

**The Pittsburgh Professional Engineer**  
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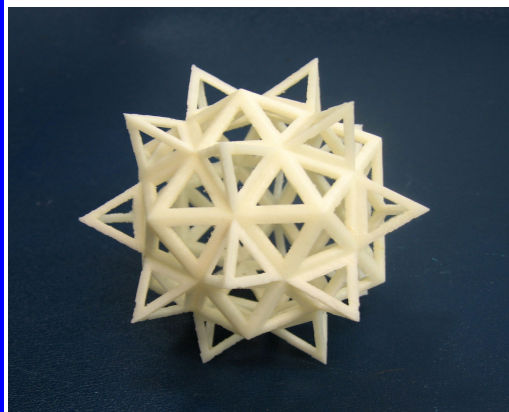
## PSPE – Robert Morris University – A New Relationship

Robert Morris University's Center for Applied Research in Engineering and Science Program (RMU-CARES) launched the Direct Digital Manufacturing (DDM) Technology Transfer Center on November 16, 2007. This new center will provide assistance to Pennsylvania manufacturers and other businesses in selecting and implementing rapid manufacturing technologies and materials. The new facility offers research, consulting, and training services in rapid prototyping, rapid tooling, rapid manufacturing, and reverse engineering. The center offers three different additive prototyping technologies – Stereolithography, Fused Deposition Modeling, and Direct Metal Printing, enabling users to accurately fabricate complex geometries within a few hours.

RMU-CARES transformed years implementing rapid prototyping production for a local hearing-aid project demonstrated that the custom and short-run production successful technology attention of local industry, from the State of Pennsylvania to Manufacturing Technology were used to acquire Stratasys modeling (FDM) and Prometal The new DDM Technology existing engineering capabilities Systems Viper SLA, Haas CNC machines, a Boy injection molding machine, Mitutoyo and Helmel coordinate measuring machines, and a Minolta laser scanner. Coupled with an extensive array of software packages, these machines offer a significant resource to the RMU community and the region.



of hands-on DDM experience by technology into ear mold company in Ambridge, PA. This technology is a viable option for in addition to prototyping. As this implementation caught the CARES received a \$75,000 grant help establish the Direct Digital Transfer Center. These funds Dimension Elite fused deposition RX-D 3D metal printing systems. Transfer Center builds upon the at the University including a 3D



The DDM Technology Transfer Center helps companies and individuals in their product development processes by providing rapid prototyping and reverse engineering services. Diverse rapid prototyping technologies and materials are employed to produce parts mimicking the final product's features, mechanical properties and appearance. Custom and short-run part production is also available to the community. This center is unique in its objective of broadening the usage of DDM technologies in manufacturing, medical, and artistic applications. The center will help industry accomplish this goal through extensive training and demonstration programs. Participants will gain extensive  
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## PSPE 2008 Winter EIT / PE Refresher Courses Announcement

The Pittsburgh Chapter sponsors refresher courses twice yearly for both the Engineer in Training (EIT/FE) and Professional Engineer (civil discipline) exams. Courses meet one evening per week to complement the semiannual examinations administered in the Commonwealth of Pennsylvania.

This coming spring 2008, the PE exam is scheduled for Friday, April 11 and the EIT/FE exam is scheduled for Saturday, April 12.

The refresher courses will be held at Robert Morris University in Moon Township. A minimum enrollment of 8 students per course is required. A tuition fee of \$350 is charged for each course, payable to Pittsburgh Chapter, PSPE. The Winter 2008 Refresher Courses are scheduled for 9 sessions beginning Wednesday, February 6, 2008 and running through Wednesday, April 2, 2008. Each course provides 22 hours of instruction. The deadline for course registration is Friday, February 1, 2008. The Civil PE Review class runs concurrently on the same dates as the EIT/FE at Robert Morris University. All classes are scheduled from 6:30 PM to 9:00 PM. For more information and registration materials for future sessions, please check the Chapter web-site <http://www.PittsburghPE.org> or contact the Chapter office at 412-391-0615. Feel free to contact the EIT/FE instructor, Steven Musial, P.E., at 412-956-6448 for additional class information.

### PSPE Registration Exam Dates

Professional Credential Services ([www.peshq.com](http://www.peshq.com)) handles the applications and testing for both the Fundamentals of Engineering and Principles of Engineering. Visit their web site, click on Applicant Information and scroll through the information.

Applications for the April exam should have been submitted by December 1. For the October exam, applications must be submitted by July 1.

#### 2007-2008 Chapter Officers

President – Virginia Dailey, P.E.	Executive Secretary - Kevin Wiley, P.E.
President Elect – Tom Weber, P.E.	Treasurer - John A. Broschious, P.E.
Vice President – Dave Samek, P.E.	Financial Secretary - Reyman Branting, P.E.
State Director - David Briskey, P.E. 2005-2008	Immediate Past President – Darryl Brogan, P.E.

