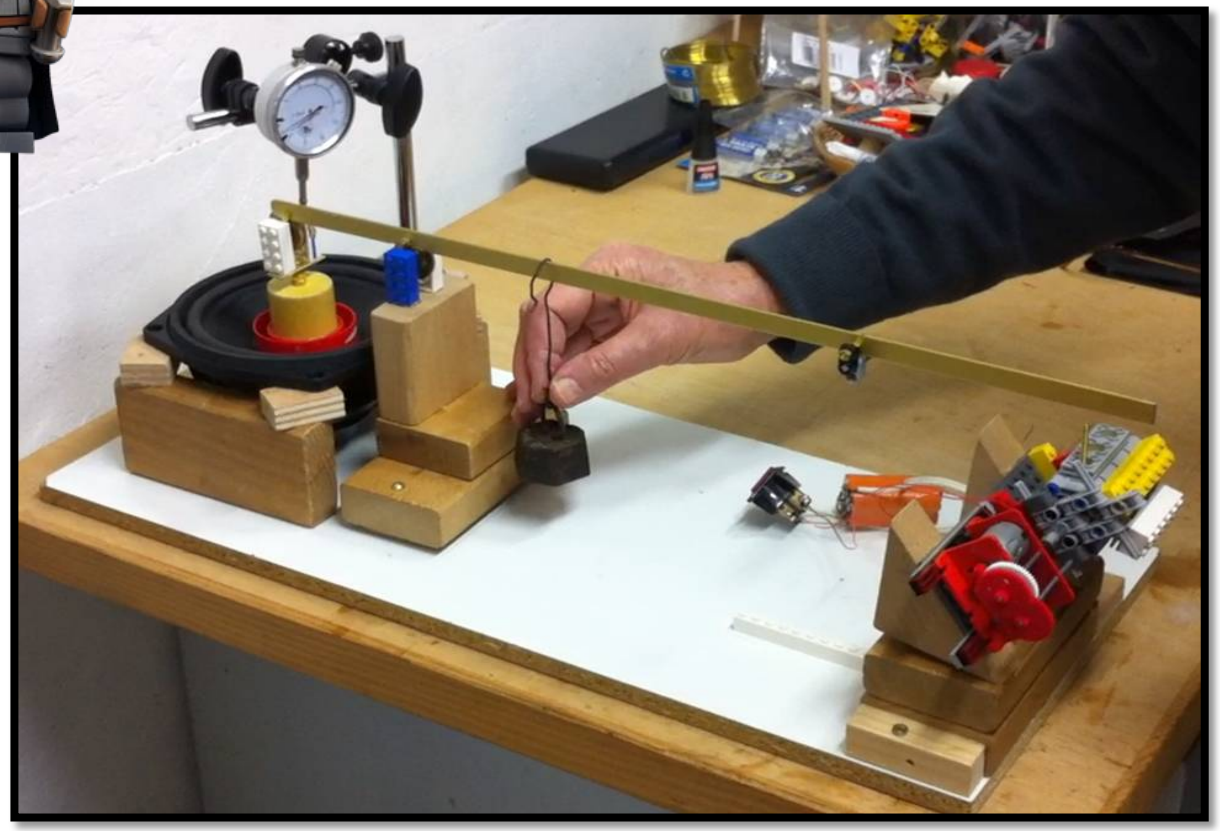
The NIST LEGO® Watt Balance

CCM 2015

The *Real* Pioneers

- Terry Quinn, Richard Davis, and Lucas Quinn (age 11!) blazed the path (THANK YOU)



- *Physics Education,* 2013, "A simple watt balance for the absolute determination of mass"

Pick a side. Any side. A? B? You can weigh on either side!

