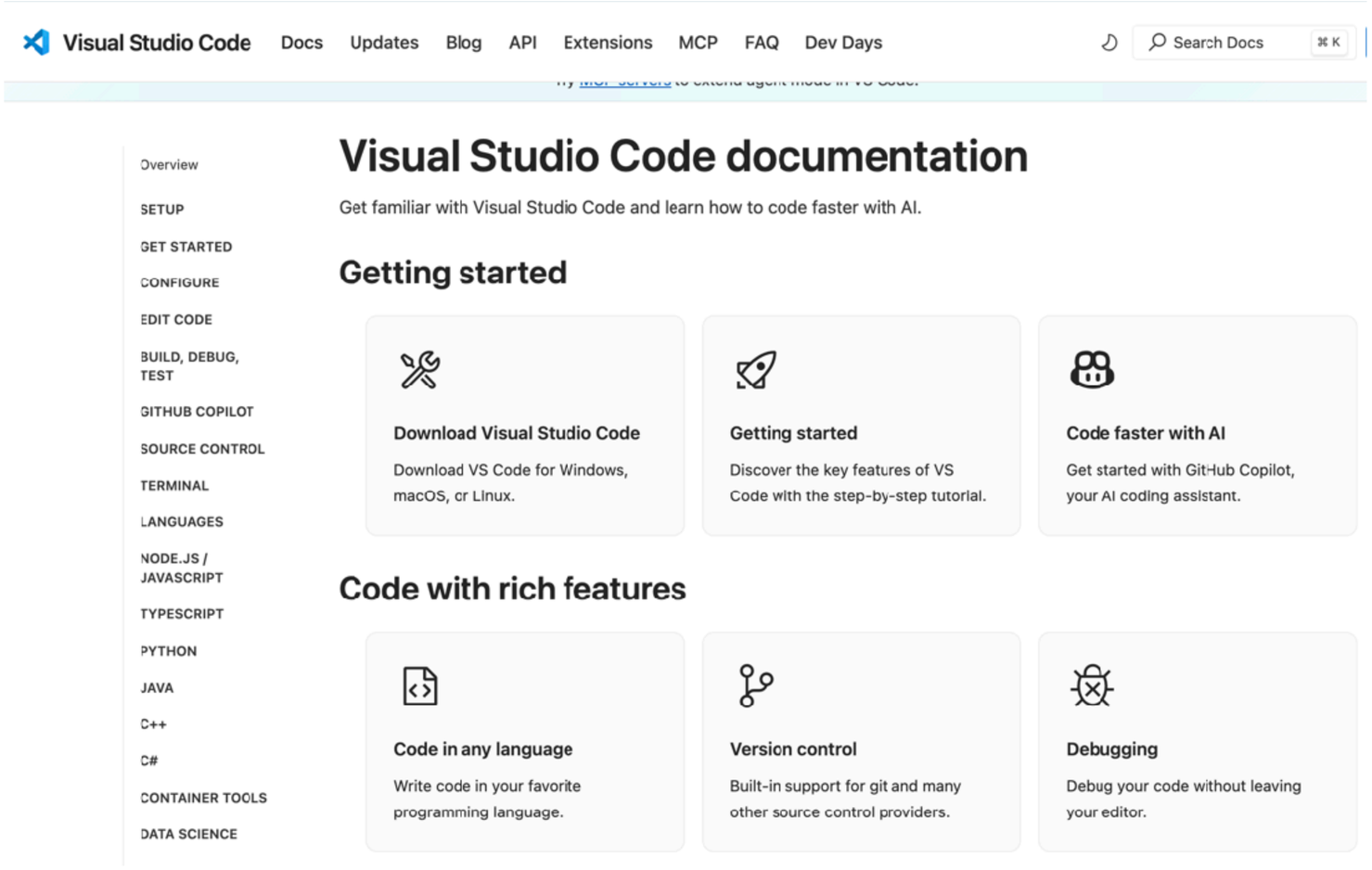


Setting up VSCode

Documentation

https://code.visualstudio.com/docs

https://code.visualstudio.com/docs/introvideos/basics

