



2011 Annual Meeting Report
The 59th Meeting of MACTLAC
Energy
Beloit College, Beloit, WI
October 21-22, 2011

General Session 1, Friday Afternoon, 1:00 PM

Plenary Address

Advanced Energy Research at Argonne National Laboratory

Dr. Mark Petri
Argonne National Laboratory
Argonne, IL

Dr. Petri gave a review of the energy research at Argonne National Laboratory (ANL), with the idea that we could use this information with our students to get them interested in energy research.

Why energy is important? Dr. Petri reviewed the reasons that make energy research important. He first showed that around 2050, the energy needs of the world will double. This will have great impact on our choices of energy production. Right now, most of this growth will be in oil, coal, and natural gas. Of course, this will affect global warming: we'll see a 1.1-6.4 °C raise in temperature by 2100. Solutions to this problem are increased efficiency, carbon-free power sources, and carbon capture and sequestration.

What energy research is being done at ANL? Founded in 1943, ANL sits on a 1500 acre site southwest of Chicago, with 3200 employees with 1450 scientists (750 PhD's). ANL has a 700 million dollar budget. ANL does a wide range of applied research. ANL instruments and facilities are open for free public use (companies pay a user fee, however). Its best facility is the Advanced Photon Source. ANL currently is working on nuclear, solar, wind, building technology, bio-fuels, and carbon capture and sequestration projects.

In nuclear energy research, they are working on power improvements and plant life-extension. ANL is looking at new reactor designs to build modular plants with total energy output of 50MW with a 30 to 60 year life-span. They are looking at metallic fuels (excellent neutron economy, refueling once every 30 years) as well as sodium coolants (low pressure, non-corrosive, and good heat sink). Their

metallic sodium cooled reactors are only 6 meters tall! Their data shows that their design will self-shut down in the event of a power loss.

In solar energy, ANL is looking at novel materials, devices, and process engineering to make solar more cost effective. They are looking at materials and devices like dye-sensitized solar cells to make a 3-D cell to more easily capture electrons; organic & hybrid cells, which are very low cost to make (current efficiencies are low, however); and concentrating sunlight to reduce the area needed to generate the same amount of energy as can currently be generated. Processes they are looking at are atomic layer deposition, scalable hybrid solar cell production, system analysis, real-world performance, and environmental impact.

In wind power, ANL looking at environmental impact, wind turbine reliability, and drive train development. Their main research area in drive train development is looking at lubricants, which are the main cause of turbine failure. Another area that they are active in is system integration: how to regulate power generation with power load (generation vs. use). Wind variability has a large impact on power generation, so ANL is looking at ways to better predict demand and weather and generation using stochastic optimization computational models.

In building technologies, ANL is looking at advanced sensors and smart control systems to better regulate HVAC, as well as building occupant behavior (using extra lights, space heaters, fans, etc.). ANL is also looking at ways to integrate weather predictions with HVAC control: for instance, it is better energetically to gradually rise or lower the temperature of a building rather to do it suddenly? They are also looking load services for buildings.

In bio-fuels, ANL is working on an integrated approach to make bio-fuels for transportation purposes (transportation is 17% of US GNP and consumes 72% of our energy production). For instance, they are looking at photosynthetic bacteria to make long chained hydrocarbons of up to 20 carbons; using computation sciences to understand catalytic surfaces and metabolic pathways; in-situ catalyst testing and characterization; processing and separations; understanding combustion chemistry; and engines and vehicles.

In carbon capture and sequestration, ANL is looking at many ways to reduce our energy carbon footprint.

General Session 2, Friday Evening, 8:00 PM

Plenary Address

The Bio-energy Landscape

Dr. Richard Amasino
University of Wisconsin-Madison
Madison, WI

Dr. Amasino began his presentation with a quick quiz about corn-based ethanol production: he asked how much of the US transportation needs would be met if the entire US corn crop were converted into ethanol (answer: only 15%). He then presented some energy facts: in our current energy system, about 8% of our energy is renewable, 20% of which is corn-based ethanol. Corn-based ethanol only accounts for 2% of our current energy needs. In terms of funding, energy funding has been flat for about 40 years, hovering around 2 billion dollars a year. In addition, atmospheric CO₂ levels are rising. Our current world-wide energy use is about 13TW, compared with the 90,000TW that we get from the sun. If solar energy reached 15-20% efficiency, we could meet all of the US energy needs with a land area equal to about 1/8 the size of New Mexico. Unfortunately, we don't have the technology to make such high efficiency solar cells, nor the technology to make so many of them at once, nor is their production carbon-neutral. In contrast, bio-fuels are carbon-neutral, and offer the promise of a renewable energy source, but there are serious questions to its use such as:

How much biomass can be sustainably harvested?

