

260710 Meeting Minutes

Attendees: Jaasiel Alvarez, Kate Malecek, Tasha Cammidge, Maddy Adolph, Emily Shi, Vijaya Kumar, Andrew Chang, Saksham Sharma, Olivia Finney, Wen Chen, Raj Mukkamala, Esteban Jarquin Bolanos, Albert Zhou, Caressa Wong, Chris Kalaw, Arman Thoresen, Tiffany Safar, Arabella Camunez, Rohan Bhattarai.

- This month, [RSVP here](#) to order catered food from [Mendocino Farms Catering Menu](#)! (**please RSVP by Wednesday 9am**)! **Please remember to bring your laptops and bring your biodegradable/compostable items for our test.** For bonus sustainability: folks can bring their own cups and/or utensils and/or plates as an alternative to our usual compostable ones!
 - Note: they had a lot of cardboard or recyclable packaging!

Will update [Restaurant Guide](#) and our [Coffee, Breakfast, and Dessert Guide](#)

Introductions ...

[Million Advocates for Sustainable Science](#) Petition

- International Institute for Sustainable Laboratories (I2SL) along with My Green Lab are petitioning to change funding granting agency policy to promote sustainable research
- By signing the letter you can help transform how science funding organizations set expectations for efficiency, resiliency, and sustainability in the way scientific research is conducted
- Reached 1100+ signatures!

New quarterly challenge: Energy Savings!

- Ever wonder how much energy your lab uses?
- Last month labs signed up and got Govee Sensors to measure baseline energy consumption
 - TC working on analyzing data!
- THIS month, I would love to see photos and a blurb about a piece of equipment your lab has with an eco-mode!
- Save energy!
- **There will be prizes**
- A different lab will be highlighted on our website every quarter
- **Submit to greenlabsinfo@caltech.edu by October 1**

Green Labs Monthly Tip: Arabella is presenting later!

Green Labs Adventure (April 2026-April 2027)

- Win a movie night for finishing various Green Labs Tasks! [Sign up here](#)!

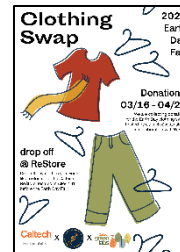
Updates

- **32 Certified labs!! WHOOOOO**
 - Please get CERTIFIED TODAY! To get certified, finish the easy, 30-minute [Green Labs Certification](#) and submit it to sustainability@caltech.edu.
 - Certified Labs-exclusive event planned for April!
 - We have a FREE LAB RECYCLING PROGRAM STARTING IN NOVEMBER!! – you can recycle pipette tips, conical tubes, and more!
 - So far our first month diverted 40.5 kg clear plastic and 6 kg coloured plastic

- New recycling signage ahead of the safety inspection next week!

Updates on our Student Interns

- Interns who will work with us over the summer:
 - JT Tran, Bhakti Ahir Ahir, Rohan Bhattarai
- New interns who will work with us over the summer:
 - Hanna Dy – ReStore Inventory and Fume Hood project
 - Emily Lencioni – Energy Benchmarking
 - Arabella Camunez – Water Saving Efforts



