Pittsburgh Award 2004

The following pictures were taken at the 2004 Pittsburgh Award Dinner held on December 9, 2004 at the Sheraton Station Square Hotel. The Dinner honored 2004 Pittsburgh Award winner, Terrence J. Collins, Lord Professor of Chemistry at Carnegie Mellon University.

The Pittsburgh Award was established in 1932 by the Pittsburgh Section of the ACS to recognize outstanding leadership in chemical affairs in the local and larger professional community. The award symbolizes the honor and appreciation accorded to those who have rendered distinguished service to the field of chemistry.

Pittcon 2005

The Pittsburgh Conference will be held in Orlando, FL, February 27 through March 4, 2005. This year’s theme is: Pittcon2005, Everything Science Under the Sun!
The Eastern Analytical Symposium is the second largest meeting in the United States dedicated to the needs of analytical chemists and those in the allied sciences. Please help us to make the 2005 EAS the best ever—be a part of the program by contributing your own papers for inclusion in the oral or poster sessions.

To submit a contributed presentation for the 2005 EAS Technical Program, you should go to our web site, www.eas.org, after March 1, and follow the instructions for preliminary abstract submission. Invited speakers should not submit preliminary abstracts to EAS, although your session organizer may request one for his/her use. All preliminary abstracts must be submitted electronically via the EAS web site at www.eas.org. The abstract submission deadline is April 15, 2005. No faxed, e-mailed, or mailed preliminary abstracts will be accepted.

Please carefully review the following information:

1. All preliminary contributed abstracts will be submitted electronically in 2005. No faxed, e-mailed, or mailed preliminary abstracts will be accepted.
2. The title of the presentation and the list of authors that you submit are final, and may not be changed.
3. The preliminary abstract that you submit will be considered to be your final abstract for use in the abstract book for the 2005 Eastern Analytical Symposium.
4. All preliminary abstracts will be acknowledged via e-mail.
5. Presenting authors of contributed submissions will be notified in June 2005 of the status of their abstract and its session assignment.

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# JOB SEARCHING FOR CHEMICAL PROFESSIONALS

Presented by

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

**Monday, March 21, 2005**  
Duquesne Room, Student Union, Duquesne University, Pittsburgh

_Fee: $10.00 (Lunch and Parking in the Forbes Avenue Garage included)_

## PROGRAM

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<td>8:30 A.M.</td>
<td>Registration</td>
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<tr>
<td>8:55 A.M.</td>
<td>Welcome and Introduction</td>
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<tr>
<td>9:00 A.M.</td>
<td>MANAGING AN EFFECTIVE JOB SEARCH</td>
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<tr>
<td></td>
<td>Dr. Ray O’Donnell</td>
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<td>Coordinator of Graduate Studies, SUNY-Oswego</td>
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<tr>
<td>10:40 A.M.</td>
<td>Break</td>
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<tr>
<td>10:50 A.M.</td>
<td>“Managing an Effective Job Search” continues</td>
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<td>12:00 P.M.</td>
<td>LUNCH</td>
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<tr>
<td>12:50 P.M.</td>
<td>Short Presentation by Tiffany Ragan, Senior Branch Leader at Lab Support</td>
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<td>1:00 P.M.</td>
<td>Resume Review and Personal Consultation</td>
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<td>Concluding Remarks</td>
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Please bring your resume in order to participate in the afternoon program

For additional information, contact Bob Theys at 412/823-3077 or theys@pittcon.org

## Registration Form

**2005 Job Searching for Chemical Professionals**

Please make $10.00 check for Workshop Fee payable to ACS Pittsburgh Section

Send this completed registration form to:

Dr. T. J. Weismann, 321 Mellon Hall, Duquesne University, PA 15282

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**Abstract**

The single biggest challenge to the development of commercially successful fuel cell vehicles is the lack of a safe, efficient, and economical method for storing hydrogen onboard the vehicle. Consumers demand a driving range of about 500 km, a competitive cost for the fuel, convenient (fast) refueling, with safety as a given. This should be accomplished without compromising vehicle performance and utility (e.g., trunk space). These requirements place stringent constraints on the hydrogen storage system. The ultimate (2015) DOE Freedom CAR goals for system hydrogen storage are 9 wt%, 81 kg/m³, a refill time of 2 minutes, and a storage system cost of 67/kg H₂. No current technologies are close to meeting these targets.

