



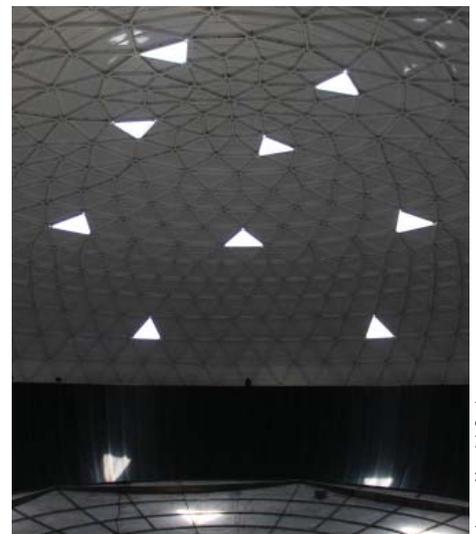
Curious SBSEers anticipate an in-depth understanding of Biosphere 2, such as this excursion into the lung tunnel....

LAST MINUTE CALL - RETREAT 2014

>Adaptation Retreat at Biosphere2, Oracle, AZ (1 hour from Tucson International Airport), focuses our conversation on “adjustment in natural or human systems (the built environment and infrastructure) in response to actual or expected climatic stimuli and their effects to moderate, harm, or exploit beneficial opportunities.” [Intergovernmental Panel on Climate Change (IPCC)] We call on faculty, practitioners, content experts, and students to share tools, case studies, and innovative studio exercises that address adaptation. We invite proposals for presentations, workshops, activities, or discussions on any of the sub-themes below. Proposals must include innovative pedagogical content that relates to teaching (and learning) for design studio and/or lecture/seminar courses.

- Biomimicry, Ecology, Greener Pastures—natural systems, biomimetic models, patterns or systems that inspire design processes to advance solutions to human issues.
- Education, Pedagogy—building interdisciplinary curriculum; experimenting with shifting lecture time to participatory activities designed to boost critical thinking; building peer-to-peer learning frameworks; exploring ways to integrate technology and using tools to embed intuitive understanding of concepts/principles.
- Regional Climates and Strategies—analysis of weather and climate in your region and impacts on design; strategies to address potential building and socio-economic impacts of climate; establishment of local 2030 neighborhoods.
- Innovations—tools, methods, techniques, or design strategies that enhance adaptation and resilience in building design and planning.
- Roundtable Discussions and Working Groups—“Hot topics” like garnering support for research and scholarship; getting your first job; administration; infusing research into teaching; focusing leadership on climate change; starting a competition, etc.
- Workshops—on energy modeling and implementation (1 hr each)

• continued pg 3



photos: Meredith Sartler

...and inside the west lung.

2014 RETREAT SCHEDULE

Sep 30, 2013	Retreat Announced
Jan 6, 2014	Call for Proposals
Mar 21, 2014	Proposals Due @ 5p PST
Mar 31, 2014	Notification of acceptance
May 1, 2014	Registration closes (or until retreat spaces are filled)
Jun 19–22, 2014	>Adaptation Retreat
Jun 22–23, 2014	Post-Retreat Tour 🖐

SEE [HTTP://WWW.SBSE.ORG/RETREAT2014](http://www.sbse.org/retreat2014)

LETTERS TO THE EDITOR

I have been a member of SBSE, but did not know about the newsletter! Wow, How can I get on the mailing list?

—Shannon Sanders McDonald, Southern Illinois

[The newsletter is digital-only now. I inform members when it is posted via the SBSE listserver. Have you signed up for the list server? Instructions are on the SBSE web site in a couple of places... membership page and contact us page...maybe I should add the link to the newsletter page too as well as the digital only language! My to-do list grows...-ed.]



Folks might like the new video we finished recently. Type 'Jeff Haberl video' to see the link <<http://vimeo.com/tag:jeff+haberl>>. It shows a time-lapse video of a new building across from our college on the TAMU campus. Very instructive to watch.

—Jeff Haberl, TAMU

[Thanks for the tip. I love to see the bones of a building develop.-ed.]



The AIA would like to hear from anyone in the academy who has partnered with an architecture firm to conduct research and to tell us what the topic of research was/is.

—Richard Hayes, AIA

[Send your info to Richard at <RHayes@aia.org>.-ed.]



“Knock Nick Pine off the back page!” Oh no!

