

# Awards Given

CU Green Labs Award recipient actions align with CU-Boulder's goals for sustainability, set examples for others, and promote a culture of sustainability among the science community.

## CU Green Labs Awards 2022

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### Physics Department Helium Facility

**Category:** Partnership for Lab Sustainability

**Who:** Helium Facility

Helium has become an endangered element. About a decade ago, the Physics Department had the foresight to establish a helium liquifying facility which enables re-use of this finite resource while saving research funding. As researchers in Physics, JILA, and LASP use liquid helium, it is captured and sent to the helium facility to be re-liquified.

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### Department of Chemical and Biological Engineering Space Optimization

**Category:** Departmental Achievement

**Who:** Chemical and Biological Engineering Department

Since at least 2003, whenever the Chemical and Biological Engineering Department faces laboratory space constraints, the department faculty choose to conduct self-assessments of lab space utilization and re-allocation. Laboratories are one of the most energy-intensive and expensive campus spaces to build. As a result, this action for optimized use of lab space serves as a leadership example for achieving significant efficiency in scientific research.

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### JILA W. M. Keck Lab

**Category:** Laboratory Achievement

**Who:** JILA Keck Lab

The JILA Keck Lab demonstrates exemplary sharing of research equipment with scientists across campus and beyond. In addition to well-maintained, important fabrication and characterization equipment within the shared clean room and metrology lab, this core has established shared fume hoods. Sharing of fume hoods is a leadership example that can be copied in laboratory buildings across campus to reduce the need for more energy-intensive fume hoods.

## **2022 CU Green Labs Award Committee:**

- Matthew Wise, PhD, Director of Chemistry Instruction, Senior Instructor in Department of Chemistry
- Robert Blacker, Environmental Health & Safety Biosafety Specialist
- Skip Maas, Doctoral Candidate in Molecular, Cellular and Developmental Biology
- Kathryn Ramirez-Aguilar, PhD, CU Green Labs Program Manager

## **CU Green Labs Awards 2021**

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### **JSCBB Autoclave Eco-Mode Project**

**Category:** Partnership for Lab Sustainability

**Who:** Nicole Kethley, Dave Simpson, Alison White, Steve Haemmerlein, Annette Erbse,

Laura Maguire, Tom Rivas, Elizabeth Stoneham, and Abby Horn

When this engaged group of autoclave users in the Jennie Smoley Caruthers Biotechnology building learned that the building autoclaves use 6 gallons of water for every minute of drying, they began an extensive project to determine what could be done to minimize water use. Autoclaves are used in science to sterilize research materials and biowaste. The group studied the gravity settings programmed into the building autoclaves which had various drying times ranging from 5 minutes to 30 minutes or more. They engaged in discussions with the autoclave company, the building administration, and with Environmental Health and Safety to learn what drying times are useful and needed. The group discovered that drying times over 5 minutes are not necessary and have very little benefit, if any at all. The group then worked through the proper building channels to program “Eco-mode” gravity cycles with only 5 minutes of drying time as the first-choice options on all the autoclave home screens. They also tested the programs and promoted the use of the Eco-modes throughout the building by creating signage, talking to lab members in each area of the building, and posting the information on the building LCD screens. As a result of their efforts, it is estimated that there are 1000 or more gallons of water saved each workday in the building which amounts to at least a quarter of a million gallons of water saved per year but likely more. The implementation of the project has been done in a transparent and professional manner where user experiences with the autoclaves are virtually identical. In fact, in some ways the Eco-mode settings has made autoclave use in the building simpler because now users can easily find the same standard setting to choose on each of the building autoclaves.

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### **Emerson Grey**

**Category:** Individual Achievement

As a graduate student and Eco-Leader in the Bryant Lab in the Department of Chemical and Biological Engineering, Emerson has stepped up to not only implement sustainability initiatives in the lab where he works, but also to help with efforts within the Jennie Smoley Caruthers Biotechnology Building. At a time when CU Green Labs was experiencing contamination issues within its pipette box recycling collection, Emerson volunteered to routinely monitor the bins on multiple floors of the building and address contamination issues when needed. Emerson made grassroots signage and posted examples of contaminants above the recycling collections until the contamination issues stopped. Additionally, Emerson has been working to include information on the CU Green Labs Program in the Department of Chemical and Biological Engineering virtual visit weekend for graduate student recruits. His efforts to highlight the university's and department's commitment to environmental stewardship in research to perspective graduate students not only lays the foundation for sustainability with students before they arrive at CU Boulder, but also raises awareness with students that choose to attend other research institutions.

