

Honors Capstone Research (HCR) Summer Program 2018

Revitalizing Labs for Physics 115

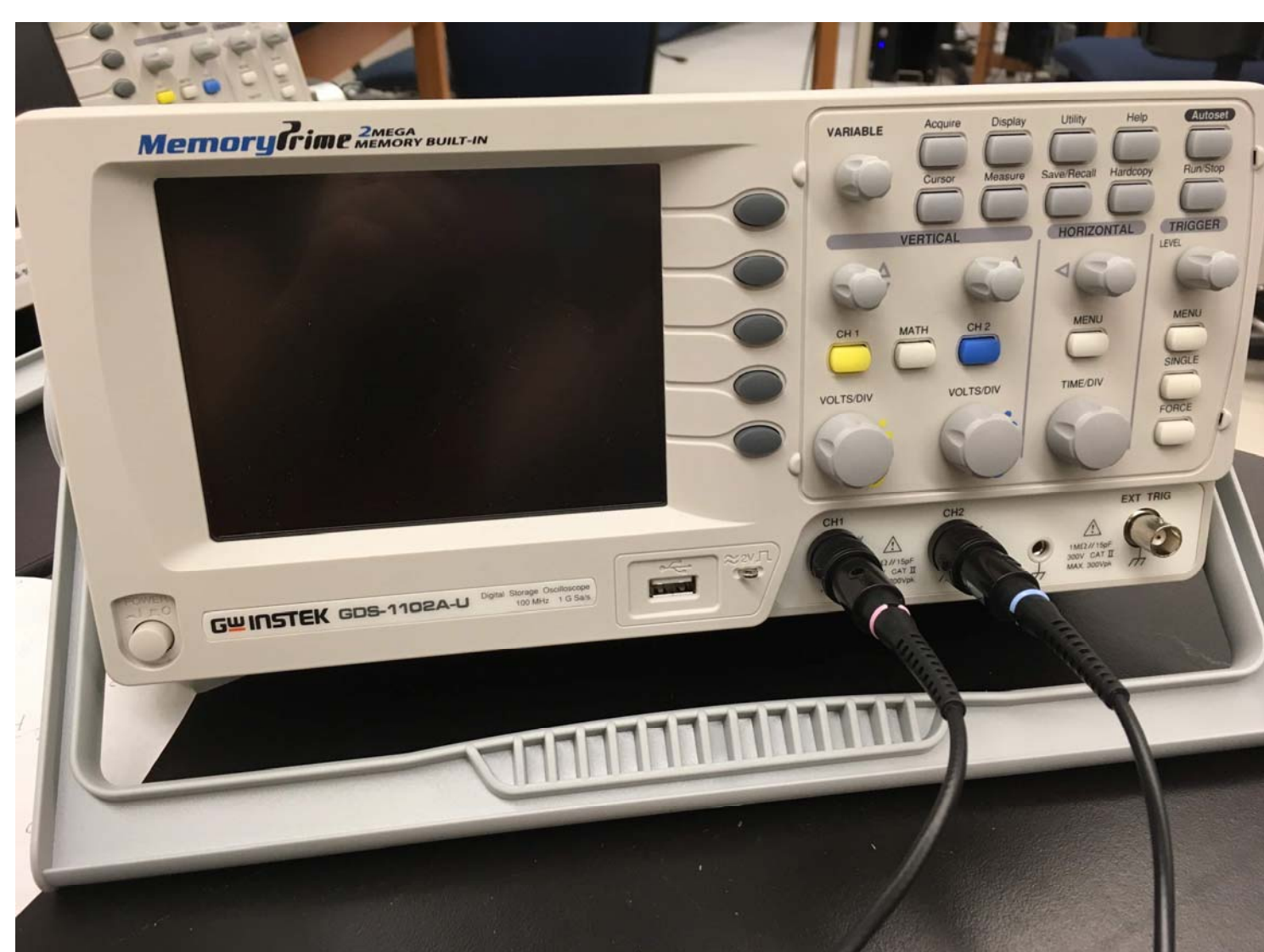
Kayli Wood, Dr. Themis Chronis, Department of Physics