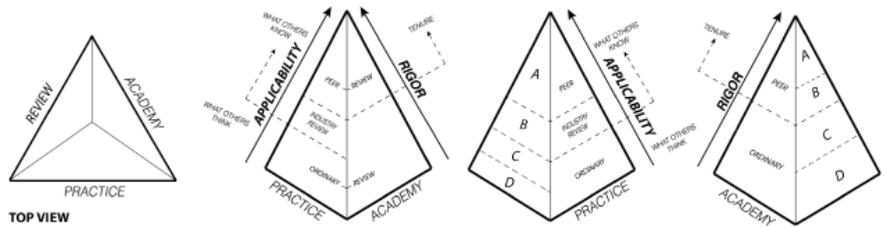
—Nick Pine, Back Page King

[OK Nick, you still rule!-ed.] 🖐

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AEC RESEARCH REVIEW

A KNOWLEDGE PYRAMID MODEL FOR DETERMINING TRUSTWORTHINESS



The AEC Research Pyramid was developed during the 2012 and 2013 AIA Research Summits, with the premise that the knowledge strata for the academy and practice are connected, but not identical. There are multiple varieties of research within the architectural, engineering, and construction (AEC) fields. A key to appreciating the research undertaken and reported upon is its devotion to the scientific method. While differences in approach are to be expected, application of the scientific method helps to ensure research is conducted in an unbiased way. Research conducted in practice and academic settings depends on different educational contexts and professional experiences. As part of the BRIK initiative, the results from the Research Summits' AEC Research Pyramid are to be posted in BRIK and expected to assist in clarifying research submissions.

Overview Shared knowledge on the academic side is based on rigor driven by peer review supporting tenure track careers. For practice, rigor is based on usefulness of knowledge for the direct application to service and project delivery. For the profession to take full advantage of research from both spheres there must be recognition of the value of the overlay and connection of these two bodies of knowledge. As a piece of research “moves up” the pyramid, it does not necessarily increase in applicability, only in that its methodology more closely followed the scientific method.

Twin concepts of reliability and validity must be considered to determine trustworthiness. Reliability is the degree to which an evaluation process yields steady and dependable outcomes. Validity is the quality of being empirically sound. So the underlying unifier for the two sides of the pyramid above is a third side that has to do with achieving trustworthiness, i.e. can you trust the study? This aspect has four graded levels: D—not reviewed, C—reviewed for structure (grammar, spelling), but not for findings, B—study findings reviewed, A—study reviewed for trustworthiness.

CARS Trustworthiness suggests a peer review process that takes into account CARS, an evaluation of a source (research) using Credibility, Accuracy, Reasonableness, and Support. The characteristics of these attributes are:

- **Credibility:** Author and credentials listed; well-edited in terms of grammar, spelling, positive well-balanced tone; and relevant
- **Accuracy:** Date, recently published or considered seminal, succinct, and original
- **Reasonableness:** Tone or language that implies unbiased attitude, no conflict of interest, specific points of fact, and reliable
- **Support:** Source for data or statistics provided or referenced, documentation provided or referenced, corroborating sources listed, and well-balanced point-of-view

Research pyramid development The knowledge pyramid model for determining trustworthiness had its genesis during the 2012 AIA Research Summit. The following year's summit revisited the model with discussions and revisions. Since the conclusion of the 2013 summit, further revisions have occurred.

Metrics/Measurements Discussion The major outcomes for this session were items to take into account when establishing metrics/measurements—Applicability (can it be used?), Replicability (can the experiment be run again and achieve the same results?), Transparency (is all the data available for review?), Findings and Supporting Data (outcome measurements in a usable manner), Usability (was it used by others?), Rigor (degree of precision coupled with

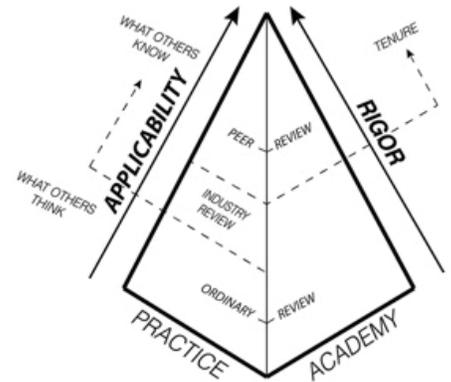
supporting documentation), Quality (standardized operations and high degree of integrity), and Cost Impact (return on investment).

