



Balloon mapping, Davis Sq, Somerville MA

Building communities
one kit at a time

Jeff Warren • PublicLab.org

Public Lab

an open community which
collaboratively develops

accessible, open source, Do-It-Yourself

technologies for investigating local
environmental health and justice issues

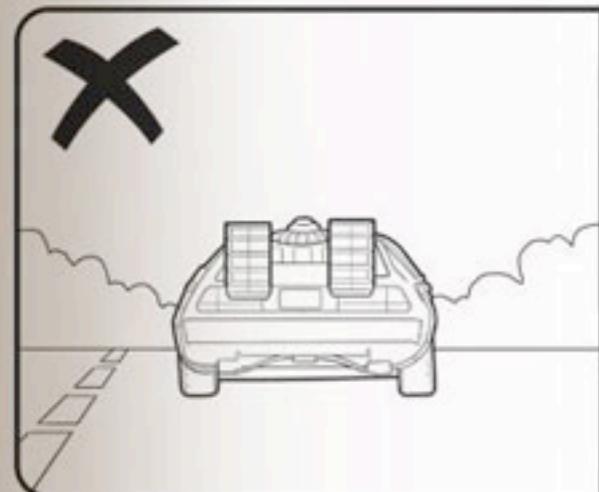
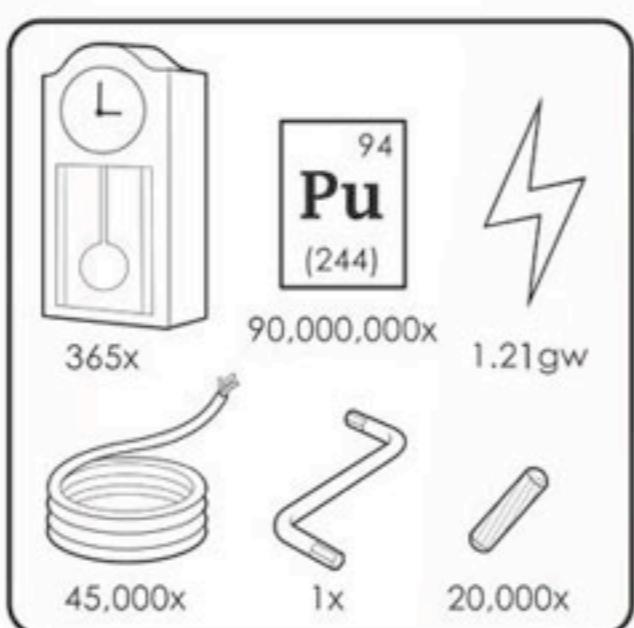
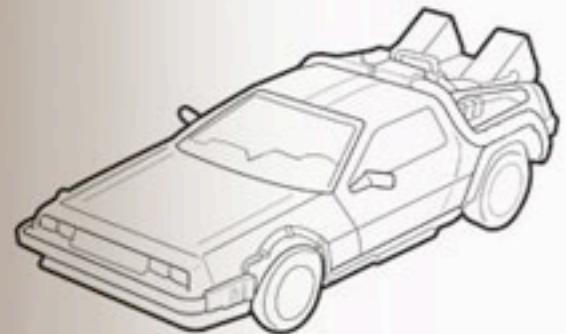
Antikythera
mechanism



Wikipedia

DJILORIANN

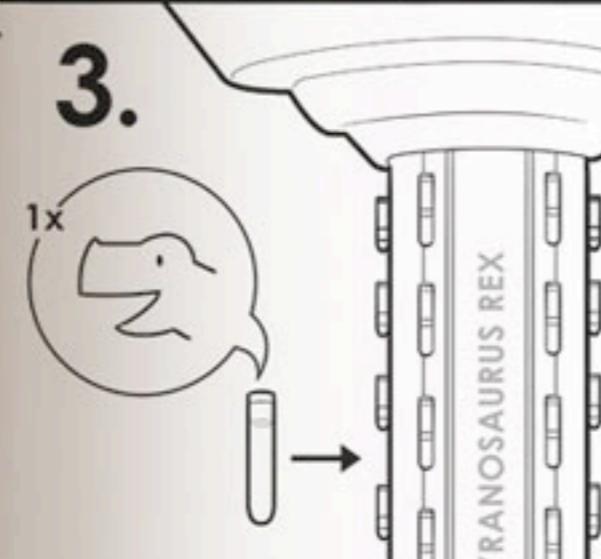
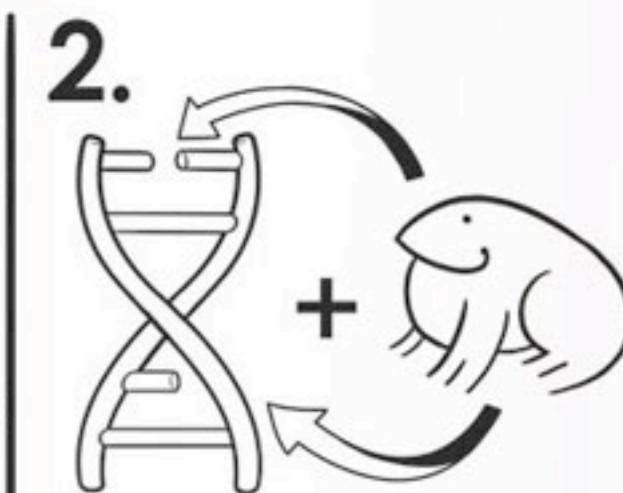
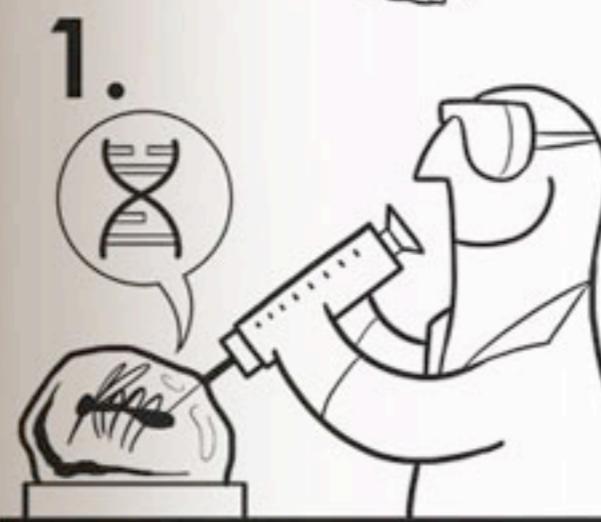
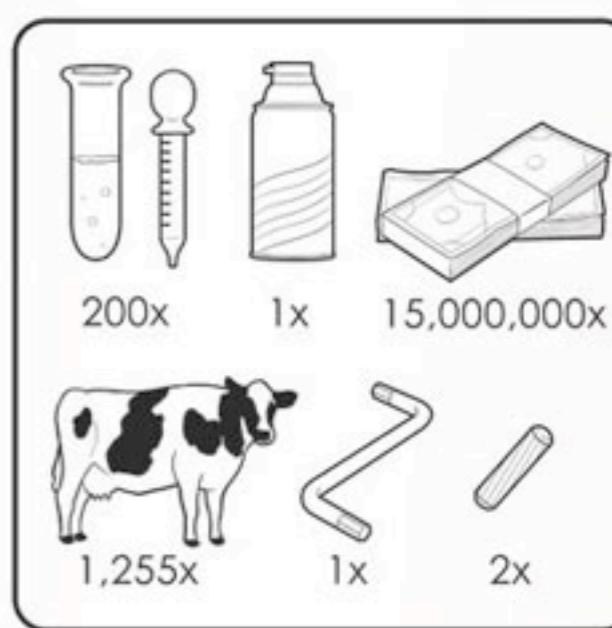
IKEA
Design and Quality
IKEA of Sweden



