accessible asteroseismology with

lightkurve

Oliver J. Hall
+ the Lightkurve Collaboration

TASC5/KASC12
MIT - Cambridge

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notebooks!

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What does lightkurve do for seismology?

It does:

It does not (yet?):

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provide uncertainties for parameters

replace a pipeline (or an email to a seismologist)

1 change a lightcurve to a periodogram

2 flatten and smooth the periodogram

3 plot the smoothed periodogram

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2 flatten and smooth the periodogram
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```
[1] periodogram = lightcurve.to_periodogram()
[2] smoothed = periodogram.flatten().smooth()
[3] smoothed.plot()
```

better to show than tell

we'll work through a quick tutorial

feel free to join in!

Characterising KIC 10963065 (Doris) with lightkurve

The star KIC 10963064 (hereafter Doris) is a high signal-to-noise main sequence Kepler target. Its a perfect candidate to showcase `lightkurve` 's asteroseismology tools, as they are best suited to long *Kepler* timeseries and high signal-to-noise.

In [1]:
```
import warnings
warnings.filterwarnings('ignore')
```

In [2]:
```
import lightkurve as lk

datalist = lk.search_lightcurvefile('KIC10963065', cadence='short')
print(datalist)
```

```
SearchResult containing 27 data products.

 target_name            productFilename                        description              distance
------------- ---------------------------------- ---------------------------------- --------
kplr010963065 kplr010963065-2009259162342_slc.fits  Lightcurve Short Cadence (CSC) - Q2      0.0
kplr010963065 kplr010963065-2010111051353_slc.fits  Lightcurve Short Cadence (CSC) - Q5      0.0
kplr010963065 kplr010963065-2010140023957_slc.fits  Lightcurve Short Cadence (CSC) - Q5      0.0
kplr010963065 kplr010963065-2010174090439_slc.fits  Lightcurve Short Cadence (CSC) - Q5      0.0
kplr010963065 kplr010963065-2010203174610_slc.fits  Lightcurve Short Cadence (CSC) - Q6      0.0
kplr010963065 kplr010963065-2010234115140_slc.fits  Lightcurve Short Cadence (CSC) - Q6      0.0
kplr010963065 kplr010963065-2010265121752_slc.fits  Lightcurve Short Cadence (CSC) - Q6      0.0
```

bit.ly/2M3MqLy

asteronomer

you can help out on this too!

by

[1] *reporting issues (please do this!)*

[2] *joining in conversations*

[3] *contributing yourself!*

[4] *getting others involved (e.g. undergrads!)*

you can do really simple quick-look asteroseismology with lightkurve

and so can your undergraduates, colleagues, and anybody else with a basic grasp on Python!

you can get started with this right now

Read the documentation	https://docs.lightkurve.org
Install lightkurve with pip	`pip install lightkurve --user`
Work with us on GitHub	https://github.com/KeplerGO/lightkurve

Enjoy!