Summit participants looked at several options to rank and rate research via a simple matrix diagram to establish an easily understood graphic that would help in establishing metrics and measurements. Also the graphic concept was to aid in depicting differences between academic peer review and professional evaluation of research documents. The idea is to establish a system where by a piece of research can be evaluated by level of review, degree of supporting documents, and degree of simulation.

The 2013 Summit revisited the pyramid as a benchmarking tool that holds potential for architectural research called a “pyramid of inquiry” (POI). The pyramid holds promise, because it combines the matrix concept and the sliding scale. A three-sided POI pyramid can represent three realms of research: practice-based, academic-based, and review rigor. The multiple faces could also be designated for specific undertakings, such as design research, educational research, and forensic studies. In each case the tip of the pyramid represents the highest degree of rigor, and statistical validity is assumed. By varying the focus of the pyramid faces, the model becomes scalable and can be applied to the design world.

A refined pyramid model was included in the 2013 Summit Report. Having the pyramid context defined, enables dialogue that allows the AIA to learn and document value propositions for firms doing research, i.e. What constitutes research for the practitioner? How do researchers help the general practice of architecture? 🖐

—Richard Hayes



Pyramid of Inquiry practice/academy sides detail. All sides shown on page 2.

graphics: AIA

LAST MINUTE CALL - RETREAT 2014 [CONT.]



Your proposals should include:

- Name(s) of session organizer/presenter
- Contact information (institution, e-mail, telephone, url)
- Theme addressed by your proposal
- Title of your presentation, workshop, demonstration, or hands-on activity
- Description of presentation (250 words max)
- Objectives, questions raised, and/or activities implemented
- Intended outcomes and deliverables
- Take away (if any) for attendees
- Indicate 30-minute activity or 60-minute workshop

E-mail your proposal to Alison Kwok <akwok@uoregon.edu> by Mar 21, 2014, 5:00p PST.

Full retreat info at <<http://www.sbse.org/Retreat2014>>. 🖐

—Alison Kwok



Maybe SBSEers can hang in the rainforest (top) or on the beach (above) in the Biosphere.

photos: Meredith Sattler

BAD/GOOD NEWS DUES

Bad news—You know that as of June 21 SBSE dues will be raised to \$50/year.

Good news—SBSE has created a new membership portal with Wild Apricot, which will help us manage our expanding and absent-minded membership [*Mostly professors—ed.*]. Wild Apricot will send you gentle reminders to re-up your dues every year. We've created accounts for current and recently elapsed members (since 2010) based on their reported e-mail addresses. Beginning now, you all can renew through June 21, 2015 for \$50 whether you have an account or not. We have also established 3-year (\$120) and lifetime (\$500) memberships for the budget-oriented and the faithful. Student dues remain at \$15 and developing country memberships are still free.

Check out the new membership portal at <<http://www.sbse.org/membership/newform2.htm>>. You can change your membership category (regular, student, developing country, 3-year, or life), update your info, and pay your dues via PayPal or personal check. Our secretary/treasurer, Alexandra Rempel <arempel@uoregon.edu>, can answer any technical questions, but she believes it's all self-explanatory!

Shout out to Alex for making it happen! A lot of work and research were required. 🙌

—Bruce Haglund

SBSE PEOPLE

☆ Kudos to **Karen Kensek** and **Douglas Noble** (USC) who were recognized by ACSA for their project, NotLY: Not Licensed Yet. Read about it at <<http://www.acsa-arch.org/programs-events/awards/archives/2014-awards-press-release>>. Those “emerging professionals” living within the reach of the project are very fortunate! This kind of pre-licensing support fills a big void for many.

☆ **Jörg Rügemer** with collaborator Erin Carraher (Utah) received Diversity Achievement & Collaborative Practice awards for Project: Architecture, which provides vital mentoring for women practitioners, architecture students, and girls learning about career possibilities in the built environment. Details at <<http://www.acsa-arch.org/programs-events/awards/archives/2014-awards-press-release>>.

👤 **Jim Wasley** is stepping down as UWM Architecture chair at the end of the school year. “Hallelujah! Back to working on issues of importance and I'm going up for full professor.” [*G'luck Jim!—ed.*] 🙌

CONFERENCE REVIEW

ARCC/EAAE RESEARCH CONFERENCE 2014: BEYOND ARCHITECTURE



photo: Bruce Haglund

ARCC/EAAE attendees take a lunch break in the architecture school's central courtyard, which is tented for winter shade and surrounded by a chromatic glass sculpture by James Carpenter for dynamic lighting effects.

