

Renewable Energy

Morrisville State College



RENEWABLE ENERGY
TRAINING CENTER

Program and Facilities Overview

Meet the instructors

Dr. Ben Ballard



Dr. Phil Hofmeyer

<http://retc.morrisville.edu>

Renewable Energy Training Center



Home

The Morrisville State College Renewable Energy Training Center (RETC) provides technical short courses for individuals seeking marketable skills in renewable energy fields. The RETC is an alliance of employers, training providers, economic development partners, and K-12 schools to address long-term and short-term needs of New York State's renewable energy sector. Course curricula are based upon employer-identified skill gaps and needs. [RETC short courses](#) and [MSC college courses](#) focus on renewable energy resources and systems, including wind, solar, micro hydro, geothermal and bioenergy/biofuels. Short courses include technical entry-level training as well as continuing education for teachers and other professionals. College courses can be taken individually as continuing education or as part of a degree program in [Renewable Energy Technology A.A.S.](#) or [Technology Management B.Tech.](#) (renewable energy option).

The Central New York Region has significant natural capital to fuel a renewable energy industry, including wind, solar, hydro, geothermal and bioenergy. These industries require a skilled workforce from local communities to succeed. The success of these industries will boost the regional economy and reduce dependence on non-renewable energy resources.

The RETC was established in 2008 with support from a \$2 million grant awarded under the President's Community-based Job Training Grants, as implemented by the U.S. Department of Labor, Employment and Training Administration.

Morrisville State College is an EEO/AA employer.



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Morrisville State College is a unit of the [State University of New York](#).

Teaching Facilities



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Wind/Solar/Hydro Lab (104-B Shannon Hall)



Photo by J. Robertson

Wind/Solar/Hydro Lab (104-B Shannon Hall)



