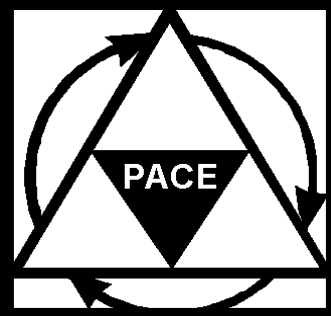


# PACE

*The Partnership for Achieving Construction Excellence*

[www.engr.psu.edu/PACE](http://www.engr.psu.edu/PACE)



SPRING 2007

BULLETIN

## 2006 - 2007 Theme: *Building Respect*

Our theme of PACE activities this year has been the development of respect between clients and project team members in the building construction industry. Our approach at Penn State has been to use the theme of respect as a "lens" to view project delivery, project management, and technology deployment in our industry. The results have been illuminating.

While a lack of respect in the building industry leads to adversarial and costly relationships, strategies to build respect are emerging. Old paradigms of process management are now seen as people management. Adversarial relationships are being replaced with long term satisfying relationships. Ignorance of the impact of construction on the environment is being replaced with a focus on the environment. This discussion has inspired student research topics that examine relationships between project teams, the differing perspectives of general and specialty contractors, and the potential of Building Information Modeling to enhance the role of builders in project delivery.

In his recent book, "*The People Profit Connection*", author G. Brent Darnell presents a vision for the construction industry based on mutual respect, trust, and teamwork. I believe this is a vision obtainable, and that in its pursuit, we could unleash the potential of our industry's workforce and leadership to achieve new heights in profitability and personal fulfillment.

I look forward to our continued efforts at Penn State to create dialog, new methods, and expanded awareness of the techniques that build respect in our industry.

- David Riley, Director

## CIC Research Team Activities

Led by **Professor John Messner**, The Computer Integrated Construction (CIC) Research Team is currently participating in multiple projects with industry partners. **Davis Construction** has been working with the team to develop 3D and 4D models for their Long & Foster Headquarters Project in Chantilly, VA. The Davis team made a trip up to the ICon Lab in March with the owner and the design team. The team conducted a walk through of the 3D vrml model in an immersive stereo display, a review of the 3D BIM developed using Autodesk Revit, and a review of the 4D model of the project.

The CIC Team is also working with the **Gilbane Building Company** in assistance on the Dickinson School of Law at Penn State's University Park Campus. Gilbane has begun design coordination with 3D shop drawings for the majority of the trades including curtain wall, concrete and structural steel and most recently, MEP contractors. The CIC program is assisting by joining, helping to coordinate, and reviewing of

the 3D and BIM files. The coordination meetings are being held in the ICon Lab to help visualize the conflicts on a large scale.

Another direction of CIC research is in incorporating more BIM and visualization, into the AE and Construction curriculum. Recently the CIC program has been working with the Architecture and Landscape Architecture departments to find ways to incorporate BIM into all of the curricula. The CIC team has incorporating the use of BIM into the AE 372 estimating and scheduling project. Students were provided with a BIM of their project to perform automated takeoffs of the project structure and shell. Next they developed a simple 4D schedule of the project in conjunction with the traditional CPM schedule. The students in AE 473 also performed 4D sequencing exercises in the ICon Lab for the MGM Grand project as a technique to learn short interval production scheduling.

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The PACE Bulletin is the newsletter for all PACE companies. The Bulletin highlights activities and noteworthy events in the Construction Management major of the Penn State AE Program. For more information or to submit prospective articles, email:

[L-pace-registration@psu.edu](mailto:L-pace-registration@psu.edu)

or

(814) 865-3369

PENNSTATE



Department of  
Architectural  
Engineering

## PACE Welcomes New Associates and Partners

In response to feedback from PACE companies, a new set of mechanisms was established in 2006 to recognize PACE participation. New levels of affiliation for PACE companies were defined, and an online membership pledge form was established to streamline the development of new members.

The response to these improvements have been rewarding, including the commitment by six companies to become PACE Partners.

Graduate student **Russ Manning** also created a new database to track correspondence with members help ensure better communication between Construction Management faculty and PACE companies.

Additional improvements to PACE planned for next year include the integration of the S:PACE and PACE websites, and expanded recruiting information provided to

PACE companies and students. We look forward to a productive year of activity in 2007-2008.

*Thank you PACE Partners*

**Balfour Beatty (formerly Centex Construction)**

**Clark Construction**

**Forrester Construction**

**James G. Davis Construction**

**Southland Industries**

**Penn State Office of Physical Plant**

*PACE Welcomes New Members*

**Tishman Speyer Construction (2007-08 Associate)**

and

**Benchmark Construction (2007-08 Partner)**

Thank you

**Caroline Evey**

For three years of outstanding support of PACE programs.

