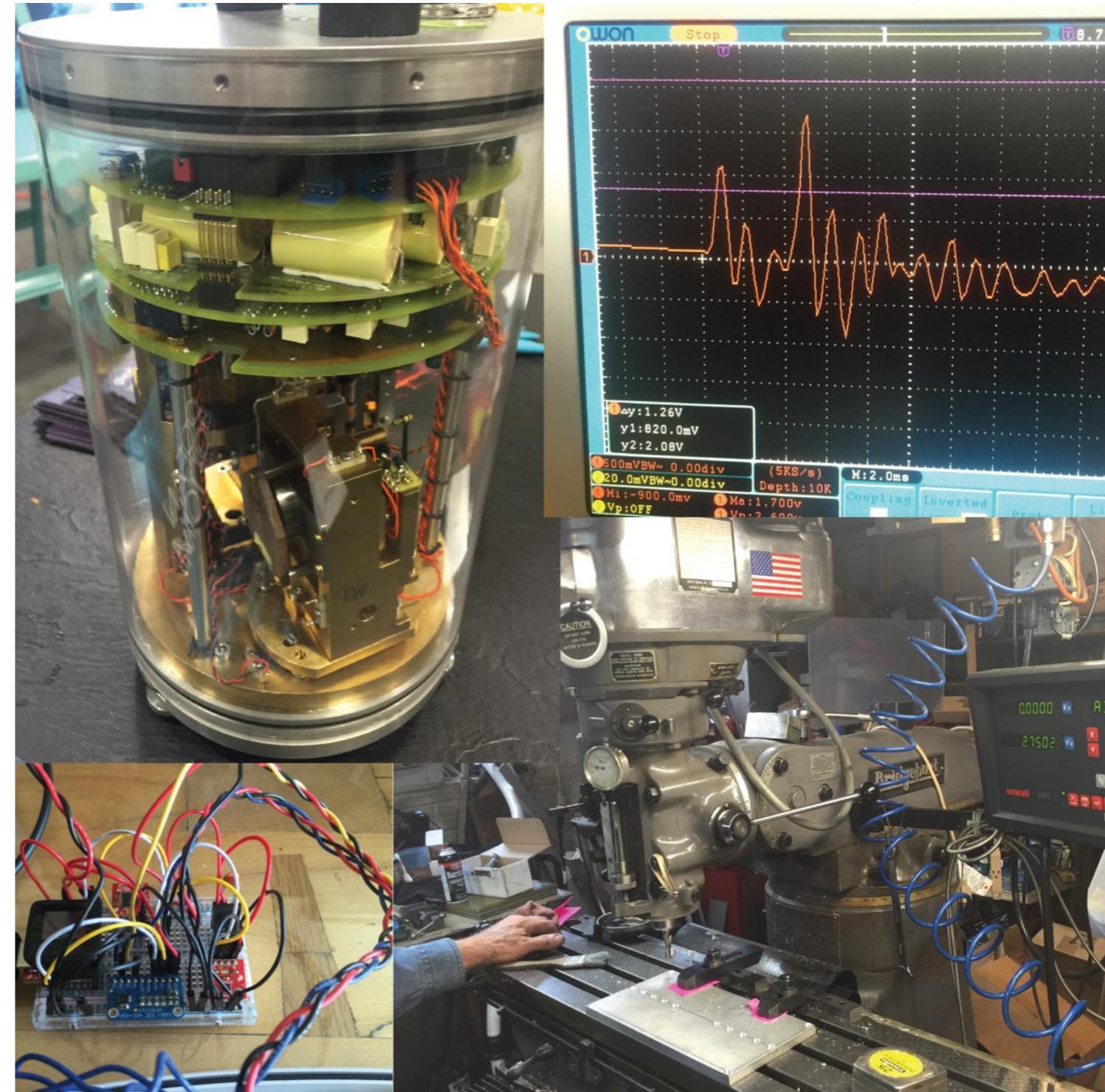


Course Introduction and Arduino Setup

Chris Marone & Clay Wood

Techniques of Geophysical
Experimentation

20 Jan 2021



Please read the syllabus and lecture plans! This is a hands on class that requires participation