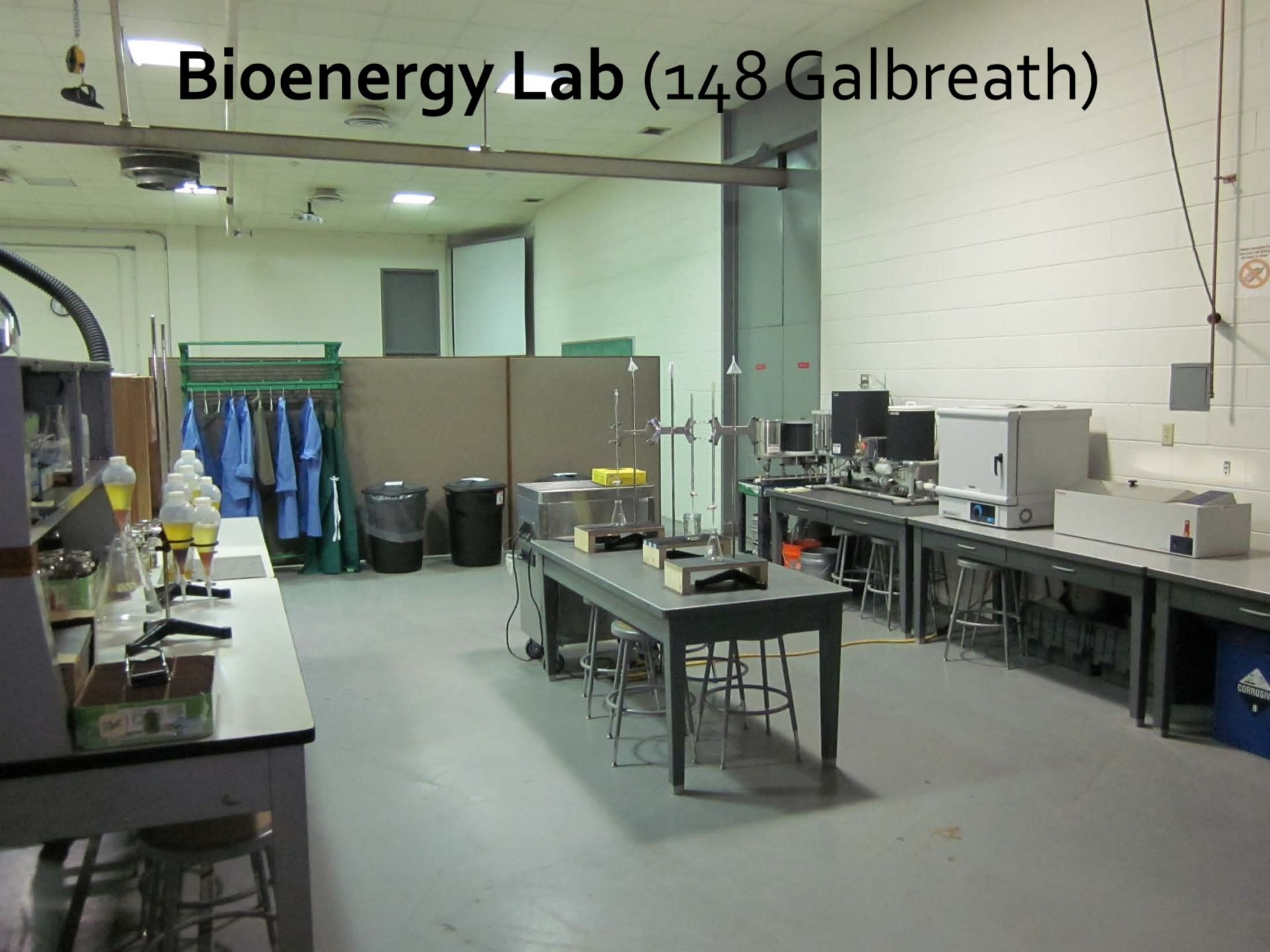
Photo by J. Robertson

Wind/Solar/Hydro Lab (104-B Shannon Hall)

