



## MARCH MEETING NOTICE

**Topic:** The Learning Factory and PRIME

**Where:** Robert Morris University  
881 Narrows Run Road  
Moon Township, PA

**When:** Tuesday, March 25, 2002

**Time:** 6:00 PM Registration and  
Tour of The Learning Factory  
7:00 PM Dinner  
7:45 PM Presentation

**Menu:** Buffet featuring the following items:

- ❖ Top Round of Beef roasted with peppers & onions
- ❖ Chicken Marsala with mushrooms and wine sauce
- ❖ Baked Scrod with lemon butter sauce

Served with tossed salad, vegetables, rolls and butter, beverage, and dessert.

(Vegetarian option available upon request)

**Cost:** \$18.00 Members  
\$15.00 Students / Unemployed Members  
\$21.00 Non-members

**FOR THE MARCH MEETING,**  
**RSVP NO LATER THAN**  
**MONDAY MARCH 17<sup>TH</sup>, 2003**

TO: Mr. Nathan Peters, Vice-Chair  
Tel: 412-889-7833  
Email: npeters@larocheind.com  
**PLEASE PAY AT DOOR**

Name \_\_\_\_\_

Email \_\_\_\_\_

Phone \_\_\_\_\_

**CANCELLATIONS:** If you must cancel your meeting reservation, please do so no later than 24 hours prior to the meeting. If you do not provide a cancellation notice, you will be invoiced for the cost of your meal.

### ~ About the Program ~

The PRIME (Partnership for Regional Innovation in Manufacturing Education) coalition is an industry-driven, five-college system delivering innovative engineering / manufacturing education and career development in Southwest Pennsylvania. PRIME was born in response to industry and economic needs in the region. Southwestern Pennsylvania area has over 3,500 manufacturing firms with a base of 166,000 employees in that field. PRIME's various manufacturing partners across the nine counties in southwestern Pennsylvania include Cutler-Hammer, Westinghouse, General Motors, Bombardier, Oberg Industries, PPG Industries, and J & L Specialty Steels. Students studying Manufacturing Engineering at Robert Morris have the benefit of working in the Learning Factory. It's a \$4,000,000, fully functioning on-campus factory-a comprehensive "real-world" facility - integrating the equipment, software and systems used in today's high-tech manufacturing operations.

### ~ About the Speaker ~

Dr. Winston Erevelles is the Associate Dean of the School of Engineering, Mathematics, and Science at Robert Morris University. He also serves as the Director of PRIME. His teaching, research, service, and publishing interests are in the areas of Manufacturing Processes, Automation, Robotics, Rapid Prototyping, Programmable Logic Controllers, and Computer Integrated Manufacturing. He has worked as a Manufacturing Engineer and Plant Manager at Mykron Engineers, India. He is a recipient of the 1996 Society of Manufacturing Engineer's Philip R. Marsilius Outstanding Young Manufacturing Engineer Award, the 1996 GMI Alumni Association Award for Outstanding Teaching in Manufacturing Systems Engineering, and the 1997 Rodes Professorship at Kettering University. Dr. Erevelles earned his B.S. in electrical engineering from Bangalore University, India and his M.S. and Ph.D. in engineering management from the University of Missouri-Rolla. He serves as a Manufacturing Engineering Program Evaluator for the Accreditation Board of Engineering and Technology (ABET) and has served as a proposal reviewer for the National Science Foundation and the Education Foundation of the Society of Manufacturing Engineers.

*CONTINUED ON PAGE 2*



## LETTER FROM THE CHAIR

**Hello everyone!**

**A special thanks to all – professionals and students alike – who made our annual Student Night a success. We were honored to have Mr. Larry Berger as our keynote speaker. We were also honored to have several student poster-presenters this year.**

**Congratulations to our Professional Promise Award winners! Their names were announced at the banquet:**

**Jeffrey Martin – YSU  
Travis Crites – WVU  
Steven Crist – Pitt  
Earl Solis – CMU**

**I'd also like to take some time to thank Jonna Martin of AdvanceMe Associates, who spoke at our most recent Career Pathways workshop. And a special thanks to all who volunteered at the Carnegie Science Center for National Engineers Week.**

