

References and Resources, Green Laboratories

Please email kathryn.ramirez@colorado.edu or apdoyle@ucdavis.edu to add resources or links

Organizations with a focus on sharing knowledge, collaboration, and organizing people on topic of sustainable labs

1. **International Institute for Sustainable Laboratories**

- a. www.i2sl.org
- b. Annual conference in Sept where the Green Labs Community convenes among other disciplines (engineers, architects, designers, etc.)- don't miss it! It is the event of the year! <http://www.i2sl.org/conference/index.html> (2015 conference is in San Diego)
- c. Laboratory Improvement Maturity Matrix (LIMM, (In Progress! Contact Allen Doyle adoyle0128@gmail.com if wish to get involved):
 - i. See working group page:
<http://www.i2sl.org/working/continuousperformance.html>
 - ii. Tool: Researcher engagement--in progress, seeking content experts
 - iii. Tool: ULT freezers--in progress, seeking content experts
- d. University Alliance Group- exploring ways to connect sustainability to research finances
 - i. See working group page:
http://www.i2sl.org/working/university_alliance.html
- e. Best practice guides, tool kit; HVAC tuning and upgrades, etc.;;
 - i. <http://www.i2sl.org/resources/toolkit.html>
- f. Access to years and years of previous conf presentations (\$185 annual membership)- here is the membership page;
<http://www.i2sl.org/globalcommunity/becomemember.html>

2. **S-Labs in the UK (Safe, Successful and Sustainable Labs)**

- a. new site: <http://www.effective-lab.org.uk/>
- b. original site: <http://www.goodcampus.org/s-lab/>

3. **US Dept to Energy Better Buildings Laboratory Technology Solutions Team**

- a. Laboratory Ventilation Guide, ULT freezer energy efficiency fields study and other documents can be found at this page::
<https://www4.eere.energy.gov/alliance/activities/technology-solutions-teams/laboratories>

Green Labs Planning Group:

1. **Green-Labs-Planning Google Group:** apdoyle@ucdavis.edu, or go to the following page to apply to join the group:
<https://groups.google.com/forum/#!forum/green-labs-planning>
2. **Green-Labs-Planning Group website** (still in its beginning stages):
<http://greenlabsplanning.org/>

Lab Assessment Tools at Various Institutions

1. **UC Davis assessment tool.** [UC Davis Green Lab Assessment, Training version, 2015](#) and Green Lab Workspace website:
http://sustainability.ucdavis.edu/action/green_workplace/green_labs.html
2. **University of California shared assessment tool**—similar to above, but a SurveyMonkey assessment that may be completed by one member of a research team, and is available to everyone on the web.
<https://www.surveymonkey.com/r/greenlabassessment>;
3. **My Green Lab** (similar to #2- from same source)
<http://www.mygreenlab.org/green-lab-assessment.html>
4. **S-Labs**
<http://greenlabsplanning.org/sites/default/files/S-Lab%20Briefing%20Paper%203%20-%20lab%20assessment%20final%20%283%29.pdf>
5. **Yale** <http://ehs.yale.edu/policies-procedures/green-laboratories-certification>
6. **Berkeley** <http://sustainability.berkeley.edu/engage/green-certifications>
7. **Duke** <https://sustainability.duke.edu/action/certifications/labs/index.php>
8. **Arizona State University :**
https://docs.google.com/document/d/1AWHzZd--Stlc984mSkeH_IzvKkLqasssimJ-yZrV2j4/edit

Freezer Efforts

1. **Freezer Challenge Links:**
 - a. Presentation at I2SL:
http://www.i2sl.org/labs21/conference/presentations/2011/pdfs/f6_doyle.pdf
 - b. Presentation for DOE Better Buildings Labs Solutions
https://www1.eere.energy.gov/buildings/commercial/pdfs/freezer_challenge_webinar_122012.pdf
 - c. Information on Freezer Challenge:
<https://sites.google.com/site/labfreezercompetitioncuboulder/>;
http://sustainability.ucdavis.edu/action/conserve_energy/store_smart.html
 - d. Brochure:
http://sustainability.ucdavis.edu/local_resources/docs/storesmart/freezer_challenge_brochure.pdf
 - e. Center for Disease Control Freezer Challenge 2012 Video
<https://www.youtube.com/watch?v=P02k0gn-e9U&feature=youtu.be>
 - f. Center for Disease Control Store Smart training slides (public): cdc.train.org Search for “Freezer Challenge”. Ready to go training program!