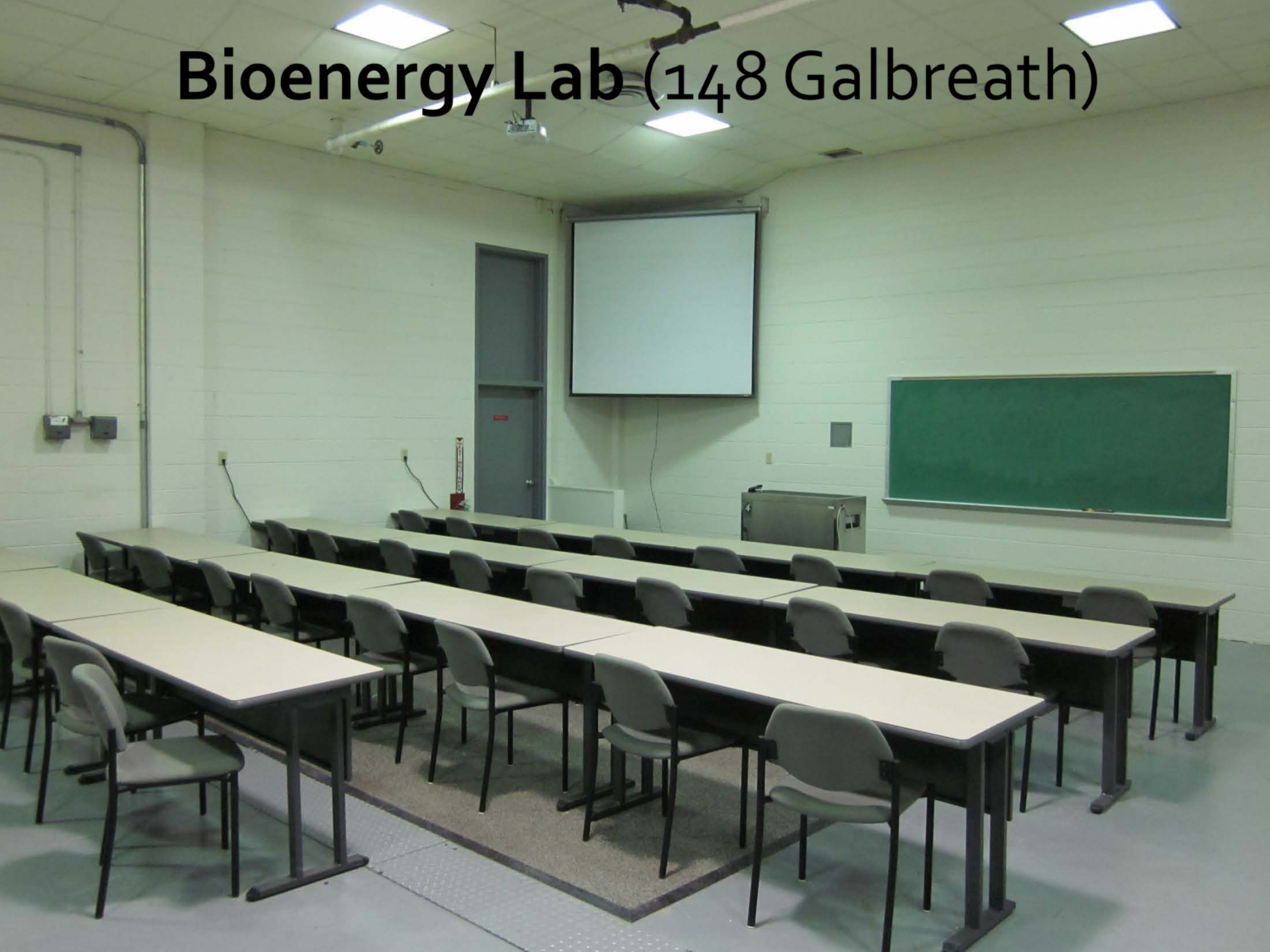


Photo by J. Robertson

Bioenergy Lab (148 Galbreath)



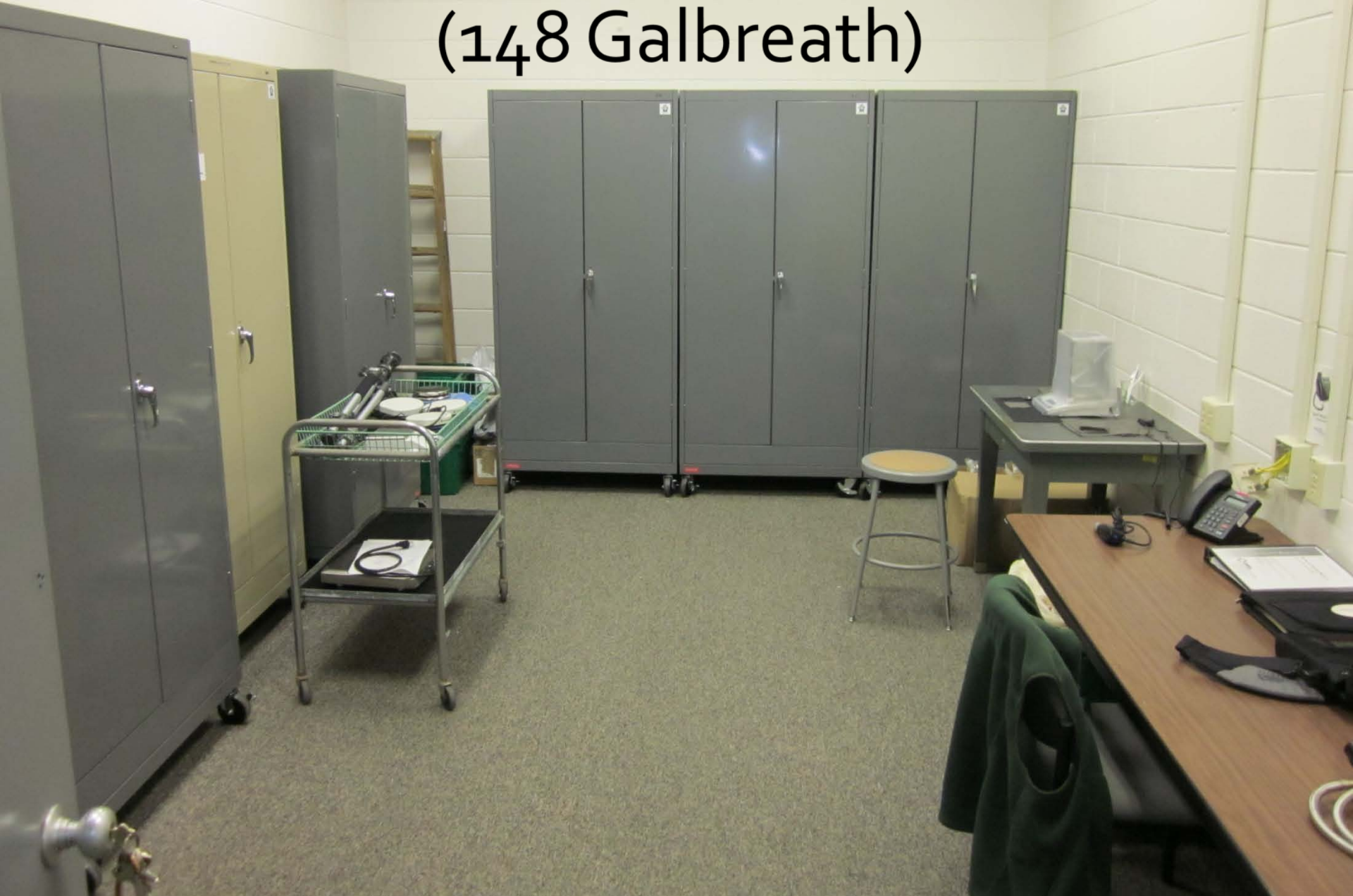
Bioenergy Lab (148 Galbreath)