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## **John Malecha**

**Category:** Individual Achievement

John has consistently worked on sustainability efforts throughout his entire time in graduate school at CU Boulder. In addition to being the Eco-Leader for the Gin Lab where he implemented resources saving efforts, John has volunteered for 5 years to be the Chemistry Department Team Lead for the CU Green Labs Program. In that role,

John has organized departmental viewings of green chemistry webinars, promoted lab participation in solvent recycling, spoken about sustainability at new graduate student orientations, shared green lab efforts at new graduate student recruitment events, helped create and distribute a CU Green Labs survey measuring undergraduate student interest in green chemistry education, and assisted with a department-wide fume hood sash competition. John's commitment has helped to grow a culture of sustainability in research on campus and has benefited the Chemistry Department's and CU Boulder's reputation for sustainability.

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## **Matthew Wise**

**Category:** Individual Achievement

During the pandemic, the Chemistry teaching labs had to alter their approach to include the use of at-home lab kits supplied by a vendor. As the Director of Chemistry Instruction, Matt worked with EH&S to ensure that use of the kits was compliant with environmental regulations. As part of this effort, Matt went above and beyond, and determined additional steps within each experiment where reduction of materials could be realized. For example, adding an extra precipitation step allowed for the removal of heavy metals which would otherwise be discharged down the

drain. He worked with the vendor that supplied the kits to provide them feedback regarding excess chemicals included in the kits. He included these topics within the coursework of the chemistry labs and provided a "teachable moment" to students regarding proper disposition of chemicals and the issues surrounding chemical disposal. Lastly, he and his colleagues established a process for students to return unused excess chemical reagents for proper disposal through EH&S, as opposed to drain disposal. Though these efforts weren't required, they demonstrate Matt's strong commitment to sustainability and to teaching students about connecting sustainability to science. Matt's efforts stand out and show his true leadership for making the Chemistry teaching labs as sustainable as possible.

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### **2021 CU Green Labs Award Committee:**

- Mariel Sabraw, MS Candidate in Global Engineering
  - Jason Tavares, Recycling Operations Center Manager
  - Laurence Fairchild, MCDB STEMtech Resource Center Assistant
  - Kathryn Ramirez-Aguilar, PhD, CU Green Labs Program Manager
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## **CU Green Labs Award Recipients (2020)**

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### **Stem Cell Research & Technology Resource Center**

**Category:** Partnership for Lab Sustainability

**Who:** Teisha Rowland and Lee Niswander



Teisha and Lee established a shared research facility that decreases the spatial footprint and the carbon footprint of performing stem cell research across campus by reducing the need for each lab to purchase their own suite of equipment to perform this research. Lee put forward her own startup funds to set up this program which opened in July 2019 and is already benefiting 26 researchers from MCDB, Biochemistry, IPHY, and IBG, as well as from the CU Denver Anschutz Medical Campus, National Jewish Health, Colorado State University, the University of New Mexico, and local companies. In setting up the facility, Teisha is constantly working on outreach projects and trainings to increase awareness and utilization of the facility. She went above and beyond to work closely with the BioCore to repair and reuse as much surplus equipment and furniture as possible when creating the facility, and she also engaged with the CU Green Labs Program to set-up lab waste recycling/composting and to ensure energy efficiency in the selection of any necessary equipment purchases. The Center serves as an example to other researchers at CU Boulder and beyond of the energy and resource efficiency possible in research through centralization and sharing.

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### **CHEMunity - Green Chemistry Scholarships**

**Category:** Partnership for Lab Sustainability

**Who:** Benjamin Deming and Oana Luca



On behalf of CHEMunity in the Chemistry Department and in partnership with the CU Green Labs Program, Oana and Benjamin worked to create the Green Chemistry Certificate Scholarship Program in 2018 which is providing CU Boulder students with the opportunity to receive green chemistry education through a nine month online program at the University of Washington. Without Oana and Benjamin's efforts, leadership, and engagement, this CU Boulder scholarship program would not have been

possible. They wrote the initial grant proposal to obtain the funding for the first scholarship from Sustainable CU and, in collaboration with CU Green Labs, led the design of the application process, establishment of the selection criteria, and set the requirements that scholarship recipients would need to follow. Two students who completed the certificate program and another currently enrolled have provided very positive feedback and appreciation for the chance to add green chemistry knowledge to their skillsets which employers are increasingly looking for among applicants. Oana and Benjamin continue to provide ongoing instrumental support for the program in partnership with CU Green Labs, including helping to line up scholarship funding from sources such as the Chemistry Department and EH&S. The program, which is about to enter its third round of scholarships is setting a precedent for green chemistry education at CU Boulder.