The Architecture Department hosted the conference on the University of Hawai'i campus in Honolulu in February. See <<http://www.arch.hawaii.edu/arcc-eaac2014/>>. Nothing to complain about in that scenario.

Typical of these collaborative international conferences, it brought together a wide range of brilliant, cutting-edge scholarship. Consequently, the sessions were interesting, vibrant, and enthusiastically received. SBSE was well-represented among the presenters/authors by Barbara Erwine, Elizabeth Grant, Walter Grondzik, Bruce Haglund, Alison Kwok, Brook Muller, Ulrike Passe, Hazem Rashed-Ali, Meredith Sattler, and Sara Tepfer. An inspiring and evocative keynote was given by Juhani Pallasmaa, my haptic hero! The venue, setting, and eats were great. I played hookey for a day in took in some of Oahu's delights—Punch Bowl, Pali Lookout, Hanauma Bay, Diamond Head, and Wakiki Beach. It filled up my senses!

I hope you all can join in the 2015 ARCC Conference “Future of Architectural Research” in Chicago April 6–9 <<http://www.arcc2015.com/>> to present your research, learn from the sessions, and network with great colleagues. 🙌

—Bruce Haglund



HANAUMA BAY 2014

KENSEK SCORES A PUBLISHING TWO-FER

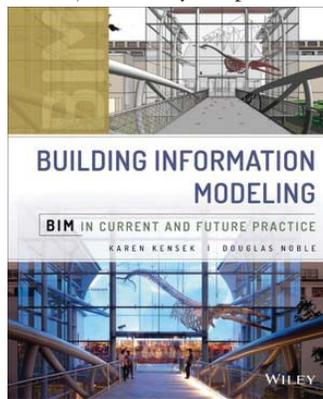
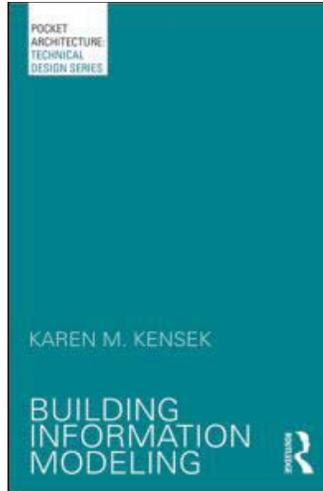
Karen Kensek has written two new books on building information modeling (BIM) that are coming out in April and June.

Technical Series: Building Information Modeling (Routledge <<http://www.routledge.com/books/details/9780415717748/>>) is an overview of BIM in the profession at an introductory, but comprehensive, level. This book addresses many key roles that BIM is playing in shaping professional offices and project delivery processes. The book is divided into two parts: Fundamentals (BIM overview, stakeholders and BIM's many roles, data exchange and interoperability, BIM implementation, and beyond basic BIM) and Application (four case studies). It includes a short section on BIM analytics that might be of specific interest to the SBSE membership.

Building Information Modeling: BIM in Current and Future Practice (Wiley <<http://www.wiley.com/WileyCDA/WileyTitle/productCd-111876630X.html>>) has many chapters that discuss the role of BIM in relationship to energy modeling and other performance-based tools that would be of interest to SBSE members. This book is an edited compilation of provocative essays providing a forum for these leadership voices in the marketplace of ideas about building information modeling in architecture. They provide clarity and direction for thinking about the current practice and the future directions of BIM, instigating commentary by foremost thinkers about both BIM research and speculation into the future of BIM. The 26 chapters are grouped thematically into six sections that present both complementary and sometimes incompatible positions: Design Thinking and BIM, BIM Analytics, Comprehensive BIM, Reasoning with BIM, Professional BIM, and BIM Speculations. In addition, full-color digital material (pdf, PowerPoint, animations) is available for professors to augment the use of this book in their classes: case studies by architecture firms, engineering firms, contractors, two faculty bonus papers, and sample teaching material.