**As a reminder, we are now soliciting nominees for the McAfee Award. It's also a good time to think about volunteering to be a section officer next year. It's the commitment of our members that makes our section successful.**

**In the meantime, I hope to see everyone at our next meeting on March 25<sup>th</sup>.**

JoAnn Truchan

**AIChE Pittsburgh Section- Chair**

## MARCH MEETING – CONT.

*DIRECTIONS TO ROBERT MORRIS – MOON TOWNSHIP CAMPUS:*

**From the North:**

Take I-79 south to Exit 19, Sewickley/Emsworth. Follow Route 65 toward Sewickley. At the third light, turn left and cross the Sewickley Bridge. At the end of the bridge, turn right and follow the Orange Belt 1.5 miles to the second light. Turn left into RMU.

**From the South:**

Take I-79 north to the Airport-Route 22/30 West Exit. Follow Route 22/30 to Route 60 north. Take Exit 3, Business Route 60, and go three miles to the second light. Turn right at the second light, which is a major intersection

(Beers School Road). Follow Beers School Road to the fourth traffic light. Turn right into RMU.

**From the East or West:**

Take the PA Turnpike to Exit 1-A. Follow Route 60 south 24 miles to Exit 8, Business Route 60. Proceed four miles and turn left at the light onto Beers School Road. Travel 1.5 miles to the fourth light and turn right into RMU. The entrance is on the right, at the fourth traffic light.

*THE LEARNING FACTORY IS IN THE JOHN JAY CENTER.*

*SEE [www.RMU.Edu](http://www.RMU.Edu) FOR CAMPUS MAP.*

*PARKING WILL BE PROVIDED BY THE UNIVERSITY.*

## AIChE OFFICER ELECTIONS

Are you interested in becoming more actively involved with the Pittsburgh Chapter of AIChE? One of the many ways you can contribute to the growth and development of the Local Chapter is to become an officer.

The Local Chapter will be holding its annual election for the following positions this April:

- Vice-Chair
- Treasurer
- Secretary
- Counselor

The Vice Chair will automatically elevate to the position of Chair in the 2004-2005 program year. The Treasurer, Secretary, and Counselor each serve a two-year term that will end in May 2005.

If you would like to learn more about these positions or would like to place your name on the ballot, please contact me by **March 14<sup>th</sup>, 2003** at (724) 274-3371 or [mflaherty@ppg.com](mailto:mflaherty@ppg.com).

Best regards,

Michael Flaherty

AIChE Pittsburgh Section - Past Chair

## CONGRATULATIONS!

Congratulations to our Pittsburgh Section Members who are celebrating 50 years with AIChE:

Philip J. Ripepi  
James A. Karnavas  
James Gore III  
David H. Archer  
Edwin R. Bindseil



## MEMBERSHIP CORNER

Dear Members,

We are constantly updating our local membership database. Please send all change of address notifications to our Membership Chair:

**Holly Gray**  
**Baker Environmental, Inc**  
**Airport Office Park, Bldg 3**  
**Coraopolis, PA 15108**  
**hgray@mbakercorp.com**

If you have not already done so, please verify your updated e-mail address with us so that you will continue to receive monthly newsletters!

Thank you!

### Please sign me up for the local Pittsburgh Section of AIChE

Name \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Business Phone \_\_\_\_\_  
 Residence Phone \_\_\_\_\_  
 Email \_\_\_\_\_

Annual Dues are \$16.00. Make check payable to "AIChE Pittsburgh Section" and send to our Treasurer:

**Leigh Anne M. Wacker,**  
**CFX Software & Services,**  
**Omega Corporate Center**  
**1260 Omega Drive**  
**Pittsburgh, Pennsylvania 15205**

## SOLICITATION FOR 2003 MCAFEE AWARD NOMINEES

**This year, the Pittsburgh Section will be awarding the McAfee Award to an outstanding chemical engineer. The award is presented to a distinguished Pittsburgh chemical engineer every two years who:**

- 1. Is widely recognized for contributing to the profession**
- 2. Has community appreciation where she or he lives and works, and**
- 3. Has participated in and contributed to the AIChE and the Pittsburgh Section**

