useful packages

`http://www.astropython.org/`

list of Python resources for astronomers (more than 80 packages, modules), tutorials, forums

- *interfaces* to codes and tools existing in other languages (`AMUSE`, `pyMIDAS`, `CASApy`, `pyMIR`, `PyMSES`, `pyRAF`, `astroWISe`, ...)
- useful packages written purely in Python (plotting, astronomy specific tools, statistics, ...)

useful packages
astrophysical simulations

`AMUSE` – Astrophysical MUltipurpose Software Enviroment

- `http://amusecode.org/`
- astrophysical simulations – any simulation you like:
  uniform interface for existing codes, coupling codes, units handling, ...
- Portegies Zwart et al. (2013), Pelupessy et al. (2013)

`PyMSES`

- `http://irfu.cea.fr/Projets/PYMSES/intro.html`
- Python modules originally written for the RAMSES AMR code

useful packages
statistics, MCMC

`emcee`

- `http://dan.iel.fm/emcee/current/`
- pure-Python implementation of Markov Chain Monte Carlo (MCMC) ensemble sampler
- Foreman-Mackey et al. (2012), *emcee: The MCMC Hammer*, `http://arxiv.org/abs/1202.3665`

`PyMC`

- `http://pymc-devs.github.io/pymc/`

`scikit-learn`

- `http://scikit-learn.org/`
- machine learning (data mining, data analysis):
  classification, clustering, nearest neighbors, principal component analysis, ...

`rpy2`

- `http://rpy.sourceforge.net/`
- R in Python

useful packages
plotting

APLpy

- https://aplpy.github.io/
- Astronomical Plotting Library in Python

Seaborn

- http://stanford.edu/ mwaskom/software/seaborn/
- visualization library based on Matplotlib

mpltools

- http://tonysyu.github.io/mpltools/index.html
- styles for Matplotlib

palettable

- https://github.com/jiffyclub/palettable
- color palettes
- formerly brewer2mpl

useful packages

astro-stuff

PyRAF

- `http://www.stsci.edu/institute/software_hardware/pyraf`
- IRAF tasks in Python

GalSim

- `https://github.com/GalSim-developers/GalSim`
- the modular galaxy image simulation toolkit

AstroLib

- `http://www.hs.uni-hamburg.de/DE/Ins/Per/Czesla/PyA/PyA/pyaslDoc/pyasl.html`
- IDL *Astronomy Users Library* (AstroLib) in Python

acstools

- `https://pypi.python.org/pypi/acstools/1.7.3`
- Python tools for ACS (Advanced Camera for Surveys) data

useful packages

more astro-stuff

`astroquery`

- `https://github.com/astropy/astroquery`
- accessing online astronomical data

`fitsblender`

- `https://pypi.python.org/pypi/fitsblender`
- aggregate values in FITS headers

`Photutils`

- `https://github.com/astropy/photutils`
- tools for detecting and performing photometry of astronomical sources

useful packages

...

LMFIT

- `http://cars9.uchicago.edu/software/python/lmfit/`
- non-linear optimization and curve fitting

K3Match

- `http://pschella.github.io/k3match/`
- fast matching of points in 3D space

pyFFTW

- `http://hgomersall.github.io/pyFFTW/`
- pythonic wrapper around FFTW, the speedy FFT library

classes and objects

- a different way to set up and structure your code
- would require an additional day to explain

generator

- created with the `yeild` keyword
- works like a list (but only in a loop)
- no actual list needs to be created in memory