CollegeHumor

DINDASÜR

JURASSIC PARK
IKEA
Design and Quality
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This kit includes:



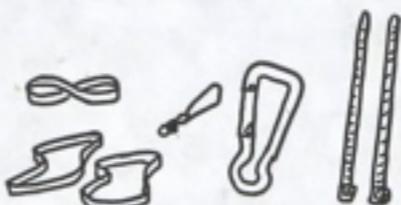
1000 ft string



5.5-ft weather balloon



protective gloves



rubber bands, zipties, & carabiner

You add:



camera with
continuous mode



2-liter bottle



80+ cu ft
helium

First contact

How do people encounter Public Lab?

- * Events/workshops (in person)
- * Media coverage
- * Website
- * “Starter Kits”



Michael A. Cooper

@MACooperr



Follow

My [@PublicLab](#) infragram filter kit arrived today. Let's make some NDVI!
#remotesensing #NDVI
pic.twitter.com/Ervp7i8HGw

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Vandecasteele Arnaud

@geotribu

Follow



Coooool ! I received my #BalloonMappingKit
Thanks [@PublicLab](#)
pic.twitter.com/1664rTsdX6

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Jenny Levine @shifted

One of my Kickstarters arrived today - [@infragram](#) flic.kr/p/fG1YRG

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Brian Boyer @brianboyer

Balloon mapping kit from [@publiclab](#) arrived just in time for sunny weather! pic.twitter.com/OdDsNjHS

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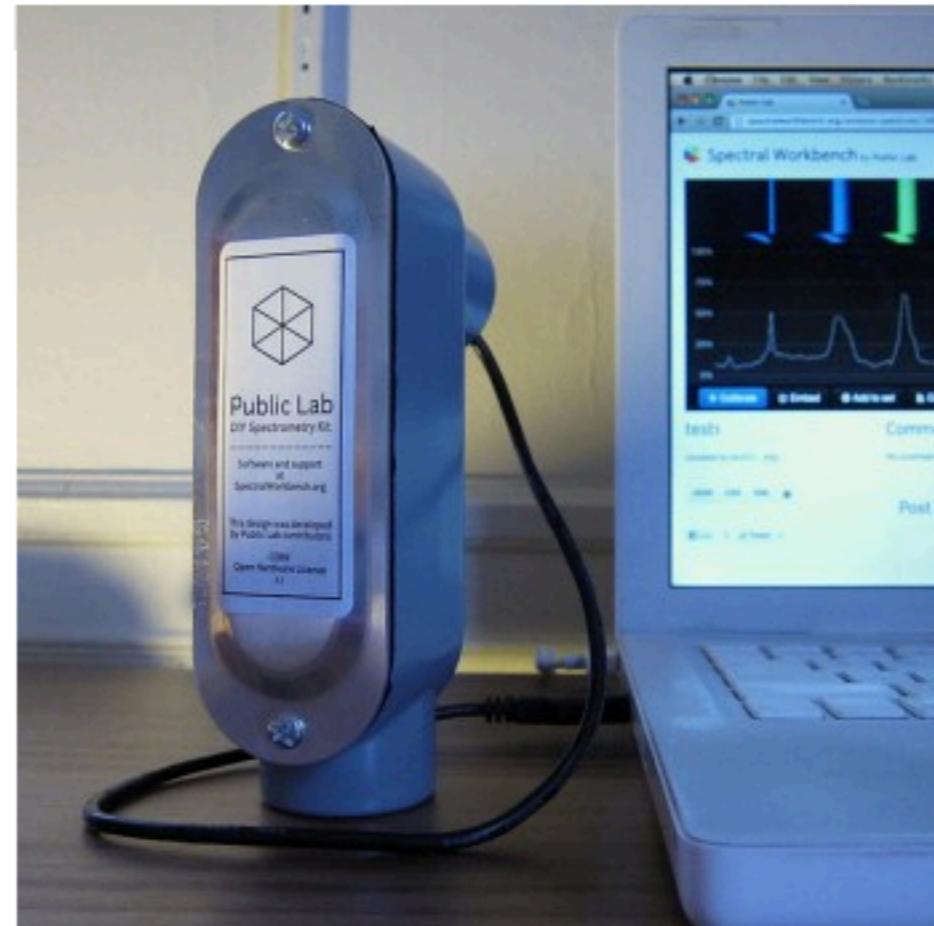
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Desktop Spectrometry Kit