If you have any questions about either book, please take a look at the appropriate web pages, ask for an instructor copy, or just e-mail me <kensek@usc.edu> with questions. 🖱

—Karen Kensek



CHEVROLET PAYS COLLEGES FOR GOING GREEN

U.S. college and university campuses can now receive money to support their clean energy-efficiency initiatives by using first-of-their-kind carbon-reduction performance methodologies penned by Chevrolet. With 675 campuses pledging to go carbon neutral, the money can help deliver even more aggressive performance to help them reach their goals.

If a college's LEED-certified building or campus-wide energy efficiency performance qualifies, their beyond-business-as-usual greenhouse gas reductions are verified as voluntary carbon credits. Chevrolet then pays campuses for these certified reductions and permanently retires them to benefit the climate.

Ball State University in Indiana and Valencia College in Florida have pioneered the application of these new performance methodologies with pilot projects, confirming that such funding is strategic to the realization of their greenhouse gas reductions. Ball State's pilot involves installation of the largest geothermal system at a U.S. college. Valencia College is using the methodology for its energy efficiency program and efficient building construction. Ball State estimates an 8 to 10 percent return on incremental capital over a 12-year span. Valencia estimates a 7 to 14 percent return on incremental capital over a 10-year span. Integrated with its piloting effort, Ball State University will provide a longitudinal (three-year) Carbon Market Study of its experience using the performance methodology to leverage deeper carbon reductions as it works to help Chevrolet meet its goal.

In addition to financial benefits for the participating colleges and universities, students gain valuable experience and insights from such initiatives. They get to learn first-hand how a complex institution can make positive change, how to share such improvements with the members of their academic community, and even participate in real-time academic research associated those achievements. Certainly, as they graduate and become sustainability leaders in their own communities, the far-reaching effects of these initiatives will be multiplied.

Visit Chevrolet's web site <<http://www.chevrolet.com>> for more information about the carbon reduction initiative. 🖱

—Bob Koester



GREEN STUFF FOR SBSEERS

THE MATRIX

Callison Architects has devised a new online tool for public use. It's called Matrix and was originally developed internally to help designers apply sustainable strategies as they design projects. Check it out at <http://matrix.callison.com/>. We welcome feedback <Darryl.Custer@callison.com>.

—Darryl Custer

SUSTAINABILITY TOOLKIT

Green Builder Media is offering a free sustainability toolkit at <http://www.greenbuildermedia.com/sustainability-toolkit>. It's a slide show of the rationale and benefits of sustainable building. "We hope you find the facts and encouragement on its pages useful as you spread the climate change story in your sphere of influence. Please let me know what you think of the toolkit. I would love to hear suggestions for improving and expanding it. You can e-mail me at <sara.gutterman@greenbuildermedia.com>."

—Sara Gutterman

SEFAIRA TOOLS VIDEOS



image: Sefaira web

Here are video links to material on Real-Time Daylighting Analysis in SketchUp <http://www.sefaira.com/daylighting> and <http://vimeo.com/88290976>; Revit Integration <http://www.sefaira.com/sefaira-for-revit>; and the Sefaira Web Application <http://www.sefaira.com/why-sefaira> and <http://www.sefaira.com/demo-video-page/>. 🖱️

—Peter Leonard Krebs

RESEARCH REPORTS

BALL STATE UNIVERSITY

BSU contributed to the ISCN and GULF "Best Practices in Campus Sustainability" report shared at the World Economic Forum.

The International Sustainable Campus Network (ISCN) provides a global forum to support leading colleges, universities, and corporate campuses in the exchange of information, ideas, and best practices for achieving sustainable campus operations and integrating sustainability in research and teaching.

In 2009, the ISCN partnered with GULF, a World Economic Forum (WEF) initiative bringing together the heads of 26 top global universities, to develop the Sustainable Campus Charter. Organized into 3 core principles, the charter requires a commitment at the highest level of the institution, and includes annual reporting on sustainability goals, initiatives, and performance. Since 2011, the ISCN has been sharing examples of the latest campus sustainability projects and programs at this world-renowned meeting.

At the 2014 WEF annual meeting, 23 of the world's leading universities representing 11 countries shared exceptional best practice case studies with presidents of GULF member institutions to enhance the global dialogue on sustainability in higher education. The culmination of these cases may be found in the state-of-the-art report, Best Practice in Campus Sustainability.