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## **Environmental Health & Safety Radiation Safety Office**

**Category:** Departmental Achievement

**Who:** Margaret Ashton, Brad Denton, and McKenzie Statham



By establishing reduction protocols and by working closely with campus labs to set-up clearly-marked, simple-to-use collections and train users, the Radiation Safety Office in Environmental Health and Safety at CU Boulder is hugely reducing the volume of research-related solid radioactive waste going to low-level radiation landfills. This is achieved in two ways: 1) a 72% reduction in volume is achieved by asking scientists to segregate radioactive waste with a short half-life in collection bins of a different color than waste with a longer half-life and then allowing the shorter half-life waste to decay in a holding area on campus until reaching background levels, and 2) for longer half-life

waste that must be sent to a low-level radiation landfill, an 82% reduction in volume for this waste is achieved by compacting the materials into barrels. Overall, these efforts are reducing university costs to ship and landfill the radioactive waste by 91% which has saved the university over \$4 million dollars since these efforts began in 1998. Outreach and collaboration with other universities is growing the positive impact of these efficiency efforts and helping to avoid the creation of more low-level radiation landfills than necessary. The efforts of the Radiation Safety Office exemplifies the large impact that a small group of people can have for sustainability.

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## **Cherie Summers**

**Category:** Individual Achievement



As the Assistant Dean for Administration in the Engineering Dean's Office, Cherie's leadership and partnership are a demonstration of the significant positive impact that action and inspiration from an administrative role can have to grow sustainability on campus. In collaboration with campus groups such as Planning Design & Construction, CU Green Labs, and research faculty, Cherie has been an advocate for efficient use of building space, sharing of research equipment, and resource conservation. Her efforts go above and beyond and are simultaneously supporting success in research, maximization of the infrastructure within the College of Engineering, and campus sustainability. She has a teamwork approach that inspires engagement and grows a culture of partnership that benefits efficiency and the development of solutions. Her partnership is valued throughout campus. Her efforts for equipment sharing among researchers are laying a foundation that over time will help expand the research capabilities of scientists, save researcher time and funding, recruit talent, and lead to optimal, efficient use of campus resources for maximum research benefit.

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## **Benjamin LaFavor**

**Category:** Individual Achievement

In addition to overseeing shipping and receiving at the loading dock of the Jennie Smoly Caruthers Biotechnology Building and helping to assist the building manager, Benjamin goes above and beyond to make sure as much shipping materials as possible flowing through the loading dock area are recycled and re-used which save the university funding in avoided landfill costs. Benjamin has a system set-up where he separates the packing materials into many different categories. Those materials that can go into the CU Boulder recycling streams are placed in those collection bins. But, for other materials, he seeks out members of the community via Craigslist and other means of outreach that can use these clean shipment materials, such as foam packing peanuts, wooden crates, and others. Furthermore, he aids CU Green Labs by providing space and oversight of our laboratory recycling streams located at one of the docks including foam, pipette tip box, plastic film, metal containers, brown lab glass, and ice packs. If it were not for Benjamin's efforts and support, so much more would be going to landfill at this large research building.

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## **Mitchell Magrini**

**Category:** Individual Achievement

In addition to conducting research as a graduate student in the Chemistry Department, Mitch has been volunteering to oversee the Cristol building collection of brown lab glass bottles and lab metal containers for recycling since 2017. These collections serve the entire Chemistry Department, a large generator of these two lab waste streams. Mitch even takes the time to outreach to labs within the chemistry department as well as line up other volunteers to take his place when he is out of town to ensure the recycling continues to run smoothly. Mitch's efforts have greatly contributed to the success of this recycling program in Chemistry and saves the CU Green Labs Program the time and labor that would be necessary to manage these collections which divert approximately 1600 lbs of brown glass and 3500 lbs of metal from the landfill per year.