Bioenergy Lab (148 Galbreath)



Bioenergy Lab Storage (148 Galbreath)



AD Monitoring Lab



Biodiesel Production Lab



Hands-on Laboratories



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Hands-on Laboratories

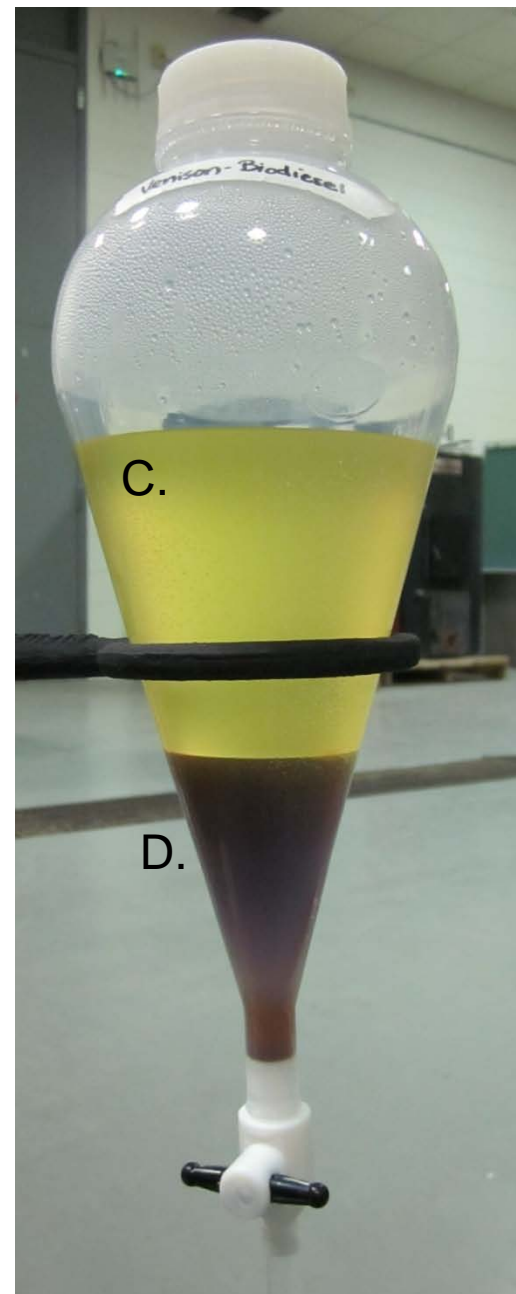
- RENG 310 – Biomass Energy Resources





Preparing oil samples for transesterification

Venison Biodiesel (mini-batch)



- A. Deer fat
- B. Rendered fat
- C. Crude biodiesel
- D. Crude glycerol
- E. Washed biodiesel





Batch biodiesel processing (campus dining hall WVO)

Replacing a pump on the BioPro 190



Veggie car conversion





Tending the willow biomass demonstration plot at the Fenner Renewable Energy Education (FREE) Center

