WUFI COMPUTER MODELING WORKSHOP
FOR WALL DESIGN AND PERFORMANCE
(HEAT AND MOISTURE TRANSFER IN BUILDING ENVELOPES)
Houston, Texas, May 7-8, 2007

Fraunhofer
Institut
Bauphysik

WUFI/ORNL[1] Program made available by the U.S. Department of Energy

This symposium and workshop is co-sponsored by the U.S. Department of Energy (DOE) through Oak Ridge National Laboratory (ORNL) in collaboration with the Fraunhofer-Institut für Bauphysik (IBP) and co-sponsored by the National Institute of Building Sciences (NIBS)/ Building Enclosure Technology and Environment Council (BETEC), the Building Enclosure Council (BEC) of Houston, and National Building Science Corporation (NBSC) of California.

New Strategies for Energy Efficient Building Design – a.k.a. What's New and Really Works – dealing with strategies in proper wall design. Drs. Achilles Karagiozis and André Desjarlais will convey the latest and best new strategies on building envelope design with an emphasis on heat and moisture transfer. **See how to use WUFI in conjunction with ASHRAE's Proposed New Standard 160,** *Design Criteria for Moisture Control in Buildings.*

The hands-on training session is for 30 students. Students will be trained to use the most powerful computer modeling program available for building envelope design and wall analysis.

Each student will receive a free copy of the WUFI ORNL/IBP modeling software, provided by the Department of Energy. Join us if you are ready to learn the next generation of building science.

WUFI series software allows the realistic simulation of the transient hygrothermal behavior of multi- layer building walls exposed to natural weather.

The **WUFI series** models can handle contributions from rain, solar radiation and other crucial weather events on an hourly basis. Both vapor and liquid transport are included, along with the sorptive capacity of building construction materials.

WUFI ORNL/IBP, one of the WUFI family software, offers an easy and user-friendly interface for data input and output and is free of charge. **WUFI ORNL/IBP** comes complete with weather data for scores of North-American cities which can easily be selected from a map. The temporal behavior of the computed quantities (temperatures, relative humidities and water contents) can be analyzed with the help of preconfigured or user-defined diagrams. Furthermore all the computed profiles can be displayed in rapid succession as a film which shows the transient thermal and hygric processes occurring in the envelope. This film is ideal for gaining insights into the hygrothermal processes and for developing a 'feel' for the situation in the envelope. The reactions of the different materials to the changing climatic conditions can be directly visualized.

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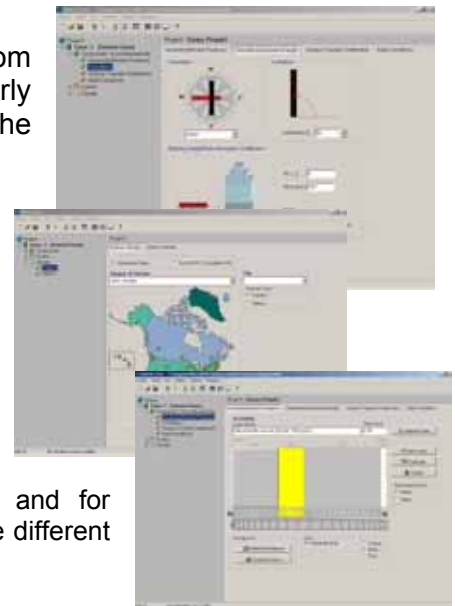
[1] WUFI = **Wärme und Feuchte instationär**   ORNL = Oak Ridge National Laboratory   2007-0420

OVERVIEW

The workshop provides:

- Basic building envelope design principles
- Heat and mass transfer fundamentals
- Validation of modern hygrothermal simulation tools
- Necessary input data: where can I get them and what accuracy is required?

- The Do's and Don'ts of WUFI-ORNL
- What do the results tell me – performance predicting
- Model growth predictions – new post-processing modules
- Development and future extensions of WUFI-ORNL, future standards and guidelines

Drs. Karagiozis and Desjarlais will walk the audience through modern and revolutionary new building envelope design concepts. The audience will be exposed to the conditions and remedies of moisture, both liquid and vapor, that have had devastating effects on modern construction. New techniques will be shown, and the audience will be introduced to new material application to eliminate moisture-related problems in buildings, such as mold and decay. The overview will end with an extensive question-and-answer session that will allow the audience to interact with the presenters.