What are the economics of biomass production and use?

What percent of our energy needs can easily come from biomass?

Current estimates suggest that 1 billion tons of biomass is sustainable in the US. The US currently mandates that by 2022, the US will produce 15 billion gallons of bio-fuels (mainly corn-based ethanol), 1 billion gallons of biomass diesel fuel, 4 billion gallons of advanced renewable bio-fuels, and 16 billion gallons of non-corn-based bio-fuels (cellulosic or lignocellulose bio-fuels). This likely will not happen due to a variety of reasons, most of which are technical. We just don't have the technology as yet to reach these goals.

For the reasons described above, many researchers are looking at how lignocellulose bio-fuels can supplement or replace corn-based ethanol. Most of the research is now focused on sustainable removal of food crop production to make the lignocellulose bio-fuels, as well as the best perennial plants to make the lignocellulose bio-fuels. Two examples of lignocellulose bio-fuel plants are switch grass and miscanthus. Advantages of perennial bio-fuels are carbon sequestration in the soil (which is a large global carbon sink), little or no soil erosion (they can actually build-up soil), they can take advantage of full growing season, they recycle nutrients, and they can grow on marginal land.

Current work at the US Department of Energy's Great Lakes Bio-energy Research Center (Dr. Amasino is the Outreach and Education Coordinator at the Center) is looking at the best way to

convert lignocellulose into bio-fuels. Today, we use fermentation and enzymatic production. The Center is looking at how to pre-treat the biomass to release more of the sugars of the biomass, as well as how to deal with a varied stream of carbohydrates that arise from the perennial biomass (corn-based production generates glucose only, all of which is converted into ethanol, while current lignocellulose production yields glucose and a variety of other carbohydrates, but only the glucose is converted into ethanol).

Other work at the Center is to try to re-engineer the structure of the lignocellulose so that it is easier to produce bio-fuel from the biomass. It is unknown how re-engineering the lignocellulose structure will affect the plant's ability to survive.

The Center is also looking for other biological ways to generate bio-fuels (which Dr. Amasino called bio-prospecting). Several examples of bio-prospecting were described, such as learning more about how extremophiles, termite gut microbes, and ants can convert lignocellulose biomass into energy.

General Session 3, Saturday Morning, 8:30 AM

MACTLAC Business Meeting

1. President Larry Ferren called the meeting to order at 9:30 AM.
2. Mark Sinton presented the Treasurer's report. Mark noted how the Association's finances have rebounded in the last few years after several years of decline. This has been due in large part to the generous financial meeting support from Hope College and Luther College. Mark reminded the membership the Association should not count on future host institutions to be so generous towards supporting the Association's Annual Meetings. A motion to accept the Treasurer's report was made and seconded. The motion passed.

Year	2007	2008	2009	2010	2011
Beginning Assets					
Checking	\$5,992.71	\$5,416.19	\$4,453.08	\$5,041.70	\$5,631.52
Savings	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total Beginning Assets	\$5,992.71	\$5,416.19	\$4,453.08	\$5,041.70	\$5,631.52
Income					
Dues	\$482.00	\$370.00	\$673.00	\$445.00	\$40.00
Annual Meeting	\$3,397.00	\$3,075.00	\$464.27	\$4,155.00	
Interest	\$146.04	\$1.79	\$10.81	\$12.49	\$11.00
Other	\$0.00	\$0.00	\$0.00	\$101.00	\$593.52
Total Income	\$4,025.04	\$3,446.79	\$1,148.08	\$4,713.49	\$644.52
Expenses					
Postage, copying, website	\$321.98	\$51.70	\$163.10	\$363.98	\$60.95
Annual Meeting	\$4,261.34	\$4,358.20	\$376.96	\$3,759.69	
Placement, Archives	\$18.24	\$0.00	\$19.40	\$0.00	
Other	\$0.00	\$0.00	\$0.00	\$0.00	
Total Expenses	\$4,601.56	\$4,409.90	\$559.46	\$4,123.67	\$60.95
Ending Assets	\$5,416.19	\$4,453.08	\$5,041.70	\$5,631.52	\$6,215.09
Asset Change	-\$576.52	-\$963.11	\$588.62	\$589.82	\$583.57

