I have to be honest; I sometimes struggle to serve my brightest students. I’ve been teaching chemistry in an economically depressed, urban high school for seven years. Some students have been exceptional, curious, and resilient, while others have been overwhelmed by family problems, mental health issues, crime, and addictions, and have decided that education can’t be a priority when obtaining the most basic of necessities, housing, food, and clothing, is a struggle. The most memorable are the students who, in spite of terrible adversity, manage to escape a pattern of behavior and better themselves, despite often being encumbered by sub-par academic preparation. These are the students who work fast food jobs to support their family and still manage to receive an excellent education, even though their school district is woefully under-funded and understaffed. These same students are often homeless and transient, moving from family member to family member, school district to school district, looking for a stable home. It’s an unforgiving consequence of poverty, that more often than not, forces young men and women out of school, and too often goes unnoticed by our culture. These young people are also the American Chemical Society’s Project SEED students, and this summer I have had the privilege of working with some very dedicated professors and career chemists who have helped provide these students with academic opportunities they would otherwise not have.

Project SEED is a long running program sponsored by the American Chemical Society that pairs economically disadvantaged high school students with research opportunities at local colleges and universities. It is a program that may have helped produce a chemistry professional that you know. Over 7000 students have participated in Project SEED since its creation in the 1960’s at institutions all over the country. An emphasis has always been placed on recruiting under-represented ethnicities and women.

This year, Duquesne University’s Chemistry Department accepted four very bright and motivated young men and women into their laboratories and provided each of them with a challenging topic of study. Miawna Johnson, a junior at Carrick High School, refined a technique for the forensic analysis of lipstick with high performance liquid chromatography, under the supervision of Assistant Professor Stephanie Wetzel. Chris Sidun, a senior at Stor-Rox High School, worked under the guidance of Professor Jeffry Madura to create a workbook that illustrated the use of molecular modeling software used to show ligand-substrate interactions. Tristan Stagger, a senior at Central Catholic High School, synthesized solid-state materials using microwave radiation and characterized the products with powder X-ray diffraction in the laboratory of Assistant Professor...
JOB SEARCHING FOR CHEMICAL TECHNICIANS

Presented by

The Society for Analytical Chemists of Pittsburgh
The American Institute of Chemical Engineers, Pittsburgh Section
The American Chemical Society, Pittsburgh Section
The Spectroscopy Society of Pittsburgh

Friday, February 1, 2008

HARBOR GARDENS, STUDENT SERVICES AREA CONFERENCE ROOMS
Bidwell Training Center, 1650 Metropolitan Street, Pittsburgh, PA 15233
412-323-4000
On Street Parking is Available

PROGRAM

8:30 A.M.  Registration

9:00 A.M.  MANAGING AN EFFECTIVE JOB SEARCH
Daniel J. Eustace, Ph. D.
Career Consultant, American Chemical Society

11:00 A.M.  OVERVIEW OF THE LOCAL JOB MARKET
Joseph D. Jolson, Ph. D.

12:00 Noon  CLOSE

For additional information, contact Michelle Blanken at 412-323-4000 ext. 161 or mblanken@mcg-btc.org

Registration Form

2008 Job Searching for Chemical Professionals
Send completed registration form by January 15, 2008 to:
Michael Mautino, Bayer Material Science LLC, 100 Bayer Road, Bldg. #2, Pittsburgh, PA 15205

Name ________________________________________________________________

Address _____________________________________________________________

City ___________________________ State __________ Zip __________________

Phone ________________________ E-mail Address _______________________

January 2008 / The Crucible
JOB SEARCHING FOR CHEMICAL PROFESSIONALS

Presented by
The Society for Analytical Chemists of Pittsburgh
The American Institute of Chemical Engineers, Pittsburgh Section
The American Chemical Society, Pittsburgh Section
The Spectroscopy Society of Pittsburgh

Saturday, February 2, 2008

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Fee: $10.00 (Lunch and Parking at Soldiers and Sailors Parking Garage Included)
( Parking Garage opens at 8:00 A.M. )

