

PROGRAM

09:30 **Welcome**

09:30-10:00 First talk: general overview on Gaia, why it is useful for exoplanets, DR4 improvements (Katia Sivkova)

10:00-10:15 Second talk: DR4 data formatting (José Vinés López)

10:15-10:40 **Coffee break**

— HANDS-ON SESSIONS —

10:40-11:25 orvara (Matias Jones, Andrea Bernardi addressing questions)

11:25-12:10 orbitize! (Andrea Bernardi)

12:10-13:20 **Lunch break**

13:20-13:40 Third talk: what you can detect with DR4, preliminary results (James)

13:40-14:25 emperor (Joanne Rojas Molina)

14:25-14:50 **Coffee break**

14:50-15:35 nereus (José Vinés López)

15:35-16:00 Fourth talk/Recap

Public talk and observations with telescope if you want to stay

19:30 Kevin Hoy's talk: "Looking for exomoons and finding... something new"

EMPEROR INSTRUCTIONS

###CREATE A DEDICATED CONDA ENVIRONMENT:

```
conda create -n emperor python=3.12
conda activate emperor
```

###DEPENDENCIES:

Numpy, Scipy, pandas, matplotlib (>=3.5.1), kepler, reddemcee, redden, tabulate, termcolor y tqdm

###ADDITIONAL DEPENDENCIES:

arviz, celerite2, corner, dynesty, emcee y scikit-learn

###INSTALLING EMPEROR WITH pip:

```
pip install astroemperor
```

```
####INSTALLING EMPEROR WITH GITHUB:
git clone https://github.com/ReddTea/astroemperor
cd astroemperor
python -m pip install -e .
```

```
####TEST INSTALLATION
python test_basic.py
```

```
####FOLDERS' STRUCTURE NEEDED TO MAKE EMPEROR WORK
```

```
working_directory/
├── mini_test.py
├── datafiles/
│   ├── 51Peg/
│   │   └── RV/
│   │       └── 51peg.vels
├── datalogs/
│   └── 51Peg/
│       └── run_1/
```

```
####BASIC USAGE EXAMPLE
```

```
import astroemperor
```

```
sim = astroemperor.Simulation()
sim.set_engine('reddemcee')
sim.engine_config['setup'] = [2, 100, 500, 1]
sim.load_data('51Peg') # reads from ./datafiles/
```

```
sim.plot_trace['plot'] = False # deactivates arviz plots
sim.autorun(1, 1) # (from=1, to=1): only a single Keplerian
```

ORBITIZE! INSTRUCTIONS

```
####You need at least Python 3.7 for orbitize! to work:
```

```
conda create -n orbitize python=3.7
conda activate orbitize
```

```
####Requirements:
```

- gcc compiler (should be already installed if you have Linux; for Mac users, install Xcode command line tools)
- *cython* and *numpy*: pip install numpy cython --upgrade

```
####Then you can finally install orbitize
```

```
pip install orbitize
```

ORVARA INSTRUCTIONS

orvara has to be installed through Git clone, and you have to install cython before installing orvara

We recommend creating a dedicated conda ambient

No minimum Python version is mentioned in the official repository, so the example here is with a version that is surely compatible with orvara

```
conda create -n orvara python=3.9.18
```

```
conda activate orvara
```

Cython installing and Git clone

```
git clone https://github.com/t-brandt/orvara
```

```
cd orvara
```

```
pip install cython
```

```
pip install -e .
```

Run a small test to check that the installation was successful: cd to the root directory of the repo and launch

```
pytest -sv
```

If you don't see any errors, congrats! Some errors related to packages' versions could arise. Here is listed a combination that works:

```
astropy==6.0.1
```

```
Cython==3.1.2
```

```
emcee==3.1.6
```

```
ipython==8.18.1
```

```
matplotlib==3.7.0
```

```
matplotlib-inline==0.1.7
```

```
numpy==1.23.5
```

```
pandas==2.3.1
```

```
pymc==1.0.0
```

```
pyerfa==2.0.1.5
```

```
scipy==1.13.1
```

NEREUS INSTRUCTIONS

GitHub link for the Julia version: <https://github.com/jvines/Nereus.jl>

GitHub link for the Python version (not fully developed yet):

<https://github.com/jvines/nereus-py>