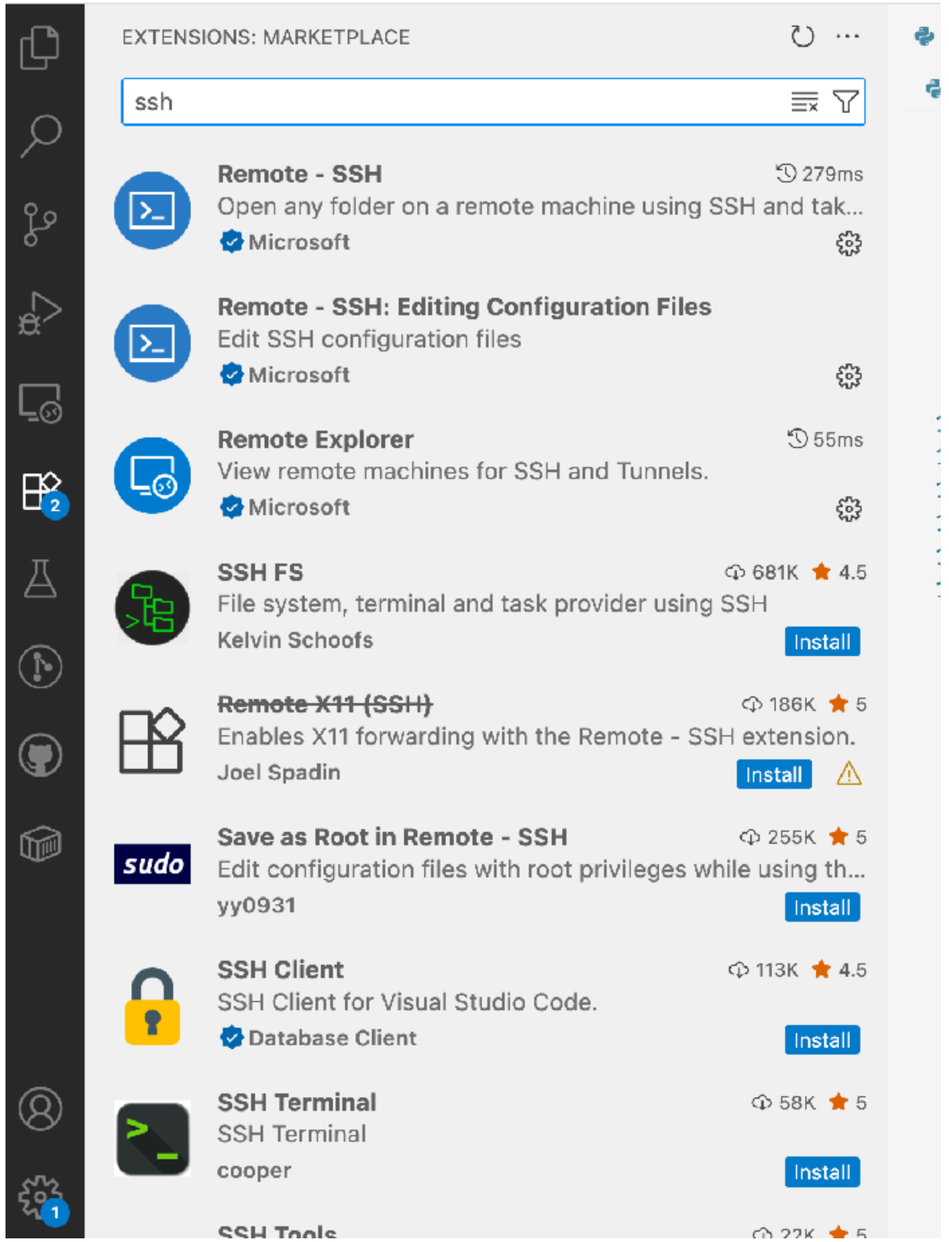


Setting up VSCode

Installing the ssh extension

Go to the left tab -> Extensions

Search for the Remote-SSH and Remote Explorer and install them



