



screen shot: Murray Milne

Sun Motion and Sun Control: the above image is one frame from HEED's hourly animation video in shadow-view mode.

HEED IS DESIGNED FOR YOU

The newest versions of *HEED* (*Home Energy Efficient Design*) and *Climate Consultant* have just been posted, marking the end of three years of development at UCLA funded by the California Energy Commission. *HEED* and *Climate Consultant* were created with SBSE faculty in mind, as vehicles for teaching principles of passive design. *HEED* is a quick-sketch design tool integrated with a powerful energy simulation engine. It is intended for right-brained thinkers using fast 4' by 4' grid drawing input, click and drag windows placement, and instant 3-D energy performance graphics that compare dozens of building elements including:

- **Climate Analysis:** *HEED* uses EPW climate files, available for thousands of locations around the world, and has a direct link to *Climate Consultant* for hourly psychrometric chart graphic analyses with dozens of other climate analysis plots.
- **Design Guidelines:** climate-specific design guidelines are given on *HEED*'s Energy-Efficient Design screen; a more detailed list is displayed in *Climate Consultant* with an architectural image accompanying each guideline.
- **Sun Motion and Sun Control:** *HEED* produces hourly animation videos (shadow view or sun's-eye view); *Climate Consultant* generates sun charts and sun shading charts for any latitude, each with temperature overlays.
- **Passive Solar Heating:** *HEED* calculates hourly gain through each individual window, considering shading by fins, overhangs, wingwalls, trees, and neighboring buildings.
- **Thermal Mass:** two types of thermal mass affect indoor air temperature in *HEED*—the hourly timelag through the opaque envelope, plus the thermal storage in high-mass interior floors, walls, ceilings, and internal objects.
- **Ventilation Cooling:** *HEED* calculates and displays the effects of either whole-house fans, ceiling fans, or natural ventilation based on hourly outdoor wind speed, window opening sizes and locations, and building interior height.

continued page 4

SBSE CALENDAR

- 2012**
- Nov 7-9 PLEA Conf/Lima, PERU
 - Dec 3-6 Ecobuild Amer./Washington, DC
- 2013**
- Feb 11-13 Geothermal Conc/Muncie, IN
 - Mar 27-30 ARCC Conf/Charlotte, NC
 - Apr 16-20 ASES Conf/Baltimore, MD
 - Apr TBD SBSE Annual Mtg/Baltimore, MD
 - Jun 21-23 SBSE Retreat/Southern?, CA?
 - Jun 24-25 BESS-SB13 Conf/Pomona, CA
 - Oct 30-Nov 2 PLDC 2013/Copenhagen, DEN
- 2014**
- Apr 10-13 Windsor Conf/Windsor, UK 🇬🇧



photo: Bruce Haglund

ADA-compliant for Siamese twins conjoined at the shoulder? Found in the finest hotel in Oxford!

LETTERS TO THE EDITOR

Now I spend half my time in Buffalo, half my time in Rochester, and half my time on the road for AIA.

RIT created a new MArch program in the Golisano Institute for Sustainability, tied to the College of Imagining Arts and Sciences. I've been on leave from UBuffalo for over a year and am likely to move into an emeritus role there as I was recruited last year to help launch this new RIT undertaking, a great opportunity to look at mainstreaming sustainability into an architecture curriculum and everyday design inquiry. We opened the doors last year and will welcome our second-year group in a few weeks. NAAB has already completed our first site visit—we're an official "candidate" program.

Lots going on in my AIA VP role. Sorry to keep missing you folks at recent SBSE events, although I know AIA's Richard Hayes has attended, and we bring SBSE up all the time in our knowledge meetings—even at our KLA event in Seattle and our research summit in St. Louis.

—Dennis A. Andrejko



As always, a great issue. Special thanks for your kind editorial comments. The retreat was both fun and hugely interesting. I continue to be grateful for stumbling across SBSE, and being able to join (with ridiculously cheap dues!) and be helped and inspired by the work of so dedicated a group of educators and practitioners.

—Peter Papesch

[Thanks, Peter and Dennis!—ed.] ✎

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NAT'L ACADEMY OF ENVIRONMENTAL DESIGN

[SBSE's rep to the academy, Ihab Elzeyadi, forwarded this news.—ed.]