Click on image to zoom



Availability: In stock

Item number: 3153423

\$49.95

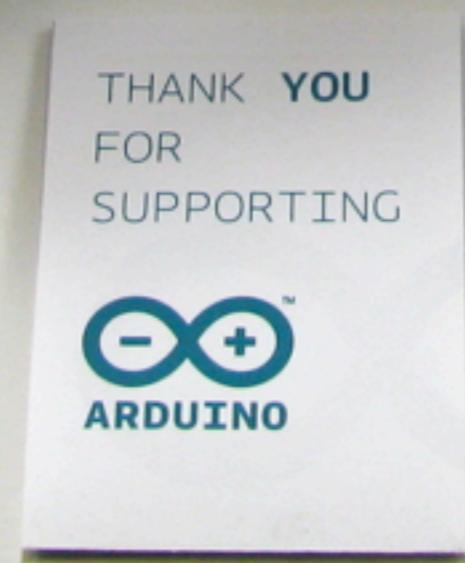
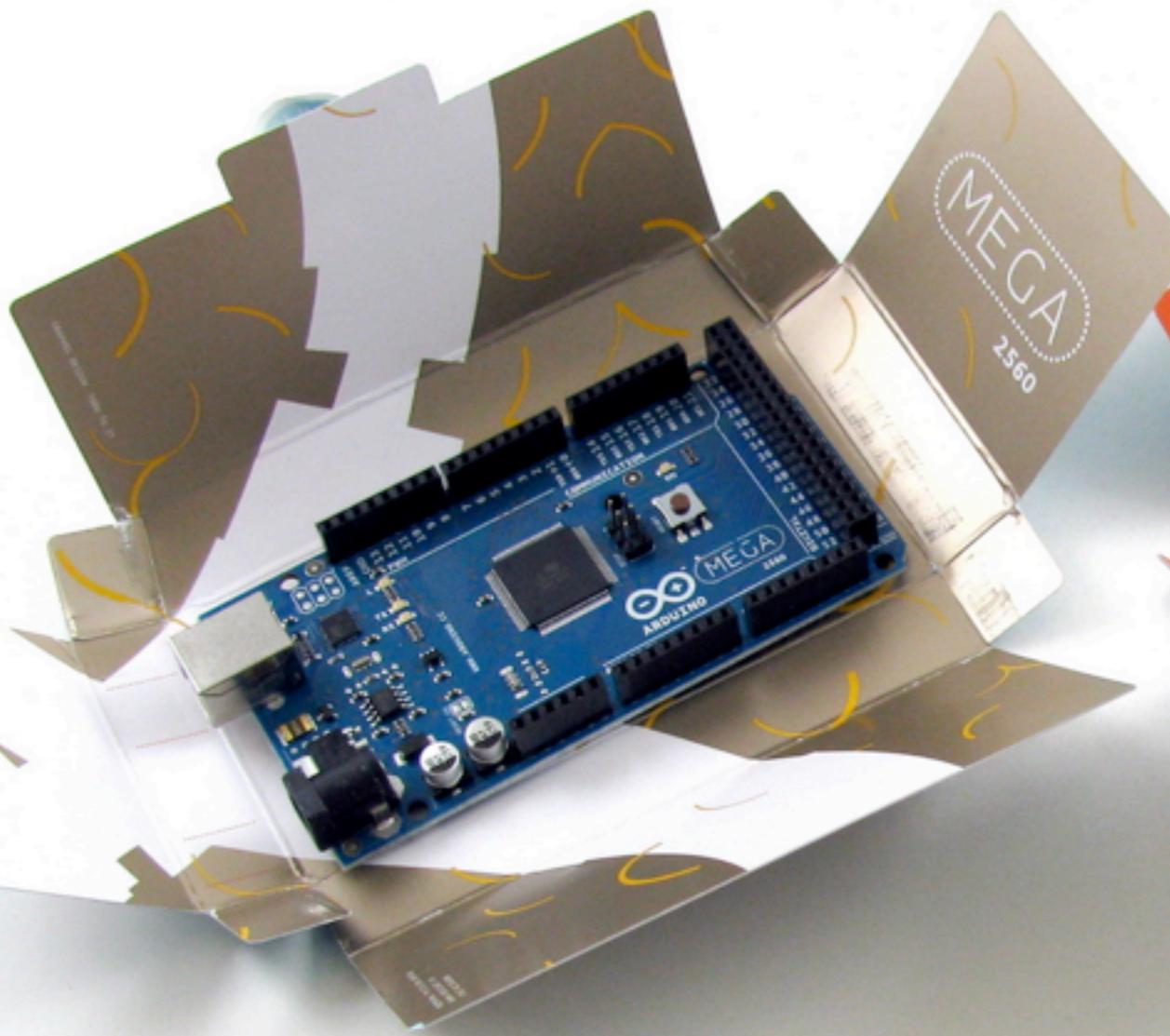
Quantity:

Buy Now

The kit includes:

- a diffraction grating (a slice of a DVD-R)
- a piece of black card paper from which to cut your aperture slit
- a small HD webcam and USB cable
- an aluminum Type LB conduit enclosure
- a strip of double-sided foam adhesive for mounting
- instructions and a copy of the CERN Open Hardware License

Unboxing



See your home
from above!
Make your own
satellite imagery!

Have you open-sourced
your data yet?

Turn your photos into
maps at MapKnitter.org

We collaborate to explore and invest in accessible "Do-It-Yourself" technology. We work with underserved communities to identify, research, and create awareness and accountability around environmental concerns. But it only works if we all share our ideas and innovations! This means that you have some responsibilities:

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spota

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If you contribute to this project, you have the right to be attributed for your work. A full and up-to-date list of contributors can be found at:

PublicLaboratory.org/tool/spectrometer

This is open source hardware

This is an open source hardware design and is released under the CERN Open Hardware License 1.1, a copy of which you can read below, or online at <http://ohwr.org/cernohl>

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Customer vs. Contributor

[PLOTS] Spectrometer - Not Ready for Prime Time



dstoft@gmail.com via googlegroups.com

to publiclaborato. ▾

Mar 19 ⭐



I recently ordered the \$50 Spectrometer kit from the PublicLab site and assembled it via the combined instructions from the web and from the kit. Unfortunately, neither this kit nor the on-line software app are not ready for prime time. I'm an engineer and very experienced with prototyping so I'd expected something more complete in a kit for public sale. However, I write this not as a rant, but as a list of issues which should be solvable or, perhaps, have been solved but just not documented. I'd like to find the answers as I have a need for a spectrometer.

Below are a number of observations / problems which resulted from attempting to follow the build / use instructions.

1 - The web-cam was not difficult to modify though the instru
description of the easiest way to 'un-snap' the housing.

2 - Focusing the camera was attempted via the CD driver/app
lens depth of field is so large that finding an actual focus at 9
ended in just a "rough-estimate" at best – but nowhere did th
there is a better way of determining the best lens setting?

3 - There is no description as to why the 9-in focus is require
system is to that distance. I still can only guess it is more re
imaging chip width but there may be other factors. Why was i
web? It is always help to understand the objective during the
a procedure blind, is much more likely to end in failure.

4 - The cardboard housing folding procedure looks ok, at first
later. Again, the instructions lack clarity of purpose.

5 - The double-stick tape is used to hold the end of the box to
However, the bottom of the housing has a heavy offset label
cardboard box end not being flat with the flaps, the entire box
mounted out of square which makes the slit no longer square
the assembly which will guarantee the slit is square to the ca

[PLOTS] Spectrometer - Not Ready for Prime Time - jywarren@gmail.com - Gmail

<https://mail.google.com/mail/u/0/?ui=2&view=btop&ver=1pxvtf3uo81z&q=non-funct>

Move to Inbox More ▾

However, having a need for a spectrometer, I'm still interested in solving these issues and would appreciate any thoughts, techniques, solutions or links to them.

Perhaps the designer would like to help clarify? That might be the most efficient method.

Thanks, in advance, for any help from the community.

...



Jeffrey Warren <jeff@publiclaboratory.org>

Mar 19 ⭐



to plots-spectrom., dstoft, bcc: publiclaborato. ▾

Hi, Dave - it looks like you've just discovered open source hardware – exciting! Namely: we are a community which [collaboratively develops new technologies](#) based on the contributions of folks like yourself, who are dissatisfied with how things are! The spectrometer (bumping msg to the spectrometry list) is the latest in our effort to improve upon expensive, proprietary tools, and it's great that you're interested in contributing your own expertise. The device is certainly NOT ready for "prime time" – it's an evolving design – and we're all doing our best to improve it! Let me suggest some places where you might join us in improving it:

* Hardware design - luckily, almost all of the issues you highlighted in your email are unimportant to construct a working spectrometer, so once you resolve your software issues, you should have a working device. I do, however, wholeheartedly agree that there is a lack of thorough documentation (if only to reassure folks that they don't have to worry about some of these questions, or to offer more detail to those who are interested in the theory), and some of your suggestions would find a great home in the [Hardware Troubleshooting page](#) or the [Spectrometer FAQ page](#) – i suggest you add them there!



