**Slide 1: Hello**

I was flattered, and a little shocked, when I was asked 4 months ago if I could do an interactive demonstration on a program that was maybe 20% finished. I’m glad they did, because otherwise I would have dragged my heels on this program until it fell off the end of my PhD.

Jessie has already shown the bulk of lightkurves capabilities, so I don’t need to explain the basics as second time. I’m going to showcase the specific frequency-domain analysis tools we’ve developed for lightkurve!

I’m going to talk you through a couple of important basics and then jump right into a hands-on data tutorial. In the bottom left corner of the presentation you’ll see a short link. This will take you to an online Google co-lab web page where you can run a pre-prepared notebook that takes the same steps I’m going to go through later, so you can follow along and get a feel for the tools!

Before we get started, I want to mention some things. The great part about lightkurve is that it is a great collaborative platform. If you think there’s something missing from this talk today, you can probably get involved and add it yourself! Earlier this year, for example, Daniel Hey, Tim Bedding, and Keaton Bell hijacked the periodogram class to set the defaults to values more appropriate for studying all pulsating stars, not just solar-like oscillators. Them getting involved to make lightkurve more accessible for their work improved the code, made it easier to use for a new subfield of astronomers, and incited useful discussion. You can do the same!

**Slide 3: Its super easy to string commands together like a sentence**

The real power of lightkurve, as Jessie has already shown, is it’s accessibility of use. We’ve tried to make it so that function names are self explanatory, doc strings are little pockets of proper explanations, and that commands can easily be strung together.

So lets say if I wanted to change a lightkcurve into a periodogram, flatten and smooth that periodogram, and then plot the smoothed version, I could code it up like this:

Pretty easy, right?

**Slide 4: Some images**

Here’s a quick look at some of the results of this. On the left is the newly made periodogram, and on the right I’ve plotted a smoothed version over a close-up of the seismic modes. At the bottom I’ve plotted an echelle diagram--- also made with lightkurve. I’ll get onto these in my example later.

**Slide 4: We can do this stuff with seismic lightkurve, but only if flattened**

There are a couple of different aspects to lightkurve periodograms. If we’re calculating it from a lightcurve (with a c) we can either get a BLS periodogram, for transit finding, or a lomb scargle periodogram, for asteroseismology. Using the flatten() function divides out a rudimentary background estimate, giving us a signal-to-noise periodogram.

The core seismology tools are accessible from this signal to noise periodogram--- this is to make sure that we’re just dealing with the seismic modes and not the low frequency noise.

**Slide 5: I’m going to show you some stuff**

Let’s jump into a tutorial now. As I mentioned, you can follow along in that link in the bottom left. I’m going to start with a look at the star Doris, which has good short-cadence observations making it a good candidate for these tools. If we have time I’ll do a quick application of these tools to TESS data, which is a little more involved due to the bad SNR.

**Notebook: Look I can quicklook a piece of in depth analysis**

**-**Doing the analysis of Doris

**Notebook: Look I can do this on TESS data too if I’m careful.**

**Slide 7: You can get started with this right now (or soon)**

As I mentioned before, lightkurve is a team effort, and that team extends far beyond the gates of NASA Ames. Some ways you, the users can help out, ranked in order of direct effort, are:

-Reporting bugs (please do this)

-Joining in conversations on github!

-Contributing yourself!

-And getting others involved! Teach your students to use lightkurve, teach your new PhD’s to use lightkurve and encourage them to use it to learn asteroseismology. Get your friends involved, if they don’t do asteroseismology but you think they should. Asteroseismology is for sharing!

PS: When this talk goes online after this presentation, the links on this slide will take you straight to guides on how to do these things! If you really can’t wait, the info is on the lightkurve docs website.

**Slide 8: You can do really simple quick-look seismology with lightkurve, and so can your undergraduates and everybody else with a basic grasp of Python**

**Slide 9:** I’ll leave you with some useful links, before going to questions. I hope you enjoyed this brief example! Feel free to ask me any questions.