I'm excited to share the news of the National Academy of Environmental Design's (NAED) newly established office and funding agreement with Spotsylvania County. The agreement grants \$200,000 for years 1 and 2, and \$100,000 for year 3. NAED's office will open in 2013 at the Center for Sustainability and Green Technologies in Ni Village, a sustainable mixed-use development master planned and funded by Luck Development Partners (LDP), the real estate affiliate of Luck Companies (see <<http://www.lucklegacy.com>> or <<http://www.nivillage.com>>). NAED will continue to work with Luck Development Partners to reach a funding goal of \$2.2 million. SBSE is one of the early supporting organizations for NAED and is represented on the NAED board.

NAED is seeking applications and nominations for its first executive director. The position announcement is available on the NAED's web site <<http://www.naedonline.org>>.

—Ihab Elzeyadi

REPORT ON THE MEMBERSHIP MEETING OF JUNE 21, 2012

President Fritz Steiner reported on NAED negotiations with Spotsylvania County. Some differences have emerged between county staff's expectations and the substance of the MOU that NAED proposed. However, Steiner remains hopeful that those differences can be resolved. It was moved and seconded to empower President Steiner to complete negotiations with the county either by terminating negotiations or by establishing a revised MOU before the next membership meeting. Discussion followed, including 1.) clarifying that NAED's agreement with Luck will provide space for NAED gratis for five years; 2.) potential contract between Luck and NAED detailing these provisions; and 3.) the importance for NAED board members to obtain board insurance before we move from an MOU to contracts with Luck or Spotsylvania County. There will be a vote on the final MOU at our July 13 membership meeting. The motion was called and passed unanimously.

Treasurer's report: Steiner identified members to serve on a finance committee—and interested volunteers are welcomed to apply. NAED dues were discussed and Steiner reported that the dues structure is being updated to reflect the number of members in each member organization as well as the budgetary structure of each member organization.

Related to fund raising, NAED is moving ahead with the Heinz Foundation. The bylaws require all membership council members be notified two weeks in advance of any special membership meeting. Steiner indicated that he will so notify. The meeting was adjourned.

NEW/OLD/OTHER BUSINESS

2011 conference book available. See <http://nccor.org/downloads/green-health-report_2012-06-04_complete.pdf>. (Special thanks to Kim Tanzer!)

FUTURE MEETINGS

2012 workshop, Oct 30, 8:30a–5:00p (reception to follow), National Building Museum (NBM), Washington, DC.

Annual Membership Meeting, Oct 31, 8:30a–3:00p, NBM, Washington, DC. ✎

—Joan Nassauer



PV shaded parking rises into the Denver skyline.

SUSTAINABILITY AND BIM AT ECOBUILD 2012

For the third consecutive year Ecobuild America is offering a strong university curriculum. This year's program, *BIM in the Academy*: the Technology Symposium on Sustainability for Building Science Educators, is a blockbuster. Twelve universities will be making presentations at this all-day event scheduled for Dec 4 as part of Ecobuild America, Washington, DC, Dec 3–6.

BIM in the Academy delivers a robust, comprehensive curriculum that reflects the ever-growing importance of BIM and its effect on making our built world better, greener, safer, and healthier. The day-long academy will answer the building science community's increasing demand for information with a four-part program (see outline below). Developed by universities that are driving industry innovation, the four 90-minute seminars discuss cutting-edge developments in BIM and sustainability.

BIM in the Academy, Part 1: BIMStorm

- Oklahoma—Educational elements of BIMStorm Oklahoma City (OKC), a unique partnership between the City of Oklahoma City and industry participants to create a virtual BIM student event.
- Penn State—Review of tools that support education using BIM to present interdisciplinary, real-world problems to students.
- Stanford—Research and development of the BIM Scorecard that evaluates outcomes of BIM adoption.

BIM in the Academy, Part 2: Design Initiatives

- Cal Poly—Using BIM to pre-plan commercial building construction.
- Texas A&M—BIM CAVE, an immersive review system that provides students a multi-faceted simulation for visualizing the details of a virtual building.
- MIT—oIQ, an interactive tool for evaluating BIM components' interactions.

BIM in the Academy, Part 3: Facility Performance

- Purdue—BIM maturity in construction projects.
- IIT—Nanotechnology and BIM for facility owners.
- Ball State—Net-zero energy and carbon neutrality with examples of students' designs.