Setting up VSCode

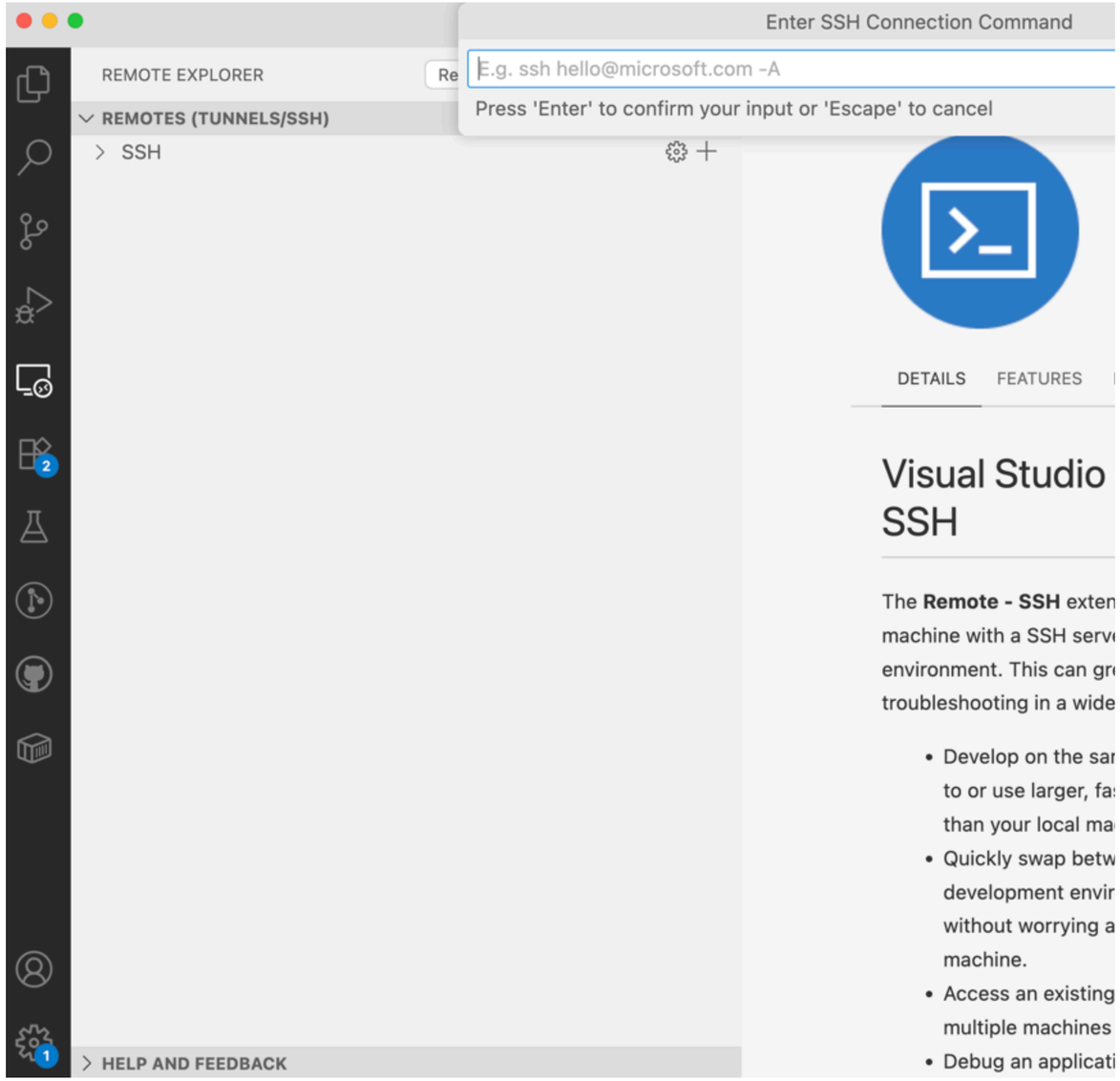
Setting up an ssh connection

Go to the Remote Explorer tab in the left tab (computer icon)