Introduction

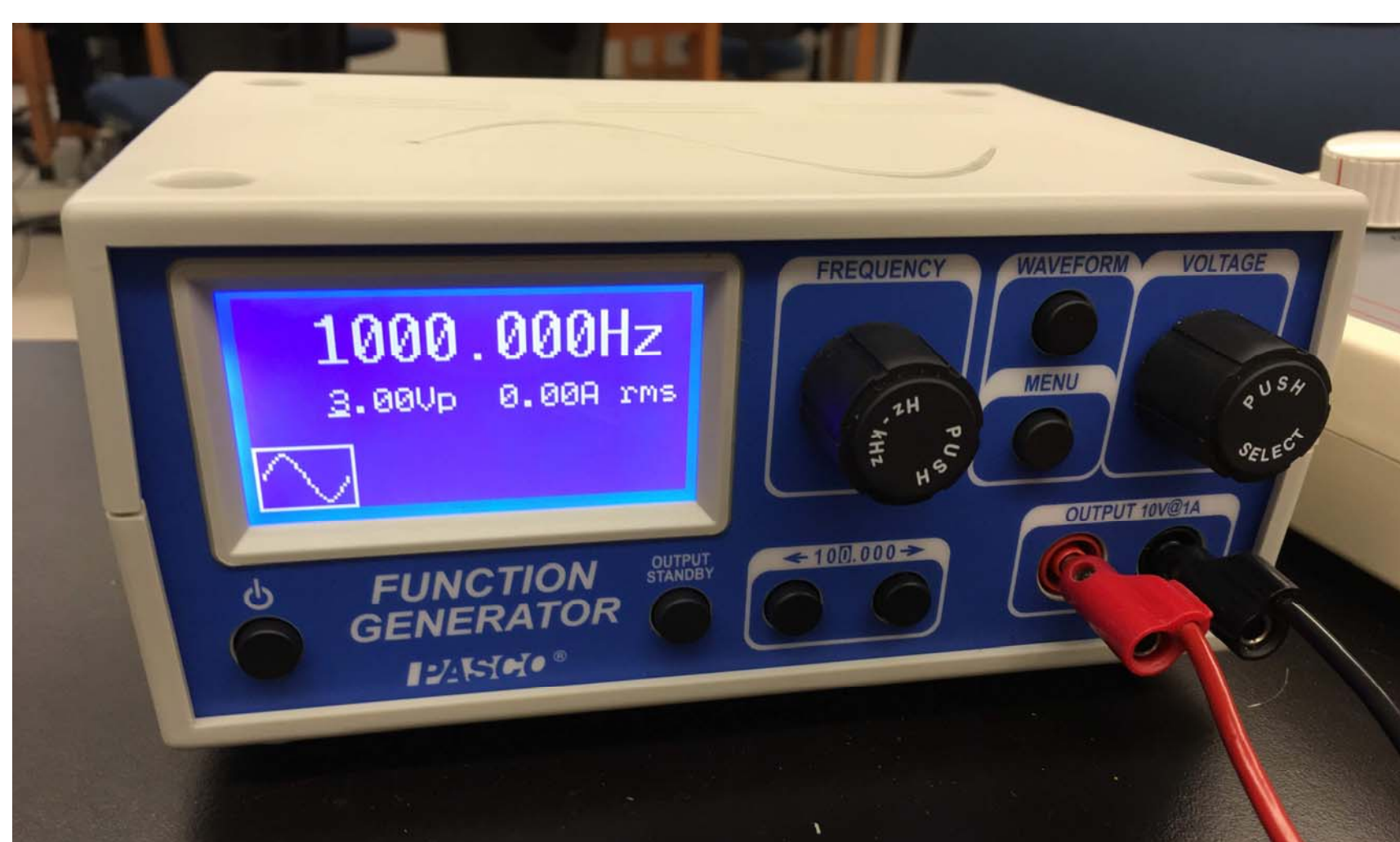
The Physics department wanted to engage the students with new equipment and a new approach to instruction, with tutorial videos. To do this, we examined each Physics topic and created a new lab to explore it thoroughly.

Key Findings/Results

- Labs are more accessible with the introduction of tutorial videos
- Procedures are now more practical with the use of new equipment, pictured below



Oscilloscope: Allows observation and measurement of alternating current.



Function Generator: Supplies various current wave forms including sine and square.