Willow biomass harvesting demonstrations





Old-field biomass assessment

Soil sampling/site assessment



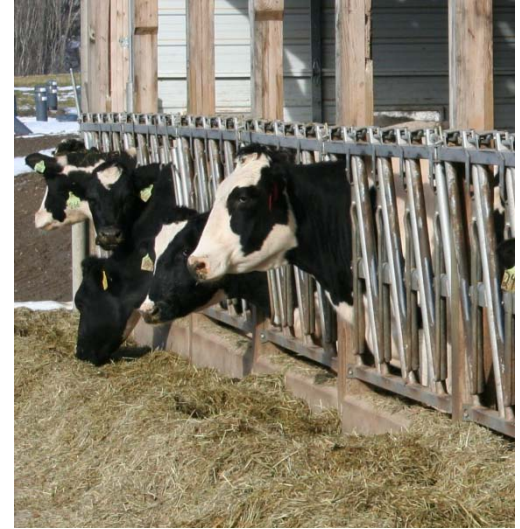


Soil sampling

MSC Dairy Anaerobic Digester



250k gal. plug-flow digester



50kW ICE/electrical generator

Madison County Landfill Tour





Madison County Landfill - biogas generator



Colgate Biomass Heating Plant Tour

Hands-on Laboratories

- RENG 410 – Bioenergy Conversions – Biochemical



Oil seed extraction



Oil seed extraction



Biodiesel





Biodiesel sample preparation/testing

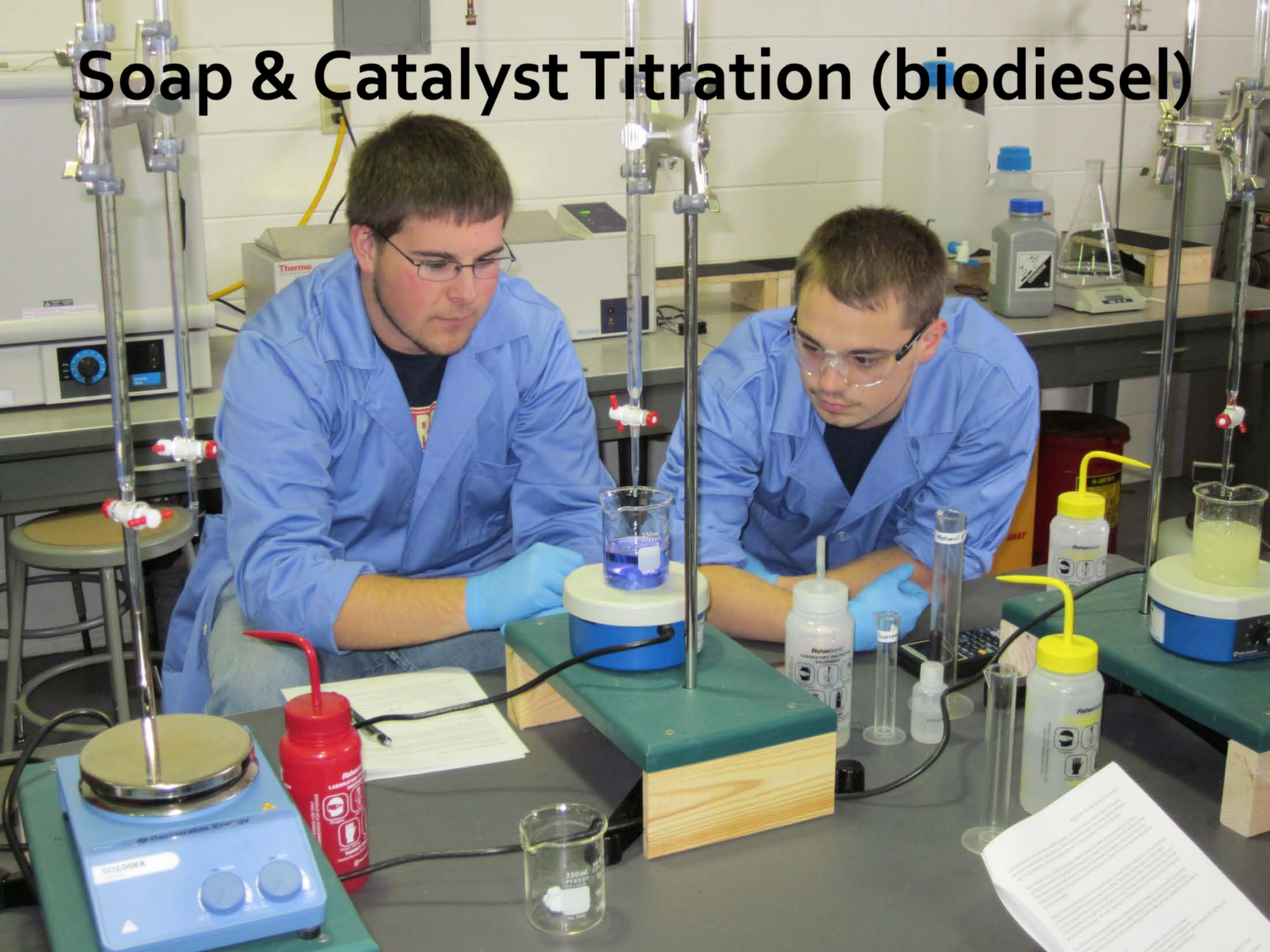


Biodiesel titration and esterification

Biodiesel test batches – various feestocks



Soap & Catalyst Titration (biodiesel)