Click the + sign in the SSH dropdown menu

Write ssh “your remote machine” to add a new host

Given that you already shared passwords, it shouldn’t ask for a password again



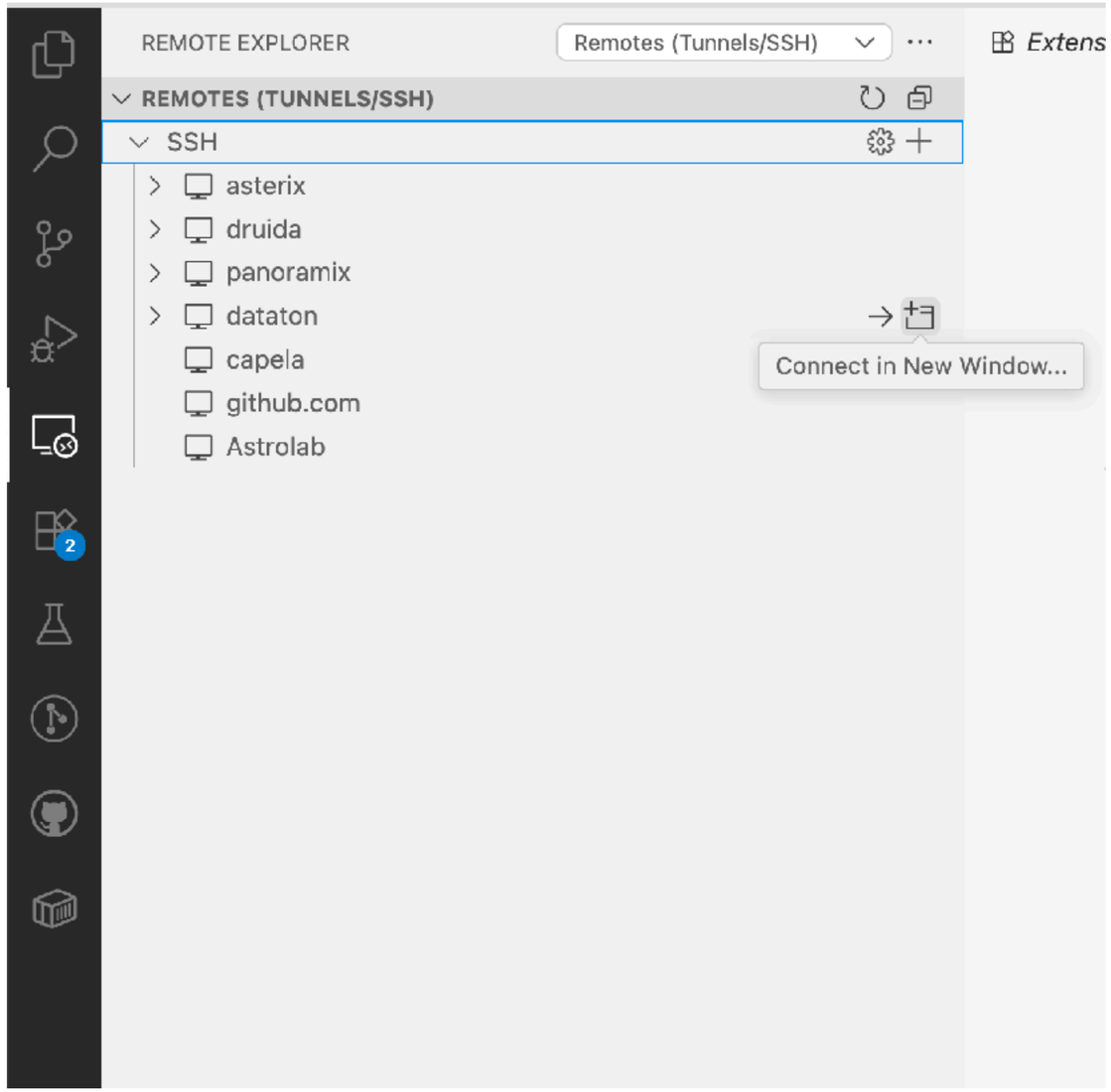
Setting up VSCode

First connection

Click myserver → Connect to Host in Current Window

VS Code auto-installs server bits under ~/.vscode-server/

When prompted: accept host key (one time)