Acknowledgements

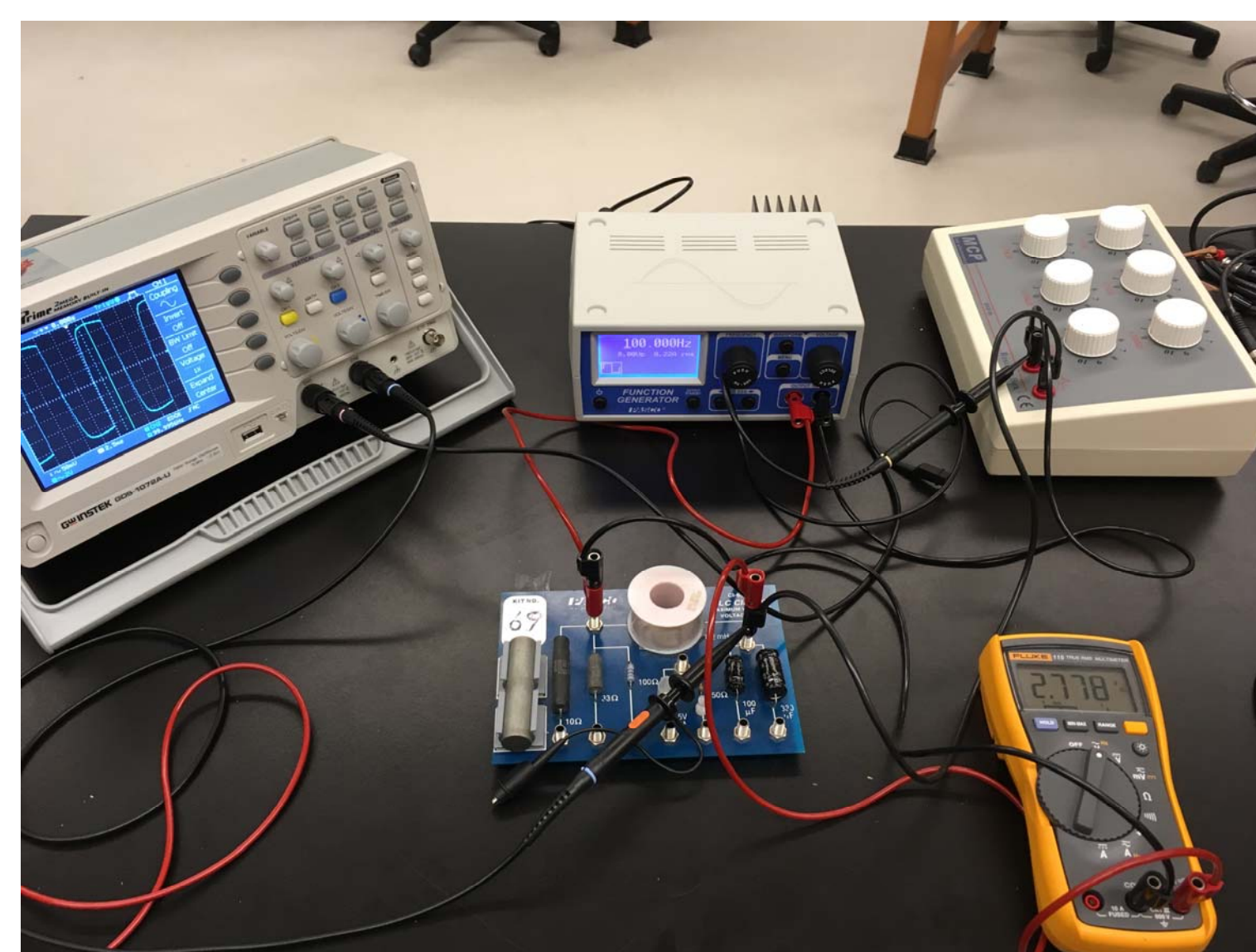
Eric Truitt for his help and expertise.

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UAH Physics Department for access to labs and equipment.