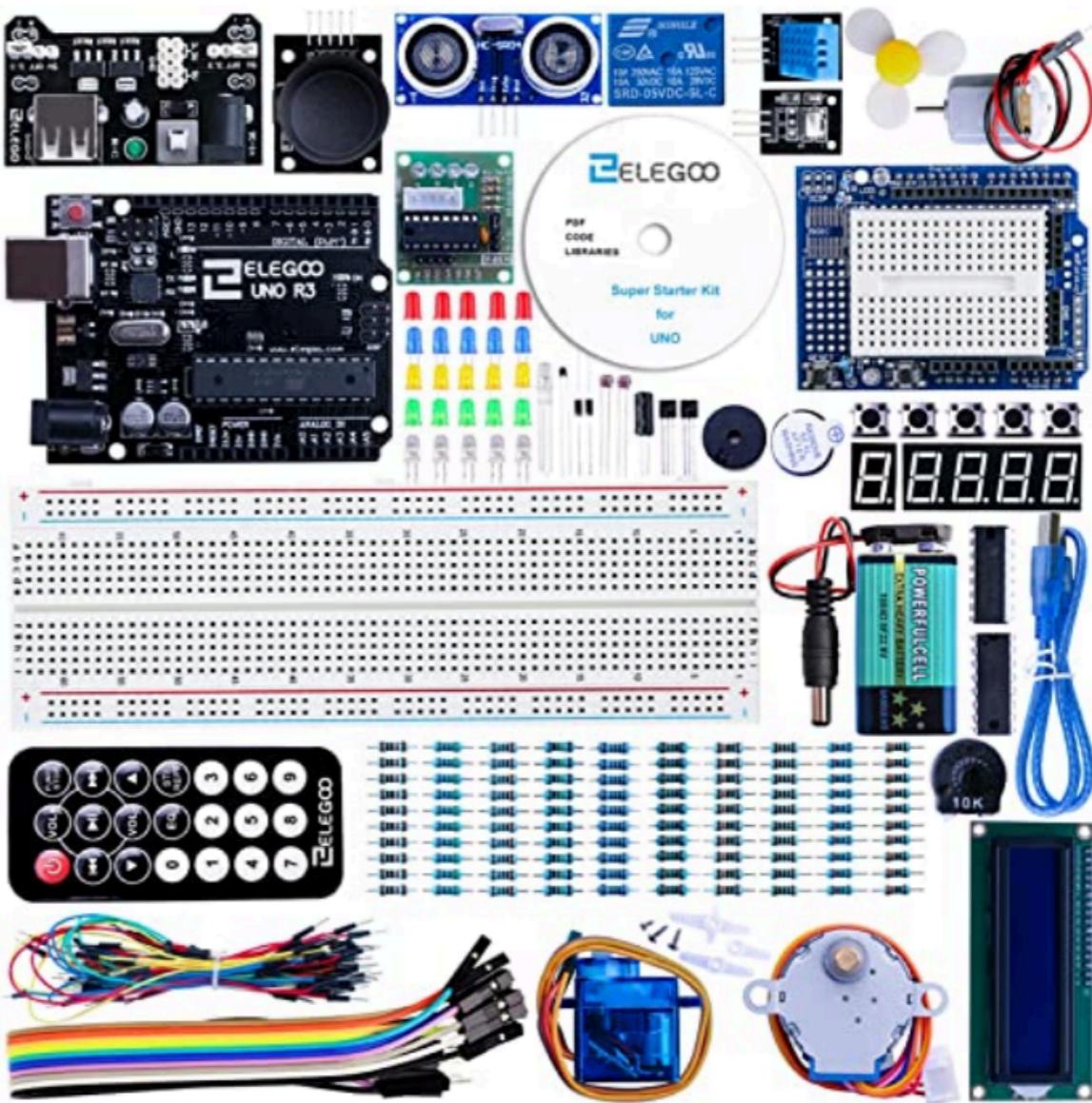
Course Goals

1. To learn how to **design and build** basic mechanical and electrical devices for laboratory measurement work.
2. Gain **hands-on experience** using real equipment, sensors, and machines with particular focus on the Biaxial deformation machine in the Rock Mechanics Lab

Exercises	50%
Final Project	40%
Class Participation	10%

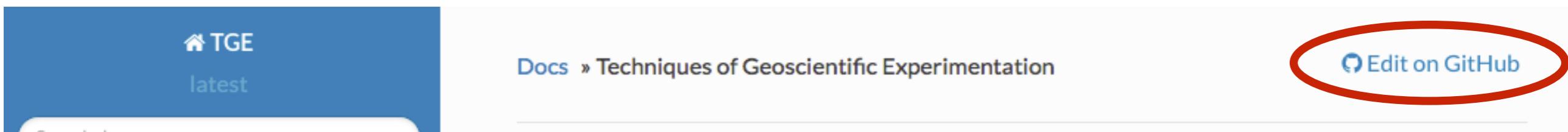
Bring your ELEGOO Kit and Laptop to every class

ELEGOO UNO Project Super Starter Kit with Tutorial and
UNO R3 Compatible with Arduino IDE



We'll use Canvas, Github and also this resource:
<https://tge.readthedocs.io>

Bookmark this website



The screenshot shows a portion of the [TGE documentation website](https://tge.readthedocs.io). The top navigation bar includes the TGE logo, a 'latest' link, and a search bar labeled 'Search docs'. Below the navigation, there's a sidebar with links to 'Shop Tools and Practices' and categories like 'Mechanical', 'Electronics', 'Transducers', 'Control Systems', and 'Lab Exercises'. A note at the bottom of this sidebar encourages funding for the project. The main content area has a breadcrumb trail 'Docs » Techniques of Geoscientific Experimentation' and a large title 'Techniques of Geoscientific Experimentation'. To the right of the title is a 'Edit on GitHub' button, which is highlighted with a red oval. The main text describes the TGE resource as a platform for learning experimental equipment development across various fields. Below the text is a photograph of a complex experimental setup, featuring a cylindrical metal vessel connected to a computer monitor displaying a waveform graph.

TGE
latest

Search docs

Shop Tools and Practices

Mechanical

Electronics

Transducers

Control Systems

Lab Exercises

Open Source (including Read the Docs) is [underfunded](#). This report from the Ford Foundation is a must-read.

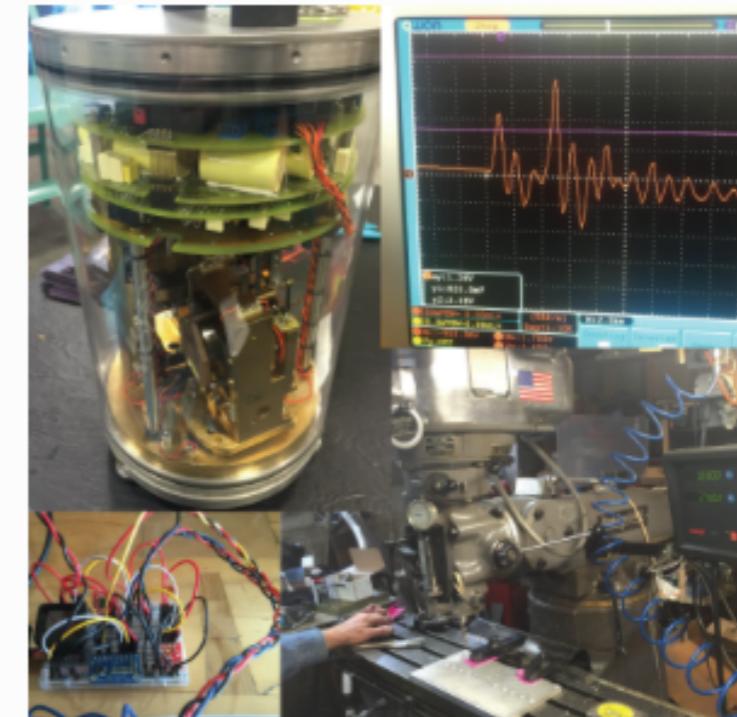
Docs » Techniques of Geoscientific Experimentation

[Edit on GitHub](#)