Striving towards that 1% uncertainty…

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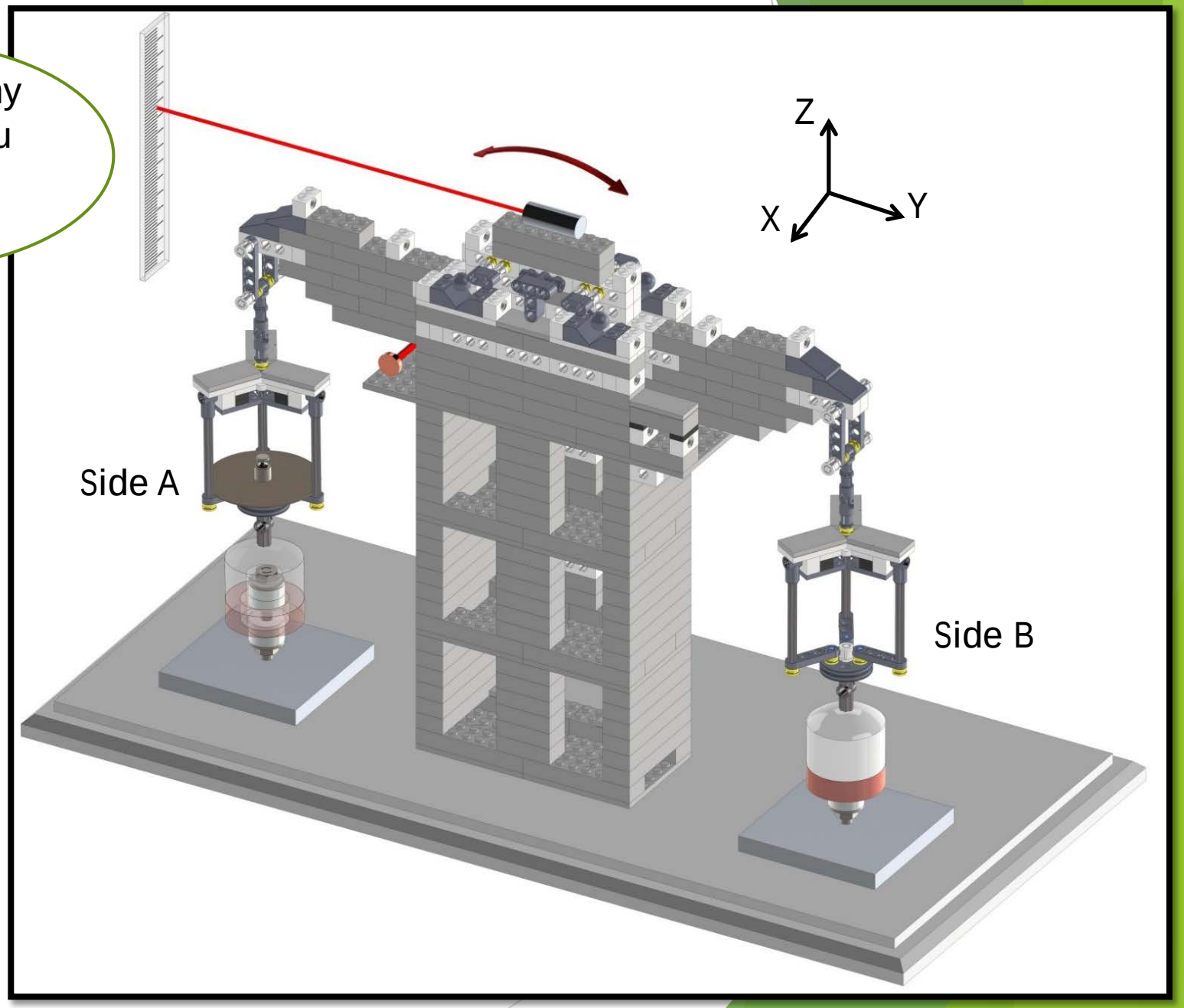