PROGRAM
8:30 A.M.  Registration
9:00 A.M.  Welcome and Introduction
9:30 A.M.  MANAGING AN EFFECTIVE JOB SEARCH
  Daniel J. Eustace, Ph.D., Career Consultant, American Chemical Society
12:10 P.M. Overview of the Local Job Market  -  Joseph D. Jolson, Ph. D.
12:30 P.M. Networking Lunch
1:00 P.M.  Resume Review, Personal Consultation, and Local Job Opportunities
4:00 P.M.  Close

Bring your parking ticket for validation and your resume to participate in the afternoon program
For additional information, contact Tiffany Ragan at 412-321-1143 or tiffany.ragan@onassignment.com

Registration Form
2008 Job Searching for Chemical Professionals
Please make $10.00 check for workshop fee payable to ACS Pittsburgh Section
Send completed registration form by January 15, 2008 to:
Susan K. Zawacky, Ph. D., 124 Old English Road, Pittsburgh, PA 15237

Name _____________________________________________     RESUME REVIEW?   YES OR NO

Address ______________________________________________________________________________

City ________________________  State ________  Zip   _____________  Phone  ____________________

E-mail address __________________________________________________________________________
Abstract:
Fluorescence imaging has revealed significant details of molecular interactions and behavior in living cells, at very high resolution. Application of these probes in living animals, however, is still limited because of the optical properties of skin and tissues, which impedes detection of fluorescence non-invasively. To a significant extent, these issues can be overcome through the use of infrared excitable and infrared emitting fluorescent probes, which allow detection in living animals in a spectral region that has significantly reduced scatter and endogenous absorbance. We have prepared bright infrared luminescent quantum dots with good imaging properties in the infrared spectral range, and applied these to detection of tumors, to examination of artificial tissues, and to tracking cells non-invasively, over time in live animals. In addition, a new range of expressible reporter with fluorescence in the infrared range has been developed in our group. The properties, design, and applications of these probes will be discussed.

Bio:
Marcel Bruchez performed his Ph.D. work at the University of California, Berkeley in Physical Chemistry with Prof. Paul Alivisatos where he developed the initial applications of quantum dots in biological research, and studied the optical properties of single quantum dots. From here, he founded Quantum Dot Corporation in 1998 to develop and commercialize quantum dots for biological applications, where he led a number of distinct efforts in basic chemistry, nanoparticle characterization and application development. Many of these contributions were published in leading journals such as Nature, Nature Biotechnology, and Science, and were recognized in 2003 as one of the top ten scientific breakthroughs by Science. In addition, he holds 16 issued US patents, and is inventor on 20 additional pending patent applications in the US. Dr. Bruchez was named as a 2004 TR100 recipient, a 2006 Rank Prize for Optoelectronics recipient, and his work at Quantum Dot Corporation was recognized by a number of corporate awards, including a R&D 100 Award, the LARTA Most Promising Innovation award, and the Forbes/Wolfe Top Nanotechnology Breakthrough Award. In 2005, Quantum Dot Corporation was purchased by Invitrogen Corporation, a large life science company and Marcel joined the program at CMU as an Associate Research Professor in Chemistry and Program Manager for the $13.3M National Technology Center for Networks and Pathways. He maintains his interests in both academic research and entrepreneurial activity.
What opportunities are there for a scientist in the military? What is an Airborne Ranger doing with a Ph.D.? How does the Department of Defense use its investment in science and technology to provide the foundation for transformational joint warfare capabilities? Is the Department of Defense basic science research strategy capable of developing the technology necessary to enable key elements of the US military’s transformation? By describing my personal journey as a soldier and scientist I hope to develop a dialog with the audience in order to answer these questions and more.

