

## Rocky Mountain AIChE News

September 2012

Volume 22 Number 1

### September Section Meeting: The Most Important Substance You've Never Heard Of (Probably)

Radio-isotopes have become an indispensable tool in modern medicine. They are used for a wide range of diagnoses, procedures, and treatments. The most widely used isotope for diagnostics is Technetium - 99m (Tc-99m). It is used in around 15 million treatments every year in the US alone. Unfortunately, Tc-99m has a half-life of six hours, so it decays quickly and cannot be "stockpiled", and thus requires a steady supply. The good news is that the mother isotope of Tc-99m has a half-life of 66 hrs, which is much more amenable to production and distribution in a supply chain. This mother isotope is Molybdenum-99.

As the primary source of Tc-99, Molybdenum-99 (aka Mo-99) is the single most important isotope in medical diagnostics. For most of us, the question is not whether we are going to have a Mo-99 test, but when, and how many. It is used for bone scanning, analysis of cardiac function, testing of brain metabolism, cancer diagnosis, and several other diagnoses.

But we have a problem...approximately 60% of the world's Mo-99 production is used in the US. Approximately two thirds of the world's current production capacity is set to dry up by 2016 because two aging nuclear reactors that produce Mo-99 are being taken out of service. And the US has no domestic supply. That's right; the biggest Mo-99 market in the world has no way to meet the demand!

*(continued on page 2)*

### September Section Meeting

<b>Topic:</b>	The Most Important Substance You've Never Heard of (Probably)
<b>Speaker:</b>	Mike Washer and Martin Biggs
<b>Date:</b>	Tuesday, September 18 <sup>th</sup>
<b>Time:</b>	6:00-6:30 Social 6:30-7:30 Dinner 7:30 Presentation and Q&A
<b>Location:</b>	Garcia's Mexican Restaurant 5050 S. Syracuse St. Denver, CO 80237 303-779-4177
<b>Cost:</b>	Members: \$20 (w/RSVP)* Non-Members: \$25 Students & Unemployed: \$10

**Please RSVP by FRIDAY, September 14<sup>th</sup>**  
(early RSVPs are greatly appreciated!) indicating your name, phone number, and number of attendees. Please RSVP to Martin Vorum at [rockyaiche@yahoo.com](mailto:rockyaiche@yahoo.com).

\*Add \$5 for attending meeting without RSVP

Be not afeard....some good citizens, with a little support from Uncle Sam, are stepping up to avert this impending crisis.

This presentation will give an overview of the supply chain and current production capacity, the geopolitical challenges and the potential technologies that may be deployed to achieve the goal of supplying the US and export market for Mo-99. We will also present some of the considerable technical and political hurdles that must be overcome along the way.

Mike Washer graduated from the University of Newcastle Upon Tyne in England in 1992 with a degree in Chemical Engineering. He joined British Nuclear Fuels Ltd (BNFL) straight out of school and worked in a variety of areas in the nuclear fuel cycle. These included uranium yellowcake processing, uranium hexafluoride production, fuel fabrication, reprocessing and radioactive waste processing and immobilization. Mike moved to the US in 1999 with BNFL to work on the Hanford Waste Treatment Plant, which is designed to process and immobilize 55 million gallons of radioactive waste from the nuclear weapons program. He moved to Denver in 2000 and then commenced a peripatetic life, moving all over the country to work on a variety of projects in the nuclear field. Mike is currently the principal process engineer at Merrick and Company, based in Aurora. He manages the process group and still dabbles in engineering, working on a variety of energy and nuclear projects

Martin Biggs graduated from the Imperial College of Science, Technology, and Medicine in England with a Masters degree in Chemical Engineering and Chemical Technology. Martin joined British Nuclear Fuels Ltd (BNFL) as a process engineer and worked in a variety of roles in their design office, their fuel manufacturing site, and at the Sellafield reactor and waste management site. In 1999 Martin moved to the US supporting the design of the Waste Treatment Plant at the Hanford nuclear site, and subsequently moved to Denver providing technical support during the business development effort to win further contracts. Martin is currently chief engineer at Phoenix Engineering providing engineering consultancy in the nuclear sector in a

role supporting development of new business initiatives through to project execution. His most recent role with the Australian Nuclear Science and Technology Organization (ANSTO) involved the development and preliminary design of a first of a kind molybdenum 99 secondary waste treatment and stabilization process at their Lucas Heights facility in Australia.

