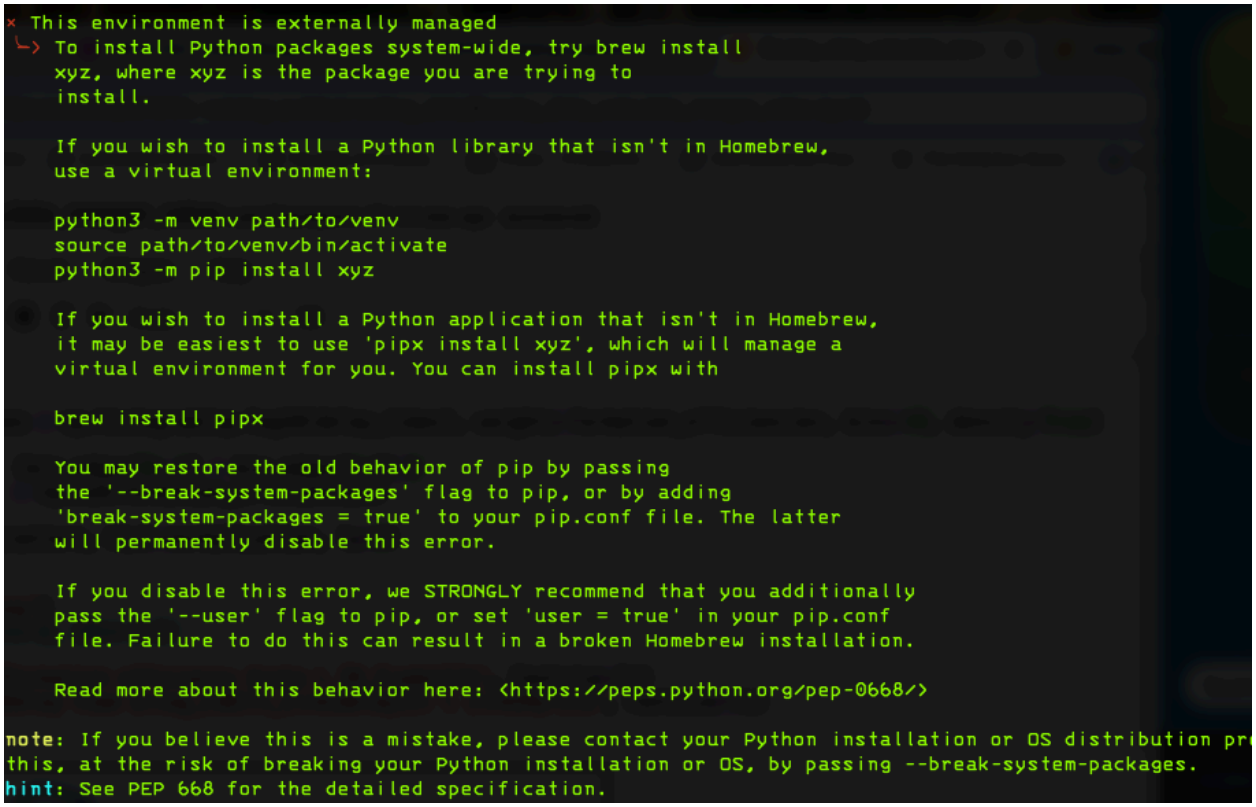
Cosmic Integration SSPC

LinkTree
https://linktr.ee/syntheticstellarpopconvolve

How to make it work:
run & activate environment:
python3 -m venv sspc_env
source sspc_env/bin/activate
 # Start jupyter from within the activated environment
jupyter notebook
What I had to do to make the installation from GitHub Work:
(1)



distutils is deprecated in Python 3.10, so in my case it threw an error about installing this package (which happens in setup.py;
You can fix this by doing the following (source: https://stackoverflow.com/questions/69919970/no-module-named-distutils-util-but-distutils-is-installed):

```
python3 -m venv path/to/venv
source path/to/venv/bin/activate
python3 -m pip install xyz
```

(2)

```
    or tarfile.is_tarfile(filename)
       ~~~~~~~~~~~~~~~~~~~~~~~~~~~
  File "/opt/homebrew/Cellar/python@3.13/3.13.5/Frameworks/Python.framework/Versions/3.13/lib/python3.13/tarfile.py", line 2959, in is_tarfile
    t = open(name)
  File "/opt/homebrew/Cellar/python@3.13/3.13.5/Frameworks/Python.framework/Versions/3.13/lib/python3.13/tarfile.py", line 1875, in open
    return func(name, "r", fileobj, **kwargs)
  File "/opt/homebrew/Cellar/python@3.13/3.13.5/Frameworks/Python.framework/Versions/3.13/lib/python3.13/tarfile.py", line 1943, in gzopen
    fileobj = GzipFile(name, mode + "b", compresslevel, fileobj)
  File "/opt/homebrew/Cellar/python@3.13/3.13.5/Frameworks/Python.framework/Versions/3.13/lib/python3.13/gzip.py", line 203, in __init__
    fileobj = self.myfileobj = builtins.open(filename, mode or 'rb')
                               ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
FileNotFoundError: [Errno 2] No such file or directory: '/Users/floorbroekgaarden/Projects/GitHub/syntheticstellarpopconvolve/dist/syntheticstellarpopconvolve-.tar.gz'
```

