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.

SBSE CALENDAR

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Conference/Location</th>
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</thead>
<tbody>
<tr>
<td>2012</td>
<td>Nov 7-9</td>
<td>PLEA Conf/Lima, PERU</td>
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<tr>
<td>2012</td>
<td>Dec 3-6</td>
<td>Ecobuild Amer./Washington, DC</td>
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<tr>
<td>2013</td>
<td>Feb 11-13</td>
<td>Geothermal Conc/Muncie, IN</td>
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<tr>
<td>2013</td>
<td>Mar 27-30</td>
<td>ARCC Conf/Charlotte, NC</td>
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<td>2013</td>
<td>Apr 16-20</td>
<td>ASES Conf/Baltimore, MD</td>
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<td>2013</td>
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<td>SBSE Annual Mtg/Baltimore, MD</td>
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<td>2013</td>
<td>Jun 21-23</td>
<td>SBSE Retreat/Southern?, CA?</td>
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<tr>
<td>2013</td>
<td>Jun 24-25</td>
<td>BESS–SB13 Conf/Pomona, CA</td>
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<td>2013</td>
<td>Oct 30-Nov 2</td>
<td>PLDC 2013/Copenhagen, DEN</td>
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<tr>
<td>2014</td>
<td>Apr 10-13</td>
<td>Windsor Conf/Windsor, UK 🌟</td>
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Sun Motion and Sun Control: the above image is one frame from HEED’s hourly animation video in shadow-view mode.
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 UB 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.] ☮

SBSE News is published quarterly by the Society of Building Science Educators, a not-for-profit corporation. Submit material for publication before the first of March, June, September, or December to Bruce Haglund, Editor; Department of Architecture; University of Idaho; Moscow, ID 83844–2451; tel 208.885.6781; fax 208.885.9428; e-mail <bhaglund@uidaho.edu>. Direct membership and mailing list inquiries to Troy Peters, Secretary-Treasurer; Wentworth Institute of Technology; College of Architecture, Design, and Construction Management; 550 Huntington AV; Boston, MA 02115; e-mail <tpersters2@wit.edu>. To join our list server or to manage your account go to <http://www.lists.uidaho.edu/mailman/list-info/sbses>. For full membership info and more, visit our home page <http://www.sbsc.org>.

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


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. ☮

—Ihab Elzeyadi

PV shaded parking rises into the Denver skyline.
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>.

**ASES 2013 Notes**

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

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
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

SBSE PEOPLE

- 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.

- 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 just for a while. [Vice-Dean definitely has a dark-side connotation, eh!—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.]
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.]

**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

**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, Francia 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**


—Robert Koester

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

WINTER ISSUE SUBMITTAL DEADLINE—DECEMBER 1

FIRST CLASS MAIL