Bio
Dr. Augustus Way Fountain III is currently the Chief Scientist for Chemical Biological Detection at the Edgewood Chemical Biological Center. He is also working with JIEDDO as the Chair of the Explosives Signatures and Analysis Working Group. He most recently served as a Professor of Chemistry and the Director of the Photonics Research Center at the United States Military Academy. Dr. Fountain holds a B.S. in Chemistry from Stetson University, a Ph.D. in Analytical Chemistry from Florida State University, and an M.S.S. degree in National Strategic Studies from the U.S. Army War College. His research has involved the development of fiber optic based Raman spectroscopy, the use of remote optical sensing for the detection of chemical and biological agents, the development of polymeric micro-sensor arrays, and hyperspectral remote sensing.

Dinner Reservations: Please email Carolyn Benga at crbssp@yahoo.com or call (412) 487-0915 to make dinner reservations NO LATER THAN FRIDAY, January 11, 2008. Dinner will cost $8 and checks can be made out to the SSP. If you have dietary restrictions, please let Carolyn know when you RSVP.

Parking Instructions: The Duquesne University Parking Garage is located on Forbes Avenue. Upon entering the garage, receive parking ticket and drive to upper floors. Pick up a parking chit at the dinner or meeting. If any difficulties arise, contact Dr. Mitch Johnson at Duquesne University.

Games have been used for training for thousands of years -- but new digital games afford new kinds of training not previously possible. This talk will examine how techniques from digital gaming and entertainment are being used for new kinds of training simulations and other “serious” purposes, and how to design these simulations so that they strike the right balance between being engaging and educational.

Bio
Jesse Schell is on the faculty of the Entertainment Technology Center at Carnegie Mellon University, where he teaches classes in Game Design, and leads several projects, including GameInnovation.com, a systematic study of the history of videogame innovations, and Hazmat: Hotzone, an anti-terror team training game for the nation’s firefighters. Jesse is also the CEO of Schell Games (an independent game studio in Pittsburgh: www.schellgames.com), and the Chairman Emeritus of the International Game
Project Seed Continued
from Page 1

Professor Jennifer Aitken. Finally, Katrina Townsend, a senior at Sto-Rox High School, synthesized primary fatty acid amides and isolated them through solid phase extraction, a project guided by Associate Professor Mitch Johnson.

In addition to cutting-edge research, our SEED students participated in a variety of career exploration activities along with a SEED student from Washington and Jefferson College who worked with Assistant Professor Michael Leonard. PPG Industries, the R J Lee Group, Inc., US Steel and Ferro Corp. provided us with tours of their facilities and panel discussions about their projects and career paths. The students also met with admissions and financial aid officers from Duquesne University and Washington and Jefferson College, who provided them with financial and scholarship information.

This year, two of our students, Chris Sidun and Tristan Stagger, presented their work at the 234th American Chemical Society Meeting’s Sci-Mix Poster Session. Our participation at the Boston meeting was well received by the constituents of American Chemical Society and the ~50 SEED students from around the country.

The effect Project SEED has on our students’ futures is measurable. Our students often continue to study science in college and have remarkable additions to their résumés to help them along. For example, this year, both Chris Sidun and Tristan Stagger will have articles published in peer-reviewed journals in their area of study. They will have had hours of technical writing and reading, and a firm grasp of the many pitfalls involved in novel scientific research - and all before they graduate high school.

While in Boston, I took some time to talk to SEED students from other academic institutions. Not surprisingly, I was struck by their poise, confidence and understanding of their research. I asked the same question to each of the SEED students, “How would your plans for college differ if you didn’t participate in Project SEED?” All of them responded the same, “I wouldn’t know what I was going to do in college.” Project SEED provides a unique opportunity to some of our most academically neglected young men and women and it would not exist without support from generous individuals, organizations and companies. This year’s program at Duquesne University was sponsored by: PPG Industries, RJ Lee Group, Inc., the Spectroscopy Society of Pittsburgh, Acusis, Westinghouse, Walmart, the Society for Analytical Chemists of Pittsburgh and Ms. Tabitha Riggio. We are also indebted to the Bayer School for Natural and Environmental Sciences at Duquesne University, Dean Seybert and the local Pittsburgh ACS section for support.