Spectrometer focus

[Edit](#) [Delete](#) [Spam](#)



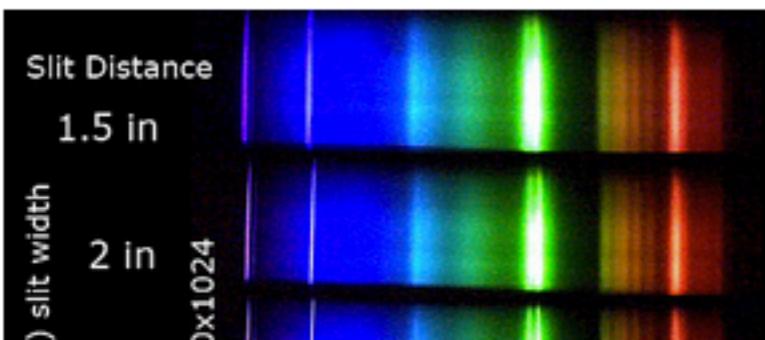
by [stoft](#) | 03 May 20:02



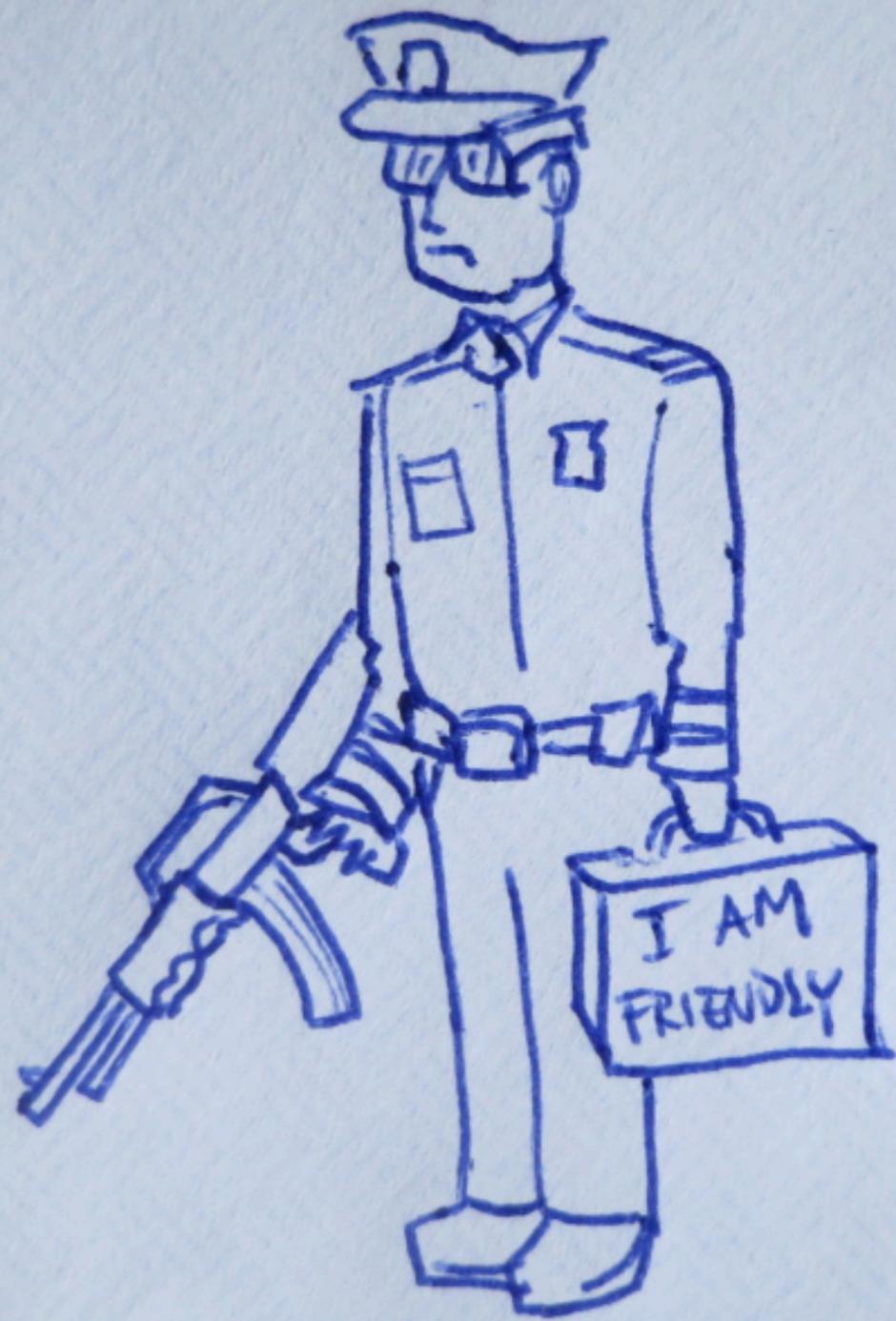
An area of concern for me in rebuilding my spectrometer has been the camera focus. The spectrometer's slit provides pseudo-collimated light so the camera lens should be focused on the slit for best resolution. This is more difficult than it might appear. So, I'm posting two sets of observations:

Setup: - My prototype "bench" setup where I can move components mounted on magnets - movable but stable (what's not shown in the photo is the black cloth cover) - A CFL (EcoSmart 5000k 27W at 5-ft) - A very narrow slit (exacto-blade prototype) - The camera positioned immediately next to the dvd grating - The default Syba camera viewer software with resolution set to 1280x1024

1) First, I used the default technique of the kit to adjust the Syba lens for "9 inches" using room light and small-font text on a card -- the DOF is high so this is very hard to do with any accuracy, so it was just my best guess. Then, I adjusted the slit distance while observing the spectrum. The first attached photo shows that the optimal slit distance for this specific default focus is actually close to 4-inches. This is about double the distance provided by the kit.



Identity



Hacking interactions?