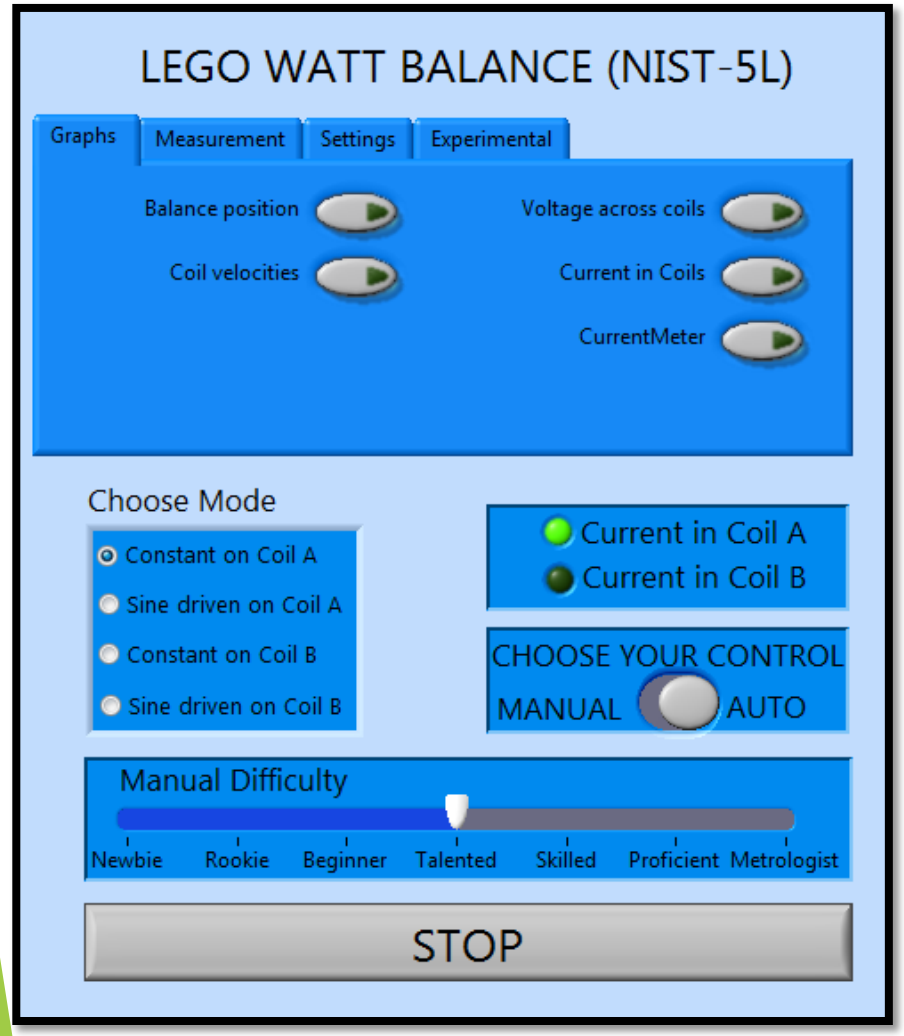
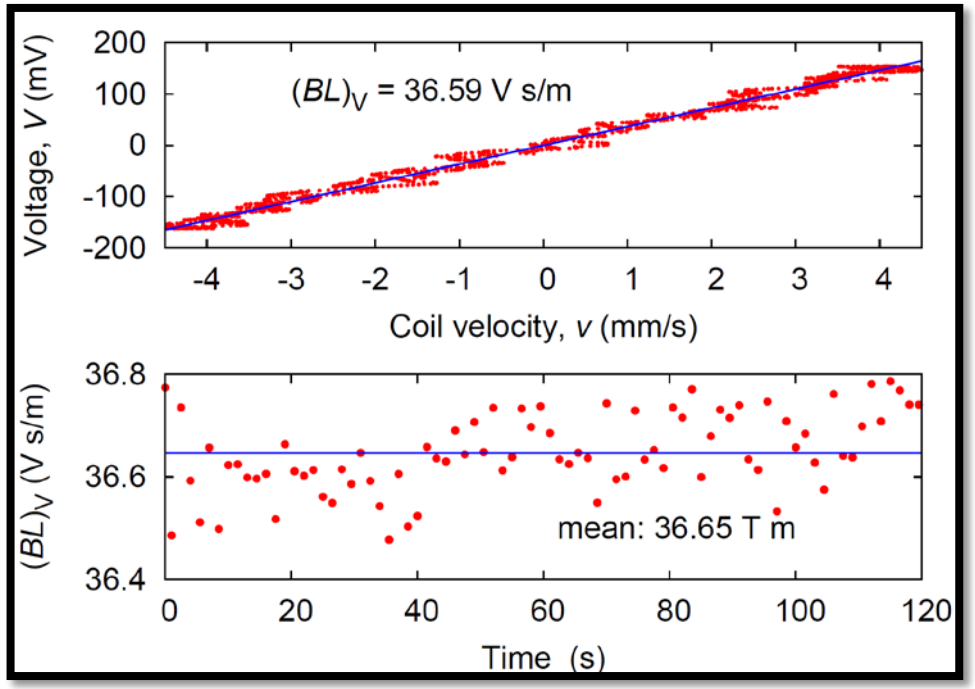
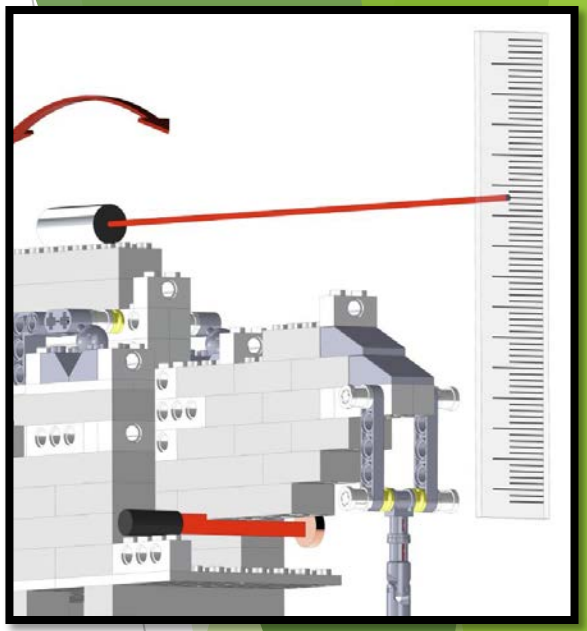