30 students will be tutored collectively and personally by our three distinguished presenters. Each student must bring with him/her a laptop computer. The student will be provided with a complete copy of the program and a licensing agreement to use this powerful modeling program. Every student will be walked through every aspect of the modeling sequencing, allowing each individual to create wall designs that would be most appropriate for the geographical location.

The student will be able to integrate weather data that has been collected for generations by NOAA, and the program will allow each wall design to be specifically engineered for its intended location and its orientation on the building site.

Point-and-click, and you can pick a material. Point and click again, and layer your wall with a huge variety of building materials that can be selected and evaluated simultaneously for the most energy and thermally efficient walls. Point and click, and change walls using your evaluation instead of materials. Each student will understand liquid water, vapor transfer, thermal transfer, the effects of humidity, drying, and the cause and elimination of vapor and condensation within walls. Whether the student is building in a hot, humid environment or cold and dry, or mixed because of seasons, this powerful modeling tool uses modern wall science to model every wall condition in the contiguous USA.

Students will be encouraged to interact and exchange ideas with the professors/instructors, exploring the possibilities of the programs' depth and multiple uses. Aspects of modeling for new products will be demonstrated by both group and individual interaction.

Agenda

Class hours 8:00 a.m. to 5:00 p.m. each day, with Continental breakfast at 7:30 a.m.

- Registration
- Installation of WUFI-ORNL/IBP Software
- History of WUFI-ORNL/IBP
- Practical Application of Simulation Tools
- Thermal Performance of Walls and Roofs (Cool Roofs)
- The Importance of Modeling for Heat and Moisture Transport in Building Envelopes
- Mold Perspectives and Design Perspective
- Fundamentals and Requisites
- Boundary Conditions / Surface Conditions
- WUFI-ORNL Group Modeling Project & Competition
- Group Modeling Project & Presentation of Results
- Analysis of Material Properties
- Assignment and Examples
- Review of Example Cases by all trainers
- Evaluation of Results
- Features of WUFI-PRO
- Assignment of More Examples of WUFI-PRO
- WUFI-2D and WUFI Plus overview
- Future Standards and Guidelines and Mold Growth
- Limitations of Modeling
- Q & A

(Chicago, Oct. 2004 Student Exercise)

Graduating Class, San Antonio, March 2005

Attendees will receive a certificate of attendance and a copy of the WUFI-ORNL/IBP Software and software keys. You will have a temporary license for WUFI Pro.

REGISTRATION – HOUSTON, TX – May 7-8, 2007
STANDARD WUFI Workshop
Location: Hampton Inn & Suites Houston-Bush Intercontinental Airport
15831 JFK Blvd., Houston, TX 77032 Phone (281) 442-4600
This form may be duplicated for additional registrations.

Please reserve your spot now. Space is limited to 30 students, so register now.

Three easy ways to register:
1. E-mail form to
jackiebh@section08.com
2. Fax to (951) 699-0876
3. Mail to National Building Science Corp.
32244 Corte Chatada
Temecula, CA 92592-6320
Office phone (951) 699-0116
Mobile phone-Jackie (951) 265-2119

WORKSHOP RESERVATION:

Last Name	First Name	Middle Initial
Title:		
Company/Organization:		
Business Street Address:		
City:	State:	Zip:
Business Phone:	Fax:	
E-Mail Address:		

Included:
- WUFI instruction w/software & temporary license, Monday, May 7 – Tuesday, May 8, 2007
- Continental breakfasts, lunches, morning & afternoon breaks

Price: **$895.00** *
Payment Method:

□ Check

□ Visa or □ Mastercard
(Sorry, no Discover, AMX, etc.)

Cardholder's Name (please print)	
Card Billing Address:	
Credit Card #	Exp. Date
Signature:	

You will be notified promptly of any cancellations or schedule or program changes. If a program is cancelled or postponed, we will refund registration fees but cannot be held responsible for any other related costs, charges, or expenses, including cancellation/change charges assessed by airlines or travel agencies. Refunds of registration fees, when cancelled by the registrant, are 90% refundable if notice is given via fax or e-mail by **April 8, 2007**.

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