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## **CU Green Labs Award Committee 2020:**

- Theresa Nahreini, Cell Culture Facility Manager
- Robert Blacker, Environmental Health & Safety Biosafety Specialist



- Micah Stoltz, OAR Operations Manager
  - Paul Rastrelli, CU Green Labs Team Lead
  - Kathryn Ramirez-Aguilar, CU Green Labs Program Manager
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## CU Green Labs Award Recipients (2019)



*From left to right: David Simpson and Vice Chancellor for Infrastructure and Safety David Kang*

### **David Simpson**

#### **Category: Individual Achievement**

David Simpson has been instrumental in supporting and leading Green Lab conservation efforts in the Jennie Smoly Caruthers Biotechnology Building on East Campus. For example, Dave has been managing an ice pack reuse pilot program which includes coordinating pickups and explaining the program to participating labs in the building. He has also helped the CU Green Labs Program with Eco-Leader outreach and been responsible for the publication of Eco-Tips in the Lab Report newsletter over the past year. He has helped with various recycling efforts in the building, assisted with a building-wide autoclave project, and led his lab's participation in the Freezer Challenge over the past two years. Dave's efforts have positively impacted the effectiveness of CU Green Labs Program initiatives in many ways in this large laboratory building and across multiple departments.



*From left to right: Robert Lenahan, Carl Pierce, Jason Tavares, Norm Van Esselstine and Vice Chancellor for Infrastructure and Safety David Kang*

## **Facilities Management Recycling Category: Departmental Achievement**

### **Who: Carl Pierce, Jason Tavares, and Norm Van Esselstine**

Laboratory material recycling has been significantly improved on campus thanks to Carl, Jason, and Norm. CU Boulder Facilities Management Recycling has voluntarily aided the CU Green Labs Program by taking over lab recycling collections, which were previously conducted through monthly pickups by Eco-Cycle and required significant work on the part of CU Green Labs student employees to get the materials to a limited number of locations for the Eco-Cycle pick-up. With the help of Facilities Management Recycling, lab material recycling has become much more flexible. For example, areas of campus in need of more frequent pick-ups can now be given that higher level of service, and it has become easier to add an extra pick-up of lab recyclables that may arise because of an unusually high generation of material during a particular month. Finally, CU Green Labs has been able to grow the number of convenient locations that can be used for lab recycling on campus. Overall, this support from Facilities Management Recycling is enabling CU Green Labs to focus on expanding lab recycling opportunities on campus.



*From left to right: Dustin Quandt and Vice Chancellor for Infrastructure and Safety David Kang*

## **Dustin Quandt**

### **Category: Individual Achievement**

Dustin Quandt has gone above and beyond his duties and expectations as the manager of the newly formed BioCore shared laboratory equipment facility, funded by CFO Kelly Fox for its first year through a seed-innovation grant led by CU Green Labs. Within the first 8 months, Dustin became the manager of 85 shared instruments, many of which were underutilized resources that moved from individual labs into BioCore space. Through outreach and engagement, the BioCore shared equipment is now being used by 59 researchers within MCDB, EBIO, and IPHY. For additional equipment resources that are not available through the BioCore, Dustin has proven over and over again to be an amazing resource to scientists by connecting researchers with similar equipment needs, furthering equipment sharing outside of the BioCore. Broken but useful equipment is being repaired and repurposed by Dustin and he has already freed up 900 sq. ft. of lab space by removing unneeded equipment and furniture from laboratory spaces. Overall, Dustin's exemplary actions are growing equipment sharing in three departments at a far greater rate than expected, and the BioCore is serving as a model that can be implemented elsewhere on campus for even greater impact.



*From left to right: Vice Chancellor for Infrastructure and Safety David Kang, Mark Lapham, Joseph Gibbs, Holly Gates-Mayer, Rachel Eastman, Cher Masini, and Micah Stoltz*

## **Animal Bedding Composting**

**Category: Partnership for Lab Sustainability**

**Who: Micah Stoltz, Julia Granowski, Mark Lapham, Jon Reuter, Cher Masini, Theresa Siefkas, Joseph Gibbs, Holly Gates-Mayer, and Rachel Eastman**

Campus animal facilities generate a large amount of animal bedding waste every day. The majority of this bedding is not contaminated with hazardous materials and previously was going to the landfill. Several years ago, a partnership was formed between the Office of Animal Resources, Environmental Health and Safety, CU Green Labs, and Facilities Management with the goal of exploring composting the non-hazardous animal bedding waste. In 2017 a successful pilot was implemented at one of the campus animal facilities followed by campus-wide implementation in 2018 to all campus animal facilities. The majority of the work and leadership on this project was a result of significant efforts on the part of the Office of Animal Resources and Environmental Health and Safety. Currently, about 1,500 to 2,000 pounds of animal bedding is being composted every week which will result in an annual waste diversion from landfill of about 75,000-100,000 pounds!!!