Arabella Camunez Update

- Reflux condenser recycling
 - Units to recycle the water used in reflux condensers
 - About \$50 in parts, easy to set up
 - Testing with low and high boiling point solvents (acetone and water)
- Autoclaves
 - Conducting [survey](#) of autoclave usage and maintenance requirements
- For website:
 - Autoclaves
 - Turn off the system when you are not running it, such as at night or on weekends. Every hour an autoclave is not on saves [10 pounds of steam](#) and 90 gallons of water.
 - Implement standby mode when the system is not in use.
 - Disable vacuum pump cycles when appropriate.
 - Maintain and fix the solenoids that control your tempering water flow. If you hear a gurgling sound when your system is not in use this is likely an indication of a [broken solenoid](#). When this happens the tempering valve can be releasing 2-3x as much water as it should be.
 - Only run an autoclave when it is full.
 - Install water misers to monitor the temperature of your outflow water and control the amount of water required to cool your water to 140° F, which can reduce the water used for this purpose by [75-90%](#).
 - When considering a new autoclave purchase there are some water efficient features that are important, and often cheaper.
 - If you run less than 5 loads a day, consider a research-grade non-jacketed autoclave instead of a medical-grade steam-jacketed autoclave. These systems use 90% less water and are 10-30% cheaper than steam-jacketed autoclaves.
 - Consider a system that requires a lower degree of water purity.
 - Single-pass cooling
 - When possible, exchange single-pass cooling systems for closed-loop systems, chiller, recirculating water baths, or air condensers.
 - Connect major water users to cooling or process recirculating water loops if these are available in your lab space.
 - Maintenance and behaviour
 - Check and report leaky faucets.
 - Regularly check valves on equipment that is connected to main water lines.
 - Post signage near sinks about water conservation.

- Only run water-intensive equipment (autoclaves, glassware washers etc.) with full loads.
 - Flow rate control
 - Install low-flow aerators on sink faucets. These devices are very affordable and can reduce your flow rate from [~4 gal/min to < 1.5 gal/min](#).
 - Choose the lowest appropriate flow rate for equipment based on manufacturer specifications. For example, if a device requires 1-3 gal/min, make sure it is set to 1 gal/min.
 - Purified water
 - Only use the minimum water purity required for a task (purified, ultra purified, softened, distilled, or DI).
 - Minimize the frequency of backwashing the filters used to make filtered water. Install a pressure sensor to monitor when the flow rate is low enough to necessitate a backwash.
 - Use tap water for the bulk of dishwashing.
 - Consider the benefits of in-house purification units. Could these be shared with other labs?
 - Equipment
 - Replace liquid ring vacuum pumps or water vacuum aspirators with dry vacuum pumps. Water vacuum system use [15 l/min](#).
 - Consider switching to [reusable thermal beads](#) to replace water or ice for a variety of temperature-control activities.
 - If in budget and useful, glassware washers or dishwashers use [less than half](#) the water of handwashing glassware.
 - When you are replacing an autoclave, consider a research-grade instead of medical-grade unit. These use ~90% less water and cost less than medical-grade system, fulfilling all of the sterilization requirements in most labs.
- Main feedback
 - KM: change the order of items so that the most relevant is first
 - Remove things that might be out of users control, or make a section that says: check with your technician to do...
 - OF: adjust the photos to include funny blurbs to attract attention
 - AC: adding her reflux project to the single-pass cooling section
 - KM: for autoclaves section add in close doors when not running
 - MA: for water purity perhaps list what each level can be used for
 - VK: for water purity check what buildings use for water in autoclaves?

Rohan Bhattarai Update

- Gave update on project – some confidential
- Goals
 - Optimize each component to be as energy-efficient as possible
 - Ultra-low power mode (Deep sleep and event-driven wakeup)
 - Validate with weekly field logs to track percentage/height + voltage
- KM: what is weekly field logs
 - Used for shut the sash competitions and to see health of each sensor, these reports could be sent out to labs