**Nominations for this year's McAfee Award recipient are now being accepted. The nomination must include a letter from a "champion" and at least three supporting letters. Please send the letters to:**

**Mr. Ed Moretti**  
**AIChE Scholarship and Awards Chair**  
**1840 Tilton Drive**  
**Pittsburgh, PA 15241**

**Nominations are due by April 14, 2003**

**The 2003 McAfee Award Banquet will be held at the Fox Chapel Golf Club on Tuesday, May 20<sup>th</sup>. Watch upcoming issues of The Catalyst for additional details.**

## SPONSORSHIPS

*Interested in placing your company's information in future AIChE Newsletters?*

Full Page	\$300
Half Page	\$175
Quarter Page	\$95
Business Card Size	\$45
1/12 Page	\$30

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Please contact Mariangela Peters at [mariangela.peters@am.sony.com](mailto:mariangela.peters@am.sony.com) or 724-696-8234 for more information.



## NATIONAL ENGINEERS WEEK - THANKS TO OUR VOLUNTEERS!

I just wanted to thank the following volunteers who helped make this year's event another success. Our local section of AIChE was again one of the most popular tables for the Engineer's Week event held on February 14 and 15<sup>th</sup> at the Carnegie Science Center.

Thanks to: John Hauser, Nathan Peters, John Gregory, Marion Maniet, John Heranic, Bill Mentzer, Mike Friedrich, David Missenda, JoAnn Truchan, Deborah Kosmack, and Laura Chevalier.

Thank you also to our Student Volunteers: Courtney Morgan and Beth Zokaites from Pitt, and Earl Solis, Diana Yoon, and Brendan Mack from CMU.

For those of you who have not experienced this event, it is a lot of fun and very rewarding. Think about volunteering next year!!

Thank you,

Nancy Hirko  
AIChE Pittsburgh Section – Engineers' Week Chair

## THANK YOU!

Thank you to AIChE Members Peggy Panagopoulos, Mike Flaherty, Dave Missenda and JoAnn Truchan who volunteered for the 2003 Future Cities Competition at the Carnegie Music Hall in Oakland!

Our AIChE Chapter provided an Award for the Best Use of Recycled Materials. Students from the Frick International Studies School were the proud recipients.



## AIChE NATIONAL CHAPTER NEWS

### AIChE SPRING SHOWCASE REPLACES EXPO

Citing uncertainties in the current economic climate, International Exposition Company (IEC), owner and producer of the Process Industries Exposition (PIE) that was to run in conjunction with the AIChE Spring Meeting in New Orleans, has decided to postpone the 2003 event. In the light of this decision, AIChE has decided to run its own exhibition, the Spring SHOWcase, in conjunction with the meeting. The exhibit hall will open with the Welcoming Reception at 6:00 p.m. on Sunday, March 30, and run through Wednesday, April 2, until approximately 1:00 p.m. Interested vendors should contact Marilyn Williams at [showcase@aiche.org](mailto:showcase@aiche.org) or at 212/591-7332.

### COATING & DRYING SEMINAR TO BE HELD IN MAY

The 11th Coating and Drying Technology Seminar, will be held May 5 to 8, 2003, followed by the 8th Adhesion Technology Seminar, from May 8-9, at the Best Western TLC Hotel in Waltham, MA.

The Coating and Drying Technology Seminar features 26 sessions on such topics as "Fluid Preparation and Delivery," "Specific Application Methods," "Impact of Web on Coating," "Electrostatic Safety," "Troubleshooting Coating Defects," "Developing Machine Specifications," and more.

The Adhesion Technology Seminar will feature 14 sessions, including: "Diffusion, Electrical, Adsorption, and Mechanical Theories of Adhesion;" "Surface Treatment of Polymers and Metals;" "Adhesive Joint Strength Performance;" "Analysis of Non-Destructive Testing for Ductile and Brittle Adhesives Systems;" and "Coating Technologies Related to Dynamic Wetting and Polymer Structure".

For more information, contact Dr. Edgar B. Guttoff, coating and drying consultant, at [ebgutof@coe.neu.edu](mailto:ebgutof@coe.neu.edu), or 617-734-7081 or go to the web site <http://www.coe.neu.edu/~ebgutof/>.