#### 2007-2008 Chapter Directors

Jeff Mazza, P.E. 2005-2008	Brian Schull, P.E. 2006 - 2009
Moe Rayan, E.I.T. 2005-2008	Kirk Thompson, P.E. 2007 – 2010
Vacant Position 2006 - 2009	Joe Garlicki, P.E. 2007 - 2010

**PENNSYLVANIA SOCIETY OF PROFESSIONAL ENGINEERS  
PITTSBURGH CHAPTER**



Invites all current and prospective members to

**JANUARY 17, 2008 Meeting**

**At the Engineers Society of Western Pennsylvania Building**

**337 Fourth Ave., Pittsburgh, PA 15222**

***RECOGNITION OF CHAPTER PAST PRESIDENTS***

***And North Shore Connector Presentation***

On Thursday, January 17, 2008, the Pittsburgh Chapter will be recognizing all past Chapter Presidents with a free hors d'oeuvres meeting, followed by a presentation by Kirk Thompson, Board Director, from the Port Authority providing insight into the North Shore Connector Project. Kirk will be giving us the latest status on the project and a slide presentation of the tunnel boring machine and project.

Cocktails: 6:00 PM Social (Cash Bar)

Free Hors D'Oeuvres

Introduction of Past Presidents

Presentation of North Shore Connector Slides

You may make your reservation by filling in the form below and mailing or faxing it to Ryan Bock, ESWP. You may also phone in all of this information to us.

Phone: (412) 391-0615 Fax (412-261-1606) e-mail: [ddengr@city-net.com](mailto:ddengr@city-net.com)  
U.S. Mail; PSPE Pittsburgh Chapter, 337 Fourth Ave., Pittsburgh, PA 15222

Name : \_\_\_\_\_ Contact Info: \_\_\_\_\_

Name : \_\_\_\_\_ Contact Info: \_\_\_\_\_

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**PENNSYLVANIA SOCIETY OF PROFESSIONAL ENGINEERS  
PITTSBURGH CHAPTER**

**Invites ALL Engineers and their guests to the Annual  
NATIONAL ENGINEER'S WEEK BANQUET**

**On Saturday, February 23, 2008**

At The Club at Nevillewood, 1000 Nevillewood Drive, Presto, Pa. 15142

Please Join us for a wonderful evening of fellowship, great food  
and the presentation of the 2008 Engineer's Week Awards

Cocktails: 6:00 p.m. (Cash bar)

Welcome & Presentation of Mathcounts Awards: 7:00pm

Dinner: 7:30 pm

Presentation of Awards: 8:30pm

You may make your reservation by filling in the form below and mailing or faxing it to the Chapter office. You may also phone in all of this information to us. If you opt to make your reservation via e-mail, do not e-mail your credit card info. Payment may be made by calling in your credit card info, faxing this filled in form, or mailing this form with credit card info or enclosing a check. **Cost of Dinner is \$55.00/person if reservations are made by February 5, 2008.** After that, the cost is \$60.00/person.

Office Phone number (412) 391-0615 e-mail: PSPE@PittsburghPE.Org

Office fax (412-261-1606) Mailing Address: PSPE, 337 Fourth Avenue, Pittsburgh PA 15222

Dinner Choice : Choose one of the following:

**Chicken Breast Roman**, Italian marinated with Vine Ripe Tomatoes, Black Olives & Artichokes

**Baked Stuffed Lemon Sole**, with Canadian Snow Crab stuffing

**Roast Tenderloin of Beef**, with peppercorn sauce

Name : \_\_\_\_\_ Dinner Choice: \_\_\_\_\_

Name : \_\_\_\_\_ Dinner Choice: \_\_\_\_\_

Payment Options:

Credit Card:  MASTERCARD  VISA Card Number: \_\_\_\_\_ Exp. Date \_\_\_\_\_

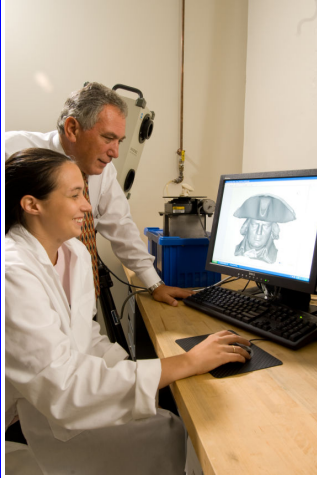
Name (as it appears on the credit card): \_\_\_\_\_

Check enclosed payable to PSPE Pittsburgh Chapter & mailed to 337 Fourth Ave., Pittsburgh, PA 15222

Directions: On Mapquest.com, enter this address: The Club at Nevillewood, 1000 Nevillewood Dr., Presto, PA 15142

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knowledge regarding commercially available DDM systems and their advantages & limitations. They will also develop the ability to select the appropriate technology and materials, consistent with their needs. The DDM Center also performs research activities in the areas of material & technology selection, implementation, testing, and post-process improvement.