*From left to right: Cynthia Torres and Vice Chancellor for Infrastructure and Safety David Kang*

## **Cynthia Torres**

### **Category: Special Recognition**

Since Cindy joined JILA in early 2018, she has been a champion for sustainability. This is something that JILA has not found the time to address in the past, but headway has now been made under Cindy's leadership. Through Cindy, CU Green Labs was able to establish lab material recycling in JILA for the first time. Cindy also worked to improve general recycling throughout JILA. She has also been communicating about sustainability efforts with the JILA members through email newsletters and promoting zero-waste events within her department.



*From left to right: Megan Schroeder and Vice Chancellor for Infrastructure and Safety David Kang*

## **Megan Schroeder**

### **Category: Special Recognition**

Megan has been a leader championing green lab practices among the 20 members of the Anseth Lab in Chemical and Biological Engineering. She co-led the lab's participation in the 2017 Freezer Challenge which resulted in the retirement of an unneeded freezer and the consolidation of research samples. Furthermore, Megan also co-leads an ongoing effort within the Anseth Lab to engage and onboard lab members to recycle foam, plastics, brown glass chemical bottles, ice packs and to compost lab paper towels.

### **CU Green Labs Awards Committee (2019)**

- Dorothy Noble, Environmental Engineering Laboratory Manager
  - Robert An, Environmental Health and Safety
  - Theresa Nahreini, Biochemistry Cell Culture Facility Manager
  - Kathy Ramirez-Aguilar, Ph.D., CU Green Labs Program Manager
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### **CU Green Labs Award Recipients (2018)**



*Left image:* Kelly Fox, Senior Vice Chancellor and Chief Financial Officer, Robert An, Ralph Bogle, Linh Tran *Right image:* Kelly Fox, Senior Vice Chancellor and Chief Financial Officer, Dorothy Noble

### **EH&S Chemical Redistribution**

#### ***Category: Partnership for Lab Sustainability***

Robert An, Linh Tran, and Ralph Bogle worked to pilot the repurposing of surplus chemicals between research labs. This is of particular need when labs are doing cleanouts, moving spaces, or a principal investigator retires. The pilot was a substantial process involving sorting through the inventoried chemicals, outreach to labs to

determine interest in available chemicals, organizing the re-location of the chemicals, contributing to the transport of chemicals where needed, and making sure rules were followed to safely move chemicals on campus. 457 out of 713 chemicals were successfully repurposed. That is a 64% success rate, indicating the value chemical redistribution can have on a larger scale for our campus. When the initiative is fully implemented across the CU Boulder campus, the impact is anticipated to be significant in terms of money saved for scientists and hazardous waste diverted from disposal. It will reduce the amount of hazardous chemicals coming to campus in the first place by helping to avoid duplicate chemical purchases and ensuring efficient use of chemical resources on campus.

## **SEEL Environmental Engineering Laboratories**

### ***Category: Partnership for Lab Sustainability***

When moving from the Engineering Center to SEEL, eleven Environmental Engineering Labs took it upon themselves to pool their resources and shift their culture towards more shared equipment. They set up collaborative laboratories centered around research themes rather than the traditional approach of one principal investigator in one lab space. Each theme area contains shared equipment that students, faculty, post-docs and visiting scientists have access to for experimentation related to that theme. Currently there are 11 principal investigators and about 65 students sharing this equipment which is maintained by a manager. This exemplary action for shared equipment is enhancing research collaboration and unity within the department. It is also greatly benefiting energy efficiency and efficient use of laboratory space, equipment, chemicals, gas cylinders, and supplies.

## **CU Green Labs Awards Committee (2018)**

- Jacqueline Richardson, Organic Chemistry Teaching Lab Instructor
  - Joe Dragavon, Director of the BioFrontiers Advanced Light Microscopy Core
  - Jennifer Ryan, MCDB Building Operations Manager
  - Kathy Ramirez-Aguilar, CU Green Labs Program Manager
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## CU Green Labs Award Recipients (2017)



From left to right: Joe Dragavon, Jennifer Ryan, Jacqueline Richardson, Vice Chancellor for Infrastructure and Safety David Kang