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## SWEET STATS

### CANDY IS JUST DANDY

Although the numbers aren't in yet for February 14, 2003, the National Confectioners Association reports that sales of candy for Valentine's Day 2002 totaled one billion, 90 million dollars, up from \$955 million in 1997.

Here are some fun holiday candy facts:

- Seven billion pounds of chocolate and candy are manufactured each year in the United States.
- Chocolate manufacturers currently use 40 percent of the world's almonds and 20 percent of the world's peanuts.
- Seventy-one percent of American chocolate eaters prefer milk chocolate.
- The Midwest and the Northeast consume more candy per region than the South, Southwest, West, or Mid-Atlantic states.
- The melting point of cocoa butter is just below the human body temperature, which is why it literally melts in your mouth.
- Americans over 18 years of age consume 65 percent of the candy that's produced each year.

For more fun facts, see: <http://www.CandyUSA.org/>

### GUESS THAT CANDY BAR

The Science Museum of Minnesota has a great online game that has users guessing which candy bar they're seeing by looking at a cross-section of it. To try for yourself, go to:

<http://www.smm.org/sln/tf/c/crosssection/namethatbar.html>

## NEWSLETTER DEADLINE

**THE DEADLINE FOR THE APRIL NEWSLETTER IS  
MARCH 14, 2003.**

**Please submit information to:**

**Mariangela Peters  
Sony Electronics - AG  
1001 Technology Drive  
Mt Pleasant, PA 15666**

**[mariangela.peters@am.sony.com](mailto:mariangela.peters@am.sony.com)  
724-696-8234**

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## A SALT Y SOLUTION

We salt the roads to prevent ice and snow from sticking to road surface. That is why ideally salt trucks go out at the beginning of a storm. They are trying to set up a slushy, soft barrier between the road and the snowfall. Then the plows complete the real snow removal. If the roads aren't salted ahead of the storm, several inches of packed snow can quickly become icy and difficult to plow.

Sodium chloride (NaCl), or salt, is cheap, readily available, nontoxic, and very soluble in water. When salt is dissolved in pure water, it alters properties such as vapor pressure, osmotic pressure, and boiling and freezing points. These are the colligative properties of a solution, and the property that road salt crews exploit is freezing-point depression. The amount of freezing-point depression is directly proportional to the number of dissolved ions in a solution.

Take a look at an example. A 0.5 molal solution of NaCl is 1.0 molal in ions. (A salt like NaCl really provides two ions, Na<sup>+</sup> and Cl<sup>-</sup>.) The freezing point of water/salt solution at this concentration is depressed by -1.86 °C. Since the freezing point of pure water is 0.0 °C, the new freezing point of our saltwater is -1.86 °C. If we double or triple the concentration of NaCl, the freezing point becomes -3.72 °C and -5.58 °C, respectively.

But can we keep adding salt to water until the freezing point is -50 °C? No. The solubility of salt in water decreases with decreasing temperature. We eventually reach what is called the eutectic point. This is the point at which a solution achieves a maximum salt concentration. Any colder and salt will begin to leave the solution and raise the freezing point. At the eutectic temperature, ice, saltwater, and solid salt exist in equilibrium. For water, the eutectic temperature is -21.1 °C. Therefore salting roads at temperatures below -21 °C is pointless. In reality, -10 °C is the cutoff for road salting for most practical applications.



Although we've only discussed NaCl, calcium chloride (CaCl<sub>2</sub>) is also used to salt roads. It has a lower eutectic point than NaCl and can work at lower temperatures. Both salts have their advantages, and some ice-melting formulations use a combination of both.

Source: <http://www.chemistry.org>

## ...AND MORE SALT

Salt. On the roads, in the ocean, in our bodies, and on our food. So important that migrations of people throughout history have revolved around it's location in the earth. The average adult body contains about 160 to 175 grams of salt.

While salt is not made, the "manufacture" of salt refers to the harvesting and purification from natural sources. The oldest method of harvesting salt is the simple evaporation of seawater. While seawater certainly tastes very salty, it only contains about 3.3% by mass salt on average.