Capabilities

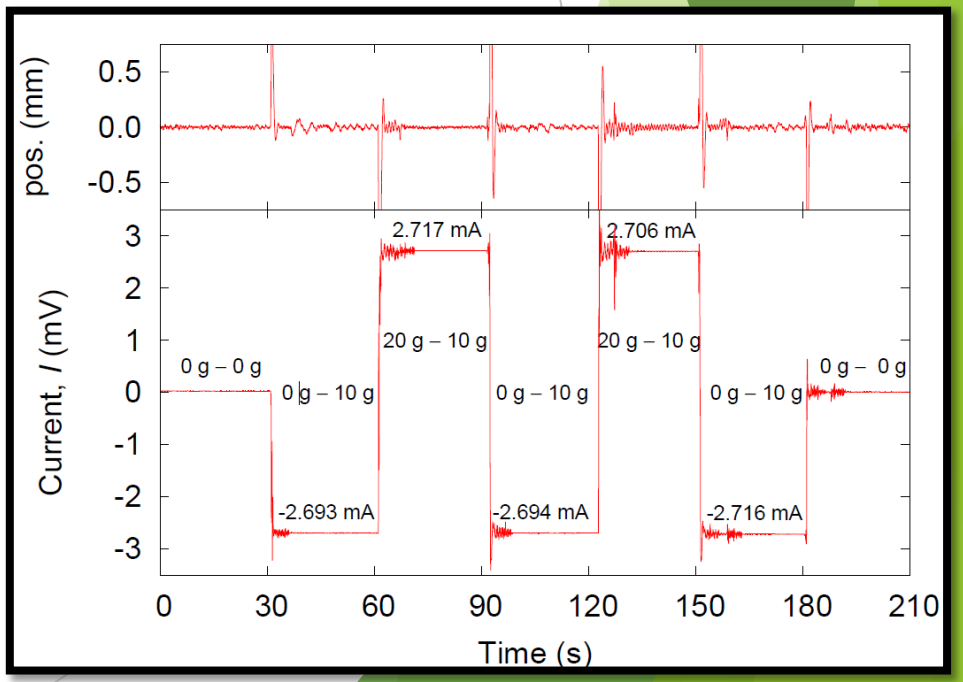






Velocity Mode
Uses a calibrated optical interrupter to measure real time displacements.