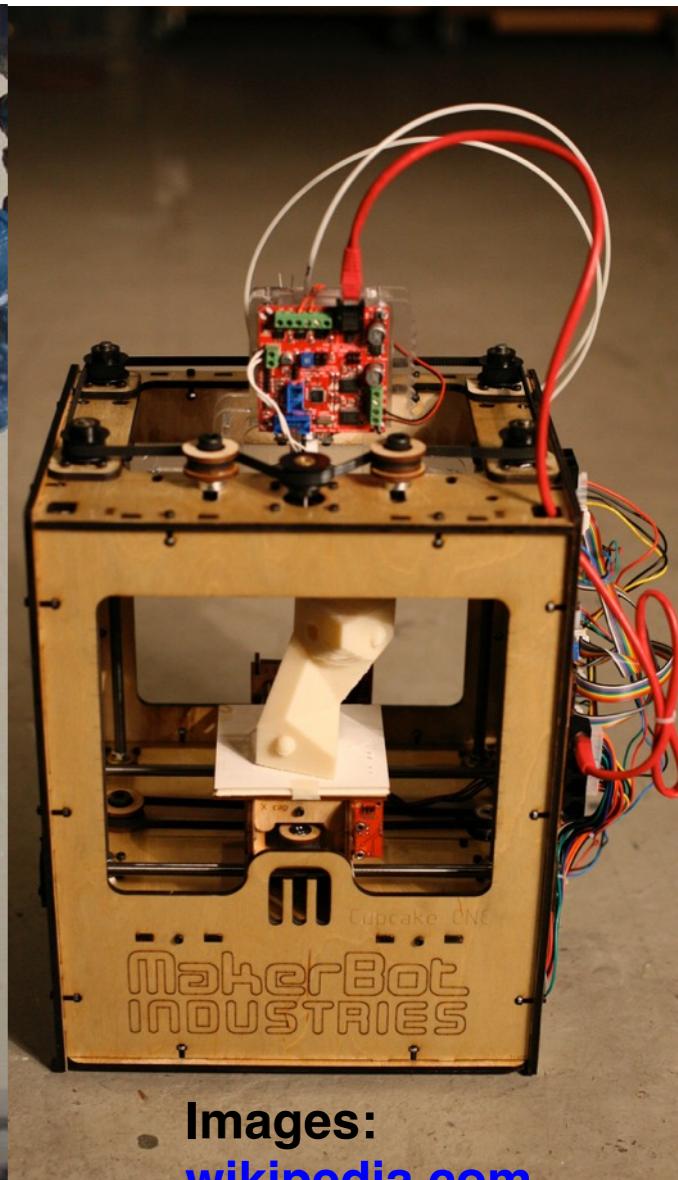
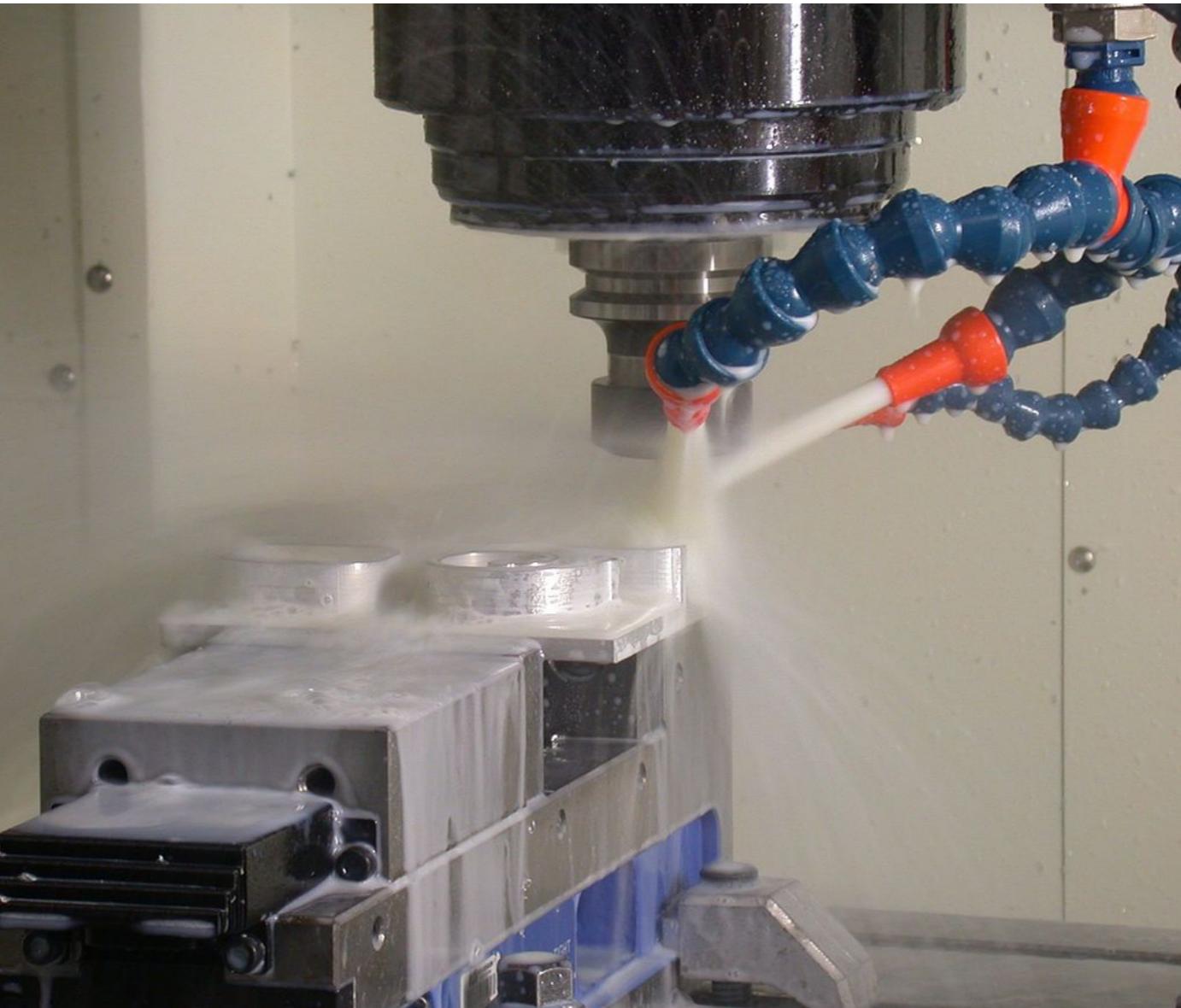
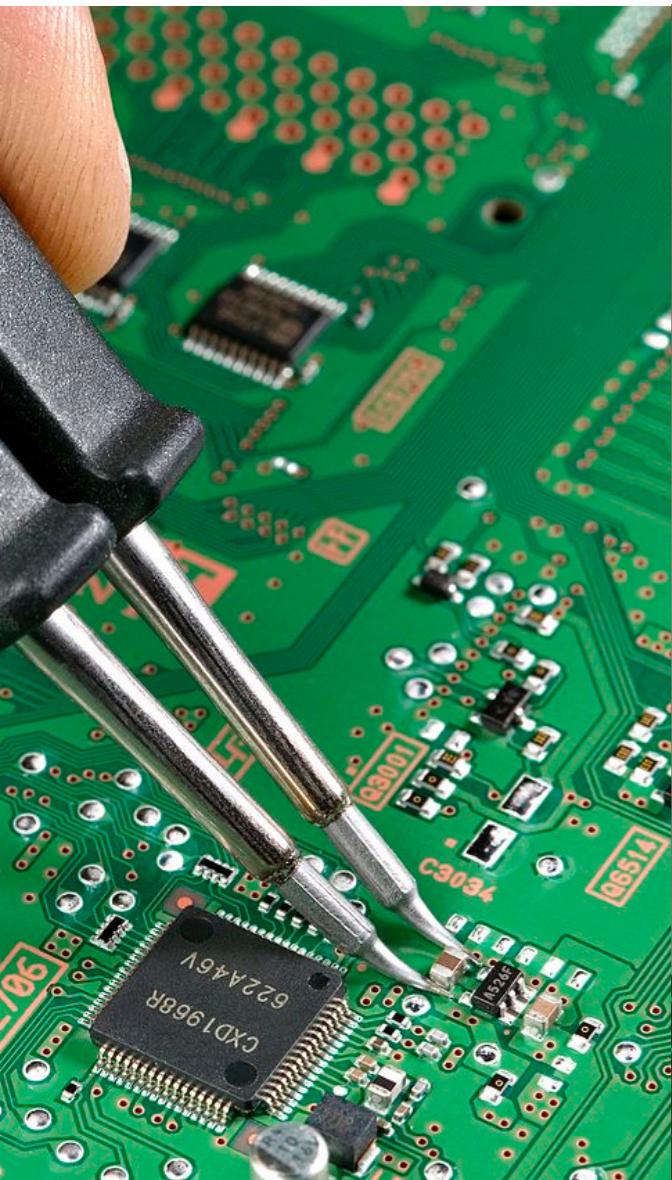
Techniques of Geoscientific Experimentation