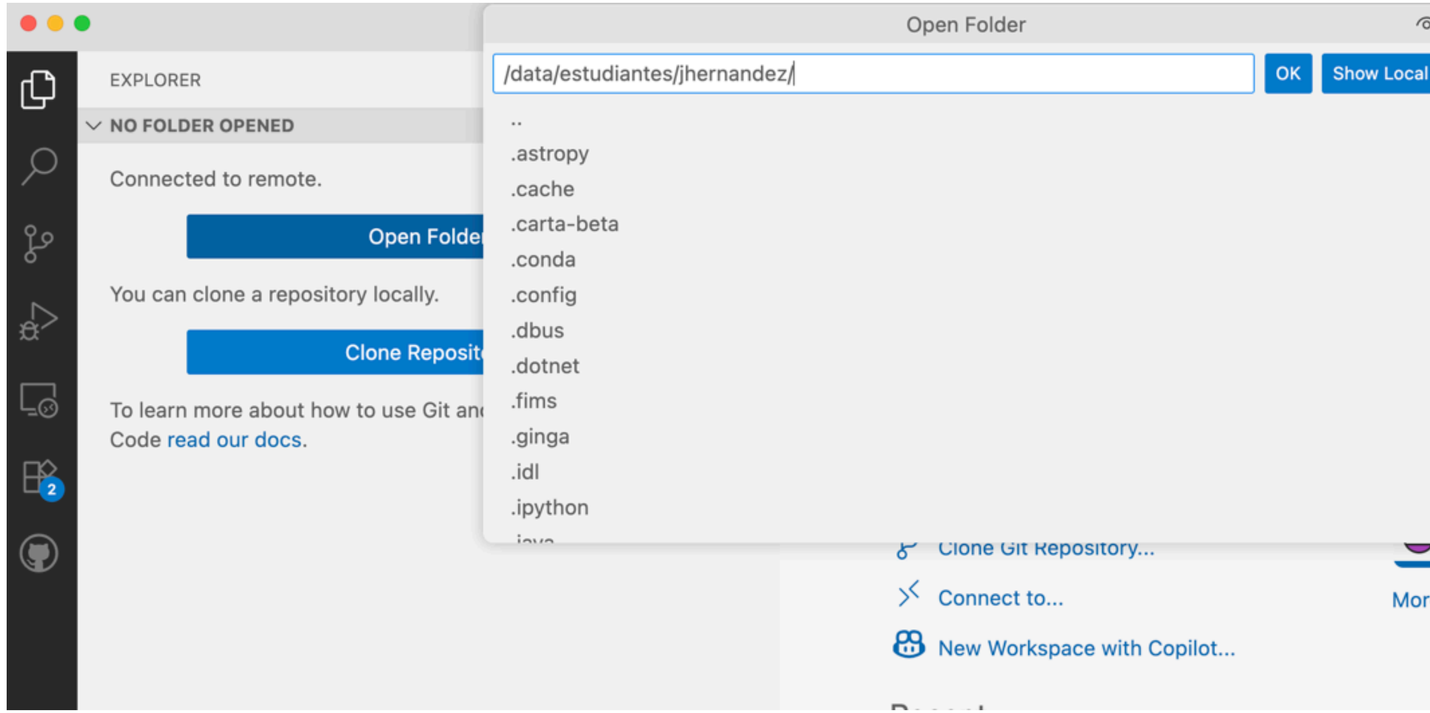
Setting up VSCode

Open Folder & Trust

File → Open Folder… (remote path, e.g. /home/username)

Click Trust for that workspace

You now have: remote Explorer, Terminal, Git, Python envs



SDSSJ2222+2745 [SSH: panoramix]