BIM in the Academy, Part 4: International Initiatives

- Wyoming—University–industry collaboration for BIM implementation.
- Salford—From Paris to Laramie: international prof–student collaboration using BIM.
- Anglia Ruskin—Cloud computing as an integration platform for BIM applications (Cloud BIM).

Special discounts for this seminal one-day event are available for educators and students at <<http://www.aececobuild.com/registration>>. Industry leaders, sponsors, and exhibitors can register and find more information at <<http://www.aececobuild.com/exhibitors-advertisers-sponsors>>. 🖐

—George Borkovich

WORTHY RESEARCH OR NOT? DO TELL

I've recently completed this project, found at <<http://sa-neighborhoodsustainability.org/>>. Would this work be a suitable item for the newsletter? [*SBSEers, do you think Hazem's project is worthy? Check out the site. Tell us what you think, after all this newsletter is s'posed to be hands-on, user-friendly, and more!–ed.*] 🖐

—Hazem Rashed-Ali

ASES 2013 NOTES

[*Go to ASES, and attend SBSE's annual meeting in Baltimore!–ed.*]

Next year's 42nd annual National Solar Conference, Solar 2013, takes place in Baltimore, MD, Apr 16–20. Solar 2013 will focus on overcoming challenges, rapid and flexible solutions, and quick-to-market opportunities for implementation in the renewable energy environment. This conference will include the inaugural Young Professionals in Renewable Energy Conference. Please encourage your students and recent grads to participate in this spin-off event. Additional information is available at <<http://www.solar2013.org>>.

ASES would like to develop cross-promotion among interested organizations, including our partners in the EEB Hub. What a welcome opportunity to participate in discussions of regionally important renewable energy integration with the built environment and the emerging smart grid. Cross-promotion includes promotion of your group on the Solar 2013 web site and a discount to register at Solar 2013 for your members. Opportunities for speaking and exhibiting are also open. To learn more see <<http://ases.org/2012/09/solar-2013-seeks-participating-organizations/>>.

—Jeffrey R. S. Brownson

We have included two Passive Conference tracks:

- **Emerging Architecture & Passive Building Technologies** investigates the relevance of passive strategies in the design of high-performance, sustainable, and net-zero energy buildings.
- **Daylighting, Modeling, and Building Automation** focuses on developments in daylighting approaches, technologies, and controls; the modeling of daylighting and whole building performance; and the integration of passive technologies with building automation systems.

Thanks for promoting ASES 2013. 🖐

—David Panich



This is affordable zero-net energy housing on Lopez Island, WA, built by the Lopez Community Land Trust.

➤ **Harvey Bryan** has been named Director of ASU's Professional Science Master's in Solar Energy Engineering Program. This PSM program, housed in ASU's School of Engineering, is funded by the National Science Foundation to train professionals for solar careers.



photo: Rajat Gupta

➤ **Rajat Gupta** has been appointed as the next Director of the Oxford Institute for Sustainable Development (OISD) at Oxford Brookes University (UK). He says, "OISD is a critical part of the national infrastructure for research and knowledge transfer in the area of built environment sustainability. I'm looking forward to overseeing this exciting next stage of development of the institute." See <<http://oisd.brookes.ac.uk/>>.

➤ **Emeka Osaji** has been awarded two prestigious designations—Fellow of the Forum for the Built Environment (FFB) and Chartered Scientist (CSci) from the Institution of Environmental Sciences and the Science Council.

➤ SBSE Secretary/Treasurer **Troy Peters** has moved to Wentworth Institute of Technology at the rank of Associate Professor. [*Best of luck in the Red Sox Nation, Troy and congrats on your promotion!—ed.*]

🏠 In becoming Vice-Dean at USC, **Mark Schiler** has gone over to the dark side, but just for a while. [*Vice-Dean definitely has a dark-side connotation, eh!—ed.*] 🖱

I was recently granted two fellowships by the Graduate School at the University of Texas at Austin for a research project to study the performance characteristics and potential energy-efficiency benefits of using thermal mass walls in Austin, TX—a hot and relatively humid climate. My research will examine the effects of several different mass wall constructions, placement schemes, and control techniques to determine a wall's ability to modulate interior air and radiant temperatures. These variables will be modeled and evaluated using a calibrated *EnergyPlus* model of the recently-constructed thermal testing chambers on the UT Austin campus.