Techniques of Geoscientific Experimentation (TGE) is a resource designed to help scientists, hobbyists, and experimentalists learn how to develop their own experimental equipment. Topics include mechanical design, data acquisition, electronics, microcontrollers, CAD, pressure vessel design, and more.

This course material has been primarily developed by John Leeman and Chris Marone. The format and online format of the course are patterned after the excellent course structure developed by researchers and students at the University of British Columbia. Their courses are available on geosci.xyz. We encourage others to use the material with proper citation. Contributions are welcome and encouraged - the material improves through repeated use! Join the development on [github](#).



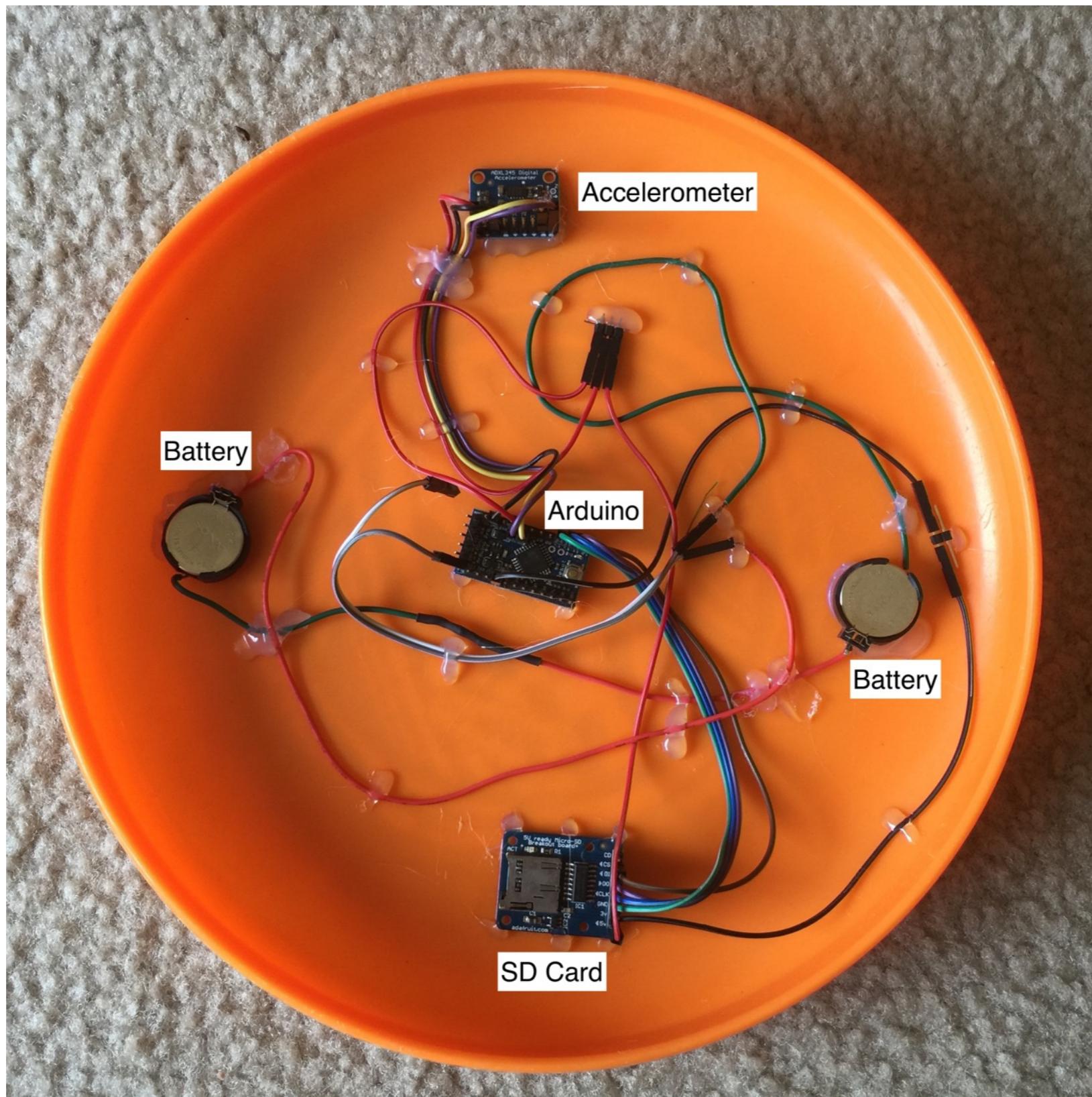
A key part of the course is a semester long project