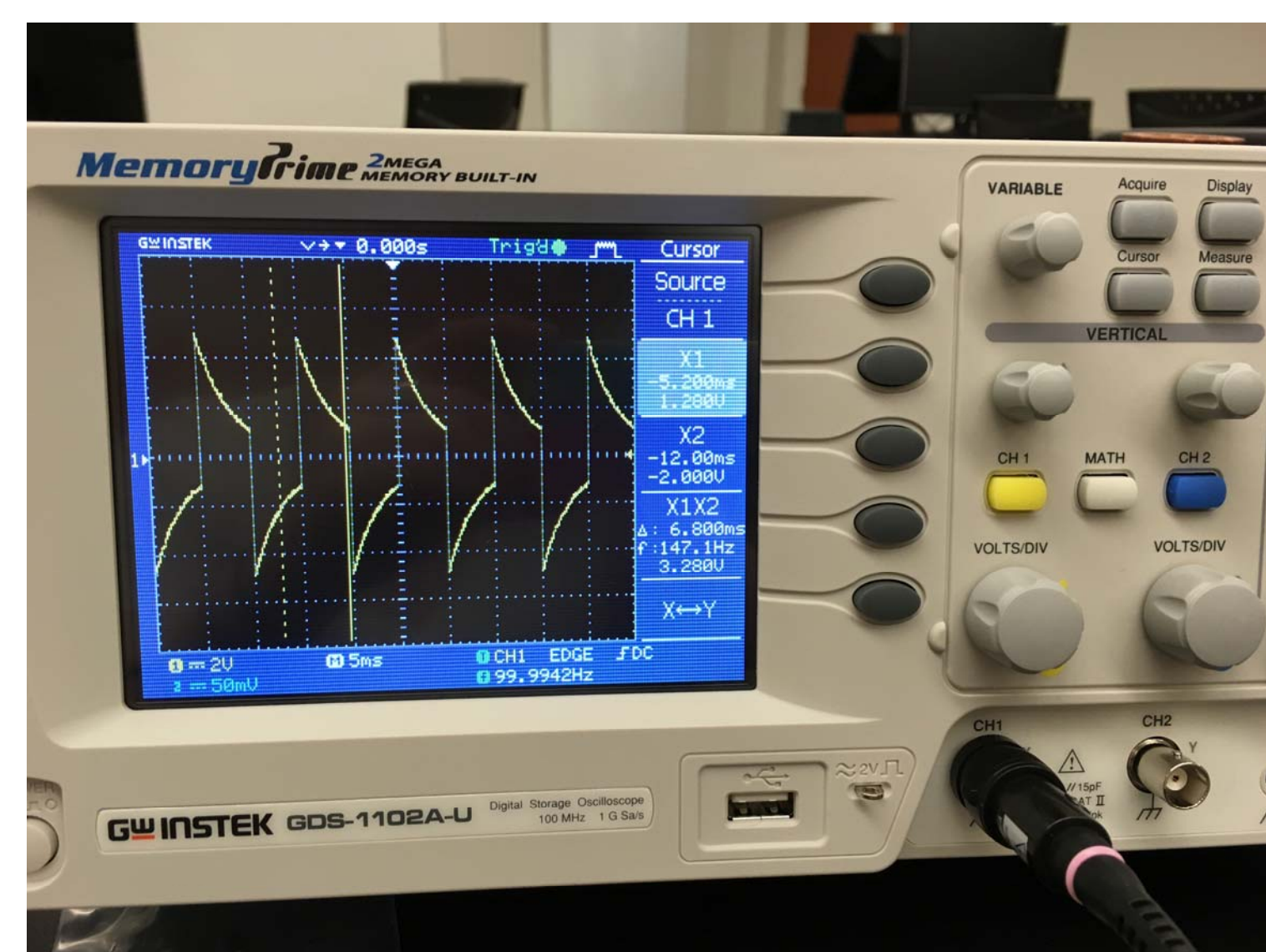
A Case Study

The majority of my work was done on circuitry experiments. One used all the new equipment, having capacitors and resistors in series, in order to have a deeper understanding of capacitors.



Circuitry for the capacitor lab

The oscilloscope allowed for calculation of the time constant τ and a way to visually watch the capacitor charging and discharging. Having a probe measure the entire circuit and one measure the capacitor alone, we were able to calculate the phase angle of the capacitor. This technique was also included in the inductor lab to highlight the phase difference between the two.



Oscilloscope displaying capacitor discharging