Typically, physical mining of salt or solution mining is used "manufacture" salt. While seawater evaporation is also popular, vast amounts of space are needed for the evaporation ponds. This method is also constrained by the rate of evaporation, but this is not really a problem in tropical areas. Solution mining is becoming very popular due to its simplicity and high level of safety when compared with traditional mining of salt.

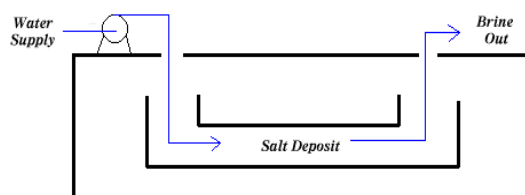


Diagram of Solution Mining

The brine exiting the ground can be run through evaporation systems to concentrate the brine, then crystallization can be used to harvest high purity salt. It may surprise you to learn that about 75% of the salt harvested is used to produce other chemicals. Mainly chlorine, hydrochloric acid, and sodium hydroxide. The popular chloroalkaline process uses salt to manufacture chlorine and sodium by applying an electrical charge to brine solutions, which causes the salt to ionize.

Source: <http://www.cheresources.com>

## SHOWER CURTAIN SCIENCE

Before you hop into the shower tomorrow morning, read this and share how an engineer solved one of the great mysteries of our time...

As you shower, the curtain can billow into the tub. After years of doubt about exactly why this happens, we now have an answer from one Mr. David Schmidt. Schmidt, an engineering professor in Massachusetts, is an expert in something called computational fluid dynamics.

The motion of many fluids, like water and air, is described by a single equation, called the Navier-Stokes equation. Discovered in the 19th century, it's so important to our world that there is a million dollar prize for anyone who can solve it completely.

Engineers, though, with a computer can approximate its solution. They use this equation to calculate the flow of air over a jet, or how blood flows through our bodies. Schmidt, himself, is an expert in using the computer to solve problems with spraying fluids, exactly the case in a shower.

There are two competing theories about why the shower curtain billows into the tub. The first is the Chimney effect, which says that the hot water heats up the air in the shower, causing the curtain to rise. The shower stall then sucks in cold air, pushing the shower curtain into the tub. The second theory is based on the Bernoulli effect: that air rushes past the curtain, lowering the pressure along the curtain, sucking it in. This is, by the way, why an airplane flies.

Now, Schmidt programmed his home computer to simulate the flow of water past the curtain. Using nearly \$30,000 worth of software, he created a virtual shower that flowed for thirty seconds at about eight gallons a minute. It took almost two weeks of computing, and had to make over 1.5 trillion calculations. Schmidt's computer showed him that we create a hurricane in our showers every morning.

The shower pushes the air into a large swirling vortex with a low-pressure center. The shower's water droplets decelerate because of aerodynamic drag, transferring their energy to the bathtub's air, which then twists like a hurricane in the bottom of the tub, pulling in the curtain. You can even see this hurricane, Schmidt says, if you blow smoke into the tub. Now, this might all seem kind of silly, but the study of how fluid drops move is of vital importance. For example, many researchers use Schmidt's computer programs to study the scattering of fluids in asthma inhalers. They want to find better ways to deliver drugs to the lungs. Now, that would be an important problem to solve, unlike the shower curtain. After all, if you don't want to be bothered by a curtain, just buy for your shower stall a door.

Source: <http://www.engineerguy.com>



## AICHE PITTSBURGH SECTION 2002-2003 OFFICERS

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412-578-7981

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#### Web Master

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Eaton Cutler-Hammer  
724-775-5122

### 2002-2003 Monthly Meeting Schedule

Date	Topic	Location
March 25, 2003	Presentation on PRIME & Engineering Facility Tour at RMU	Robert Morris University, Moon Township Campus
April	Plant Tour - TBA	TBA
May 20, 2003	The McAfee Award	Fox Chapel Golf Club

## Mark your calendars!

For the Following Dates:

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March 14, 2003	Officer Nominations Deadline	For 2003 - 2004 Program Year AIChE Pittsburgh Section
March 25, 2003	Monthly Meeting	PRIME and The Learning Factory At Robert Morris University
April 14, 2003	Award Nomination Deadline	For the May 2003 McAfee Award

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