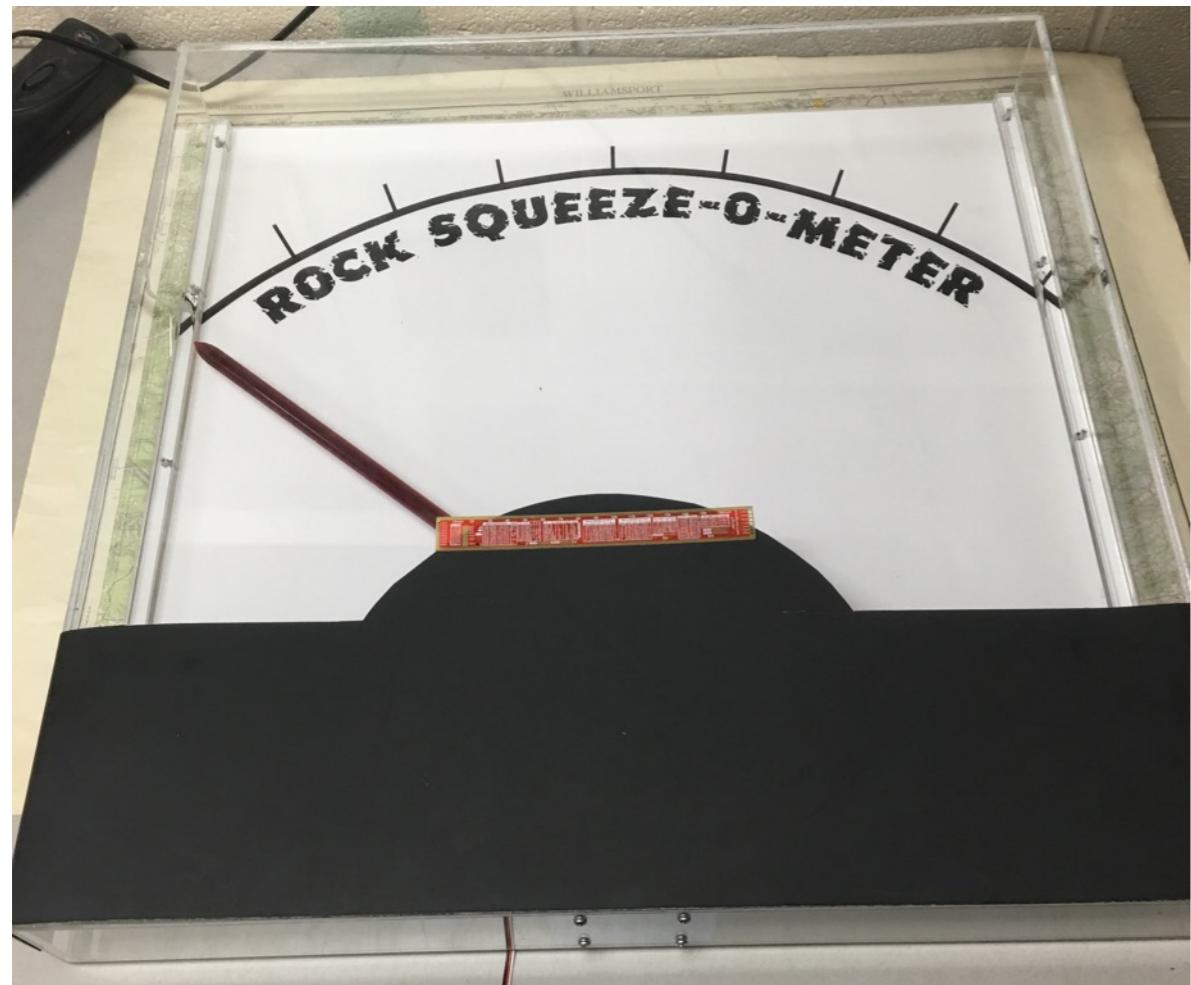
Images:
[wikipedia.com](https://en.wikipedia.com)

- Uses multiple disciplines we discuss (i.e. mechanical, electrical, software, etc.)
- Solves a problem with no commercial solution or no economical commercial solution.
- Will not cost thousands of dollars to build
- Does not put you or others in the path of potential harm or danger.