Current hydrogen storage technologies, including compressed gas, liquefaction, metal hydrides, chemical hydrides, and physisorption will be reviewed. Experimental and computational studies of physical adsorption of hydrogen on nanoporous carbons, including carbon nanotubes will be reviewed in detail. Pure graphene systems, such as pristine carbon nanotubes and graphitic nanofibers, have heats of adsorption for hydrogen that are too weak to allow substantial hydrogen uptake at room temperature. Activation of nanoporous carbons has been shown to substantially increase the hydrogen storage capacity. Atomistic computer simulations provide insight into the adsorption mechanism for hydrogen storage on well-defined nanoporous sorbents. Experiments and simulations of hydrogen adsorption on novel metal organic materials will also be discussed.

**Biography**

Dr. Johnson obtained his BS and MS degrees in Chemical Engineering from Brigham Young University, and his Doctorate at Cornell in 1992, majoring in Chemical Engineering with a minor in Computer Science. He did post doctoral work at the Naval Research Laboratory. He has been a professor in the Chemical Engineering Department at the University of Pittsburgh since 1995. His research interests include application of statistical mechanics to problems of chemical engineering, adsorption of hydrogen and other gases, and calculation of thermodynamic and transport properties. He has published widely, with fifteen closely related publications in the area he will discuss.
“Weak Alignment Provides New NMR Opportunities to Study Molecular Structure”

Dr. Ad Bax
National Institutes of Health

March Meeting
Wednesday
March 16, 2005

Duquesne University
Mellon Hall of Science
(Maurice Falk Hall)

March Meeting:
Dr. John M. Andresen, from Penn State University, will describe technical activities of the Consortium for Premium Carbon Products from Coal on Thursday, March 3, 2005 at More Restaurant. 11:30 am Networking; 12 noon Lunch; 1 pm Presentation. Mark your calendar!

Duquesne University
Mellon Hall of Science
(Maurice Falk Hall)

March Meeting
Wednesday
March 16, 2005

“Fischer-Tropsch Synthesis: Can It Become a Reality for the U.S.?”

by
Burtron H. Davis, Ph.D.
Center for Applied Energy Research
University of Kentucky

More Restaurant
214 N. Craig St., Pittsburgh, PA, 412-621-2700
11:30 am Networking-Cash Bar
12:00 noon Luncheon
1:00 pm Presentation

All are welcome! Please plan to attend. For reservations, call Christina at 412-386-4484 (for Tom Sarkus) by noon on Friday, January 28, 2005.

A brief introduction will cover the effort at the U.S. Bureau of Mines and the commercial operation at Brownsville, Texas during the 1940-1950 time period and contrast it to that of South Africa. Today two catalysts have commercial potential: iron and cobalt. Conventional wisdom dictates that iron is the preferred catalyst for a coal-based industry whereas cobalt is preferred for a natural gas-based industry. One reason for this belief is that a syngas with the required H₂:CO ratio of 2 is obtained from natural gas and that cobalt has a higher catalytic activity and produces higher molecular weight products. On the other hand, iron is more suitable for coal since a low H₂:CO ratio is obtained for coal gasification and iron is preferred because of its water-gas shift activity. Contrary to this belief, Sasol has produced a syngas from coal with a H₂:CO ratio nearly 2 and has utilized an iron catalyst but for the major fraction of its production in a high-temperature process. Data will be provided to show that an iron catalyst can be as active or even more active than a cobalt catalyst and that the iron catalyst produces a higher wax product than the cobalt catalyst. Impediments to the utilization of an iron catalyst today are its water-gas shift activity and its attrition when used in the liquid phase reactors. Finally, it will be claimed that the decision to use the Fischer-Tropsch process in the United States is largely a political one and that it is as, or more, competitive on a cost basis than some other alternatives that already receive political support.