Updates – Pilot Programs

- FUNDING IS AVAILABLE – SEE PILOT PROGRAMS WEBSITE
- Aug 5– Styrofoam recycling day
 - [Sign the petition!](#) [Technical bulletin from I2SL](#), [LCA of Styrofoam](#)
 - [Do you want a location added? LET US KNOW!](#)
 - [How to do LCAs](#)
- Pipette tip pilot is now a Caltech-run program
 - Now accepting all brands!
 - Over 1 dumpster full the first 2 weeks!
 - Do you want a location added? LET US KNOW!
- Lomi
 - Moving to giving dirt to Catalina Compost
 - 1,078 lbs of dirt (or 5,391 lbs food waste) – hasn't been collected yet for last month!
- -70°C/-80°C Comparison Pilot
 - 5 labs involved, collaborating with NIH and UVA + Norway labs collaboration
- Investigating animal bedding composting... more to come on that soon!
- PolyCarbin
 - Initial order replaced 31 pounds of crude oil and reduced 122 pounds of CO₂E via sustainable procurement
 - 22 labs have bins installed!
 - So far our first month diverted 40.5 kg clear plastic and 6 kg coloured plastic
- Fume hood sensor project
 - Around \$1,300 savings per fume hood on average!!
- **Grenova pipette tip washer:** looking into funding options!
 - [Survey](#) for pipette tip types, cost per year, etc. to gather data
 - Looking into funding options
- Marketplace
 - \$360,222 (2,914 kg) diverted
 - \$28,008 (367 kg) donated to local schools (so far!)
 - Open houses rehomed \$96,000 + \$54,000 in just 1 day + online open house \$39k in 2 weeks
 - Over \$164k of supplies and \$159k of equipment online!
 - Sustainability website launched in February
 - Plants! They have arrived and we are growing now
- [Follow us on Instagram](#) →

Marketplace Update

- ReStore models (background information)
 - ReStores for glassware and chemicals only (UTAustin)
 - Pay-per pound (WashU) Circularity Center
 - Combine clothing, move-in/out, food pantry
 - Target whole buildings for a month (CUB)
 - Get space, get donations from building, categorize items, rehome event, ewaste/recycle the rest
 - Online only and delivery by student interns (UAB)
 - Swap-palooza AKA The BIG Swap (Stanford)(WashU)
 - Spread out all items on a lawn and everything must go within a day

- Metrics
 - Most do waste- and cost-diversion at least
 - Others collect information like “Would you have bought this normally?”
 - Mixture of home goods and lab supplies
- Events
 - Creative reuse like glassware painting
 - Repurpose and repair events, especially collaborating with local K-12 schools
 - Creation of shared equipment spaces
 - Clothing swap events
 - We’ve done glassware painting!
- Our ReStore:
 - Started with the Clean Up Events annually – Vijaya and her daughter developed a website so we could help folks rehome the items from that
 - From March 2026-November 2027 we saved Caltech over \$70k
 - From that success were able to secure a space in Alles 181 for a ReStore (now shared with EHS!)
- 1. Items are given to us from various sources
 - a. To ReStore:
 - i. **\$64,366** from BioTech companies (2 companies)
 - ii. **\$404,309** from Clean Outs (8 incl. 3 open houses – talk about below)
 - 1. **N Mudd 106 (GPS) (\$7,570)**
 - 2. Noyes 129 (CCE) (\$16,871)
 - 3. Spalding 326 (CCE) (\$67,979)
 - 4. *Kerckhoff 3rd floor (BBE) (\$170,260)
 - 5. Noyes 201-213 (CCE) (\$11,734)
 - 6. *Broad Basement (HHS) (\$80,286)
 - 7. *Baxter Basement (HHS) (\$39,667)
 - 8. Church 3rd Floor (CCE) (\$9,938)
 - iii. **\$60,533** from Clean Ups (19 labs)
 - iv. **\$259,969** Equipment from Divisions (2 donations)
 - v. **\$614,089** (11,290 kg, 8,480 items) TOTAL
 - b. To Surplus store
 - i. **\$99,116** from various internal sources
- 2. Items are entered into ReStore or Surplus Store Inventory
 - i. Given a unique number and colour-coded location
 - ii. Price out item (for cost-diversion)
 - iii. Weight item (for waste-diversion)
 - b. These are all entered into our database along with other information such as who donated it, what kind of item (electronic, paper, metal, etc)
 - i. KM: why do you track Division?
 - 1. TC: Divisions want to make sure most of the items they donate stay within their Division! I report this
- 3. Items are Rehomed (AKA Divested)
 - a. At ReStore:
 - i. At ReStore folks use checkout form to keep track of item, number of item (And we ask for a brief description in case the number is hard to read etc), and we also track lab, Division, and person who picked up the item
 - ii. All gets entered into our database so we can track each transaction