3. Starting a new tradition, Mark Sinton next presented the Secretary’s report on the state of the Association’s membership. Mark described the process used to remove inactive members from the membership database (the process for removal can be found in paragraph 2 of the Association’s By-Laws, a copy of which can be obtained on the “About Us” page of the Association’s web site). He also brought to the attention of the members the fact that our membership now has about 15% Emeritus and Honorary members, which do not pay dues, as well as the fact that about 55% of the Association’s membership is now one or more years in arrears for their dues. As a result, only about 30% of MACTLAC members are financially supporting the Association with dues. Mark noted that without the support that comes with paid-up dues, the Association will likely see it’s financial situation again begin to decline. A motion to accept the Secretary’s report was made and seconded. The motion passed.

Year	2011	2012	2013	2014	2015
Beginning Membership	384	297			
New Members	3				
Members Removed	90				
Ending Membership	297				
Member Dues Breakdown					
Emeritus and Honorary members	43				
Paid up members	86				
In arrears members	168				
Total Dues Paying Units	297				
Member Dues by Year					
Paid up	86				
One year behind	57				
Two years behind	64				
Three years behind	47				

4. John Zimmerman presented the Archivist's report. A motion to accept the Archivist's report was made and seconded. The motion passed.

I am assembling an Archives poster for the Beloit meeting. It will be a somewhat old fashioned posting of lists. I have completed sorting and removing redundant items from the archives from 1976 on. Tracy completed that task up to 1976 and made archival copies of the retained material. I will hold off further copying until I receive Committee direction on what should be included. Tracy will return a check for ca. \$150, unspent funds from her initial \$1000 grant, to the MACTLAC treasury. I propose the remaining archival expenses (up to the initial \$1000 grant) be billed directly to MACTLAC. I am willing to continue (if the Council is willing) working with the archives for two more years. To that end, I ask the following questions.

What function does the Archives serve?

What is the proper relationship between the MACTLAC website meeting summary posting and similar material in the Archives?

5. Larry Ferren presented the Placement Officer's report. A motion to accept the Placement Officer's report was made and seconded. The motion passed.

In 2011, 16 applicants used the Placement Service, and 22 positions were listed with the Placement Service. Of all the positions advertised, all 22 were MACTLAC Colleges. All the positions advertised were either located by way of advertisements placed with the Placement Service, C & E News, the Internet, or electronic notices forwarded to me by various sources. The 22 MACTLAC positions were advertised only to those who had e-mail capabilities. Of the 22 MACTLAC positions listed, 13.3% were Inorganic Chemistry, 20% were Organic Chemistry, 13.3% were Analytical Chemistry, 13.3% were Physical Chemistry, 23.3% were Biochemistry, and 16.7% were other areas of chemistry (General).

All MACTLAC schools with positions open had their advertisements forwarded to Craig Bieler who placed them on the MACTLAC web page. There is no way of knowing of exactly how many people accessed the employment information by referring to the MACTLAC web page on the Internet, but we do know the MACTLAC website has had 580 visitors in the last 9 months. Each of those visitors might have accessed the employment information.

Applicants to the Placement service were of several groups -- graduate students, Ph.D.'s as post doctorates, and some professors at MACTLAC schools looking for positions, but the largest group would have been graduate students. This past year **eight** new candidates came into the Placement Service, and **one** candidate had his name removed from the service after securing a position. Presently, (October 2, 2011) **17** candidates are in the Placement Service looking for employment. One candidate came into the system during the current year (2011-2012) to bring the number up to 17.

This past year no schools requested resumes or specific information related to qualified candidates from the Placement service. Electronic mail was sent to the e-mail candidates when positions were sent to me.

The MACTLAC schools have been very good sending me notices of open positions. I appreciate the notices and try to respond promptly when a notice comes in. I get information about the position out to everyone on the electronic list, and I get the position to Craig for posting on the web page. Thus happens usually within 24 hours of receipt of the information.