## **PAST SEPTEMBER PRESENTATIONS TO THE AIChE ROCKY MOUNTAIN SECTION**

Sep 2000	Progression of Ethanol from Gasoline Additive to Alternative Fuel
Sep 2001	Proton Exchange Membrane Fuel Cells by Dr James Ohi, NREL
Sep 2002	Risk Management Programs in the Post 9-11 World by Barbara Benoy and Jim Peterson, U.S. E.P.A.
Sep 2003	Solid-Liquid Extraction in the Natural Products Industries by Dennis Gertenbach, Hazen Research
Sep 2004	Need to Have an Energy Literate Public & Consumer Base by John C Tobin, Energy Literacy Project
Sep 2005	Loss of Odor Through Conjugation, Suppression and Cross-Adaptation by Tom Bruno, NIS Chemist
Sep 2006	Chemical Engineering Science & Education at CU by Al Weimer, CU Chapter AIChE
Sep 2007	Chemical Engineering at CSM by Tony Dean, Colorado School of Mines
Sep 2008	Iceland - Energy Utopia? by Dr. Masami Nakagawa, Colorado School of Mines
Sep 2009	Ethanol from Cellulose by Glenn Sprenger, GeoSyn Fuels, LLC
Sep 2010	Sustainability & Carbon Management in Chemical & Energy Industries by Jeffrey Siirola, AIChE
Sep 2011	Simulation of Methanogenic Microbes for Renewable Biomethane From Coal Seams by Patrick Gilcrease, South Dakota School of Mines

## ANOTHER OUTREACH EFFORT BY OUR LOCAL SECTION

Three members of our local section, Tom Welborn, Martin Vorum and Michael Mutnan, were judges at a poster session held at the Colorado School of Mines on August 2. The session was the culmination of a summer program sponsored by the National Science Foundation titled "A Research Experience for Undergraduates". The program covered research projects in polymer science and engineering. Twelve students from 12 different universities located in 10 states participated. The program lasts 10 weeks and concludes with a poster session where the students present a synopsis of their projects.

Our members judged students whose projects were in the Advanced Polymer Materials Research area. An evaluation system provided by staff of the School of Mines was utilized during the judging. Up to five projects were evaluated by each member.

Matthew W. Liberatore, Ph.D., Associate Professor, Colorado School of Mines ran the summer session. He recently announced the winners for our judging effort. A three way tie occurred between Christopher Henry, Cody Nance, and Zach Poskin. CONGRATULATIONS TO EACH!!! The name of each student and their poster title is listed in the chart following.

<u>Student Name</u>	<u>Poster Title</u>
Virginia Cousens	Complex Conductivity Response of Xanthan Polymer and NAPL Contamination: Detection and Tracking
Joshua De La Cruz	Cost Efficient Harvesting of Microalgae via a Nanoparticle-Polymer Brush Composite
Jessica Earl	In Situ Control of Temperature and Humidity for the ARES Rheometer
Amanda Fankell	PEGylation of Silicon and Alumina Surfaces
Adam Gage	Nanostructure Formation on Thin composite films and Anisotropic Colloidal Particles

Christopher Henry	Grafting Poly(3Hexylthiophene) from Silicon Wafers
Alexandra Jarriel	Conductivity of Anionic Fuel Cell Membranes
Noah Menard	Dispersion of Nanorods Within a Poly(3-hexylthiophene) Film
Matthew Milner	Synthesis of Monomers as Precursors for Thermally Stable and Processable Imide Polymers
Amit Mishra	Molecular Simulation of Ion Transport in Polymer Electrolyte Materials for Batteries
Cody Nance	Synthesis of Fully Aromatic Conjugated Polymers Through Imide Precursors
Zach Poskin	Influence of Anion Exchange Membrane Structure on Ionic Conductivity and Mechanical Properties

It is always encouraging to see the talents of the future generation on display.