then it throws me an error called `FileNotFoundError: [Errno 2] No such file or directory: '/Users/floorbroekgaarden/Projects/GitHub/syntheticstellarpopconvolve/dist/syntheticstellarpopconvolve-.tar.gz` because $VERSION_NUMBER is not defined. This is because in ```instal.sh``` the “grep -oP” -P is not recognized. This should be instead something else. But for now I fixed it by opening `install.sh` and adding a line
```VERSION_NUMBER=$"0.4" # fix for now ``` under VERSION_NUMBER=$(grep -oP '__version__ = "\K[^"]+' syntheticstellarpopconvolve/_version.py | awk '{print $1}')

Specific steps:

- I do in the terminal `subl install.sh’ (but you can use a different text editor than sublime)
- then add the line “VERSION_NUMBER=$"0.4" # fix for now” under line 5 (See screenshot below)
- then I run `./install.sh’ and it installs

Scroll Tabs in/*bash*

```
2
3   # Script to install syntheticstellarpopconvolve in the current venv
4
5   VERSION_NUMBER=$(grep -oP '__version__ = "\K[^"]+' syntheticstellarpopconvolve/_version.py | awk '{print $1}')
6   VERSION_NUMBER=$"0.4" # fix for now
7
8   echo "installing syntheticstellarpopconvolve version $VERSION_NUMBER"
9
10  # we can only use python3 and python3, but allow
11  # the user to set these in environment variables
12  # PYTHON and PIP.
13  : "${PYTHON:="python3"}"
14  : "${PIP:="pip3"}"
15
16  # do stuff...
17  $PYTHON setup.py clean
18  cd docs
19  $PIP uninstall -y syntheticstellarpopconvolve
20  cd ../
21  $PYTHON setup.py build --force
22  $PYTHON setup.py sdist
23  $PIP install -v dist/syntheticstellarpopconvolve-$VERSION_NUMBER.tar.gz
24
```
```

#####
then to make it work in a random jupyter notebook, I open a jupyter notebook (where I load in the data I care about and have other scripts and did) (be sure to rerun the notebook) :

```
import os, copy, h5py
import astropy.units as u
import numpy as np
import pandas as pd
import sys
sys.path.insert(0, '/Users/floorbroekgaarden/Projects/GitHub/syntheticstellarpopconvolve')
from syntheticstellarpopconvolve import convolve, default_convolution_config,
default_convolution_instruction
from syntheticstellarpopconvolve.general_functions import generate_boilerplate_outputfile,
extract_unit_dict, temp_dir
and continued with the rest of the SSPC demo
# load filename
data_filename = os.getenv('EXAMPLE_DATA_USECASE_GW_FILENAME') if FULL_VERSION else None
example_usecase_GW_events_filename = data_filename if data_filename is not None else
str(files("syntheticstellarpopconvolve") /  "example_data/example_data_usecase_gw.h5")
# load data
example_usecase_GW_events_data = pd.read_hdf(example_usecase_GW_events_filename,
key='data/combined_dataframes')
if data_filename is not None:
    example_usecase_GW_events_data['delay_time_values_in_years'] =
example_usecase_GW_events_data['formation_time_values_in_years']+example_usecase_GW_events_d
ata['merger_time_values_in_years']
if 'delay_time_in_years' in example_usecase_GW_events_data.columns:
    example_usecase_GW_events_data['delay_time_values_in_years'] =
example_usecase_GW_events_data['delay_time_in_years']
# query data
example_usecase_GW_events_data=example_usecase_GW_events_data.query('stellar_type_1==14 &
stellar_type_2==14')
example_usecase_GW_events_data=example_usecase_GW_events_data.query('comenv_counter==0')
#
log10_metallicity_centers = np.log10(example_usecase_GW_events_data['metallicity'].unique())
stepsize = np.diff(log10_metallicity_centers)
# TODO: use function
log10_bin_edges = np.concatenate([log10_metallicity_centers[:-1]-stepsize/2,
log10_metallicity_centers[-2:]+stepsize[:2]/2])
```

ADDED in CONVOLVE:
import numpy as np
np.round(