Please take some time this year and make contact with your local SEED Program and see how you can help facilitate a unique opportunity for an exceptional young student (J L U C A S @ s r s d . k 1 2 . p a . u s , a i t k e n j @ d u q . e d u , m leo n a r d @ w a s h j e f f . e d u ).

Submitted by: Josh Lucas, Chemistry Teacher, Sto-Rox High School

Society for Analytical Chemists of Pittsburgh

February Meeting
Monday, February 4, 2008
Duquesne University
Maurice Falk Hall

“Exploring the Limits of Resolution in Liquid Chromatography and Capillary Electrophoresis”

James Jorgenson, Ph.D.
Professor, Department of Chemistry, University of Pittsburgh

Dinner - Student Union, City View Café (6th Floor) 6:30 P.M.
Technical Presentation 8:00 P.M.

Abstract:
While the basic separation mechanisms of chromatography and electrophoresis are different, there are still some interesting parallels between them. Pressure is a primary factor controlling separation efficiency (theoretical plates) in liquid chromatography, while electrical potential is a primary factor controlling separation efficiency in electrophoresis. It is possible to increase the separation power of liquid chromatography through the use of smaller particles of packing material and the application of higher pressures for pumping mobile phase. In an analogous manner it is possible to increase the separating power of capillary electrophoresis through the application of higher electrical potentials. Alternatively, enhanced separations can be achieved by creating an “endless” separation system. In capillary electrophoresis, this can be accomplished by doing separations in a circular system (Cyclic Capillary Electrophoresis) or in a linear system with a counterflow (Flow Counterbalanced Capillary Electrophoresis). Similar improvements can be attained by doing liquid chromatography in a cyclic system (Recycling Chromatography).

Continued on Page 9

January 2008 / The Crucible
Voltage-gated ion channels underlie the generation of action potentials in the brain and heart, and they trigger transmitter release and muscle contraction. These proteins are made up of two parts: a voltage-sensing domain and a pore domain. The voltage-sensing domain has charged residues that sense changes in the membrane electric field thereby driving the pore domain between open and closed conformations. A wide range of experimental techniques have been used to study these proteins including electrophysiological recordings, genetics, fluorescence techniques, and X-ray crystallography; yet, there is no consensus on their mechanical operation.

I will discuss our recent efforts to determine what these channels look like when they are open and when they are closed. Specifically, we used a high-throughput yeast screen in combination with computational analysis to determine the structural arrangement of the voltage-sensing domain at negative membrane potentials. Comparisons of our model to the Kv1.2 crystal structure at zero membrane potential provide insights into the mechanism of voltage gating.

**Biography**

Professor Michael Grabe completed his undergraduate degree in mathematics & physics at Brown University and then went on to obtain his Ph.D. from the UC Berkeley in the Physics Department. While at Berkeley he worked with Prof. George Oster using computational methods to study the rotary molecular motors V-ATPase and F-ATPase. In 2002 he joined Prof. Lily Jan’s group at UC San Francisco where he studied aspects of potassium channel structure and function such as ion selectivity and channel opening. Since 2006 Prof. Grabe has been an Assistant Professor in the Biological Sciences at Pitt.

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American Chemical Society Society Debuts Bytesize Science — A New Podcast for Young Listeners

The American Chemical Society (ACS) Office of Communications has launched Bytesize Science, an educational, entertaining podcast for young listeners. Like the flying car, Anglia, in the Harry Potter films, Bytesize Science transports kids, teachers, and other listeners into a real-life world realm where science is the enchantment.

Bytesize Science translates cutting-edge scientific discoveries from ACS’ 36 peer-reviewed journals into stories for young listeners about science, health, medicine, energy, food, and other topics. It includes content from Chemical & Engineering News, ACS’ weekly news magazine.

New installments of Bytesize Science are posted every Monday and available without charge. The archive includes items on environmental threats to killer whales, a scientific explanation for why some people love chocolate, some unlikely new uses for compact discs, and a hairy tale about “hairy roots.”