If any member is involved in any type of outreach effort, they are encouraged to share their experience with the section members. If any member knows of a potential outreach activity, they are encouraged to share that information with the membership. In either event, please send your write up of that outreach or the information about the potential outreach to Michael Moes for inclusion in our newsletter. His e-mail is mmoes@ekiconsult.com

### Paraprosdokians

(Winston Churchill loved them)

Paraprosdokians are figures of speech in which the latter part of a sentence or phrase is surprising or unexpected; frequently humorous.

1. Where there's a will, I want to be in it.
2. The last thing I want to do is hurt you. But it's still on my list.
3. Since light travels faster than sound, some people appear bright until you hear them speak.
4. If I agreed with you, we'd both be wrong.
5. We never really grow up, we only learn how to act in public.



# SWE Rocky Mountain Section

## Engineer A Little Play Into Your Day

*The secret to fueling our personal & professional growth, success & happiness*

Saturday, September 15, 2012

8:30am – 2:00pm

Tivoli Event Center, Denver, CO

[www.swermsprograms.com](http://www.swermsprograms.com)

Do you make time in your busy schedule for play? Or... better yet...do you include play in your work?

*“What is so amazing is that we do one thing-work-to the exclusion of the other thing-play.”*

~ Barbara Brannen, Human Resources Expert & Author

Too often we view play and work as totally independent activities. But, as the National Institute for Play states, “science already provides data to show that playful ways of work lead to more creative, adaptable workers and teams.”

Join the Society of Women Engineers Rocky Mountain Section for this unique, fast-paced and engaging mini-conference and experience first-hand why play is essential to enhancing innovation, problem-solving, and our overall well-being.

Whether you are an experienced professional or a collegian preparing for your career, you can:

- Enjoy Lindsay Levkoff, our dynamic keynote speaker, and meet our section’s new board
- Learn from highly recognized local author, human resources expert, and play activist, Barbara Brannen (sponsored by ExxonMobil)
- Find new tools and resources to support your work aspirations, relieve stress, and make life and work more zestful
- Go beyond typical networking to “play” with other brilliant, like-minded engineers and technologists throughout the day
- Participate in a behind-the-scenes technical tour hosted by RTD or a fun Glass Fusion class

For more information and to register visit [www.swermsprograms.com](http://www.swermsprograms.com) today.

# ***EMPLOYMENT - Positions Available***

Send **Position Available** notices to [lauramoes@msn.com](mailto:lauramoes@msn.com). \$25/month per listing.  
Listing will also be placed on web page ([rockymtn.aiche.org](http://rockymtn.aiche.org)).



## AIChE Meetings

### 2012

- Sept 9-13 2012 Annual Safety in Ammonia Plants And Related Facilities Symposium Chicago, IL
- Oct 4-5 Regional Process Technology Conference League City, TX
- Oct 26-29 AIChE 2012 Annual Student Conference Pittsburgh, PA
- Oct 28- Nov 2 AIChE 2012 Annual Meeting Pittsburgh, PA
- Nov 1-2 AIChE and A&WMA Joint Workshop: Shale Oil & Gas E&P – Water Challenges & Opportunities Pittsburgh, PA

### 2013

- Apr 28-May 2 AIChE 2013 Spring Meeting and 9th Global Congress on Process Safety San Antonio, TX

### National AIChE Contact Info

#### **AIChExpress Service Center:**

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## Rocky Mountain AIChE Officers

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Open	Vice-Chair / Program	
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The objectives of AIChE are to advance chemical engineering in theory and practice, to maintain a high professional standard among its members, and to serve society, particularly where chemical, engineering can contribute to the public interest.

AIChE Rocky Mountain is a public non-profit 501(c)(3) organizations and thus any and all donations are tax deductible.