1. **\$360,112** (3,378 kg, 2,787 items) Labs rehomed internally
2. **\$59,449** (9,044 kg+, 281 items) Surplus Store rehomed internally
- iii. Grand opening - 50-100 people came to grand opening (85 transactions, 182 items, \$5,745, 129 kg)
- iv. Since then 208 separate transactions (though some are repeat customers!)
 1. On average 16 transactions per open day
 2. Folks take, on average, 2.59 items each time they visit
 3. Each day we're open we rehome an average of 48 items (on average \$5,231, and 60 kg worth of items)
- b. At Open Houses
 - i. **\$178,347** (1,836 kg, 1,836 items) Labs open houses rehomed
 1. **Lester Lab (March) - \$98,944 DURING (\$25k pre-event, \$46k ReStore)**
 - a. Lots of lab support (Purnima is the BEST)
 - b. Itemized things beforehand but abandoned - that system since so much changed
 - c. Send a spreadsheet with items and photos
 - i. No numbering system!
 - d. OVERWHELMED
 - i. TC was frantically entering in data
 - ii. Too crowded
 - iii. Likely missed things
 - e. Cookies!!
 2. **Brain Imaging Center (June) - \$54,116 DURING (\$26k ReStore)**
 - a. Learned from Lester Lab
 - b. Lots of lab support (Mike is AWESOME)
 - c. Itemized everything more like ReStore
 - d. ORGANIZED
 - e. Had folks check out with the forms
 - f. Easier to track data (who took items etc)
 - g. Easier entry into the ReStore database post-event
 - h. Cookies
 - ii. **\$39,667** (4,200 kg, 171 items) Surplus Store Open Houses
 3. **Baxter Lab (June) \$39,667 DURING**
 - Online only
 - All items rehomed!
 - SO MANY EMAILS
 - All in all, probably took longer than BIC to handle
 - Poor communication with lab but Victoria was GREAT
 - No cookies
- c. Externally (AKA Donation)
 - i. **\$28,008** (367 items, 412 kg) donated to local schools (so far!)
 1. 7 donation days
 2. 4 donation partners (High schools, College, Startup)
 3. Average # items 54, weighing 59 kg, costing \$4,001
 4. Other things like pipette tip boxes not tracked!
 - ii. **\$37,886** (87 items, kg not tracked) Surplus Store donated

1. Many donation partners including Habitat for Humanity, Local Surplus Stores, and more
- In summary
 - Given to ReStore
 - **\$614,089** (11,290 kg, 8,480 items)
 - Input into ReStore Inventory
 - Rehomed (AKA Divested)
 - ReStore
 - **\$360,112** (3,378 kg, 2,787 items) Labs rehomed internally
 - **\$59,449** (9,044 kg+, 281 items) Surplus Store rehomed internally
 - Open House
 - **\$178,347** (1,836 kg, 1,836 items) Lab open houses rehomed
 - **\$39,667** (4,200 kg, 171 items) Surplus Store Open Houses
 - **637,575! Rehomed TOTAL**
 - Externally (AKA Donation)
 - **\$28,008** (412 kg, 367 items) donated to local schools (so far!)
 - **\$37,886** (kg not tracked, 87 items) Surplus Store donated
 - **65,894! Donated TOTAL**
 - Over \$0.5M saved!
 - WE WANT TO CELEBRATE!!! Suggestions?
 - MA: do something with cookies?!
 - KM: do a swap-palooza?
 - WC: do a repair event (she has previously connected us with repair group and wanted Caltech to host an event!) – CK will look into this
 - TC will get back to the group, probably plan something in Fall!!!!

Next meeting August 14