EXPLORER

SDSSJ2222+2745 [SSH: PANORAMIX]

- MUSE
  - white.fits
  - Notebooks
    - __pycache__
    - ARCTOMOGRAPHY_EWs
    - data
    - delensing
    - EW_plots
    - galfit
    - KCWI_spectral_resolution
    - plots
      - SDSSJ2222_RGB_HST_contours.pdf
      - SDSSJ2222_RGB_HST_contours.png
    - QSO_SPECTRA
    - VoigFit
    - voronoi_bin
    - align_data_wcs.ipynb
    - align_data_wcs.py
    - arc_spectrum.fits
    - check_wave_alignement.ipynb
    - cutout_cubes_for_delensing.ipynb
    - extract_spectra.ipynb
    - fit_mgii.ipynb
    - ifuanal.py
    - ImagingPlots.ipynb
    - line_fitter.py
    - SDSSJ2222+2745.code-workspace
    - spatial_maps.ipynb
    - subtract_star.ipynb
    - voronoi_binning_for_Lya.ipynb
  - Photometry
  - SExtractor

OUTLINE

TIMELINE

ImagingPlots.ipynb

Notebooks > ImagingPlots.ipynb > Photometry > empty cell

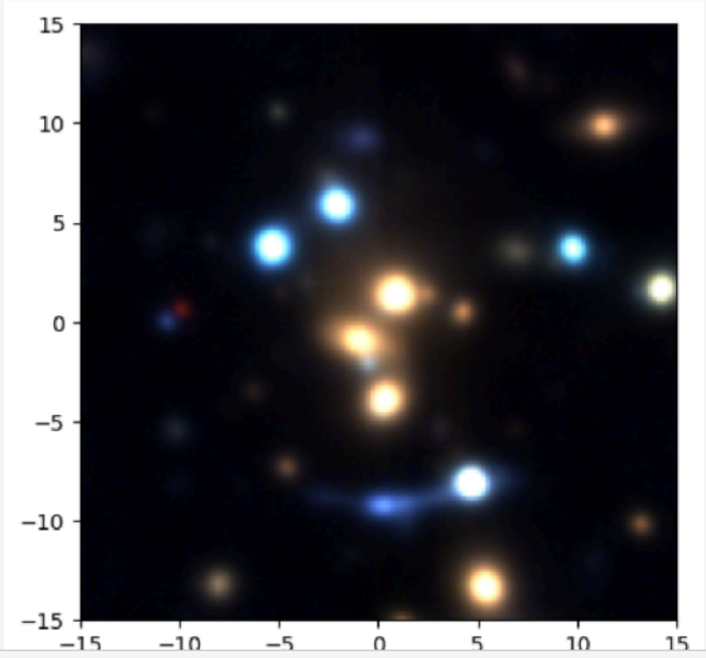
Generate | Code | Markdown | Run All | Restart | Clear All Outputs | Jupyter Variables | Outline | stenv (Python 3.9.16)

```
12 rgb_image_muse = rgb_image
13 fig, ax = plt.subplots(figsize=(5, 5))
14 ax.imshow(rgb_image_muse, origin='lower',
15            extent=[-r.shape[1]*0.2/2, r.shape[1]*0.2/2,
16                    -r.shape[0]*0.2/2, r.shape[0]*0.2/2])
17 ax.set_xlim([-width_cutout_arcsec/2, width_cutout_arcsec/2])
18 ax.set_ylim([-width_cutout_arcsec/2, width_cutout_arcsec/2])
```

[35] Python

```
Clipping input data to the valid range for imshow with RGB data ([0..1] for floats
```

```
(-15.0, 15.0)
```