## Rocky Mountain AIChE News Publication Schedule

### October 2012 issue

Articles due Wednesday, October 3<sup>rd</sup>

Publish on Friday, October 5<sup>th</sup>

Meeting on Tuesday, October 16<sup>th</sup>

## MEETING SCHEDULE

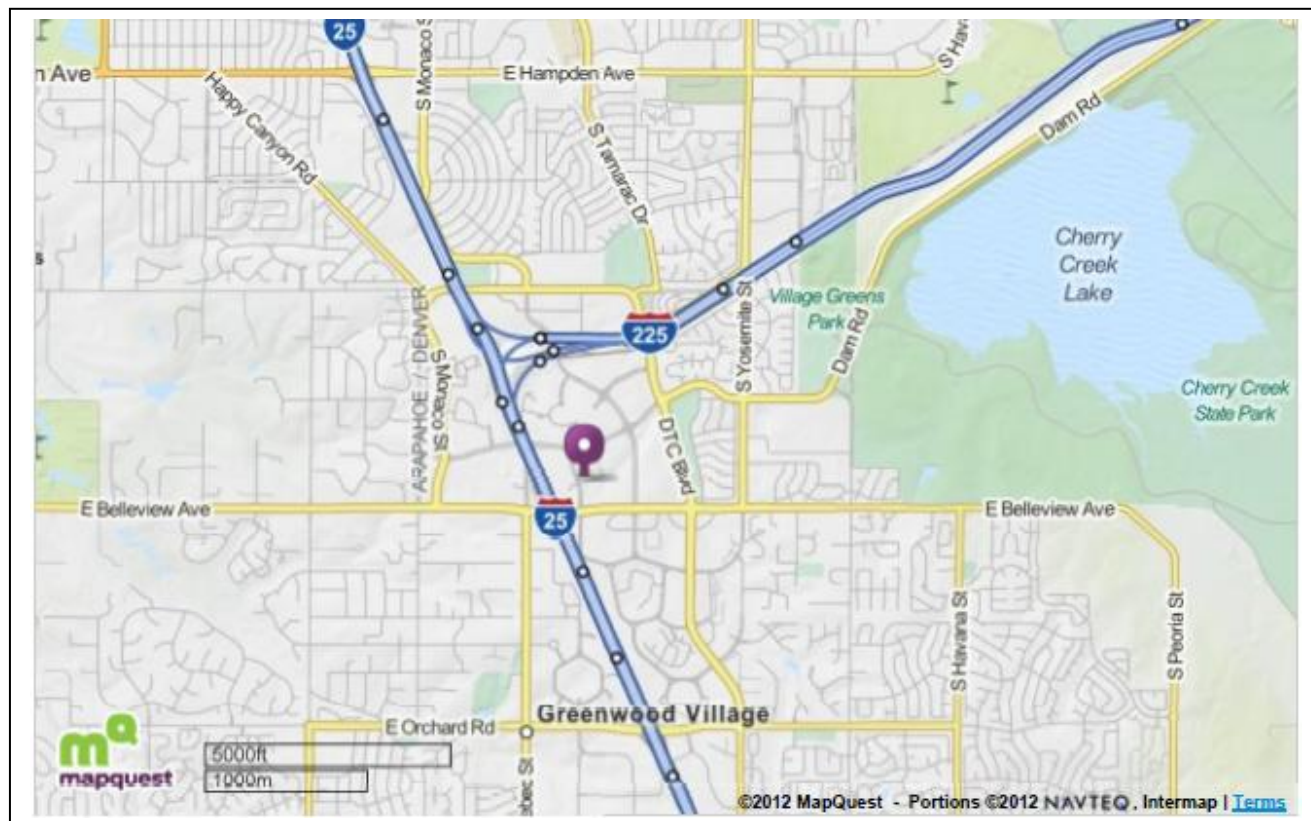
*The Rocky Mountain District of AIChE generally meets the third Tuesday of every month, September through November and January through May.*

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*this newsletter electronically!*



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