- g. “-70 is the new -80” Short [video](#) from My Green Lab reasons to *Chill Up* your ULT freezer.
- h. “Be Smart; Store Smart. (please throw away old samples!) Short [Video](#)
- 2. **ULT Freezer Operations: MythBuster’s Guide**
http://apps1.eere.energy.gov/buildings/publications/pdfs/alliances/ulf_freezer_use_r_guide.pdf
- 3. **DOE Field Study of Energy Efficient ULT freezers**
<http://energy.gov/eere/buildings/downloads/field-demonstration-high-efficiency-ultra-low-temperature-laboratory>

Market Analysis of Opportunities for Conservation in California Labs

<http://www.etcc-ca.com/reports/market-assessment-energy-efficiency-opportunities-laboratories>

University Green Labs Initiatives (info from Green Labs Planning website: www.greenlabsplanning.org)

[LabRATS University of California, Santa Barbara](#)

[Green Lab Program University of California, Davis](#)

[Green Labs Program, University of Colorado Boulder](#)

[Green Labs, Harvard University](#)

[Working Green at MIT Massachusetts Institute of Technology \(MIT\)](#)

[Certified Wolfpack Green North Carolina State University](#)

[Green Labs University of California, Berkeley](#)

[Green Labs Program, Arizona State University](#)

[LivingGreen University of California, San Francisco](#)

Green Labs Program University of California, Santa Cruz

Green Labs, University of Pennsylvania

Green Labs Initiative Washington University in St. Louis

Green Lab Certification, Yale University

Green Laboratory Program University of Texas at Austin

Sustainable Lab Recognition Program University of Michigan

Green Laboratory Program University of Washington

Be Spartan Green Michigan State

Green Chemistry in University Laboratories:

1. **ACS website:** <http://www.acs.org/content/acs/en/greenchemistry.html>
2. **Green Chemistry Commitment** (incorporating green chemistry into curriculum)
<http://www.greenchemistrycommitment.org/>
3. **Green Education Materials for Chemists** (Univ. of Oregon):
<http://greenchem.uoregon.edu/gems.html>
4. **Univ. of Toronto:** <http://www.chem.utoronto.ca/green/chemistry.htm>
5. **MIT Chemical Wizard:**
<http://ehs.mit.edu/site/content/green-chemical-alternatives-purchasing-wizard>
6. **Univ. of Michigan ReUse:**
<http://www.oseh.umich.edu/hazmats/chem-reuse.shtml>
7. Avoid mercury lamps in microscopy [video](#)

CU Boulder Posters and Contests:

<http://www.colorado.edu/ecenter/green-labs-outreach-materials/green-labs-posters>

<http://www.colorado.edu/ecenter/green-labs-outreach-materials/contest-materials>

Fume Hood Stickers: ...a one dollar solution to a thousand dollar problem.
A sash closure campaign, without the campaign! (approved by EH&S)

https://marketplace.ucdavis.edu/C21642_ustores/web/product_detail.jsp?PRODUCTID=288&SINGLESTORE=true

UC Santa Barbara Shared Instrumentation Website:

www.sharedinstrumentation.ucsb.edu

Ventilation Management

- JCHAS article with 8 vs 6 ACH flow chart:

http://sp.ehs.cornell.edu/lab-research-safety/chemical-safety/lab-ventilation/Documents/Control_Banding_JCHAS.pdf

- Cornell website P-D-C-A

<http://sp.ehs.cornell.edu/lab-research-safety/chemical-safety/lab-ventilation/Pages/default.aspx>

- LVMP Systems approach:

http://sp.ehs.cornell.edu/lab-research-safety/chemical-safety/lab-ventilation/Documents/LVMP_paper_final.pdf

- Room control banding form:

http://sp.ehs.cornell.edu/lab-research-safety/chemical-safety/lab-ventilation/Documents/Control_Banding_Survey_v2.pdf

- Control Banding:

http://acsdchas.files.wordpress.com/2014/02/4_decker_control_bands.pdf

- ACS:

<http://www.acs.org/content/dam/acsorg/about/governance/committees/chemicalsafety/identifying-and-evaluating-hazards-in-research-laboratories-draft.pdf>

- Slides on LVMP development

[http://www.rpic-ibic.ca/documents/RPIC_SLCAN_2013/2013_presentation/
Stream_2/3_-_Thomas_Smith_part6.pdf](http://www.rpic-ibic.ca/documents/RPIC_SLCAN_2013/2013_presentation/Stream_2/3_-_Thomas_Smith_part6.pdf)