Biography
Dr. Burt Davis is Associate Director of the Center for Applied Energy Research at the University of Kentucky in Lexington, KY. His research interests include direct and indirect liquefaction, catalysis in coal conversion, analysis of synfuels products, and the relationship that exists between coal structure and liquefaction behavior. Dr. Davis earned a bachelor’s degree from West Virginia University, a master’s degree from St. Joseph’s College, and a doctorate degree from University of Florida, all in chemistry. He belongs to ACS and the Catalysis Society, and serves on the editorial boards of both Fuel and the Journal of Fuel Chemistry and Technology. Dr. Davis has authored more than 500 technical publications, and was recipient of the ACS 2002 Henry H. Storch Award in Fuel Chemistry.

March Meeting:
Dr. John M. Andresen, from Penn State University, will describe technical activities of the Consortium for Premium Carbon Products from Coal on Thursday, March 3, 2005 at More Restaurant. 11:30 am Networking; 12 noon Lunch; 1 pm Presentation. Mark your calendar!
Polymers are simplistically just large, polyvalent analogs of their low molecular weight cousins that are the subject of undergraduate organic chemistry. However, because polymers are larger and polyvalent, they often differ in both profound and subtle ways from a low molecular weight organic molecule. In many cases, these differences manifest themselves in the form of entropic differences - entropic differences that we have used to advantage in synthesis, catalysis, and separation chemistry. For example, low molecular weight compounds typically are more soluble hot than cold. In contrast, polymers often have so-called lower critical solution temperatures - that is, they can become very insoluble on heating because polymer dissolution can be enthalpically favorable but entropically unfavorable. Such behavior has allowed us to develop and prepare ‘smart’ catalysts that turn reactions first OFF if there is an exotherm and then back on once the reaction has cooled. Polymers’ polyvalency also magnifies the effect of what would otherwise be small interactions. Thus, weak bonds like hydrogen bonds or simple van der Waals interactions can be used to assemble functionalized surfaces when polymeric materials are used as reagents.

For dinner reservations please contact Terri Ziegler (Tel: 412-492-5674; email: tziegler@ppg.com) no later than Monday, February 7, 2005. The cost of dinner is $19.00 per person; discount rate of $11.00 for retirees; no charge for students.
On December 9, 1742 Carl Wilhelm Scheele was born in Stralsund, a town in Swedish Pomerania. This year, 2004, is the 200th anniversary of the death of Joseph Priestley and has been the occasion for many celebratory events. Without in any way trying to diminish Priestley’s achievements it seems only fair to devote one short column to the life and discoveries of the chemist who isolated oxygen before Priestley did.

Scheele’s father was a merchant and Carl Wilhelm was one of eleven children. In 1757, at the age of 14, he was apprenticed to a local pharmacist and immediately showed great aptitude in his given profession. He read a wide assortment of chemical texts available to him at his workplace, including those by Lemery and Boerhaave, and began research in his free time. By 1768 Scheele was in his third position, now in Stockholm, and observed the differential effects of different wavelengths of light on the photo-reduction of silver chloride, work that was not published until much later. Scheele’s first publication, jointly with his friend Retzius (later a Professor at Stockholm University) was on the isolation of pure tartaric acid from cream of tartar (potassium hydrogen tartrate). By the time this article was published Scheele was energetically pursuing pneumatic chemistry - the chemistry of gases - the liveliest research field in chemistry at that time.

In Scheele’s first significant work on gases he prepared and collected, devising ingenious apparatus to do so, a gas from the action of water or acids on iron or zinc. At first identified simply as inflammable air (hydrogen, of course) Scheele later called it phlogiston elasticum. It was, you may recall, a part of accepted chemical theory at that time that all metals contained phlogiston, the principle of flammability.