While several built examples have recently emerged in Texas, and many more vernacular applications of mass walls can be found in Asia, much less is still known about the potential for using thermal mass in hot and humid environments than is known about their benefits in climates with a high diurnal temperature swing. I have been looking at several architectural precedents that demonstrate the use of mass walls in Texas, including the Texas headquarters of Wiss, Janney, Elstner Associates, Inc. I would like to ask the SBSE community for any other examples that they may know of where mass walls are being used in a climate similar to Austin's. It would be a tremendous help to my research efforts! 🖱

—James Sherman

HEED IS DESIGNED FOR YOU [CONT. FM PG 1]

- **Evaporative Cooling:** wet-bulb temperature is derived from EPW climate data and is used to calculate either passive or active evaporative cooling.
- **Human Thermal Comfort:** *HEED* calculates hourly effective temperature based on indoor dry-bulb temperature plus air motion; also calculates and displays the number of uncomfortable hours if any.
- **Heat Gain and Loss:** Manual J calculations and annual simulations are used to size HVAC equipment, in addition our *OPAQUE* program that generates U-factor, timelag, and decrement for any wall or roof.
- **HVAC Systems:** *HEED* offers an array of residential heating and cooling equipment, a smart thermostat, various fans and blowers, plus duct insulation and leakage options.
- **PV and SHW:** Bill Beckman adapted his Solar Hot Water and PV routines so *HEED* shows hourly and total annual on-site energy collection.
- **Building Energy Performance:** *HEED* displays bar charts and tables of annual energy costs based on local utility rates, annual site and source energy consumption, and annual carbon dioxide production, as well as the EUI for Architecture2030.
- **Zero Net Energy Buildings:** *HEED* calculates the home energy rating relative to an automatically generated code-compliant building, and also shows how closely each scheme approaches zero net energy.

HEED can be used in a design course to encourage students to experiment with various passive strategies, to quickly produce quantitative evaluations against criteria like zero net energy, zero net carbon, or Architecture2030, and to objectively compare all other designs in the class. *HEED* uses an hourly heat balance model similar to *EnergyPlus*, that has been validated against HERS Bestest, ASHRAE 140, and published *EnergyPlus* performance results.

HEED was created to be a free, user-friendly sketch design tool to help architects, builders, contractors, homeowners, and students design zero net energy buildings, in compliance with California's mandate for all new homes to be zero net energy in 2020. Over 100,000 copies of *HEED* and *Climate Consultant* have been downloaded to-date. They are each available free at <<http://www.energy-design-tools.aud.ucla.edu>>. 🖱

—Murray Milne

SBSEERS BOOKS

ADAPTIVE THERMAL COMFORT: PRINCIPLES AND PRACTICE

Fergus Nicol, Michael Humphreys, and Susan Roaf

The fundamental function of buildings is to provide safe and healthy shelter. For the fortunate they also provide comfort and delight. In the twentieth century comfort became a “product” of machines, running on cheap energy. In a world where fossil fuels are becoming more scarce and more expensive and the climate more extreme, the challenge of designing comfortable buildings requires a new approach.

This timely book is the first in a trilogy, and clearly explains how we stay comfortable by using our bodies, minds, buildings, and their systems to adapt to indoor and outdoor conditions. The book is in two sections—the first introduces the principles and theory of adaptive thermal comfort, and the second explains how to use field studies to measure thermal comfort in practice and to analyze the data gathered.

Adaptive Thermal Comfort is essential to understanding and informing building design, and should be required reading for all students, teachers, and practitioners of architecture, building engineering, and management—for all who have a role in producing and occupying twenty-first century adaptive, low-carbon, comfortable buildings. [Anyone want to review this new book for the SBSE News? Let me know.—ed.] 🖐



cover: Routledge

OPS AND STUFF

ARCHITECTURE AND ENERGY

The presentations from the Architecture and Energy event at the University of Pennsylvania in January 2012 (plus a few additional essays) will be published by Routledge in 2013. The volume is co-edited by Dan Willis (Penn State) and William Braham. It includes contributions by Daniel Barber, Luis Fernandez-Galiano, Dean Hawkes, Vivian Loftness, Kiel Moe, Franca Trubiano, and Simos Yannas, among others. A sequel event is being planned for January 25, 2013, to address the Influence of Climate and Region on Energy and Architecture along with an accompanying book. Check out <<http://www.architectureandenergy.com>>.