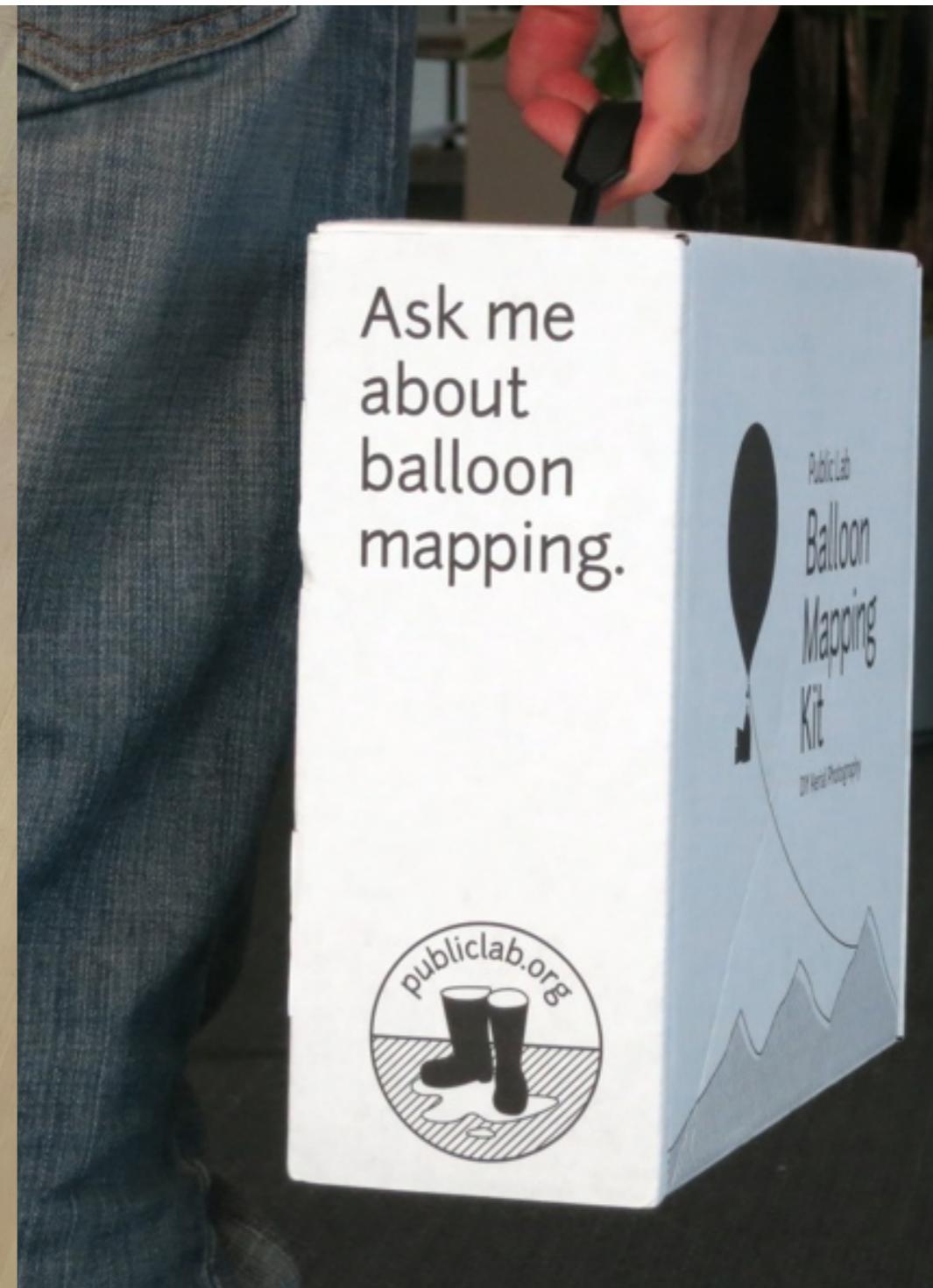
Ask me
about
balloon
mapping.



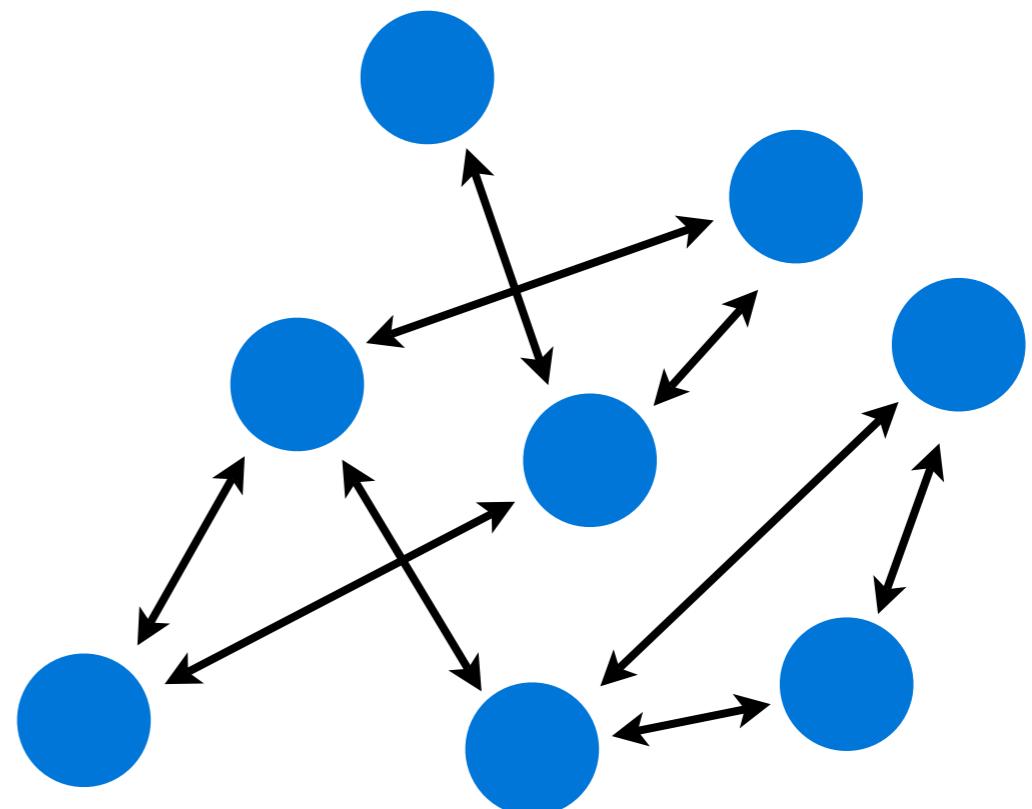
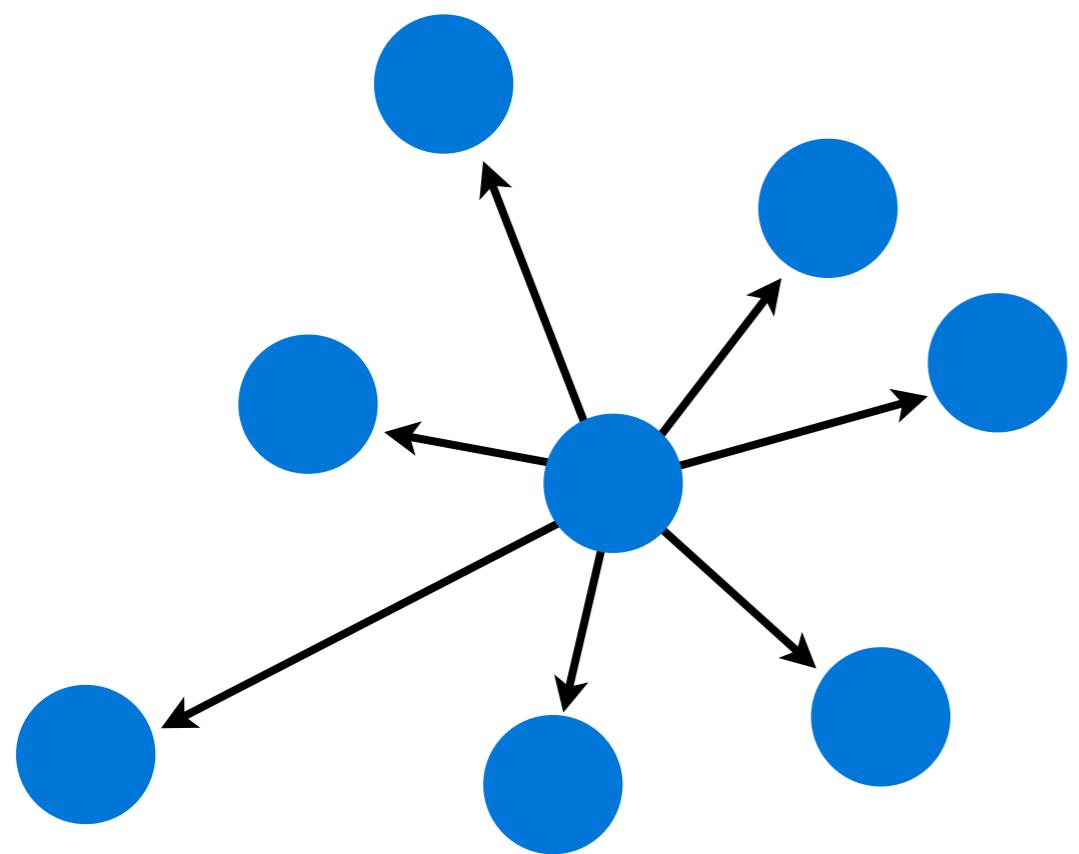
Public Lab
**Balloon
Mapping
Kit**