In 1770 Scheele moved again to Uppsala, becoming the laboratory assistant of a pharmacist named Lokk. The next three years were amazingly productive, providing the experiments described in Scheele’s magnum opus “On Air and Fire”. His investigations of manganese dioxide, suggested to him by Torbern Bergman, Professor of Chemistry at Uppsala and one of the best analysts of his day, led to the preparation of chlorine and the recognition of manganese as a new metal. He isolated pure arsenic and characterized silica, magnesium oxide, barium oxide, and oxalic acid. But, central to this story, he isolated oxygen as a product of several different reactions: by heating silver carbonate, mercuric carbonate, mercuric oxide, potassium nitrate, or magnesium nitrate; and by strong heating of a mixture of arsenic (V) oxide and manganese dioxide. All this before the end of 1773, as we know from Scheele’s notebooks, whereas August 1, 1774 marks Priestley’s first preparation of oxygen by heating mercuric oxide.

Though Scheele’s manuscript was sent to a publisher near the end of 1775 (and remember that he was a working pharmacist all this time) it was not published until mid-1777. Priestley was much quicker to publish, and news of his “new” gas was rapidly spread in England, France, and Germany. Scheele, relatively isolated in Sweden, and unable to travel because of the demands of his daily work, only received belated recognition for his work on oxygen.

Scheele’s subsequent work was no less distinguished. In gaseous chemistry he isolated cyanogen, hydrogen cyanide, and cyanogen chloride. By his calcium salt technique he purified many organic acids including citric, lactic, benzoic, and gallic. He isolated glycerin from fats, and devised an efficient preparation of Prussian Blue and of a new pigment containing arsenic now named Scheele’s Green.

Throughout his career Scheele was a supporter of the phlogiston theory (as was Priestley) but it was not destined to be a long career. Plagued with a variety of ailments from the age of 35, Scheele finally succumbed on May 26, 1786, at the age of 43.

I cannot resist a final note. In late 1774 Scheele wrote to the great French chemist Lavoisier to thank him for the gift of a copy of one of Lavoisier’s books. In the letter he suggests an experiment for Lavoisier to try. Heat some dry silver carbonate with a burning glass and treat the resulting gases with lime water (to remove the carbon dioxide). “You will see how much air is produced in which a candle will burn and an animal will live”. So who first discovered oxygen?
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* Interplay of Chemistry and Biology in Integrative Drug Discovery  
  March 6 - 9, Miami
* Advanced Forensic Science to Combat Counterfeit Drugs, Crime & Terrorism  
  May 1 - 5, San Diego
* Advances in Structure-Based Drug Discovery  
  June 5 - 8, Philadelphia
* Discovery and Selection of Successful Drug Candidates  
  May 15 - 18, Boston
* Organic Microelectronics (joint with IEEE and MRS)  
  July 10 - 13, Newport, RI
* Mechanisms of Chemical Toxicity As Applied to Drug Safety Prediction  
  September, Philadelphia
* Exploring Opportunities Along the Nano-Bio Interface  
  1. (joint with MRS, ACS POLY and ACS PMSE divisions)  
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February

Thurs. 3 **Energy Technology Group**
More Restaurant
“Fischer-Tropsch Synthesis: Can It Become a Reality for the U.S.?”
Burton H. Davis, Ph.D., Center for Applied Energy Research, University of Kentucky

Mon. 7 **Society for Analytical Chemists of Pittsburgh (SACP)**
Duquesne University, Laura Falk Hall
“Nanoparticle/Cancer Drugs”
James Baker, University of Michigan

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David E. Bergbreiter, Department of Chemistry, Texas A&M University, College Station, TX

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“Hydrogen Storage: Prospects and Problems”
Dr. Karl Johnson, University of Pittsburgh, Department of Chemical Engineering

March

Thurs. 3 **Energy Technology Group**
More Restaurant
Dr. John M. Andresen from Penn State University will describe technical activities of the Consortium for Premium Carbon Products from Coal

Wed. 19 **Spectroscopy Society of Pittsburgh (SSP)**
Mellon Hall of Science (Maurice Falk Hall)
“Weak Alignment Provides New NMR Opportunities to Study Molecular Structure”
Dr. Ad Bax, National Institutes of Health

Mon. 21 **Job Searching for Chemical Professionals**
Duquesne Room, Student Union, Duquesne University, Pittsburgh

*The Crucible*

*A newsletter of the Pittsburgh Section of the American Chemical Society*

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