—William Braham

BESS-SB13 CALIFORNIA

Something more to work on during your fall quarter—BESS-SB13 California, “Advancing towards Net Zero” will be held at Cal Poly Pomona on Jun 24–25, 2013. The conference is the third BESS conference and now part of the international Sustainable Buildings (SB) series. Papers will be peer reviewed in the following topics: Innovative Design, Improving Existing Building Stock Performance, Validation, Affordable Sustainability, Empowering the User, and Education. The deadline to submit papers is January 21, 2013. More information is at <<http://www.bess-sb.org/13/>>.

—Pablo LaRoche

GEOTHERMAL CONCLAVE I

Ground-Source Geothermal Resources: An Important Source of Renewable Energy, presented by Ball State University, Feb 11–13, 2013, in Muncie, IN. See <<http://www.bsu.edu/sustainability>>. 🖐

—Robert Koester

NEW MSC IN SUSTAINABLE ARCHITECTURE

In fall 2010 the Norwegian University of Science and Technology (NTNU) in Trondheim introduced an international interdisciplinary MSc program in Sustainable Architecture that bundles graduate and post-graduate courses into a single holistic program aiming to educate building professionals in the use and development of competitive methods and solutions for existing and new buildings that will contribute to lowering GHG emissions related to the production, use, management, and demolition of architecture with a life-cycle perspective through close collaboration with the Norwegian research center on zero emission buildings <<http://www.zeb.no>>.

Throughout the two years of the MSc program, each of the theory and project courses stresses to ensure usability and synergy of designs with their surroundings and users. Students are continuously trained in interdisciplinary cooperation, preparing them for integrated professional practice.

The first cohort of master’s students has finished the program. See <http://www.ntnu.no/trykk/publikasjoner/Master_of_sus/> for a summary of submissions and defenses of their master’s theses.

A paper published at the SB2011 in Helsinki describes the learning aims, course structures, and pedagogical methods of this MSc program. See <<http://www.sb11.org/sb11-helsinki/home.html>>. 🖐

—Matthias Haase



photo: Bruce Haglund

Sucking kWhs in London. Why isn’t this mode the usual?

COOK SCHOLARS AT PLEA 2012, LIMA, PERU

titles: Los Cabos Restaurant, Denver



We're delighted to announce that the two recipients of the SBSE Jeffrey Cook Student Travel Scholarships to PLEA 2012 in Lima, Peru, in November are Abhay Nagory (University of Southern California), "Natural Ventilation Using Ventilation Shafts" and Islam Abohela (Newcastle University, UK), "Validating CFD Simulation Results." The scholars will be presented with their certificates and monetary awards (US \$1,000) and during the conference. 🐾

—Walter Grondzik

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RUMORS ABOUT THE NEXT SBSE RETREAT

Cleverly, the retreat theme "Measuring Design: Models and Metrics" proposed by Ihab Elzeyadi, follows on this issue's cover story by Murray Milne and many recent SBSE list server posts on modeling and measuring techniques from *Diva* to *EnergyPlus*, to physical daylighting models, and beyond.

Pablo LaRoche has volunteered to handle retreat logistics as well as organize the SB13 conference to be held in Los Angeles June 24–25. So, the retreat dates have been determined to synchronize with SB13 in LA. We know when it will be in Southern California Jun 21–23, 2013, but we don't have an exact location. It may be at the Lyle Center for Regenerative Studies at Cal Poly Pomona [*a great choice!—ed.*] or in Santa Barbara [*not bad either!—ed.*]. Nonetheless it will be close to Los Angeles, within 2 to 3 hours away. To get into the mood to attend both the retreat and SB13 look into *Building Research & Information* Volume 40 Number 5 September–October 2012, which is a special issue dedicated to examining SB11 in Helsinki—the World Sustainable Buildings Conference 2011 <<http://www.tandfonline.com/doi/full/10.1080/09613218.2012.711600>>. SB13 in Los Angeles is one of several worldwide regional conferences offered as a run up to the next World Sustainable Buildings Conference in 2014. More info is available at <<http://sb13-14bis.hatandcatdesign.com/>>.

Any counter proposals out there? An SBSE Board decision on the retreat is imminent. Stay tuned. Ponder your contribution to the discourse. 🐾

—Pablo LaRoche



Alison Kwok at the previous SBSE Retreat at CRS years ago!

photo: Bruce Haglund

WINTER ISSUE SUBMITTAL DEADLINE—DECEMBER 1

FIRST CLASS MAIL