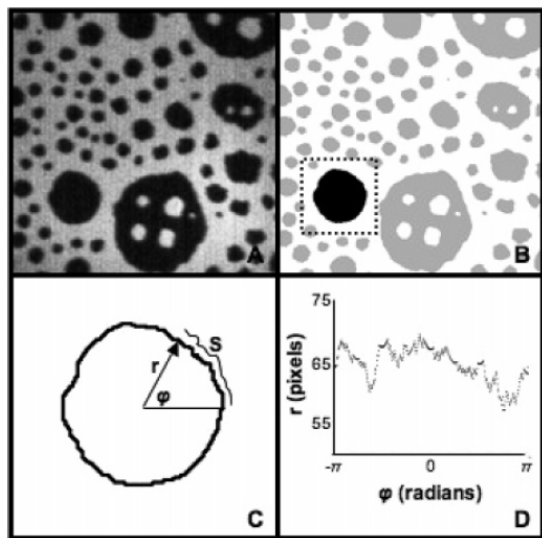


GREETINGS FROM THE LAB

It has been a busy few months for Augsburg Biophysics. We will kick off this edition of the Micelle with a closer look at the line tension between coexisting domains. For the past two and a half years the lab has focused its efforts on studying miscibility phase transitions in cholesterol/phospholipid systems. These phase transitions are believed to be a potential mechanism for lateral organization within the cell membrane. One interesting property to study is the line tension (interfacial energy) between two coexisting phases. One technique we are developing to determine this energy is by simply analyzing static images of domains. We do this using a Fourier analysis. The illustration below briefly outlines the steps in the analysis process. The advantages of this technique are that it does not require any mechanical perturbation of the boundary and it can be carried out even when the tension between the two coexisting phases is very low. The lab has been very fortunate to work with Dr. Erkan Tuzel of the Institute for Mathematics and its Applications (U of MN) on this project.



Domain Boundary Parameterization

SUMMER PREVIEW

- Professor Stottrup intends to continue his work with Matt Goertz and Dr. Xiaoyang Zhu at the University of Minnesota to measure the mechanical properties of supported lipid bilayers. The IFM is running and Matt will be graduating with his PhD soon.
- Christine Staloch (2009) will lead efforts to measure the transbilayer diffusion flip-flop rate in lipid bilayers. Her successful efforts last summer provide us with trustable protocols and preliminary data.
- Tom Lopez (2011), a new face in the lab, will be working on a viscometer for measuring the mechanical properties of lipid monolayers. Tom is a native of West St. Paul and is a McNair Scholar. We are excited to have Tom join us!

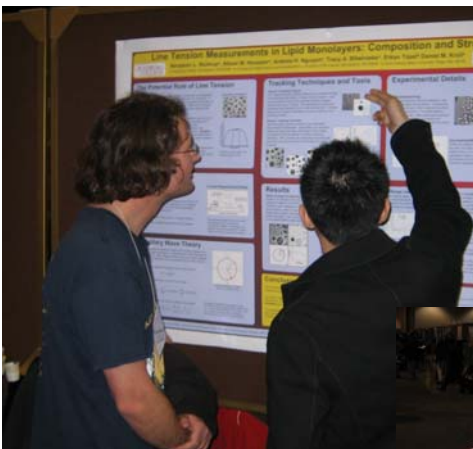
RECENT NEWS

- Dr. Tracy Bibelnicks has received tenure and will be on sabbatical next year. She intends to focus her attention on image processing questions in biological systems.
- Ben Hoffmann (2010) and Alison Heussler's (2009) hard work were recognized at the December meeting of the American Society for Cell Biology. Dr. Michael Halter of NIST presented a paper on live cell imaging. Ben and Alison were crucial in collecting this data.
- The Lipids Lab also published a paper in the Journal of Physical Chemistry B. This work was the result of Alison's work on lipid domain tracking and line tension measurements. Alison will be doing an REU this summer in the physics department at the University of Minnesota.
- In the summer of 2007 Andrew Nguyen continued the line tension work. Andrew and Prof. Stottrup presented their progress at the 2008 meeting of the Biophysical Society in Long Beach.
- Cait Kortuem (2010), a 2008 Goldwater nominee, will be traveling to the U of Chicago this summer to take part in their REU program. At last report Cait was scheduled to work with Dr. Ka Yee Lee. Good Luck Cait!
- Two new students Nate Johnson (2011) and Sergio Romero-Garcia (2011) both wrote proposals to the URGO program to fund their summer research. We wish them the best of luck.