### **Joe Dragavon**

#### ***Category: Individual Achievement***

Joe Dragavon is the BioFrontiers Advanced Light Microscopy Core Director. Joe has a true passion for promoting laboratory equipment sharing. Over the past two years, Joe has helped to increase awareness of the campus' many shared equipment facilities by coordinating "open house" events - that featured lightning round presentations - and by launching the "Shared Instrumentation Network" website in collaboration with the Research and Innovation Office. He has worked across campus with instrumentation managers and directors and the CU Green Labs Program to move toward a culture of collaboration and shared lab resources, and continues to manage the Shared Instrumentation Network website. Joe's efforts will have a lasting impact on campus, not only of benefit to science by improving scientist access to research equipment, but also of benefit to minimizing the environmental footprint of research by avoiding the need for campus space and resources to support unnecessary equipment duplication.

### **Jennifer Ryan**

#### ***Category: Individual Achievement***

Jennifer Ryan is the MCDB Building Operations Manager. Jen goes above and beyond the duties of her job to support laboratory sustainability efforts within her department. For example, she is a long-time advocate of promoting re-use of equipment within her department and then offering up unneeded equipment to other departments on campus. Furthermore, Jen's willingness to encourage labs to speak with CU Green Labs about energy/water efficiency opportunities related to equipment purchases has likely resulted in significant utilities savings to the Gold and Porter buildings. Jen has also



served as a source of advice and help to CU Green Labs from the very beginning. For example, Jen was instrumental in helping CU Green Labs launch its first recycling effort for lab materials, a program that now extends to labs across campus. These actions, plus many others not mentioned, are fostering a culture of sustainability in the MCDB department. Because of the respect that Jen carries in MCDB, her impact is significant and extending to those MCDB scientists-in-training that will carry the culture that they learn at CU with them in their careers.

## **Jacqueline Richardson**

### ***Category: Individual Achievement***

Jacquie Richardson is the Director of the Organic Chemistry Teaching Labs. In collaboration with EH&S and CU Green Labs, Jacquie has played a vital role in efforts to re-use solvents by making them clean again through distillation. She manages a solvent distillation unit which Jacquie has already utilized to recover 560 gallons of acetone which is re-used by teaching and research labs. Jacquie also gives her time and expertise to determine if other solvent waste streams identified on campus are feasible for re-use. She does so by distilling test samples and then utilizing instrumentation to determine the purity of the distilled solvent. For example, presently she is working with a lab to determine if ethanol can be re-used for the storage of biological specimens and previously she helped with a methanol waste stream that is now being re-used for staining and de-staining of gels in biological labs. Of equal importance is Jacquie's impact on students and future chemists attending class in the Organic Chemistry Teaching Labs. Jacquie has exchanged at least 5 more toxic teaching lab experiments with green chemistry experiments. Students in the teaching labs are also participating in the solvent recycling efforts by collecting their acetone waste separate from their other chemical waste streams. These efforts will have real and lasting impacts since there are large numbers of students that pass through the Organic Chemistry Teaching Labs every year.

## **CU Green Labs Awards Committee (2017)**

- David Simpson, Lab Manager - Palmer Lab
  - Theresa Siefkas, EH&S Assistant Biosafety Officer
  - Abigail Horn, Graduate Student - Goodrich Lab
  - Rebecca Stossmeister, Compliance Officer - Office of Contracts and Grants
  - Kathy Ramirez-Aguilar, CU Green Labs Program Manager
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## CU Green Labs Award Recipients (2016)



From left to right: Vice Chancellor for Research Terri Fiez, Veronica Bierbaum, Tina Smith, Chris Sneary, Annette Erbse

### **Christopher Sneary**

#### ***Category: Individual Achievement***

Chris Sneary is the JSCBB dock manager. Chris is truly passionate about diverting waste from the landfill and goes out of his way to re-use and recycle the high volume of packaging materials received at JSCBB. For example, he saves materials such as bubble wrap and shredded packing paper for re-use with outgoing shipments, collects & brings foam peanuts to Pack Mail (a local company) in his personal time, makes sure "mail-back" foam shipping containers get shipped back to their companies, and recycles materials as much as possible using campus programs. Even specialized items such as vermiculite and ice packs are reused when possible. Chris has also been instrumental in the recycling success of JSCBB by permitting the storage of numerous recycling carts, totes, and collection bags for CU Green Labs in the loading dock. Chris is knowledgeable about the recycling programs in JSCBB, and tries to guide lab members to do the same. As the focal point for JSCBB shipments, Chris has a direct impact on both the people and materials in the building, leads by example, and instills a positive culture of recycling at the loading dock.