Anaerobic Digester Monitoring





Ethanol wort preparation

Hands-on Laboratories

- RENG 415 – Bioenergy Conversions – Thermochemical



Biochar production unit fabrication





Biochar production process – strategizing



Biochar production – loading



Biochar batch production run #1

Biomass processing: wood chipping



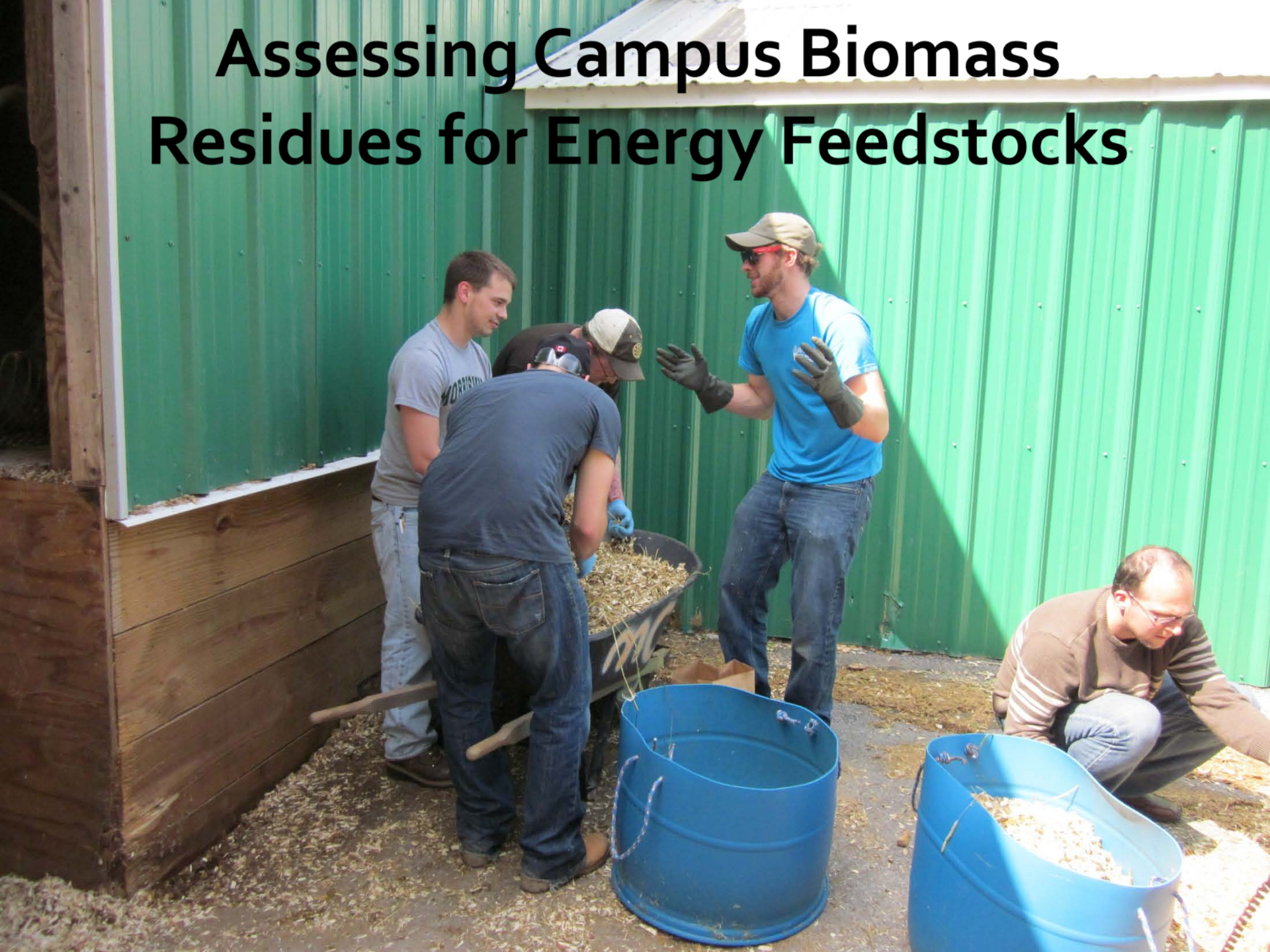
Measuring wood samples



Measuring wood samples



Assessing Campus Biomass Residues for Energy Feedstocks



Wood gasification – Power Pallet



Wood gasification – Power Pallet



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- RENG 320 – Wind and Hydro Energy Systems





Raising the MET tower gin pole

Installing a micro hydro intake



Assembling wind turbine alternator



Photo by J. Robertson

Repairing a residential micro hydro turbine





Intake maintenance at the Galbreath Farm micro hydro site



Installing micro hydro turbine at the Galbreath Farm

Micro hydro site assessment



Assembling a Raam wind turbine



Assembling a Whisper wind turbine



Assembling an Air Breeze wind turbine



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- RENG 330 – Solar PV and Thermal Systems