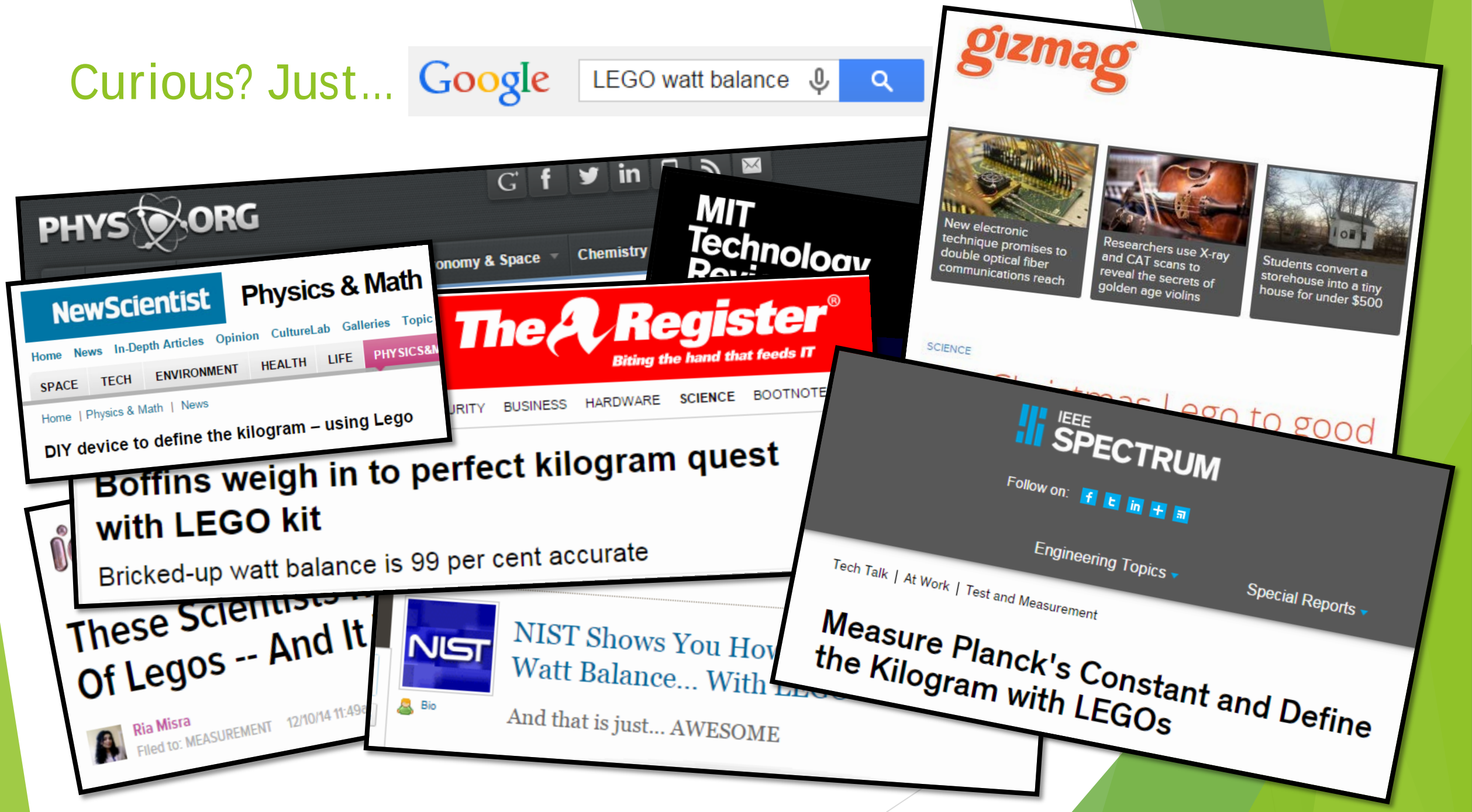
Force Mode
Control loops adjust the current to null the balance during a series of mass on and mass off measurements.



We are aspiring to grow a community

- Submitted to *American Journal of Physics*, 2015:
  - **"A LEGO Watt Balance: An apparatus to demonstrate the definition of mass based on the new SI"**
  - **http://arxiv.org/abs/1412.1699**
- **New Facebook page:** LEGO Watt Balance
  - **www.facebook.com/LEGOwattbalance**
- **New NIST Redefining the Kilogram webpage**
  - **http://www.nist.gov/pml/si-redef/kg_redefinition.cfm**
- YouTube **video on the way…**

Curious? Just...



What are you waiting for?!

- There's a LEGO watt balance community sprouting right now. Don't get left out!
- We encourage everyone to build their own table-top sized watt balances.
- Build your own version and keep improving the concept!!!

- Contact: Leon Chao
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