"As an ISCN Member, Ball State University has taken the opportunity to promote its geothermal district scale ground source heat pump chiller heating and cooling system; when complete, fully 47 buildings will be connected for heating and cooling as one campus-scale system. We are pleased to share this project with an international audience of top leaders through the ISCN WEF publication of best practices."



photo: Ball State University

—Jim Lowe, BSU

OXFORD BROOKES UNIVERSITY

A research project led by Oxford Brookes University has been held up as an exemplar of research on energy and communities, in a UK Government report on Community Energy.

Research being led by Professor Rajat Gupta, as part of the Economic and Social Research Council (ESRC) funded £1.14m Evaluating Low Carbon Communities (EVALOC) project <http://www.evaloc.org.uk>, was highlighted in the Department of Energy and Climate Change's (DECC) Community Energy Strategy.

The report looks at the benefits of putting communities at the heart of energy policy, of which EVALOC is an excellent example. It notes that "the researchers have developed a robust approach to evaluating the impacts and effectiveness of community-led renovations of homes and behaviour change initiatives on household energy use."

The four-year EVALOC project (2011–14) is evaluating the impacts, effectiveness, and success of low-carbon communities on localised energy behaviours. The multi-disciplinary project involves community-led action research and a programme of household-level monitoring and evaluation. A Community Energy Toolkit is being created that includes materials and guidance for energy projects. The toolkit also includes methods for monitoring and evaluation of household energy use as well as carbon mapping tools to help groups identify, activate, and monitor energy projects in their communities.

Further information is available on the dedicated EVALOC web pages. The DECC report can be read online. 🖱️

—Rajat Gupta

OPPORTUNITIES

WORKSHOP ON BUILDING SCIENCE EDUCATION IN NORTH AMERICA

Students, professors, and lecturers of building science, as well as practicing architects, engineers, and risk management professionals interested in building science education, should attend an upcoming workshop from ASTM International and the National Institute of Building Sciences. The ASTM/NIBS Workshop on Building Science Education in North America will be held **April 6** at the Sheraton Toronto in Ontario, Canada.

Sponsored by ASTM Committee E06 on Performance of Buildings; ASTM Subcommittees E06.55 on Performance of Building Enclosures and E06.41 on Air Leakage and Ventilation Performance; the ASTM Built Environment Advisory Council; the National Institute of Building Sciences; and the Joint Committee on Building Science Education, the workshop will provide an overview of building science education as it currently exists in North America. The one-day event will offer a critical review of graduate-level curricula currently available in building science and how that curricula can be further developed and refined to more effectively educate architects, engineers, and construction professionals.

Speakers, recognized as subject-matter experts in Building Science education, training and curriculum development, representing universities in Canada and the United States, will make presentations. View the speakers list at <http://enews.nibs.org/t/r-l-pdjyutk-buhckuhu-a/>.

The workshop will conclude with an appraisal of the ASTM/NIBS Building Enclosure Certification and Training Program currently under development, which offers a new opportunity for professional development, certification, and career advancement in architecture and engineering. Talks will address how that curriculum can be developed to align with curricula at Canadian and American colleges and universities to satisfy the certification requirements being developed.

Registration is \$110 USD online and \$135 USD on site. (ASTM members receive a \$25 discount.) Presenters and students with a valid ID get in free. Online registration closes April 2. But don't wait. Register now <http://enews.nibs.org/t/r-l-pdjyutk-buhckuhu-g/>. For additional technical information, contact workshop chairman, Daniel Lemieux dlemieux@wje.com.

—Justin Boone

2014 LIGHTING RESEARCH CENTER SEMINARS

Residential Lighting Technologies and Techniques is a one-day seminar to help those involved in residential lighting to select and install efficient, new lighting technologies, such as LEDs. Participants will handle actual lighting products (bulbs, fixtures, controls) to learn how these products operate, are interconnected, and are installed; and will redesign existing lighting plans to increase efficiency, and estimate costs and energy savings. Seminars will be held across New York State: April 9 in Troy; April 30 in Newburgh; May 8 in Buffalo; May 14 in Elmira; May 15 in Syracuse; and October 1 in NYC.

The LED Lighting Institute is a three-day seminar covering all the latest on light-emitting diode (LED) and organic light-emitting diode (OLED) technologies. Through hands-on experience, participants learn how to incorporate LED and OLED technologies into architectural lighting fixture designs, develop lighting systems using the unique characteristics of solid-state lighting, and compare LED and OLED system components from a variety of manufacturers to determine operating characteristics and other important specification factors. The seminar will take place May 13–15 at the LRC in Troy, NY.