PACE welcomes new PACE interns:

**Tessa Srebro and**

**Stephanie D'Antonio**

**PACE**

**Roundtable**

**Meeting**

**October 23-24, 2007**

For more information

Visit our website  
[www.engr.psu.edu/pace](http://www.engr.psu.edu/pace)

## Students Prepare for Solar Home "Blitz-Build"

The Northern Cheyenne Reservation in Southeastern Montana will host two exciting American Indian Housing Initiative (AIHI) projects in the summer of 2007. The first project, the planning, design, and construction of the "Morning Star" Solar Home, is an AIHI effort that complements Penn State's Solar Decathlon entry. The AIHI version of the Morning Star home is a more affordable version of the Penn State Solar Decathlon home using solar panels, strawbale construction, and energy conservation and reuse mechanisms. Built on the campus of Chief Dull Knife College (CDKC), the Morning Star Home will serve as a residence for visiting professors. It is anticipated that the home will also be a key first step in developing a community-based homebuilding program on the reservation.

The second AIHI project is the new sustainability certification program which was piloted last summer on the CDKC. The "Sustainability@

Home Workshop Series" will include five afternoon workshops dedicated to the topics of land, water, resources, health, and energy. The certification program is designed to educate homeowners about simple, effective technologies and practices to reduce environmental impact, save money, and increase home efficiency. Upon completing the program, participants will receive certificates in sustainability cosponsored by Penn State and Chief Dull Knife College. Designed and led by Penn State students, the certification program also serves as a forum for student leadership.

As part of the spring AIHI class, students are asked to develop workshops sessions to share the lessons and principles learned in the classroom in a manner both accessible and meaningful to homeowners.

The goal of this process is to help students develop both the knowledge of sustainable practices and the skills to communicate this

knowledge to broad audiences. This summer, the certificate in "Sustainability@Home Workshop Series" will be open to 2007 participants attending Week 2 (July 1-7) of the AIHI summer program.

Learn more about AIHI and the workshops at:

[www.engr.psu.edu/greenbuild](http://www.engr.psu.edu/greenbuild)

**PACE**

**Advisory Board Meeting**

**June 7, 2007**

For more information

Visit our website  
[www.engr.psu.edu/pace](http://www.engr.psu.edu/pace)

## S:PACE 2007 Internship Workshop Planned

The Student chapter of PACE: S:PACE will be hosting its 2nd annual Internship Workshop this Fall.

This event is designed to help younger AE students become aware of what to expect during an internship, how to interact with industry professionals, as well as give PACE companies an opportunity to interact with younger AE students.

The First S:PACE Internship Workshop was held at the Days Inn with over 90 second and third year AE student participants. Activities began with a panel discussion between industry members and internship experienced AE students. After a short break, the industry members split up into smaller groups and the students participated in a round-robin of smaller

group discussion topics including a mock interview, preparing for an interview, interaction skills, and resume building.

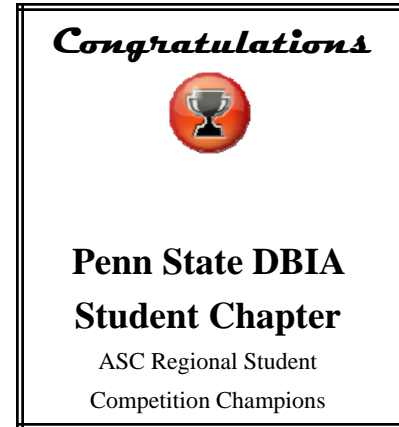
We would like to thank all of the PACE companies that took part in this event last year:

- Southland Industries
- Barton Malow Company
- James G. Davis Construction
- Centex Construction Company

This year's event will take place on **October 23, 2007** and will be planned and moderated by the 2007-2008 S:PACE officers. The officers are looking forward to continuing the tradition of this calendar of events. If you are interested in

participating as a company or student, please **contact the S:PACE President Alyssa Adams** at

aaa5030@psu.edu.



## PACE Members Support Penn State Solar Decathlon Team

Several PACE members have extended their support to the Penn State Solar Decathlon team. The 2007 Solar Decathlon marks Penn State's debut entry into this international competition to design and construct a completely solar powered home. The twenty universities involved with the 2007 Solar Decathlon will assemble their homes on the National Mall in Washington D.C. in October. The Department of Energy estimates that over 200,000 people will visit the homes. After the competition, Penn State's entry, the MorningStar will return to Penn State's campus to become a permanent teaching and research facility.