The podcaster for Bytesize Science is Adam Dylewski, an ACS science writer and recent graduate of the University of Wisconsin-Madison with degrees in genetics and science communication. Dylewski spent his college career immersed in science and journalism, writing down-to-earth explanations of vital discoveries as a weekly science columnist for The Daily Cardinal, UW-Madison’s student newspaper. Later, he continued to translate science news as a reporter for UW-Madison’s Communications office and for The Why Files, an award-winning science news site with a witty, fun edge.

Podcasting is an increasingly popular way of accessing news, information, and entertainment content from the Internet. The term was derived from Apple’s “iPod,” a portable digital audio and video player, and “broadcasting.” Podcasts allow users to subscribe to a “feed” and receive new files automatically whenever posted to the Internet.

Subscribe to Bytesize Science in iTunes

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NCW 2007: The Many Faces of Chemistry

For the 9th consecutive year, the Pittsburgh Section’s National Chemistry Week (NCW) celebration was held at the Carnegie Science Center (CSC). For 2007, the event was conducted on Friday and Saturday, October 26-27 and featured the theme “The Many Faces of Chemistry.” A total of 296 volunteers, from 33 groups and organizations, conducted hands-on experiments, activities, and demonstrations. In addition to the hands-on activities, a career fair was held in conjunction with the NCW event, with participating groups providing information on careers in science and chemistry. Including PPG Industries Inc.’s demonstration titled “Reaction in Action,” there were 8 theater-style shows presented 17 times over the two-day period, in the various CSC stages. Of the 296 volunteers, 149 (50%) were ACS members or affiliates (students, teachers, technicians, etc.). Total attendance for the two-day event was approximately 4760 (2897 on Friday, 1863 on Saturday), an increase of 1000 compared to the Section’s 2006 NCW event and the 2nd highest attendance for the Section’s NCW event over the past 9 years.

The Pittsburgh Section wishes to extend its gratitude to the 2007 NCW sponsors, including the Society for Analytical Chemists of Pittsburgh, the Spectroscopy Society of Pittsburgh, Bayer Corporation and the Carnegie Science Center. Without the continued support from these organizations, the Pittsburgh Section would not be able to reach so many in our communities with a positive message about science and chemistry, while promoting science education and literacy. The Pittsburgh Section also wishes to thank the 296 dedicated volunteers! Special thanks also go to Steve Valasek from PPG Industries, Inc. for his demonstrations in the Science Stage Theater.

Mark Your Calendar: NCW 2008
The Carnegie Science Center has been reserved for Friday and Saturday, October 24-25, 2008 for the Pittsburgh Section’s 10th consecutive NCW event. The 2008 NCW theme is “Having a Ball with Chemistry,” focusing on the chemistry of sports and tying into the 2008 Olympics.

Submitted By V. Michael Mautino

SSP Technology Forum Continued from Page 5

Developers Association. In 2004, he was named one of the world’s Top 100 Young Innovators by Technology Review, MIT’s magazine of innovation.

Before coming to Carnegie Mellon, he was the Creative Director of the Disney Virtual Reality Studio, where he worked and played for seven years as designer, programmer and manager on several projects for Disney theme parks and DisneyQuest, as well as on Toontown Online, the first massively multiplayer game for kids. Before that, he worked as writer, director, performer, juggler, comedian, and circus artist for both Freihofer’s Mime Circus and the Juggler’s Guild. He is presently trying to cram everything he knows into a book called The Art of Game Design.

See more pictures from the Pittsburgh Section’s National Chemistry Week event on the Section’s website. http://membership.acs.org/P/Pitt
Bio:
James Jorgenson was born in Kenosha, Wisconsin in 1952. He received his undergraduate education at Northern Illinois University where he received a B.S. in Chemistry in 1974. Following this he entered graduate school at Indiana University, where he worked in the research group of Professor Milos Novotny, and received a Ph.D. in Chemistry in 1979. His Ph.D. research concerned two principal areas; the study of mammalian pheromones, and the development of new detection schemes for liquid chromatography.