Working on a mock solar roof



Installing a solar hot water system in Shannon Hall



Measuring module temperature and performance





Photo by J. Robertson

Making final home run connections

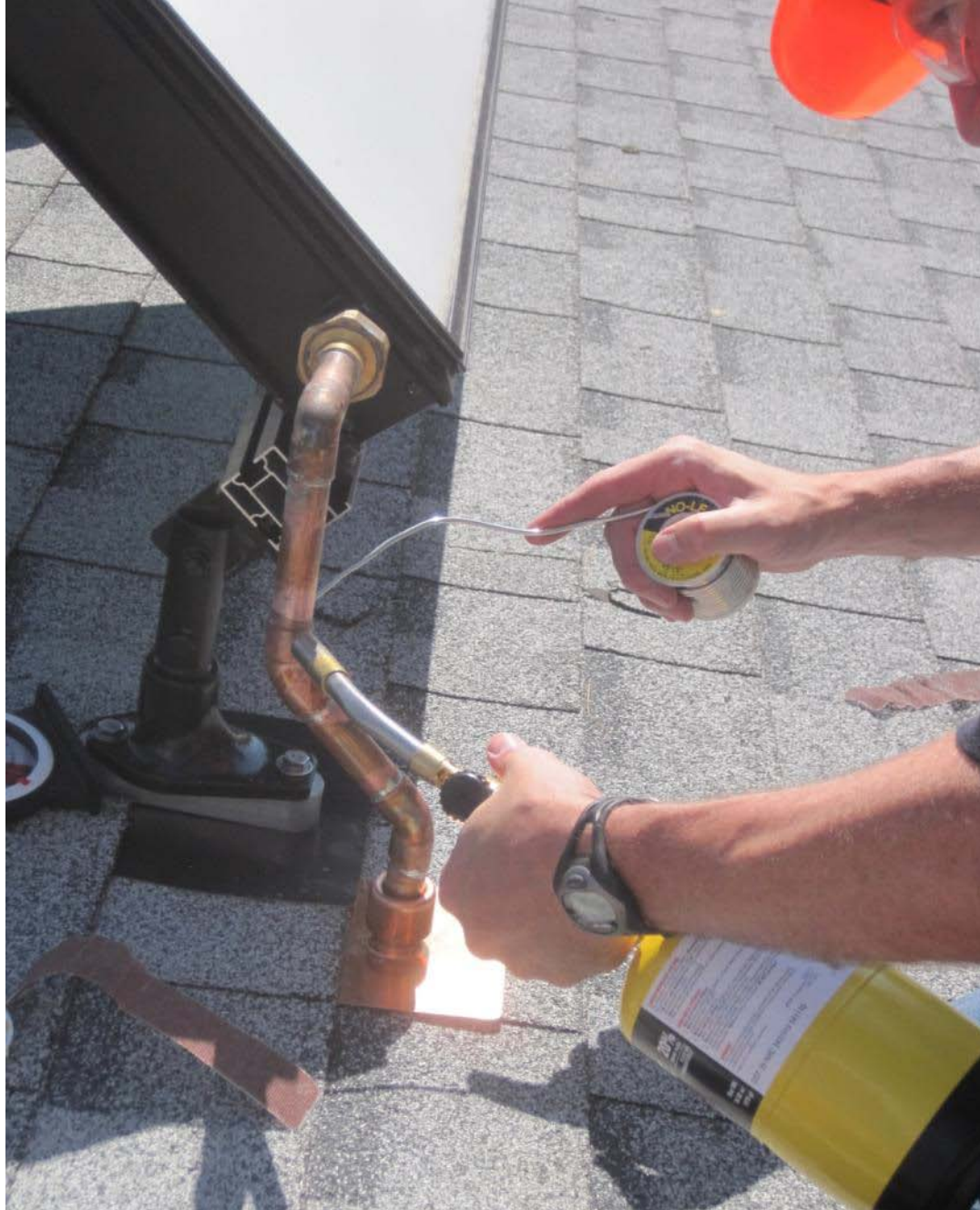




Installing a solar hot water mock-up



Installing an evacuated tube collector



Soldering a solar hot water pipe connection

Roof safety first!