So far over 1000 Penn State students across many disciplines have been involved with the design, procurement, and construction which began in April. The MorningStar Pennsylvania features innovative technologies and explores the role that prefabrication and modularization can play in sustainability. A sister home will be built during the summer in Montana as a part of the American Indian Housing Initiative. Both homes will serve as prototypes that demonstrate sustainable technologies that are best suited for their climate and community.

We extend our appreciation to PACE members **Balfour Beatty, Southland Industries, Truland, Davis Construction, Barton Malow, Holder, and Gilbane Building Co.** who have aided our efforts by providing technical and financial support. [www.solar.psu.edu](http://www.solar.psu.edu)

### Construction Virtual Reality:

Virtual Reality (VR) and Augmented Reality (AR) are exciting technologies that offer benefits to all stages of the Architecture, Engineering and Construction (AEC) process. From initial planning and conceptual design to facility management and operations, VR and AR allow people to see and interact with building and infrastructure designs process prior to construction.

*Learn more about advancements in CONVR next Fall*

*2007 International CONVR Conference proudly hosted by the Pennsylvania State University.*

### ***Congratulations***

2007 PACE Hall of Fame Inductees

(Class of 1977)

Peter Nettleton

Michael Miller



## Interested in helping us advance the building industry?

Please contact us if you would like to become involved in a research project, or learn more about our research program and results.

### Faculty Research Programs

#### Michael Horman, PhD - [mjhorman@engr.psu.edu](mailto:mjhorman@engr.psu.edu)

- Director of Lean and Green Research Initiative
- [www.engr.psu.edu/leanandgreen/](http://www.engr.psu.edu/leanandgreen/)

#### John Messner, PhD - [jmessner@engr.psu.edu](mailto:jmessner@engr.psu.edu)

- Director of Computer Integrated Construction Research Initiative
- [www.engr.psu.edu/ae/cic/facilities/Icon/](http://www.engr.psu.edu/ae/cic/facilities/Icon/)

#### David Riley, PhD - [driley@engr.psu.edu](mailto:driley@engr.psu.edu)

- Director of PACE, and Executive Director of the Penn State Center for Sustainability
- [www.engr.psu.edu/PACE](http://www.engr.psu.edu/PACE)

### Graduate Student Research

"A Model for Building-Centered Community Development"	Claudia Torres Arriaga	<a href="mailto:cxt313@psu.edu">cxt313@psu.edu</a>
"Characteristics of Immersive Virtual Environments to Support Design"	Nevena Zikic	<a href="mailto:nuz102@psu.edu">nuz102@psu.edu</a>
"Decision Support for Prefabrication Applications in Green Building"	Vivien (Yupeng) Luo	<a href="mailto:yzl119@psu.edu">yzl119@psu.edu</a>
"Green Building Delivery Strategies in Healthcare"	Elena Enache-Pommer	<a href="mailto:eue110@psu.edu">eue110@psu.edu</a>
"Information Management in the Design and Construction of Green"	Andreas Phelps	<a href="mailto:afp112@psu.edu">afp112@psu.edu</a>
"High Performance Green Building Project Delivery"	Sinem Korkmaz	<a href="mailto:szk146@psu.edu">szk146@psu.edu</a>
"Implementing Building Information Modeling (BIM) Applications in"	Dragana Nikolic	<a href="mailto:dragana@psu.edu">dragana@psu.edu</a>
"Increasing Transparency of Sustainable Project Delivery at Penn"	Leidy Klotz	<a href="mailto:lek161@psu.edu">lek161@psu.edu</a>
"Information Modeling & 4D CAD for Civil Infrastructure Projects"	Adam Platt	<a href="mailto:aep145@ps">aep145@ps</a>
"Optimizing the Design and Review Process with BIM and Interactive"	Kurt Maldovan	<a href="mailto:kurtm@psu.edu">kurtm@psu.edu</a>
"Optimizing the Healthcare Construction Process"	Russ Manning	<a href="mailto:russman-">russman-</a>
"Planning Tool for Implementing Building Information Modeling"	Rob Leicht	<a href="mailto:rml167@psu.edu">rml167@psu.edu</a>
"Sustaining Sustainability at the Pentagon"	Pete Dahl	<a href="mailto:pkd109@psu.edu">pkd109@psu.edu</a>
"Using 4 D CAD and Immersive Projection Display for Teaching SIPS"	Grace (Lingyun) Wang	<a href="mailto:luw113@psu.edu">luw113@psu.edu</a>
"Using Virtual Reality to Improve Construction Engineering Education"	Alex Zolotov	<a href="mailto:zolotov@psu.edu">zolotov@psu.edu</a>