6. Larry Ferren announced that the following members had been granted Emeritus membership status: Mary Lou Caffery (Clarke University), Jim Evans (Lawrence University), Zinnia Lim (Mount Mercy College), and Alex Nisbet (Ouchita Baptist University). Since none of these members were in attendance at the meeting, Larry directed Mark Sinton to mail each individual a certificate that designates their new membership status.
7. President Larry Ferren next introduced the new Illinois, Indiana, and Wisconsin State Representatives: Pairs Barns (Illinois), Bill Morrison (Indiana), and Janice Pellino (Wisconsin).
8. Larry Ferren opened the floor to nominations for President-Elect. Christine DeVries was nominated for President-Elect. There being no other nominations for the office, Larry closed the nominations. Christine was elected as President-Elect by a majority vote.
9. A motion to have the Secretary-Treasurer send letters of thanks to the following individuals and organizations was made. The motion was seconded and passed.

Outgoing officer: President Larry Ferren
Outgoing state representative: Gail Vojta
Host institution: Beloit College
Host organizer: George Lisensky

10. Craig Bieler invited the Association to Albion College for the 2012 meeting on October 5th and 6th. The theme of the meeting will be announced at a later date. George Linsenski next passed the MACTLAC meeting banner to Craig. The President then mentioned possible future meeting sites: Westminster in 2013 (west), Alverno in 2014 (central), and Millikin in 2017 (central).
11. President Larry Ferren completed his duties as the Association's President by handing the meeting over to the President-Elect, Beth Jensen.

12. Beth Jensen began her duties as the Association's President by asking if there was any other business. No other business was brought to the attention of the members.
13. A motion to adjourn was made and seconded. The motion passed, and the meeting adjourned at 10:30 AM.

Respectfully submitted
Mark Sinton
MACTLAC Secretary-Treasurer

Discussion Groups

Analytical Chemistry

Friday, October 5th, 2011

Textbook?

Skoog is now \$200, but \$30 for international version. Is a good dense text, but problems are not a favorite of any of the users. Harris, has loose-leaf and electronic versions, and many old editions are very similar. This is a bit easier to read and more approachable for the regular students. Micheal, Lauralee, and Jack have just switched to Harris from Skoog – he (Micheal or Jack?) was worried, but is feeling better since so many of the rest of us use it. Questions and examples are preferred over Skoog. The “lower level” of Harris is also used and supplemented by Matthew. Not all schools offer an instrumental course but rather include instrumental techniques into analytical. Instrumental can be included in p-chem. Christine uses Harris, but suggests students who are going on get Skoog.

How many labs do each teach?

Jack integrates p-chem and instrumental lab to increase lab time overall. The lecture and lab are not taught simultaneously. Labs need to be rotated through for students because of limited equipment. Sometimes students need to do calculations with data first – then interpretation, if data might need to be done later when that part has been covered in class. Rotations in class can be used to help balance

In e-chem what do people cover?

If anyone does stuff should be cyclic voltametry and ISE.

What is most beneficial for students to have done?

Students will use their experiences in lab when they go to the real job world. Learning the procedures to work in lab – calibrating glassware is important. Hope has a first experiment

where they test glassware in response to a memo from the “Head of the Lab”. They have to know how to get good precision in the workforce.

How are people greening?

Already fairly green. Most are trying to replace solvents, adjusting pH of solutions, etc.

Buret stopcocks?

Teflon seems to be favorite. Cleaning glassware is something that instructors need to clean sometime.

Old vs. new equipment – what is better?

There are advantages to both types. Students in general need to know the basics of how instruments work. XRF is now fairly easy to use and might be useful as replacement to aa. Capillary electrophoresis experiment was used by Lee – but was not very consistent – he now prefers LC-MS. Students will get instrumental experiences in other classes. We teach technique and basics about how instruments work – take the instrument out of the box and look at the workings. Christine would like gc-ms lab: test a sample – separate and id two peaks, or using the library search. Look at a halogenated sample also. It would be nice to have students compare one method to another – but it is hard for them to do well enough to get data that are good enough to compare.