### **Christina Smith**

#### ***Category: Individual Achievement***

Tina Smith is a graduate student in the Yin Lab in Biofrontiers. Tina has given countless hours of volunteer time to the CU Green Labs Program to lead and organize efforts in JSCBB as a CU Green Labs Team Lead. She has been instrumental in helping the stockroom supply more sustainable pipet tips, which use less plastic and are packaged in more environmentally friendly materials. Ongoing she monitors and switches out

collection containers for the pipet tip box recycling in JSCBB which results in the collection of approximately 6,000 lbs of plastic every year in JSCBB. She also has taken charge of the lab container metal recycling and solvent recycling in the building. Solvent recycling in the building has expanded to not only acetone but also methanol now because of Tina's outreach efforts. Tina acts as a point person in the building that lab members can contact with their ideas for conservation and she regularly communicates opportunities and successes with building occupants by submitting announcements for the building LCD screens and also to the building weekly email bulletin. Tina has been essential in engaging lab members into the Green Labs Program in JSCBB and inspiring new volunteer leaders in that building.

## **Bierbaum Lab**

### ***Category: Laboratory Achievement***

Since January 2010, the Bierbaum Lab has been turning off 5 diffusion pumps at night and on the weekend for large electricity and water savings. In general, lab diffusion pumps are left on 24/7 and cannot be turned off at night and on the weekends. But because the Bierbaum Lab closes off their vacuum chamber from their pumps each night, it made this idea feasible. At first Facilities Management installed timers and valves to allow the lab to turn the electricity and water off/on as needed. But later the lab decided to turn the electricity to the pumps off manually for larger savings and just use the timers to turn the water off since that required a 2 hour delay. Even after two problems were encountered, the lab was willing to work through the issues so they could continue to turn the pumps off. Because diffusion pumps have large energy and water-cooling needs, the amount of electricity and water savings resulting from the effort of this lab is significant. Since 2010, it is estimated that the lab's efforts have saved 6 million gallons of water (the same as 9 Olympic size pools) and 350,000 kWh of electricity (the same that 8 inefficient Ultra Low Temperature Freezers would use in the same period of time).

## **Biochemistry Shared Instruments Pool**

### ***Category: Partnership for Lab Sustainability***

The Biochemistry Shared Instruments Pool is a collection of shared lab equipment assets, managed by Annette Erbse, started several years ago by the Biochemistry Division of the Department of Chemistry and Biochemistry. This unique offering reduces the purchase of redundant instrumentation which saves researcher funding, reduces energy use that would result from redundant equipment, and benefits effective, efficient lab space utilization. The Pool also enables showcasing of available equipment resources to potential new scientists and saves researcher time by facilitating researcher access to equipment resources and also placing upkeep, repairs, and training responsibilities on Annette rather than researchers. Annette also has extensive experience with the instrumentation and is able to help researchers with experimental optimization, data evaluation and interpretation. The Pool benefits university compliance with Code of Federal Regulations requiring equipment sharing and avoiding duplication, and is available for use by university researchers outside of

Biochemistry as time will allow. Importantly, the Pool serves as a great model for other campus departments to implement because it utilizes a gradual, rather than a heavy-handed, approach to growing the assets available in the Pool (by adding equipment as faculty retire and needs are discovered), and secondly because it has enabled sharing of more than just very expensive lab equipment, but also more common, general-use equipment where there is the greatest potential on campus to grow lab equipment-sharing.

### **CU Green Labs Awards Committee (2016)**

- Karen Regan, Assistant Vice Chancellor of Research
  - Jacqueline Richardson, Organic Chemistry Teaching Lab Instructor
  - Stephanie Mayer, EBIO Instructor
  - Chris Quattrociocchi, EH&S Hazardous Materials Manager
  - Kathy Ramirez-Aguilar, CU Green Labs Program Manager
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### **CU Green Labs Award Recipients (2015)**



From left to right: Jessica Henley, Theresa Nahreini, Janet Fox, Jennifer Shannon Law

### **Jessica Henley**

As the lab manager and Lab Eco-Leader for the Fierer Lab in EBio & CIRES, Jessica Henley strives to promote a culture of sustainability and implement sustainable practices in her lab which serves as an example for other labs. Typical to molecular microbiology labs, the Fierer lab requires significant use of consumables and freezer space. Jessica has reduced the lab's environmental impact by instituting practices such as raising their Ultra Low Temperature Freezer setting from -80 to -70°C; organizing and removing freezer samples no longer needed to reduce the need for additional freezer space; and establishing and maintaining a pipet tip box recycling site which otherwise

would not exist for Cristol and Ekeley and which requires walking full totes of pipette tip boxes across a section of main campus multiple times a month. Jessica has also tested a new technique to store DNA samples at room temperature, which will further reduce the need for freezer space and energy consumption, serves as a leadership example for other labs, and provide confidence for other labs to implement this new technique without the worry of sample degradation.