CARES and the new DDM Technology Transfer Center are initiatives of the School of Engineering, Mathematics, and Science (SEMS) at Robert Morris University. Founded in 1999, SEMS offers undergraduate and graduate degree programs in software, mechanical, manufacturing and industrial engineering; engineering management; applied mathematics; actuarial science; pre-medicine; and environmental science to meet the needs of the region and the nation. For more information, please visit [www.rmu.edu/sems](http://www.rmu.edu/sems) or [www.rmu.edu/cares](http://www.rmu.edu/cares)

Dr. Zbigniew Czajkiewicz, Head - Center for Applied Research in Engineering and Science, RMU

Dr. Winston Erevelles, Dean - School of Engineering, Mathematics, and Science, RMU

The Pittsburgh Chapter of PSPE and RMU have begun a partnership in several areas. RMU now is the site for the Chapter FE/PE Refresher Course – see the article on Page 2 of this Newsletter. In addition, RMU will be hosting the Mathcounts competition for the Chapter – see the article on page 7 of this Newsletter.

## North Shore Connector – January In-House Meeting Presentation

Mr. Kirk Thompson, Pittsburgh Chapter PSPE Director and PAT Representative, will be giving the Chapter a slide presentation of the North Shore Connector Project as a part of the January Chapter meeting. This will be followed in either April or May with a site visit of the actual construction.

The North Shore Connector project will extend Port Authority's Light Rail Transit System, the T, 1.2 miles from the Gateway Subway Station underneath Stanwix Street and the Allegheny River – in twin bored tunnels below the river - to the North Shore. While remaining underground along the North Shore, the alignment would travel adjacent to Bill Mazerowski Way accessing a station near PNC Park. Continuing below grade adjacent to Reedsdale Street, the alignment will transition to an elevated alignment near Art Rooney Avenue to a station along Allegheny Avenue near Heinz Field before terminating near the West End Bridge.



The North Shore Connector is a significant regional investment that will support the revitalized Downtown Pittsburgh and North Shore's residential areas, business districts, educational institutions, entertainment developments and cultural venues in addition to enhancing development opportunities. The North Shore Connector will also enable the Authority to construct future extensions of the T to other destinations within Allegheny County, thus making it a catalyst for future development opportunities throughout the region.

# **MEDRAD Visit Report**

## **Engineering Apprenticeship – Group 1**

**Rachel Cassidy and Greg Borza**

On Tuesday October 30<sup>th</sup> the Engineering Apprenticeship group visited Medrad, a global company that focuses on the marketing, development, and manufacturing of innovative medical technology. Medrad has fifteen international locations and is growing at a rate of 15% annually. With an emphasis on customer satisfaction, Medrad has been producing unique injection and infusion systems since the 1960s. The four presenters, Susan Felix, John Rovnan, Rick Morton, and Andy Hutelmyer, attribute the success of the company to the leadership of John Friel, the CEO. These engineers work within the cardiovascular business unit, through which the fluid management injection system Avanta<sup>TM</sup> was developed.

Susan Felix, a senior mechanical engineer, introduced the machine. The Avanta<sup>TM</sup> is a cardiovascular injector used in conjunction with a catheter to identify blockages in the heart, veins, and arteries. The fluid leads to a better image, which is conducive to more accurate diagnoses. The Avanta<sup>TM</sup> is more desirable than manual injections because it reduces the occurrence of air injected. Air can shock the heart, causing undesirable complications such as heart attacks. Another advantage of the Avanta<sup>TM</sup> is the longer disposables that reduce the amount of radiation with which the doctor must come in contact. With the aid of proEngineer, moldflow, and ABAQUS softwares, Ms. Felix worked closely on the development of the part of the machine that holds the tubes. The amount of revision in the design process was evidenced by the numerous prototypes she showed the group. These models were produced by the injection of liquid plastics into molds. Throughout her presentation, Ms. Felix emphasized the business aspects of her job like cost efficiency, customer satisfaction, and dedication to quality, values echoed by each engineer presenter.

