



# Opportunities for Cooper Union Student Projects in Guatemala in Summer 2023

Dr. Lisa A. Shay

Associate Dean for Educational Innovation,  
Albert Nerken School of Engineering

# Strong Connection with Guatemala

- The Sisters of Charity of New York have served in Guatemala since 1971
- The ministries in Guatemala have partnered with US universities on engineering and medical projects and welcome partnership with Cooper Union
- Six students had wonderful experiences in the summers of 2020 & 2021 doing projects that combined their expertise with the local needs







THE COOPER UNION

# The Barbara Ford Peace Building Center

- Founded in 2009 in memory of Sister Barbara Ford, murdered in Guatemala City May 5<sup>th</sup>, 2001.
- [www.cenpaz.org](http://www.cenpaz.org) and <https://vimeo.com/489887446>
- 50-acre campus
  - Administrative buildings
  - Hotel
  - Restaurant
  - Farm
  - Eco-trail
- Three categories of programs
  - Health
  - Entrepreneurship
  - Human rights
- “Home base” for Cooper Union projects





# Barbara Ford Center - Facilities

- Conference Center
  - 100-pers on conference room
  - Two meeting rooms for 10-15 people
- Offices in administration bldg.
- Restaurant
  - 100-person capacity
- Hotel with 60 beds
- Model farm
  - originally instituted by Save the Children to develop techniques for affordable small-scale agriculture to improve the diet of indigenous people in the surrounding area
- Beekeeping equipment





# Barbara Ford Center - 2021 & '22 EE projects



- Power improvements for campus: Joya Debi (EE '23)
  - Several buildings spread across 50 acres
  - Tied to local grid but electricity is expensive and has periodic outages
- Solar power for entrepreneurship projects: Azra Rangwala (EE '24)
  - Women were provided sewing machines and taught to use them
  - Electricity cost in Guatemala is a high barrier