Biochemistry

Friday, October 5th, 2011

- Introduction of members including college taught at, courses taught, and who taught one-semester biochemistry courses or two-semester biochemistry courses.
- The question was asked "What kinds of enzyme-kinetics experiments do you do?"
 - o Tyrosinase (potatoes, etc)
 - o Alkaline Phosphatase (including active site mutant analysis by isolating the enzyme from E.coli – contact Ted Gries)
 - o Lactic Dehydrogenase (from chicken or beef muscle – contact Tom Goyne)
 - o Co sensing heme protein
- The question was asked, "What kind of luck do you have with kits?"
 - o Several people had used EDVOTEK kits and had reported good luck with them.
 - Electrophoresis, PCR (restriction enzyme kit), Food DNA
 - Western blot kit was reported to be unsuccessful.
 - o One individual had used a BIORAD transformation kit and had seen good results with it
- A question was asked, “How one can successfully run a protein column without a cold room?” After some discussion about some mobile refrigeration units from supermarket type stores, the idea of using a heat stable protein like alkaline phosphatase or tyrosinase was brought

out. Doing this would allow one to do a column at room temperature without much loss of activity.

- A question was asked. “What type of metabolism labs might be used in a second semester course that would not involve too much expensive equipment and radioisotopes?” Two ideas were brought forth. It was mentioned that if one had a C-13 NMR, you might be able to look at some C-13 uptake studies. Further, mitochondria might be purified from cauliflower and DCP used as an electron acceptor.
- It was mentioned that there was a photosynthesis experiment in Boyer’s book that rarely worked. One of the people in the group had contacted Boyer about the experiment, and Boyer’s own group was only able to get it to work about one out of three times it was attempted. Ami Johansen has modified the experiment and reported some improvement. Pesticides in spinach may stop proton exchange.
- The question was asked, “Does anyone have any good carbohydrate labs?” Dr. Buddha mentioned that she does a lab that uses some color tests like the Benedict’s test and the Tollen’s test at Saint Xavier University to let the student’s see some of the qualitative tests of sugars.
- A similar question was asked about lipid labs. “Are there any good lipid labs out there?” One person mentioned that he characterized the fatty acids in an oil. Another mentioned a lab from the old Clark and Switzer lab text in which phosphatidylcholine is purified from egg yolk on an absorption column and the fatty acid in the number 1 position is cleaved using phospholipase A₁ from bee venom. The fatty acids are made into methyl esters by reaction with BF₃/methanol and are characterized by gas chromatography.
- One of the schools is requiring its departments to engage in community-based education. The question was asked if the group had any ideas as to what that department might offer the community in the area of biochemistry.
 - Responses were quite varied but seemed to go toward the idea of linking up with a bio-tech company to see if they would let the department get in and do something jointly with them. Alternatively, one might focus in the area of food chemistry, and do something with the community relating to food.
- What books are being used in the biochemistry course?
 - Nelson and Cox – Lehninger Principles of Biochemistry
 - Voet, Voet, and Pratt – Fundamentals of Biochemistry
 - McKee and McKee- The Molecular Basis of Life
 - Horton et al- Principles of Biochemistry
- Sunil Malapati mentioned that he found a website that has a series of movies that demonstrate how molecules interact. There is a movie that shows how DNA binds to Chromatin that is really interesting that students might enjoy. The address of the website is [HTTP://www.molecularmovies.com/](http://www.molecularmovies.com/).
- A final piece of information was shared with the group about the Center for Biomolecular Modeling. This group has available “suitcases” of molecular models that they will check out and lend to you that deal with a variety of topics. They will send you these suitcases to work with and use with your students. You might have to bear the cost of shipping. You would have to work out the details with the Center, but it would be worth checking into.

General Chemistry
Friday, October 5th, 2011

- 1) What's the first experiment you do in general chemistry?

Skills lab (pipetting, balance, etc)

Honors—radioactive samples and counting experiments (statistical analysis)

Have students do experiment and move to another station. Then the next group of students needs to reproduce the experiments based on the first group of students' lab notebooks.

Acetic acid freezing point. Monitor temperature with a thermistor.

- 2) How many sections of general chemistry and how many students in the lab?

Be careful about state law for number of students allowed in a chemistry lab (24 student max in Illinois).

7 sections with 22-24 in each section (for two schools).

Maximum of 22 students (16-20 students) at another school. About a dozen students for honors.

40 students with one instructor and two TA's.

- 3) Do you have evening classes?

Almost impossible to do it for one session, so need to meet at least twice which goes against the grain of many evening programs.

- 4) What is honors chemistry like?

Evansville has an honors program and honors general chemistry is part of that. Do more instrument intensive labs because have fewer students. The lab is the biggest difference. Also can take sophomore level course for honors credit, but add on an honors project.