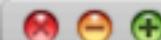
DIY Aerial Photography





Connecting ~~hardware~~
people





Spectral Workbench by Public Lab



Learn ▾

Help

warren ▾

Capture spectra

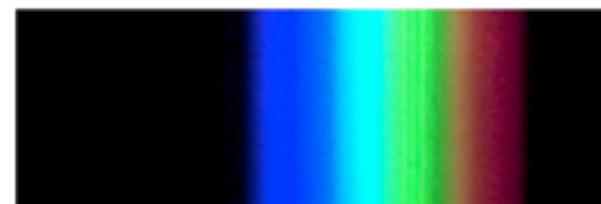


DIY materials analysis

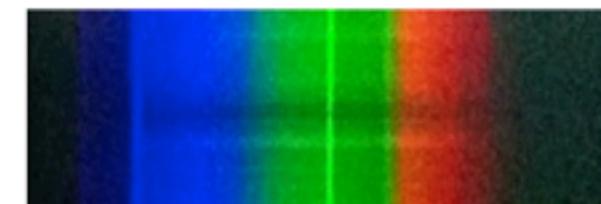
Use a homemade spectrometer to scan different materials, and contribute to an open source database for as little as \$10.

[Build one](#)[Preorder one »](#)

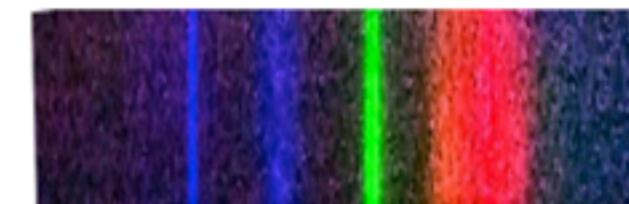
Recently uploaded spectra by contributors like you

[2012/12/5](#)

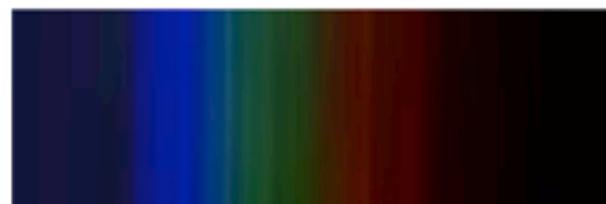
xiangcy | about 7 hours ago

[Flourescent](#)

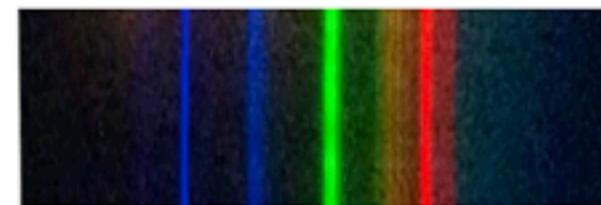
bannseang | about 11 hours ago

[Desklight 6oW 2.0](#)

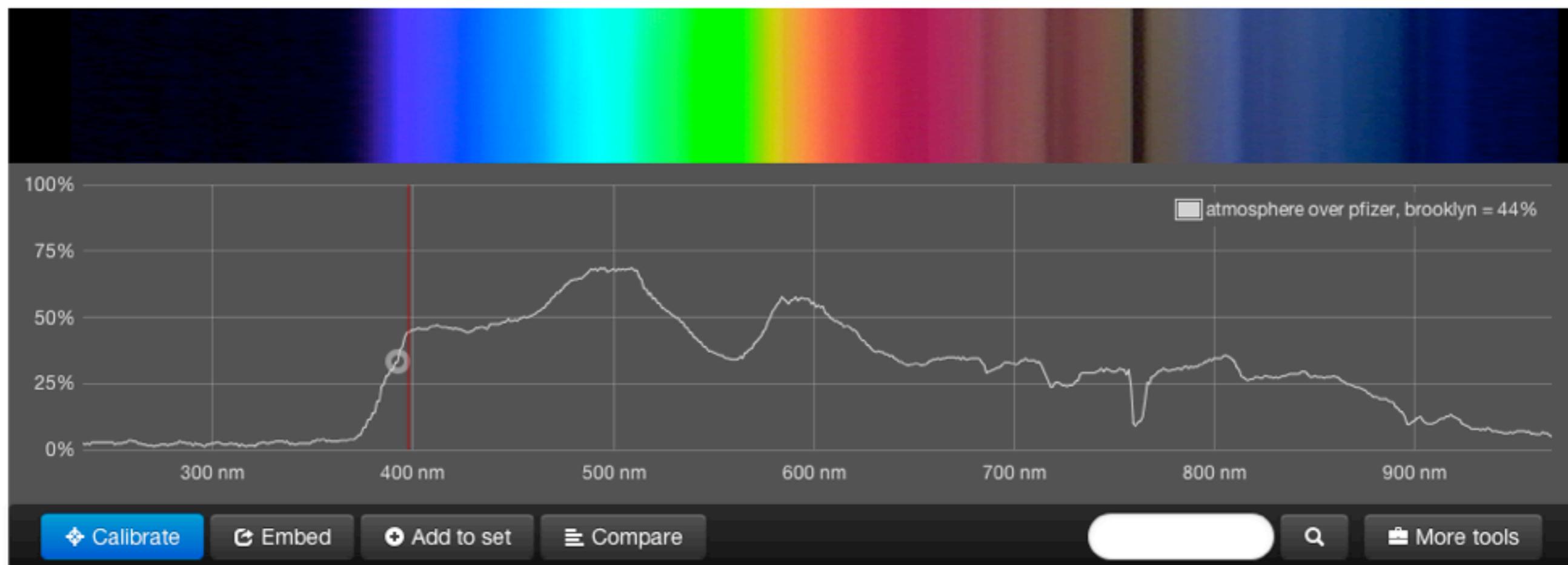
bannseang | about 11 hours ago

[Lightning spect...](#)

amirber | about 11 hours ago

[Desklight 6oW](#)[Lightning spect...](#)[tbh_UV_flashlight](#)[tbh_nite-ize_LED](#)

Spectral Workbench by Public Lab

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atmosphere over
pfizer, brooklyn

uploaded by [liz](#) [RSS](#)

-- (Cloned calibration from
[calibration](#))

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Comments (2)

2 months ago, [warren](#) wrote:

https://en.wikipedia.org/wiki/Fraunhofer_lines Fantastic O₂ lines at ~900nm, 760nm and 685nm! 760 especially. The double line at 717 and 725 that we were wondering about seems to be H₂O according to the graph on Wikipedia:

https://en.wikipedia.org/wiki/File:Spectrum_of_blue_sky.svg I think that if it weren't as overexposed in the blue-green region we'd have gotten some of those lines as well.