A few example projects



A few example projects



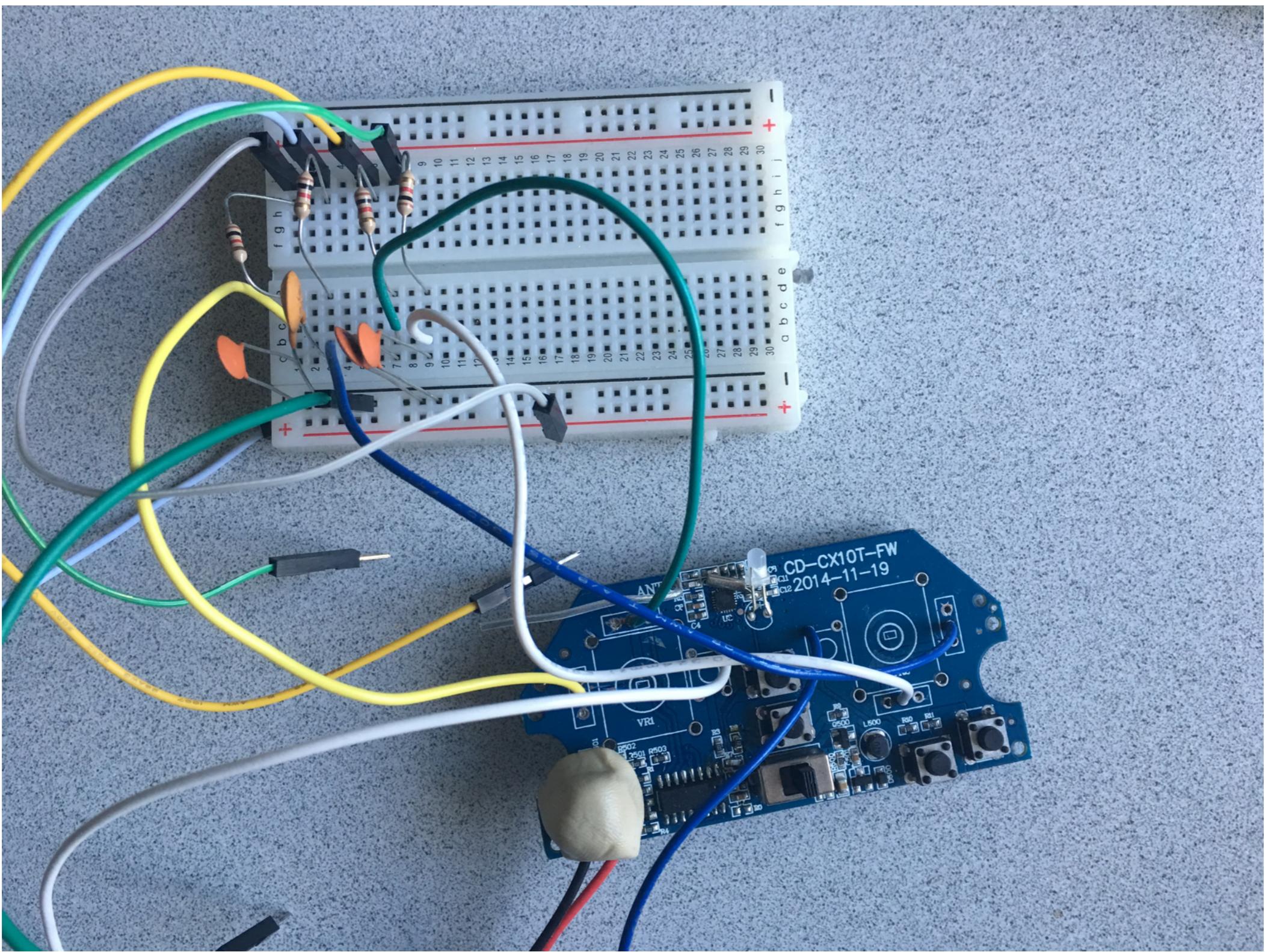
A few example projects



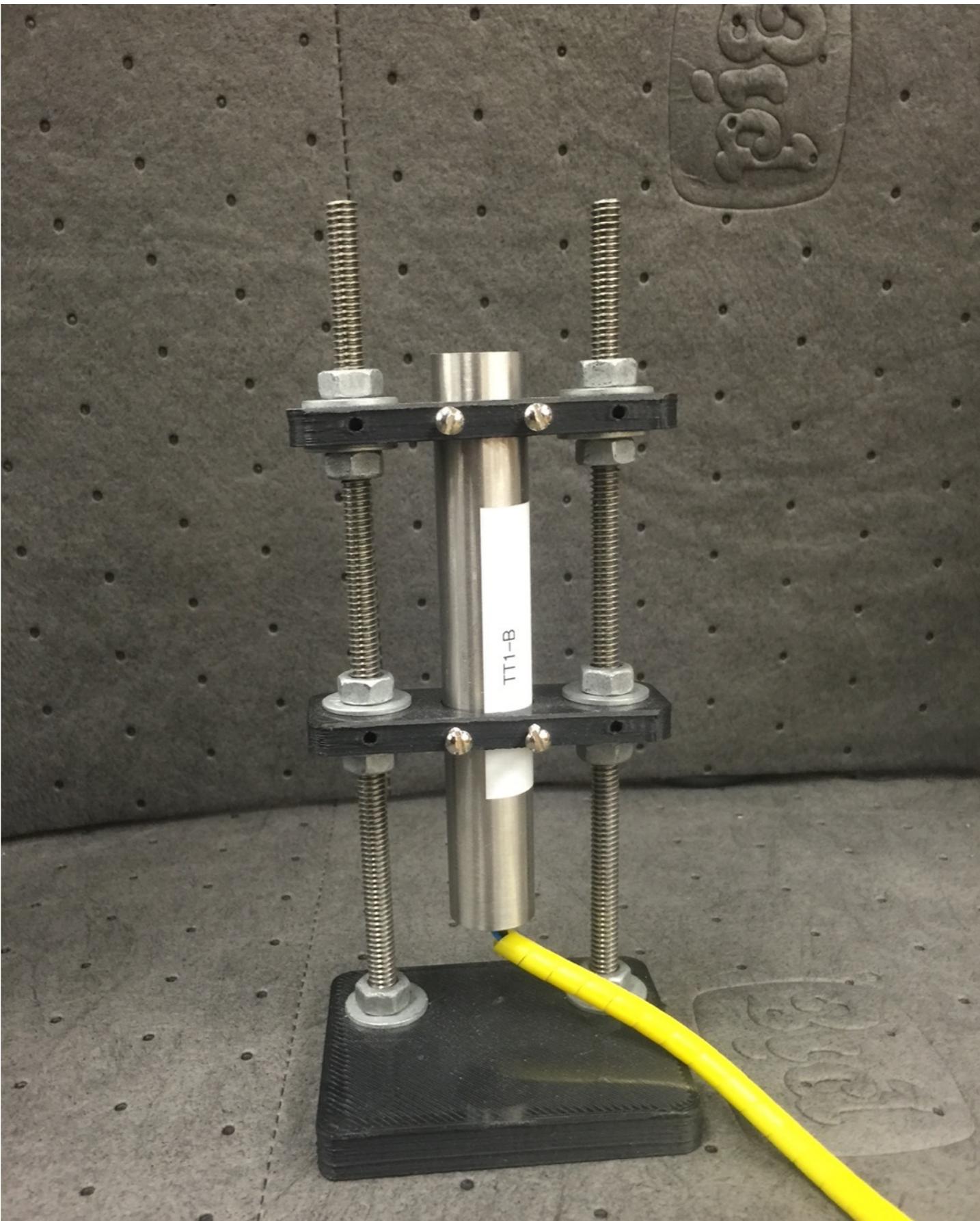
A few example projects



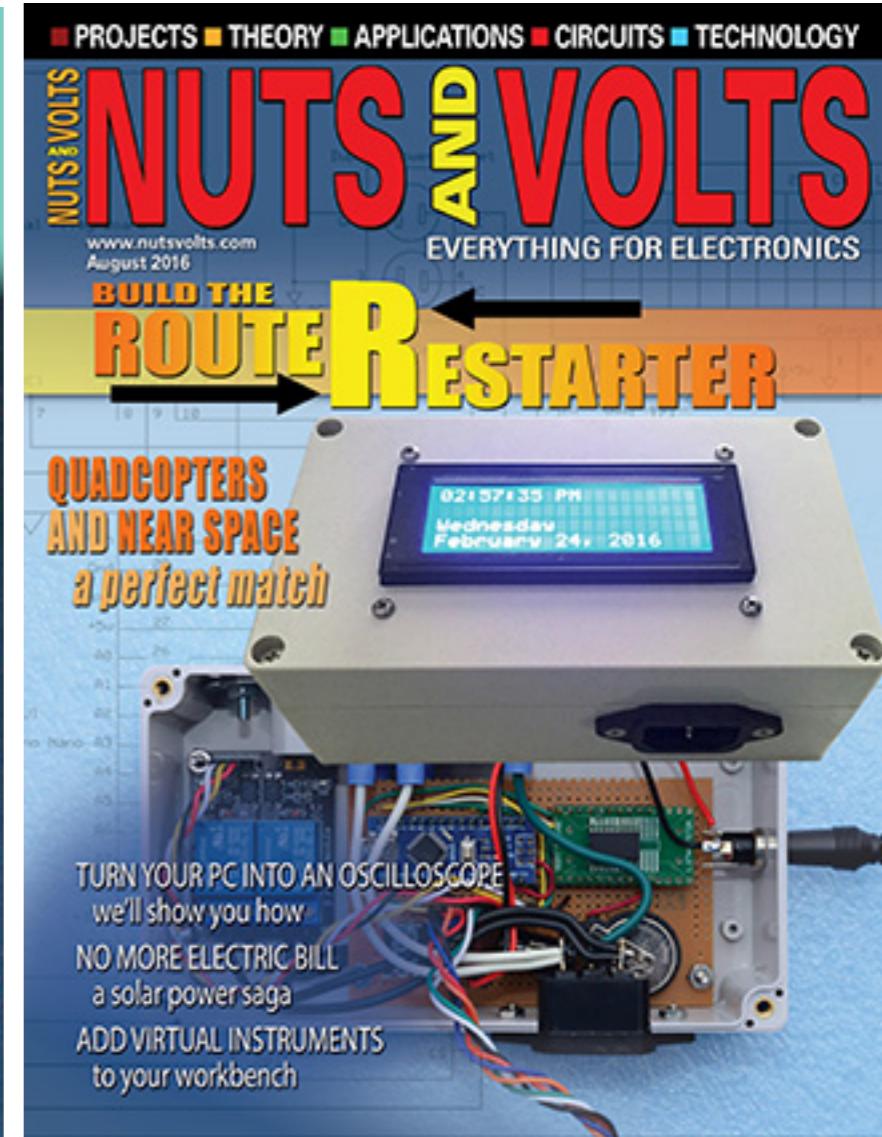