Installing a wind system brake switch



Photo by J. Robertson

Entering a main distribution panel



Photo by J. Robertson

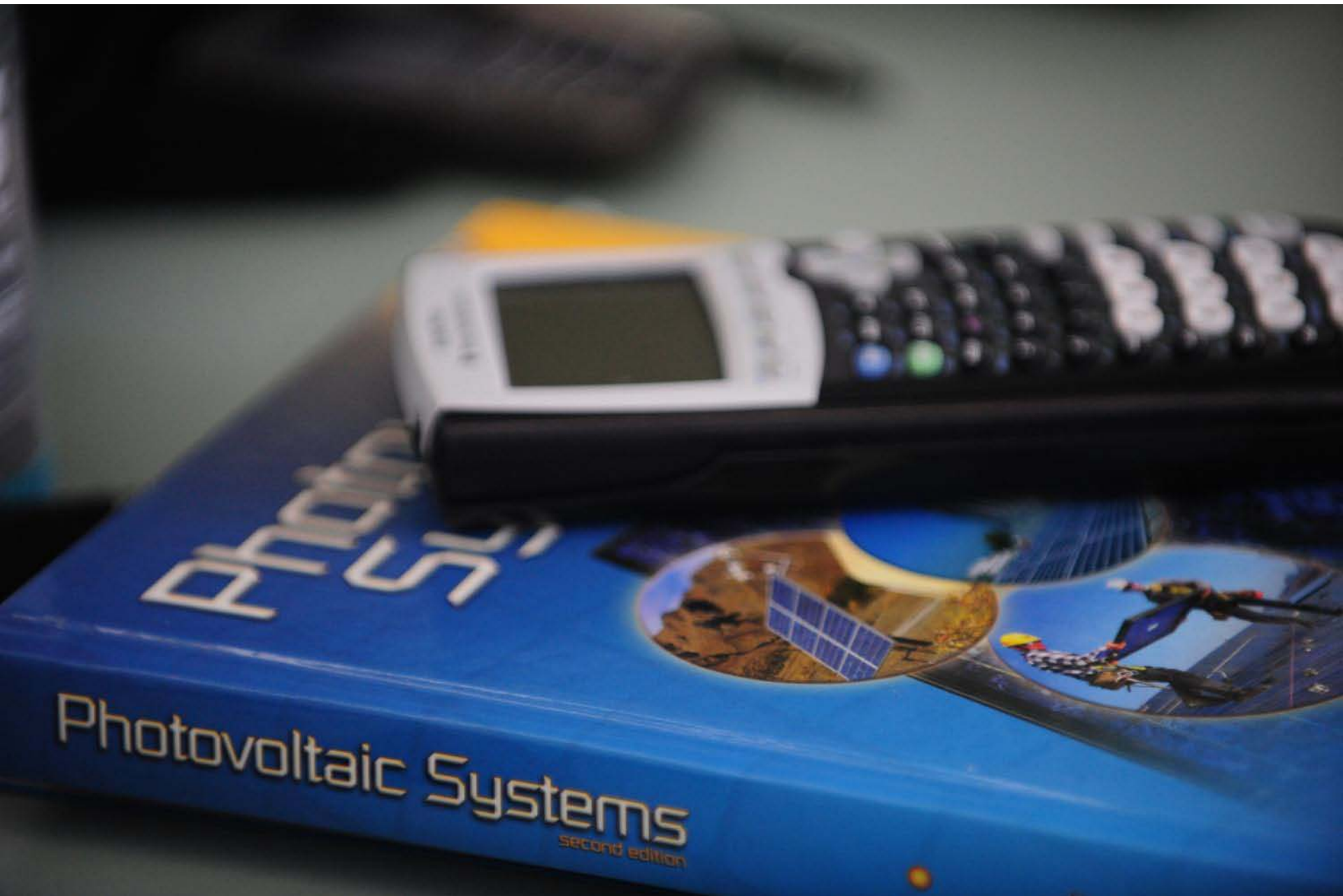


Photo by J. Robertson

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- RENG 225 – Tower Climbing and Rescue



Tower climbing ground crew



Photo by J. Robertson

Learning to go “hands free”



Photo by J. Robertson

Our wind facility



Photo by J. Robertson



Photo by J. Robertson

Off duty?



Photo by J. Robertson

Up to 120 feet...



Photo by J. Robertson

Enjoying the view



Photo by J. Robertson



Photo by J. Robertson



Tower climbing instruction

Photo by J. Robertson



Shannon Hall indoor climbing tower

Photo by J. Robertson

Rescue Randy needs a break



Real-world work experience

- Students working with local contractors
- Wind and solar product training





Skystream Installation



Tightening foundation bolts



Wiring the alternator

Fortis Montana Installation





Tightening foundation bolts

Installing a MET tower



Measuring stream discharge



Priming an off-grid micro hydro system



HDPE heat fusion for a micro hydro system





Wiring an off-grid micro hydro system

Plumbing a wind turbine tower



Questions about the program?

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