[Delete](#)

about 1 month ago, [Fernando](#) wrote:

By the way, the spectrum you took looks really interesting! You can see the Oxygen absorption around 760nm quite well. Although there is a whole world of information in the IR which is not present, where you can see CO₂, water vapour and other greenhouse gases: <http://www.stellarnet-inc.com/images/solar%20image%202000-2400nm.gif>

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The ecology and history of forests and landscapes, and new ways to see these things. High-resolution stitched images of vegetation, including low elevation aerial photography. Enlightening communities about where they live by revealing new perspectives on their environment.

Research Comments Liked (5) MapKnitter maps Joined over 1 year ago



FungalFest

by cfastie | about 9 hours ago | 1 | 51 views | 0

It's been a damp summer, and last week was wet. So there are mushrooms popping up everywhere. The...

Read more »



LEAFFEST project

by cfastie | 2 days ago | 0 | 113 views | 0

Image above: Marzano tomatoes, RGB and infrablue.

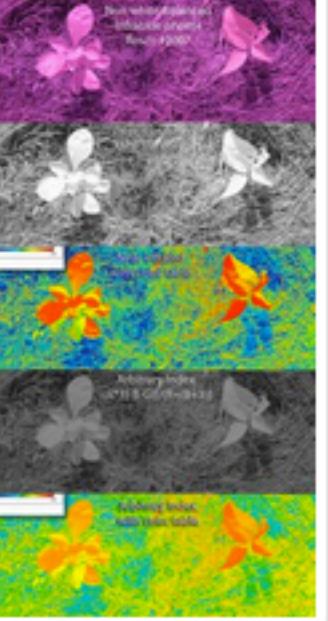
Read more »



LEAFFEST 2013

by cfastie | 6 days ago | 0 | 284 views | 0

Image above: I don't have any photos from the first week of September, so please interpolate betw...



Recover your balance

by cfastie | 15 days ago | 2 | 277 views | 1

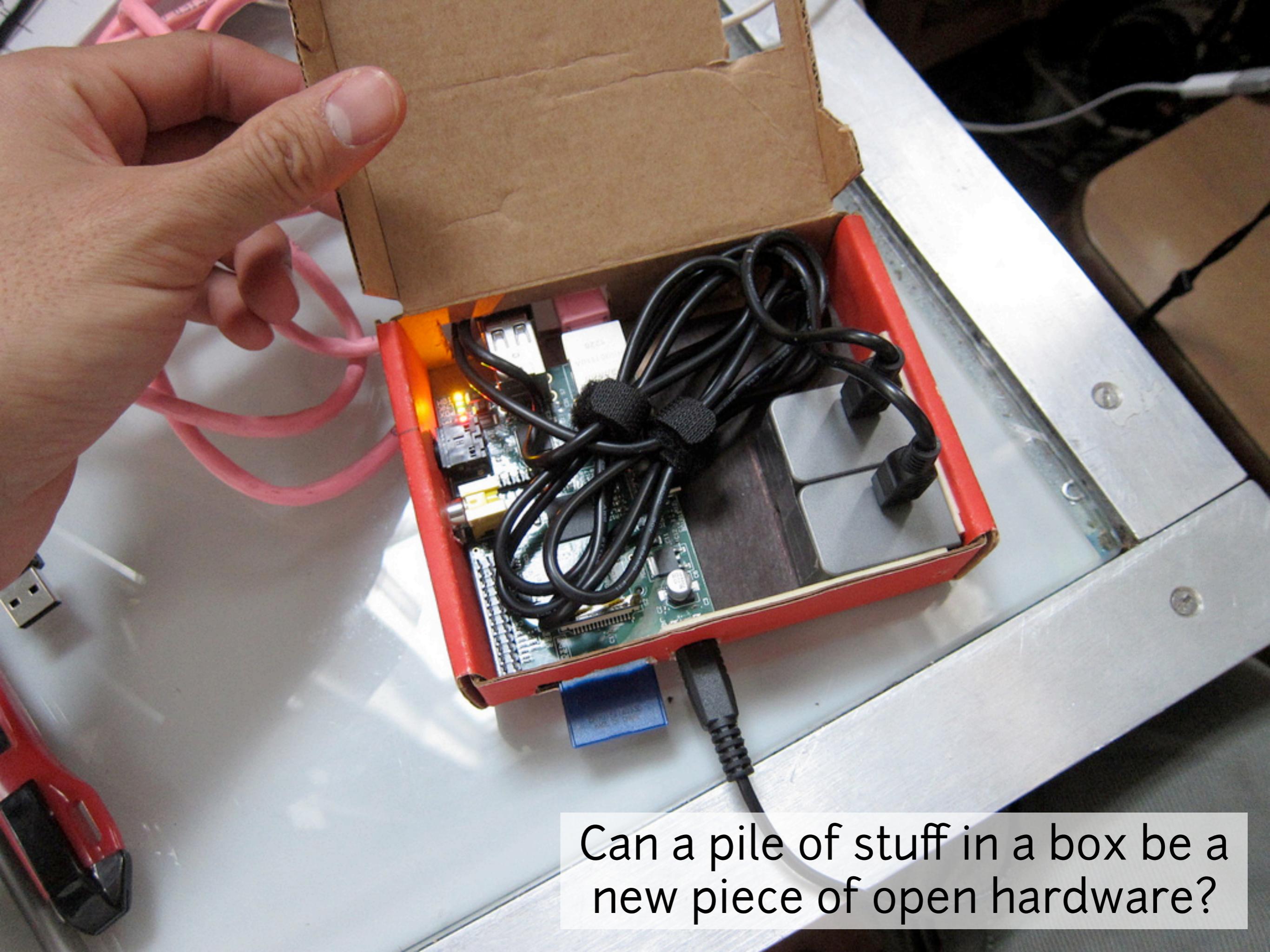
Greg asked about getting useful information from