PROBLEMS | OUTPUT | DEBUG CONSOLE | TERMINAL | PORTS | JUPYTER

JUPYTER: JUPYTER VARIABLES

Name | Type

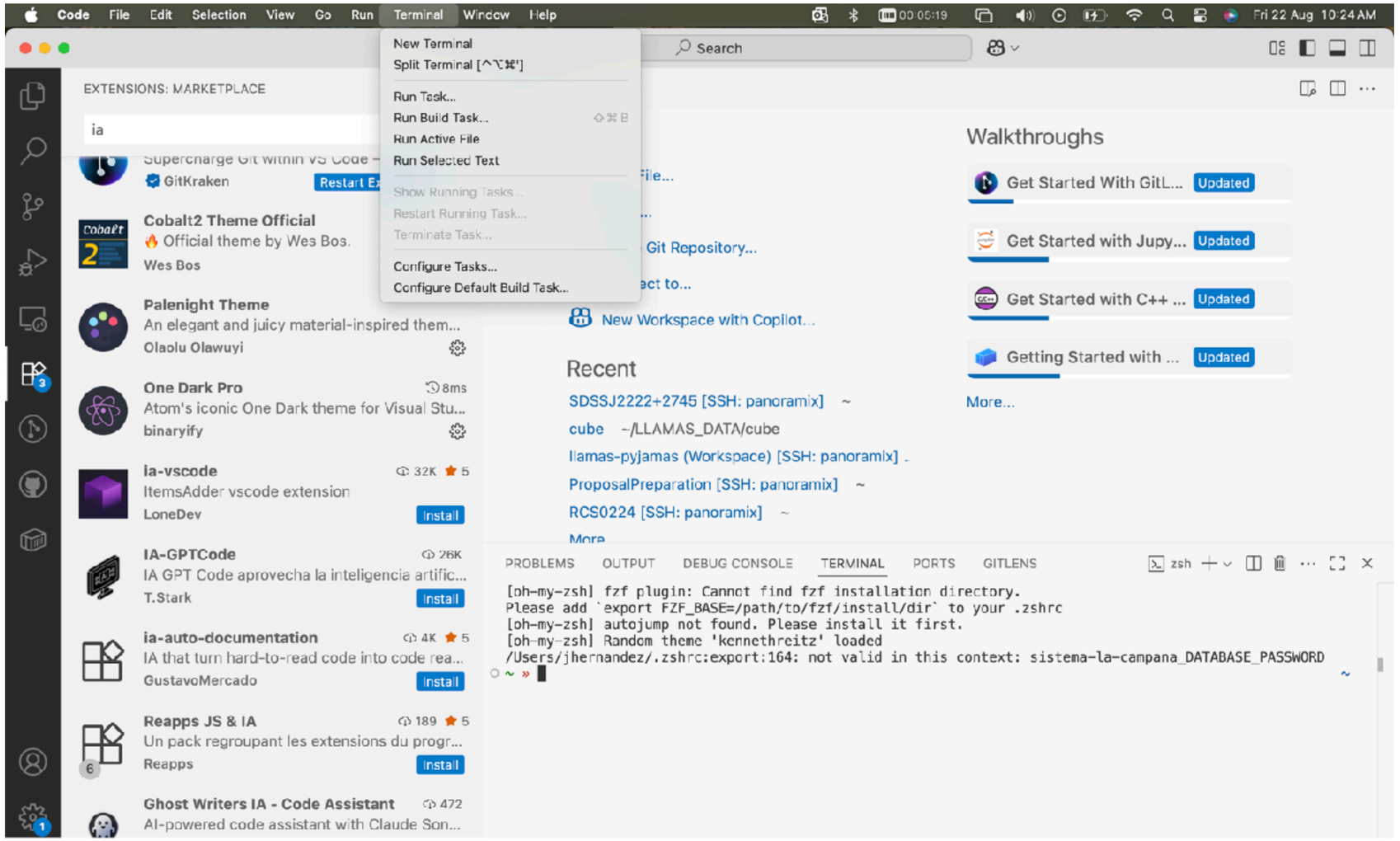
TERMINAL

$

Hide Panel (⌘J)

Setting up VSCode

Opening a terminal



Setting up VSCode

Extensions

VSCode has a market for many useful things:

- Jupyter notebooks
- Python tools
- Visualizing pdfs, csv's, and other files
- Nice color themes
- IA autocompleting tools
- And much more

Plain VSCode

VSCode with extensions