Luther runs general chemistry and an honors chemistry where they do most of the material of two semesters of general chemistry in one semester. It's for students who have a stronger background in math and chemistry. Then they can go on to analytical chemistry. Chemistry majors or biology majors and chemistry minors will take honors chemistry.

- 5) How do people place students in the appropriate chemistry course?

Advising at Evansville. Not a formal process. Used to give a mini-exam on the third day of class, to advise students to take a different course (honors or algebra instead of general chemistry). This process didn't work well because students didn't drop the course even though they probably should have.

Does the SAT math (or verbal) score correlate to how well students will succeed in general chemistry?

6) What textbook do you use?

Electronic homework gives immediate feedback---works well (except for faculty resistance). It grades itself—bonus!

Master in chemistry (comes with Brown and LeMay)—for each chapter some people do a huge assignment that takes a week or two to complete. Others do a shorter assignment after each class. Complaints have been that the assignments are too long. Perhaps it's better to divide the assignments into shorter versions. Tutorials in Master in Chemistry are useful for students, often assigned as optional exercise. Software also tells you when students attempted it---shows you that many students don't open it until the night before.

7) Do you use an atom first textbook?

Nomenclature is troublesome with an atoms first textbook. Nomenclature traps the students who are low performers. Need to learn the vocabulary before you can learn more chemistry. Would computerized instruction help with nomenclature?

Inorganic Chemistry

Friday, October 5th, 2011

- Introductions
- George Lisensky mentioned that he taught nano chemistry. He addressed questions about this course. He discussed that his first inorganic chemistry course was renamed nanochemistry. He uses it as a literature review course, focusing on articles from Nano Letters and ACS Nano. He described how the course is run. This course is taken after Gen. Chem.
- Karen Nordell-Pearson mentioned that enough was being done in inorganic chemistry to build a general course.
- George referred to the raspberry solar cell and mentioned how you need to teach about band gaps to truly understand it.
- Benjamin Lovaasen asked about setting up a course with a presentation component. James Goll suggested that Ben pass it by his class (paper vs. presentation) before including it. George Lisensky suggested that another professor will be listening to the talks as well (multiple professor review; second professor does not evaluate). James included that he required other students in the course evaluate the other student's presentations. James graded how the class graded the individual's presentation. Paris Barnes included that the multiple professor's evaluating the presentation was ideal. Karen Nordell-Pearson encouraged discussion with the students about how presentations are given. Additionally, she suggested that Ben frankly tells his students that these are the expectations that students will have in graduate school. Ben gave more details about the presentation, including that it was a 30 minute semi-formal presentation.
- Jesse Rowsell asked about reading materials in classes. James Goll stated that no text book will do what you want. He stated he has used both Shriver/Atkins and Miessler/Tarr. Paris Barnes suggested using a mixture of Rodgers and other sources, such as papers. George

Lisensky agreed, stating that if your book covers 2/3rds of the material you want, it's a usable book. Todsapon Thananantthanachon suggested using Housecroft. John Moore stated that a new version of Rodgers was available this year. Karen Nordell-Pearson stated she used a variety of books, but suggested getting a good thorough book. She supported Housecroft, but stated it was weak in group theory. Lisensky stated that group theory could be covered using handouts. Todsapon Thananantthanachon discussed more about Housecroft. Benjamin Lovaasen stated that he used Shriver. Rowsell mentioned that he covered many conceptual topics in his course, but he didn't cover so much descriptive chemistry, and hoped that his students would read that part in leisure. The discussion then turned to books not written by the authors that are listed on the book.