John Rovnan, a software engineer, worked on the sensors and the custom controls unit. The interface was designed to be user-friendly and accessible to the global market, with multiple languages and characters programmed into it. Mr. Rovnan outlined the extensive development process for the custom controls unit. First, ideas and specifications are developed in marketing, where Medrad analyzes common requests from the customers. Then the engineers receive the Software Requirement Specification, a document that relays the needs and requirements to those who will develop the product. The Software Architecture Description details how to accomplish the task, while the Detailed Requirements Specification provides more regulations. The regulations must be explicit and strict for the device to pass the FDA tests. The Software Design Description contains actual code and is peer reviewed. Finally, the product undergoes both unit and integration tests. Mr. Rovnan also worked on the sensors which prevent air bubbles from reaching the patient. He too emphasized the importance of patient safety, which the engineers incorporate into the design of the disposables to prevent disease transmission and into the mechanisms to prevent air bubbles. Although the tubes are disposable, some aspects of the machine are reusable to save hospitals money.

Rick Morton, a project electrical engineer, worked with plastics engineers, mechanical engineers, electrical engineers, disposables engineers, procurement, and quality assurance to develop the hand control for the Avanta<sup>TM</sup>. He attributes his success as an engineer to creativity, math skills, and a system view. For his project, specifications like reliability, cost, durability, safety, and patent violations are very important. The design steps for the hand control are design and simulation concept peer review, detailed circuit design, review, tests, FDA approval, and finally numerous iterations to ensure reliability. Mr. Morton also does post-production work in analysis and improvement.

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Andy Hutelmyer is an Industrial Engineer, who works on the business and price aspects of the Avanta.<sup>TM</sup> He worked to lower the prices of all the parts in the system and to reduce the labor required to create each part. He concentrated on cost and time efficiency. He compared suppliers to see which would be best for him to go to. Andy was also trying to figure advice for the engineers on how to make the products' assembly line efficient. He worked on visual works instructions and looked after manufacturing flows, conveyor lines and cell format to save floor space. He also tried to prevent unrealistic items from ever being started to be designed or built. He incorporates regulations throughout these processes. Mr. Hutelmyer also works on supply chain engineering and quality assurance.

This trip was very informational for us and taught us much of what is required to be an engineer. First, engineers must be able to talk to each other and effectively communicate their ideas. Second, they must be very creative and open to improvements to their ideas. We also learned how many different types of engineers are required for even the simplest of items. These companies also face two problems. One is competition, which drives them to make better products, but requires more time. The second, is patent issues, this forces them to sometimes buy a product in order to use it instead of making one themselves.

## **MATHCOUNTS 2008 PLEASE VOLUNTEER**

Each year, for the past 24 years (since 1984-1985), the Pittsburgh Chapter of PSPE has sponsored the MATHCOUNTS competition for 7<sup>th</sup> and 8<sup>th</sup> grade students. The first competitions were held at Carnegie Mellon (twelve schools participated). We then moved to the University of Pittsburgh to be able to use the Benedum Auditorium (last year, 32 schools participated). Now, we are moving one more time to Robert Morris University to take advantage of the facilities there.

One thing that does not change is the Chapters' need for volunteers and companies who are willing to donate time and financial support for the competition. In 2006, donations for Pennsylvania Mathcounts were received from Dr. James Cobb, P.E., Peter Crescimanno, P.E., Cullen Flanders, P.E., Ralph Gilbert, P.E., Earl McCabe, Jr., P.E., Ed Witt, P.E., Buchart Horn, Inc./BASCO Associates, and Gannett Fleming. We would like to extend a special thanks to these individuals and firms for their historical support.

We would also like to send out a request for other individuals and engineering firms in the Pittsburgh area to consider financial support for this wonderful opportunity. There are many needs for this support. If you or your company would like to make a donation to MATHCOUNTS, please contact Virginia Dailey at [ddengr@city-net.com](mailto:ddengr@city-net.com).

The Pittsburgh Chapter is proud to be involved with such a worthwhile program that encourages mathematics and engineering.

If you may be interested in volunteering for the February 2, 2008 Competition, please contact Tom Schwartzmier via e-mail [toms@nauticom.net](mailto:toms@nauticom.net).

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(Return Service Requested)



PSPE, Pittsburgh chapter – <http://www.PittsburghPE.Org>

### 2007-2008 CALENDAR

#### MEMBERSHIP EVENTS & MEETINGS

Date	Time	Description	Location
January 17, 2007	6:00pm	January Chapter Meeting	Engineers Building
February 2, 2008	8:00am	MATHCOUNTS Competition	Robert Morris Univ.
February 23, 2008	6:00pm	Engineer's Week Banquet	Club at Nevillewood
March, 2008	TBD	March Chapter Meeting	TBD
April, 2008	TBD	April Chapter Meeting – Tunnel Site Visit	TBD

BOARD OF DIRECTION MEETINGS WILL BE HELD ON: Nov. 8, 2007, Dec. 13, 2007, Jan. 17, 2008, Feb. 21, 2008, Mar. 13, 2008, Apr. 10, 2008, May 8, 2008 and June 12, 2008

All BOD meeting are to held @ 5:30PM @ the ESWP Building pending further notice.