### **Theresa Nahreini**

As the manager of the Department of Chemistry and Biochemistry Cell Culture Facility and a Lab Eco-Leader for the CU Green Labs Program, Theresa Nahreini has been engaged and involved in numerous efforts for energy savings. In particular, Theresa researched and implemented a policy in her facility in 2007 that blowers on the Class II A2 Biosafety Cabinets would be turned off when not in use, an action that continues today and has been promoted both across campus by CU Green Labs and shared nationwide. It has resulted in an estimated 95,000 kWh or ~\$8000 in electricity cost savings in just Theresa's facility alone, and extends the lifetime of the filters on the Biosafety Cabinets. Theresa is also a strong advocate for waste diversion. She willingly acted as the JSCBB pilot for plastic film recycling in 2012 which has resulted in 600 lbs. of film recycled and in 2013 began participating in the ethanol reuse program where 200 gallons of clean humidified ethanol from INSTAAR has been re-used to sterilize Biosafety Cabinets instead of being disposed as hazardous waste. Lastly, Theresa is noteworthy for building a culture of recycling and energy efficiency in JSCBB since all cell culture users must participate in an orientation where she emphasizes the availability of recycling and energy conservation efforts.

### **Janet Fox**

Janet Fox is the lab manager for the Winey Lab in MCDB and is one of the most engaged Lab Eco-Leaders in the CU Green Labs Program. Janet promotes a culture of sustainability in her lab, regularly participates in CU Green Labs efforts and has spearheaded many actions for energy savings in her lab. In 2010, she was the first to suggest the idea to CU Green Labs that we pursue an effort to raise the temperature of Ultra Low Temperature freezers from -80°C to -70°C, an effort which she had implemented in her lab. As a result, 50% of CU-Boulder's ULT freezers are now set at -70°C, saving an estimated 80,000 kWh/yr or \$6000/yr in electricity costs. This idea is now being pursued at universities and federal research labs across the nation. In 2012, Janet and the Winey Lab participated in a deep lab audit pilot by the CU Green Labs Program leading to a near 50% reduction in their lab's plug load, from 113 to 52.5 kWh/day. Two major changes led by Janet included consolidating from two Ultra Low Temperature freezers to just one and replacing two low temperature incubators with a single, much more efficient, heating only incubator for their 30 °C work, both resulting in significant reductions in electricity use.

## **Jennifer Shannon Law**

Jennifer has been incorporating sustainability into her role as the operations manager for the IPhy Department for several years which is promoting a culture of sustainability in her department because of her regular interactions with department members and actions she takes on behalf of the department. She is a point person for many departmental needs and when there is a new equipment purchase, she always recommends equipment that is energy efficient. When it came time to purchasing a new Ultra Low Temperature freezer as a departmental back-up unit, she purchased a unit which is still one of the most energy efficient Ultra Low Temperature freezer owned on campus and has resulted in other labs purchasing the same unit. With metering assistance from CU Green Labs, she then had the IPhy lab with the most inefficient freezer switch to the new efficient unit and leave the inefficient unit unplugged as a back-up, a non-typical exemplary action which is influencing other departments to unplug their back-up units as well. She has been a strong supporter of CU Green Labs efforts including raising the temperature of ULT freezers from  $-80^{\circ}\text{C}$  to  $-70^{\circ}\text{C}$  with PI approval and permitting and supporting an energy savings study of Ultra Low Temperature Freezers conducted by DOE on campus.

## **CU Green Labs Awards Committee (2015)**

- Shane Frazier, Graduate Student
- Stephanie Mayer, Ecology and Evolutionary Biology
- Ashlyn Norberg, CU Green Labs Student Employee
- Kathryn Ramirez-Aguilar, CU Green Labs Program Manager
- Jacquie Richardson, Department of Chemistry and Biochemistry
- Theresa Siefkas, EH&S Biosafety