- Karen Nordell-Pearson turned the book discussion back to how the professors use the book and how they get them to engage in learning. How do you help your students engage in the material? Jesse Rowsell suggested teaching inorganic in a workshop mode. George Lisensky suggested that it would be difficult to teach inorganic chemistry as a workshop. Karen Nordell-Pearson discussed a model that she observed. Jesse Rowsell suggested group work over covered material and to use peer pressure to keep the students up on their reading. Willa Harper asked if the students kept up on their reading, in which Jesse Rowsell stated "as well as expected."
- Todsapon Thananantthanachon asked what additional topics do you include when you teach inorganic chemistry that isn't in a book. Jesse Rowsell suggested that there isn't enough time to cover everything that we want to. He mentioned bio-inorganic chemistry is important. James Goll has discussed metal organic frameworks.
- Benjamin Lovaasen wants to know what are some interesting topics he could include in a second semester inorganic chemistry course. James Goll restated that searching the literature and talk about interesting topics. Karen Nordell-Pearson and George Lisensky discussed quasi-crystals/Nobel prize. Paris Barnes suggested looking for interesting materials science manuscripts to look at.
- Todsapon Thananantthanachon asked if it was worth having the students purchase a textbook for advanced inorganic chemistry. Elizabeth Jensen suggested that it might be more worthwhile if the students use their general chemistry textbook since students forget so much information. She suggested that you can supplement the information in a general chemistry with other notes (like group theory). James Goll suggested that you require students to relearn much of the information at the beginning of inorganic chemistry.
- Some general frustrations with students were voiced by Elizabeth Jensen and John Moore – re: student brain leakage (forgetting previously covered information).
- Willa Harper asked how many chemistry majors do you have? Paris Barnes stated that Millikin has a steady number of students, normally around 6-12 each year. Paris stated that finding what interests the student sells them on becoming a chem. major. Karen Nordell-Pearson stated that you just need to sell the major. George Lisensky stated that chemistry uses the intro courses to recruit students. Willa Harper stated that they try to get them from biology, but it doesn't seem to work.

Organic Chemistry
Friday, October 5th, 2011

Attendees introduced themselves, describing where they teach, what book they use, and how long they've been at their institutions. 20 attendees were present, spanning a wide range of experience levels. One attendee was a representative from Norton publishing.

Attendees are using a wide range of textbooks and lab manuals. Textbooks used included those by Wade, Stromanis, Brown, and Solomons, among others. Several instructors use the book by Stromanis and they talked about how the book's guided inquiry approach works in their classes.

The talk then shifted to a general discussion of using guided inquiry in the organic course. The effectiveness of small group work compared to individual problem solving was considered. Proper preparation is vital for effective small group/guided inquiry learning, according to one professor. The moderator asked the group how many used on-line homework. Four or five people raised their hands. It was noted that the instructor needs to check to see that students are doing the homework when it is assigned on-line. The problem of the on-line grading system requiring an exactly correct answer (down to the last lone pair or formal charge) was raised; instructors often have to do their own grading to make sure grading is done correctly.

One attendee asked whether professors follow the order of chapters in their books or use their own sequence of topics. One person only teaches spectroscopy in the lab because it gives him more time on spectroscopy and the ability to reinforce it immediately with lab exercises. He also can cover more material in the lecture. Another uses the book only as a resource because he has developed his own "story" of organic chemistry. The talk then shifted to what types of reactions and mechanisms are commonly emphasized; each person seems to focus on slightly different specific reactions and mechanisms and the order in which each is introduced.

The next topic was the lab course. Several people indicated that they have students do independent projects in the second semester course. One professor has students work in groups on projects of their own development; they also have to include waste-stream considerations to comply with OSHA regulations.

The question of new ACS guidelines regarding the purposes of Organic I and Organic II was raised. No professors have made changes to their organic courses to try to accommodate the new guidelines. The Norton rep has not seen these changes nationally, either.

Physical Chemistry
Friday, October 5th, 2011

P-Chem Lecture:

Structure:

Chemistry majors – 2-semester course (thermo, quantum, kinetics)
Biochemistry – 1 semester course (generally thermo) but both semesters are encouraged
In some case, 1 semester course of all topics, then a second 2 semester more detail
advanced p-chem – alternate years, topics of interest, stat mech, instrumental modules
POGAL is used at one school...student dependent, time dependent, many have group
structured activities that work well.

“quantum first”:

Generally, it works, but some are not comfortable about how the ideas are developed (as long as calculus II is a prerequisite).

Text Books:

Ladler, XXX, and YYY (2003 version)
Thermo – POGAL, Quantum – POGAL
McQuarrie
Atkins
Engel and Reed
Chang
Atkins for life sciences – not well liked for traditional p-chem
Alberty (have Mathematica exercises)
Levine

P-Chem Lab:

Structure:

Each class (2) has a lab (3 hr labs)
Separate course (2 lab meetings per week)
Pull from many sources

Text:

Schoemaker, Sime, Halpern

Software:

Computations (Gaussian, GMMES)

ACS Physical Chemistry Exams, please consider using.