The Light and Health Institute is a two-day seminar on designing and using efficient lighting to benefit health and wellbeing. This hands-on seminar will explore light's effect on sleep, alertness, and performance, and will illustrate how light can be used to improve conditions such as Alzheimer's disease, depression, and jet lag. The seminar will be held May 6–7 at the LRC in Troy, NY. Participants who register by April 15 will receive a Daysimeter (personal light measurement device) to wear for a two-week period prior to the institute. LRC researchers will analyze the light exposure data collected and these participants will receive a report detailing their circadian entrainment during the two-week period.

For more information or to register, please visit <http://www.lrc.rpi.edu> or contact Dan Frering at 518.687.7100 or frerid@rpi.edu. 🖱

—Dan Frering

LRC INTERNSHIPS



photo: LRC

The Lighting Research Center (LRC) and ASSIST are making available a limited number of paid summer internship opportunities for undergraduate students from engineering, physics, science, architecture, or industrial design. Selected students will participate in an intensive, eight-week education and research program focused on solid-state lighting. The program will be held from June 2 to July 25, 2014 at the LRC facilities in Troy, NY.

Undergraduate students from universities within the United States with at least a 3.0 grade point average who have completed at least three years of study in one of the following areas:

- Mechanical, electrical, or other engineering discipline
- Physics or other area of science
- Architecture or architectural engineering
- Industrial design

Students selected for the program in solid-state lighting at the LRC will:

- Participate in cutting-edge research under the mentorship of world-class scientists and engineers
- Characterize LED/OLED products using state-of-the-art photometry equipment
- Improve the design and application of LED- and OLED-based lighting systems
- Present work to potential employers at major solid-state lighting companies
- Receive a stipend of \$4,800.

Students can apply for the internship by completing the application form <http://www.lrc.rpi.edu/education/SSLInternship/application.asp>, and submitting other requested materials by the deadline specified on the form.

For more information on the summer internship program in solid-state lighting, contact Dan Frering frerid@rpi.edu. 🖱

—Dan Frering



photo: Gary Reysa

This isn't a lawn boiler. It's a solar shed. Just like Yeti, Nessie, and Bigfoot, no lawn boiler has been caught on film!

WHAT THE HECK IS A LAWN BOILER?

I've been helping a family near Colorado Springs figure out how to solar heat their house, which has too many windows. At first we thought it needed a lawn boiler.

Brian Modrzewski writes, "I must have missed something, what is a lawn boiler?"

It's a box on the lawn with a large hot water tank and a solar heater designed to help solar heat a nearby house close to 100%. It's similar to a solar shed <<http://www.builditsolar.com/Projects/SpaceHeating/SolarShed/solarshed.htm>>, but with a single bare sloping bidirectional pipe that's empty most of the time instead of 2 insulated pipes that are always full to move hot water from the boiler to the house and cool water back from the house.

"Are there pictures of one? Has anyone built one? Are there any detailed plans to build one?"

Not yet. 🖐

—Nick Pine

[Now it looks like the house can be exactly 70°F for every hour of a TMY2 year in Colorado Springs, with the help of an evaporative cooling pond and an internal house tank and no lawn boiler.—Nick]

SBSE CALENDAR

2014

- Apr 10–13 Windsor Conference/Windsor, United Kingdom
- Jun 19–22 SBSE Retreat/Biosphere 2, Arizona, United States
- Jun 26–28 AIA Convention/Chicago, Illinois, United States
- Jun 28–Jul 2 ASHRAE Annual Conference/Seattle, Washington, United States
- Jul 6–10 ASES Solar 2014 Conference/San Francisco, California, United States
- Sep 16–19 ISES EuroSun 2014 Conference/Aix-les-Bains, France
- Oct 28–30 World SB14 Conference/Barcelona, Spain
- Nov 24–28 MACDES.2014 Tercer Congreso Internacional/Havana, Cuba
- Dec 16–18 PLEA 2014/Ahmedabad, India

2015

- Apr 6–9 ARCC Research Conference/Chicago, Illinois, United States
- May 14–16 AIA Convention/Atlanta, Georgia, United States 🖐

SUMMER ISSUE SUBMITTAL DEADLINE—JUNE 1



SBSE NEWS
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TO: SBSE MEMBERS & FRIENDS
PLANET-WIDE