near-Infrared-camera
kite-mapping events

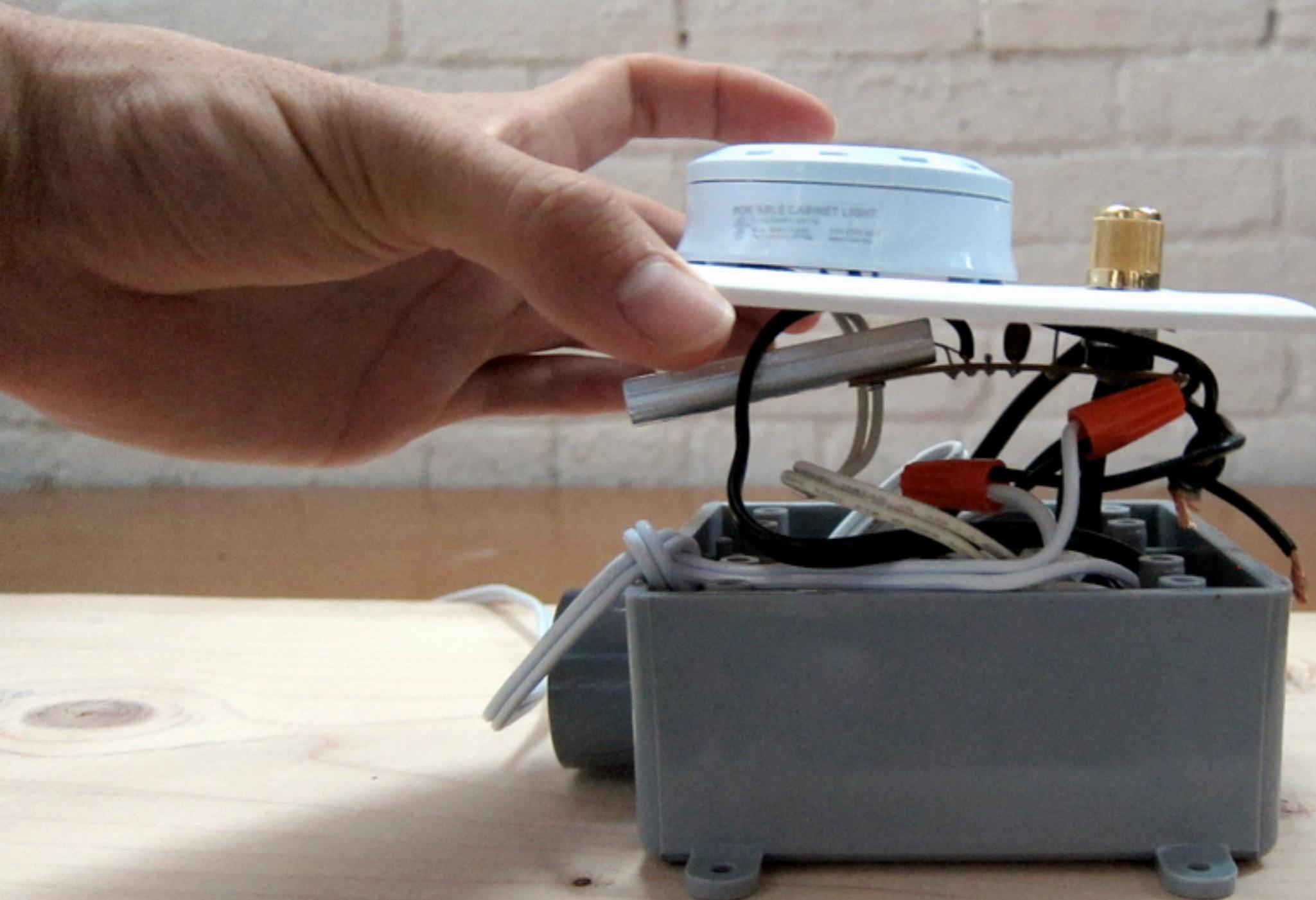
Scale & black boxing

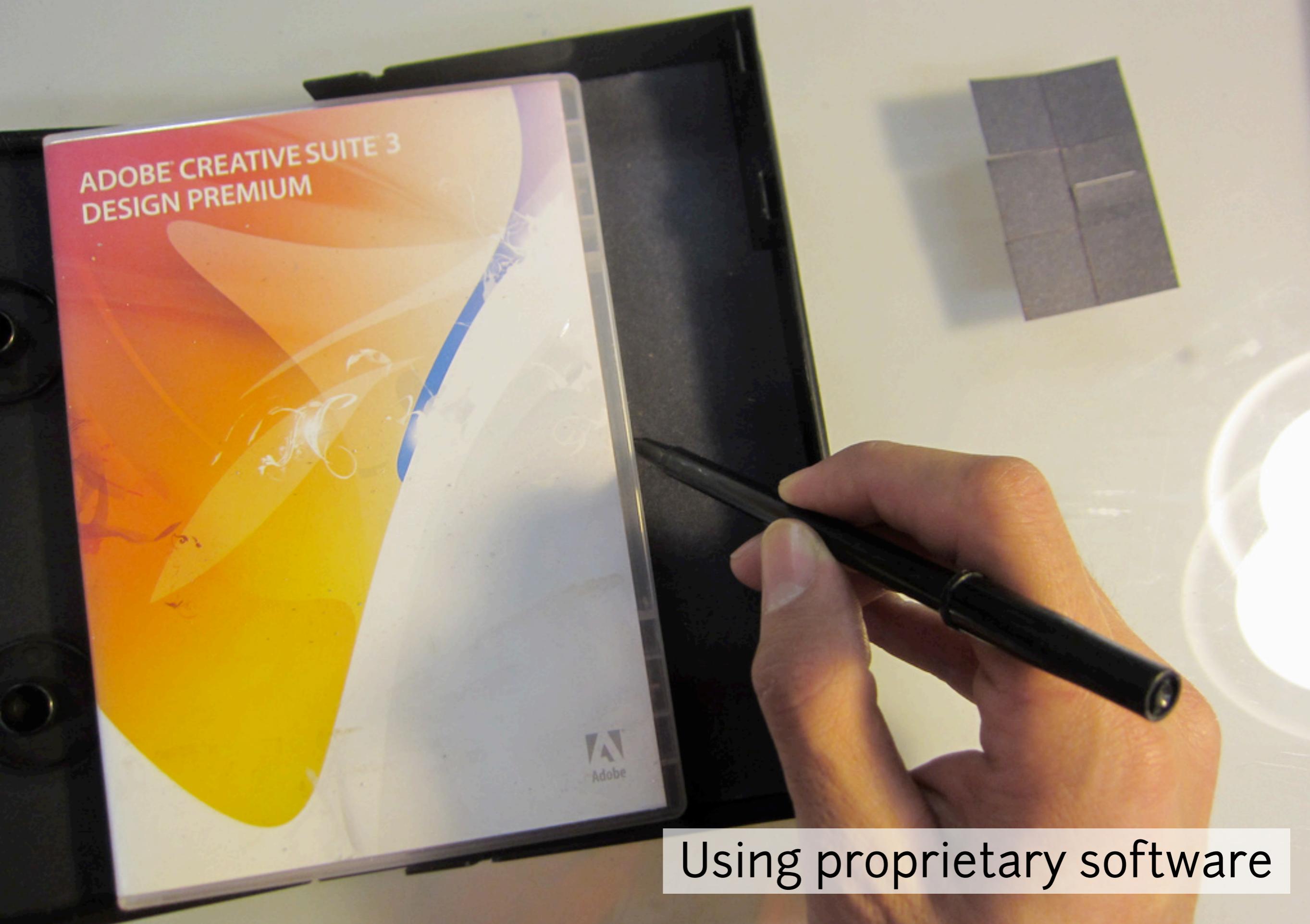
TRICORDER





Can a pile of stuff in a box be a
new piece of open hardware?





Using proprietary software





Designing for one-off and/or mass manufacturing

Open Hardware Kit Checklist

- * Credit contributors
- * Rely on communal, peer support
- * Parts list -- on outside of box
- * Widely available parts
- * Provide peer network point of contact (forum, etc)

Intangibles:

- * Think of how your object/box will make people feel
- * Help newcomers identify as part of the community
- * Make your object/box a gateway to that community

PublicLab.org



This presentation uses the open source font Junction