Vendors and Sponsors

The organizers of this year's meeting wish to express their thanks to the following vendors and sponsors:

Institute for Chemical Education
Journal of Chemical Education
Micro Lab
Thermo Mattson
WW Norton

Please note that several of our regular vendors and sponsors were not present at the 2011 meeting since our meeting overlapped with the ACS Great Lakes Regional meeting.

MACTLAC Officers and Representatives for 2012

Past President:	Larry Ferren	Olivet Nazarene University
President:	Elizabeth Jensen	Aquinas College
President Elect:	Christine DeVries	Wartburg College
Secretary/Treasurer:	Mark Sinton	University of Dubuque
Placement Officer:	Larry Ferren	Olivet Nazarene University
Archivist:	John Zimmerman	Wabash College
State Representatives:		
Illinois:	Pairs Barnes	Millikin University
Indiana:	Bill Morrison	University of Evansville
Iowa:	Adam Hoffman	University of Dubuque
Michigan:	Michael Seymour	Hope College
Minnesota:	Jamie Mueller	St. Mary's University of Minn.
Missouri:	Bernhard Hansert	Westminster College
Wisconsin:	Janice Pellino	Carthage College

MACTLAC Weather Report

It has become somewhat of a tradition to mention something about the weather surrounding the MACTLAC meeting.

Friday's Weather

Friday saw a typical beautiful fall day in Beloit, Wisconsin. The temperature ranged from a low of 33°F (0.56°C) to a high of 57°F (14°C). The sky was sunny with a few clouds, and the day had a light wind (5 mph or 8 kph) out of the west north northwest. The barometric pressure rose slowly to 30.12 inHg (765.0 mmHg), and then remained steady. No precipitation was recorded for the day.

Saturday's Weather

Saturday was another beautiful fall day in Beloit. The temperature ranged from a low of 35°F (1.7°C) to a high of 66°F (19°C). The sky was mostly cloudy to partly cloudy, with a light of 3 mph (5 kph) out of the south southwest. The barometric pressure remained steady all day around 30.08 inHg (764.0 mmHg). As on Friday, no precipitation was recorded for the day.

MACTLAC News

Placement

MACTLAC's Placement Officer maintains two lists: 1) a list of faculty positions available within the MACTLAC member colleges, and 2) a list of candidates seeking positions with member colleges. Our goal is to ensure that candidates are in contact with the colleges having positions available. If you are currently recruiting new faculty, are looking for a teaching position at a Liberal Arts college, or have any other questions, please contact the Placement Officer. A copy of the list of available positions can also be found at www.mactlac.org.

Website

The address for the Association's website is www.mactlac.org. Feel free to visit this site to get information on our organization and the services that it offers. Be sure to check out the links page as there are some things on that page that may be of interest to you.

Listserv

Craig Bieler, the MACTLAC webmaster, has set up a Listserv for the member of MACTLAC to use for discussion of topics of mutual interest. To subscribe to the listserv, send an e-mail to imailsrv@mactlac.org with the phrase 'subscribe mactlacinfo (your full name)' in the body of the message. Place nothing in the subject line of your subscription message. To post comments to the listserv, send your message to mactlacinfo@mactlac.org. To unsubscribe from the listserv, send an e-

mail to imailsrv@mactlac.org with the phrase 'unsubscribe mactlacinfo' in the body of the message. Do not place anything in the subject line of your unsubscription message.

Honorary and Emeritus Membership

Honorary membership is granted only by a unanimous vote of the Executive Council, and shall be reserved for those persons who have rendered extraordinary service to the Association or who have made noteworthy contributions to the improvement of chemistry teaching in member colleges. To be considered for honorary status, the candidate must be nominated by a colleague in a letter submitted to the Secretary-Treasurer at least one month prior to the Annual Meeting at which the letter is to be considered by the Executive Council. A second letter of support from another colleague should also be submitted at least two weeks before the Annual Meeting to the Secretary-Treasurer. These letters should attest to the criteria needed for honorary membership status.

Emeritus membership is reserved for any person who has been an active member of MACTLAC for 10 years and who has retired from teaching. An Emeritus member will be excused from further payment of dues and will be listed as an Emeritus member. Anyone seeking emeritus membership should request it, preferably by sending a letter to the Secretary-Treasurer of MACTLAC.

2012 Meeting

Our 2012 meeting will be held at Albion College in Albion, Michigan, on October 5th and 6th. The meeting theme will be announced at a later date, along with the speakers and their topics. We hope to see as many of you as possible in Albion next fall for another excellent meeting!