Joya Debi (EE '23) and the solar meter



Azra measuring voltage in a Guatemalan home

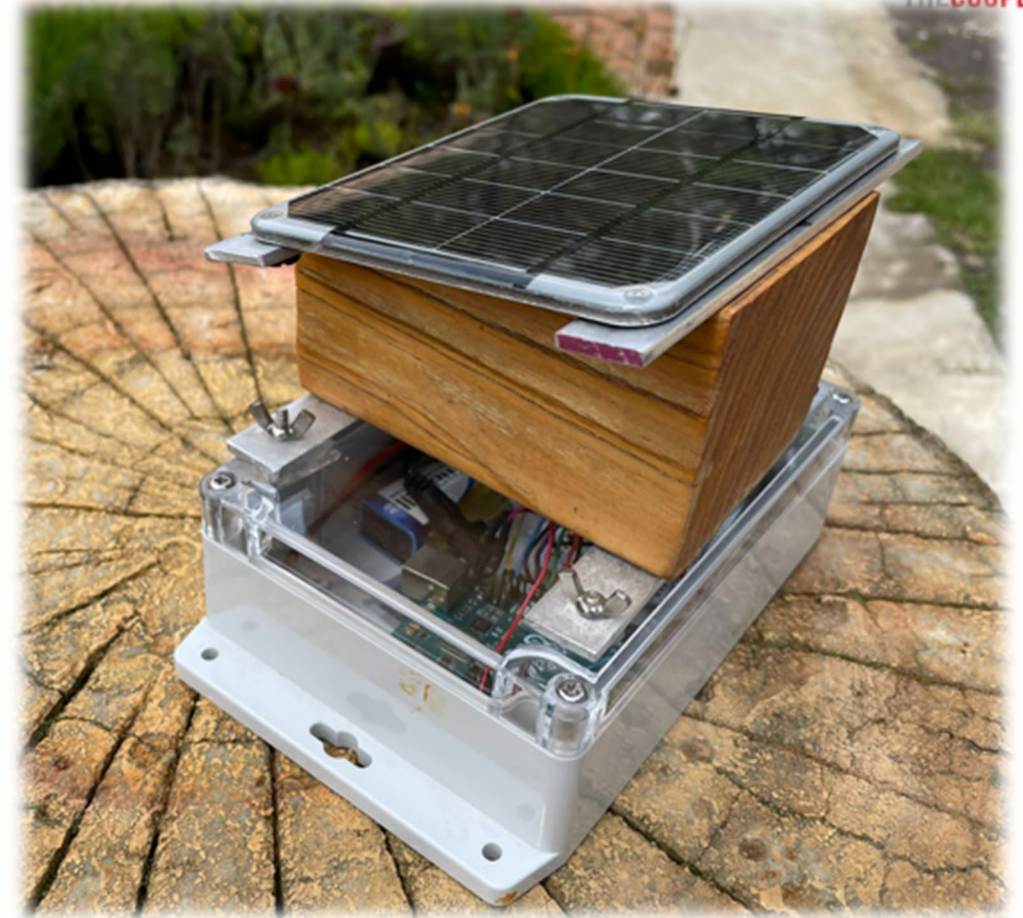
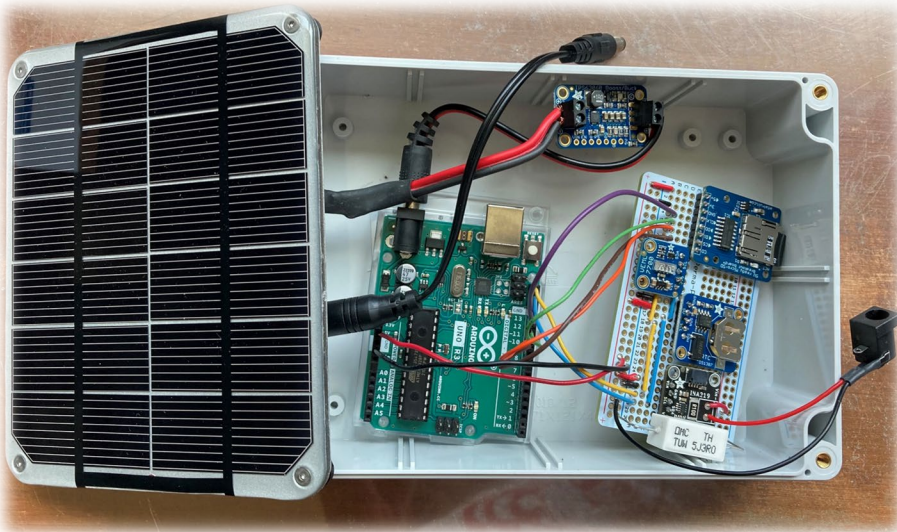


Joya measuring batteries at the Barbara Ford Center



# EE Project for Spring 2023

- Improved solar meter design
  - Used to determine local solar insolation levels
  - Two are in Guatemala, but had flaws
  - Features to add:
    - Water resistance
    - Wireless data downloads
    - Battery recharging





# Barbara Ford Center- 2022 MechE project

- Chicken-raising entrepreneurship project: Ryan Chung (ME '24)
  - Local women were given materials to build coops and taught to raise chickens
  - Baby chicks need to be kept warm
  - High electricity cost for heat lamp: turning off heat lamp increases chick mortality
  - Ryan presented options:
    - Hot-water heating system
    - Better coop design





# Barbara Ford Center-2022 CE project



- Water reduction and conservation: Jacob Krebs CE '24
  - Water pumps: largest source of electricity consumption
  - Jacob addressed this in two ways
    - Rainwater collection feasibility study
    - Improvement of irrigation plan





# Barbara Ford Center - 2021 ChE, BSE projects



- Organic waste
  - Seena Seon (ChE '23) and Brandon Bunt (BSE '22) examined waste production and recycling
  - Developed a proposal for turning waste into biochar
  - More work could be done in this area
- Other projects possible
  - Based on student interest
  - And client needs
  - **Real-world engineering!**