A few example projects



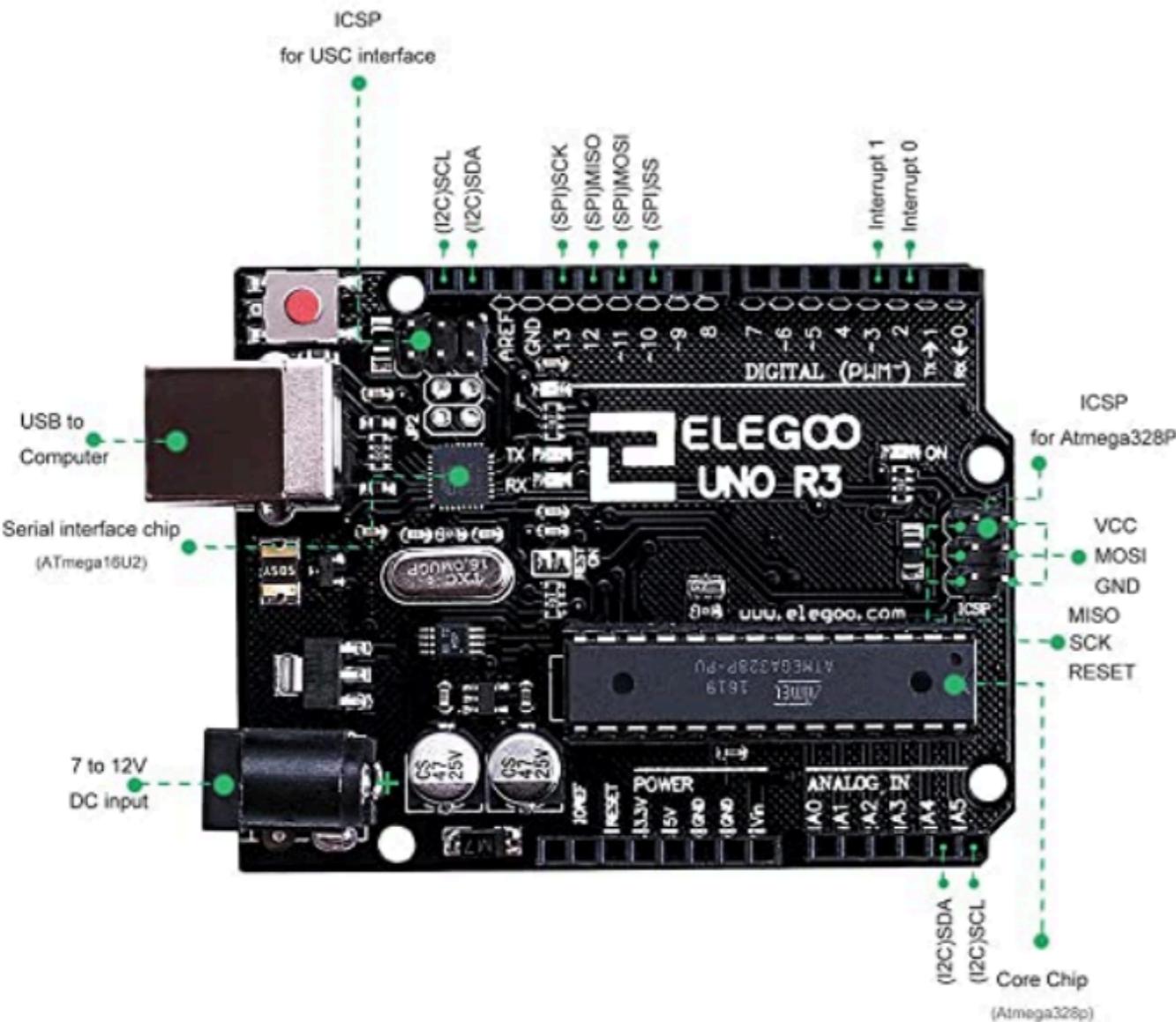
A few example projects



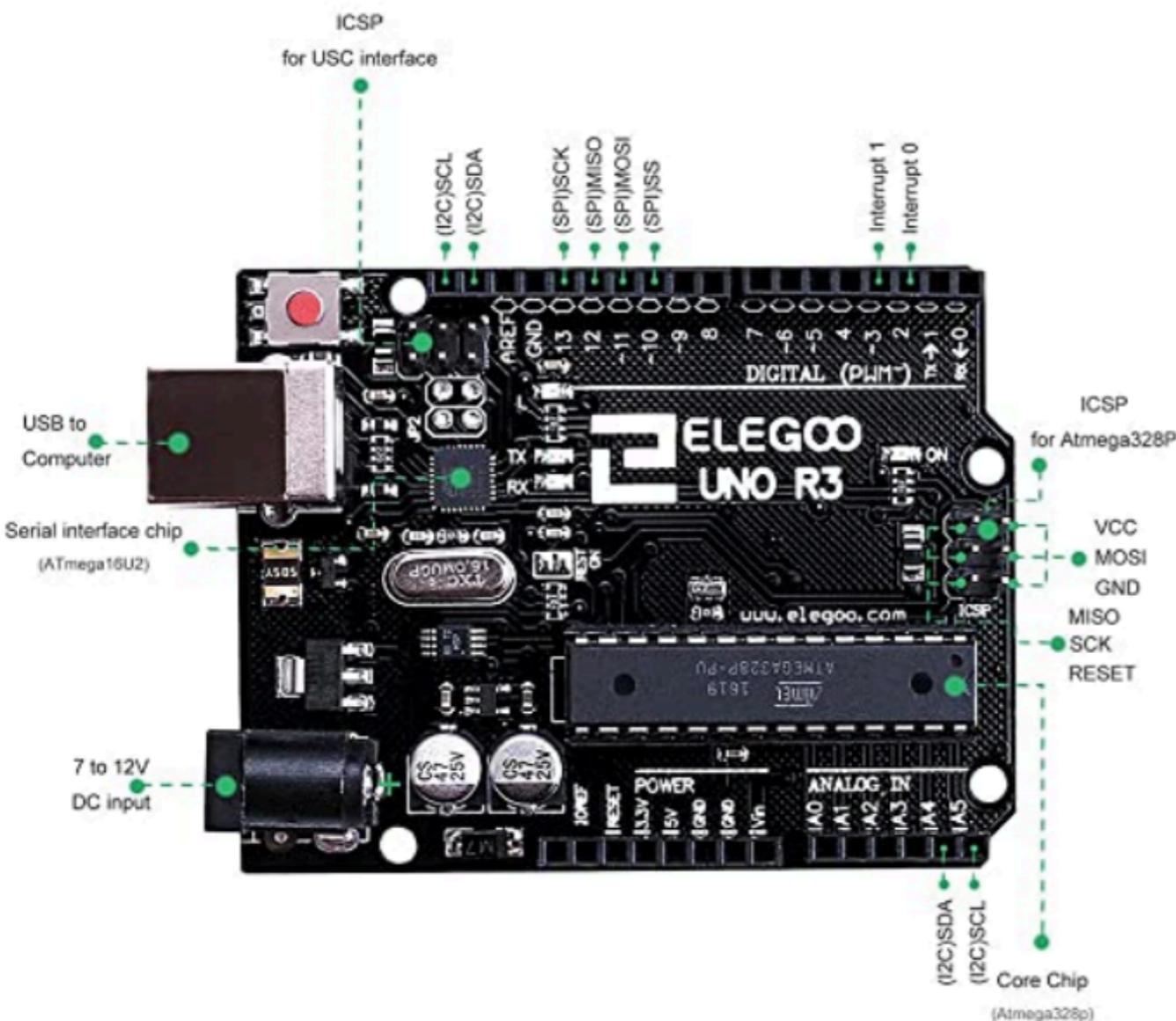
Sources of inspiration are everywhere



Let's dig into the kit and see what you have



Activity: Blinky --Let's do it now



<https://www.arduino.cc/en/Tutorial/BuiltInExamples/Blink>

Activity due next week: Stoplight

<https://www.instructables.com/Arduino-Street-Traffic-Light/>

Submit your code via Canvas