Dr. Jorgenson joined the faculty of the University of North Carolina as an Assistant Professor of Chemistry in 1979. He was promoted to Associate Professor in 1985, Professor in 1987, appointed the Francis P. Venable Professor of Chemistry in 1994, and William Rand Kenan, Jr. Distinguished Professor of Chemistry in 1999. He was Chair of the Chemistry Department from 2000 to 2005.

Among the honors he has received are the Esselen Award for Chemistry in the Public Interest in 2004, the Pittsburgh Conference Analytical Chemistry Award in 2005, the American Chemical Society Award in Analytical Chemistry in 2007, and elected to the American Academy of Arts and Sciences in 2007.

Professor Jorgenson is one of the originators of capillary electrophoresis, with his first publications on this topic appearing in 1981. His current research interests include ultrahigh pressure liquid chromatography, multidimensional separations, microscale separations coupled to mass spectrometry, and the design of detectors for chromatography and capillary electrophoresis.

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Dinner Reservations: Please email Larry Senor, Arrangements Co-Chair at senor@pittcon.org, by Thursday, January 31, 2008 to make dinner reservations. Should you not have email, please call Larry at 724-327-4428. Dinner will cost $8 ($4 for students) and checks can be made out to the SACP. If you have any dietary restrictions, let Larry know when you leave message.

Parking: Duquesne University Parking Garage entrance is on Forbes Avenue. Upon entering the garage receive parking ticket and drive to upper floors. Pick up a parking sticker at the dinner or meeting. Contact Dr. Mitch Johnson at Duquesne University if any difficulties arise.
New Officer Information and Election Results will be published in the February issue of The Crucible!
The Crucible

The Crucible is published monthly, August through May. Circulation, 3,000 copies per month. Subscription price, six dollars per year. All statements and opinions expressed herein are those of the editors or contributors and do not necessarily reflect the position of the Pittsburgh Section.

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### January

**Mon.  7**  
**Society for Analytical Chemists of Pittsburgh (SACP)**  
Duquesne University, Maurice Falk Hall  
*“Imaging Infrared Fluorescence in Living Animals and Cells: Quantum Dots and Expressible Reporter Systems”*  
Marcel Bruchez, Ph.D., Associate Research Professor in Chemistry, Carnegie Mellon University and Program Manager, National Technology Center for Networks and Pathways

**Wed.  16**  
**Spectroscopy Society of Pittsburgh Technology Forum**  
Duquesne University, Mellon Hall of Science, Laura Falk Hall  
*“Serious Games: Past, Present and Future. How CMU’s Entertainment Technology Center Assists Global Business Toward Profitability”*  
Jesse Schell, Carnegie Mellon University

**Wed.  16**  
**Spectroscopy Society of Pittsburgh**  
Duquesne University, Laura Falk Hall  
*“Combat Boots and Lab Coats: My Journey as a Soldier-Scientist”*  
Augustus (Way) Fountain III, Ph.D., Chief Scientist, Chemical Biological Detection

**Tues.  29**  
**ACS Pittsburgh Chemists Club**  
Duranti’s Restaurant  
*The Cell’s Doors: Ion Channels and Insight Into How They Open and Close”*  
Michael Grabe, Ph.D., Assistant Professor, University of Pittsburgh, Department of Biological Science

### February

**Mon.  4**  
**Society for Analytical Chemists of Pittsburgh (SACP)**  
Duquesne University, Maurice Falk Hall  
*“Exploring the Limits of Resolution in Liquid Chromatography and Capillary Electrophoreses”*  
James Jorgenson, Ph.D., Professor, Department of Chemistry, University of North Carolina

**Fri.  1**  
**Job Searching for Chemical Technicians**  
Harbor Gardens, Student Services Area Conference Rooms, Bidwell Training Center, Pittsburgh

**Sat.  2**  
**Job Searching for Chemical Professionals**  
Ashe Auditorium, University of Pittsburgh