2008 Biophysical Society Meeting in Long Beach



This year's Biophysical Society meeting was a success, the lab's poster was well received, and it was a good chance to catch up with old friends and learn about new projects. Left: our sunny hotel courtyard!



Left: Andrew describes his tracking process and routines to Dr. Sylvio May of North Dakota State University.

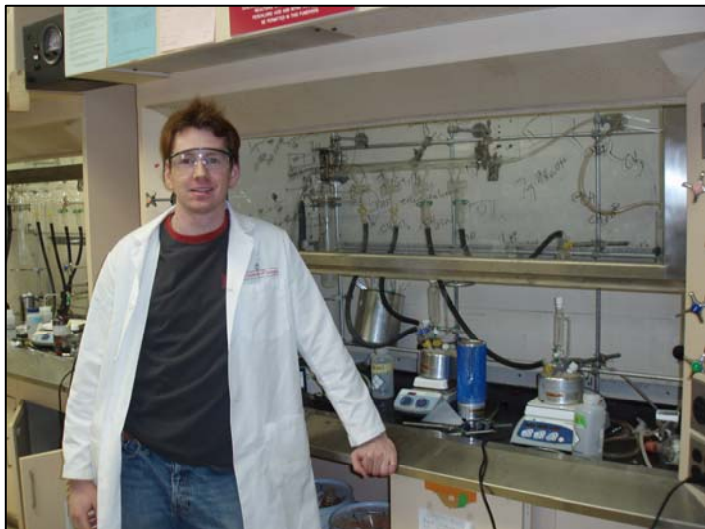
Right: Dr. Ka Yee Lee is always happy to encourage our students at the end of a long day. THANKS!



The Micelle

Spring 2008

Micelle: (pronounced: my-cell) 1) Unit of structure built up from polymeric molecules as a molecular aggregate that constitutes a colloidal particle. 2) The Newsletter of Augsburg Biophysics



ALUMNI PROFILE: Kyle Sontag worked in the Lipid Lab in the summer of 2006 and during the 2006-2007 academic year. Kyle graduated from Augsburg and is now studying Chemistry at the University of Georgia. Kyle generously took time out of his busy schedule to answer a few questions from the Micelle to help others considering graduate school.

How has your first semester gone? What has been the most exciting part of the experience? What has surprised you the most? My first semester went great. It was a little bit difficult adjusting to the new level of math required for one course, but I figured it all out as I went along. The most exciting part of my experience was the teaching part. When you are given a responsibility to teach three labs totaling 76 students, it is both challenging and rewarding. The most surprising part of graduate school is the amount of new and interesting people you meet.

What classes are you taking and will you take? How do you like TAing? I am on the physical/organic track. I took two courses last semester, which were Chemical Applications of Group Theory and Quantum Chemistry. In the Spring, I will take Electronics and Special Topics in Organic Chemistry (involving polymer electronics). These two classes will help me in the research I am doing. My research group specializes in organic electronics. My advisor teaches one of the courses I will be taking (Special Topics in Organic Chemistry). Being a TA is an interesting job. I try to be the best TA I can be by simply being helpful to the students and being fair on grading. I feel like I was a bit harsh on grading last semester, but everything worked out well. My students really liked me for the most part (from reading my evaluations). In addition, I won the award for being one of the top TAs last semester, which gave me a 300 dollar raise in my salary. That made me feel pretty confident in my teaching ability.

What influenced your decision to attend the University of Georgia? The warm weather! Also, I have family in Georgia (they live about an hour and a half away).

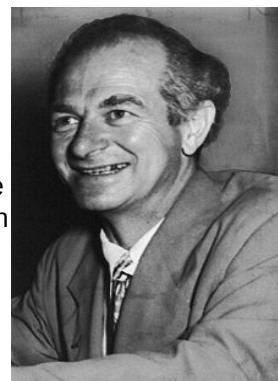
What has been most helpful in preparing you to do graduate studies? Learning Labview and Matlab. The software is heavily used in various research groups at UGA. I feel I know more than most of the new graduate students, which gives me a head start on my research. Another thing is writing long lab reports (especially in Prof. Kunz's Advanced Inorganic Class!). In graduate school, you are expected to write papers pertaining to your research. I feel that writing lab reports as an undergraduate really prepared me to write papers in graduate school.

What advice would you give other science students? I would recommend taking a differential equations course. I wish I had done that as an undergraduate, so I would not have had to play catch up last semester. The Quantum Chemistry course I took last semester was a little harsh. I would also recommend a summer research experience. This allows students to become familiar with software and tools that are commonly found in a research environment. If you are considering graduate studies, keep in mind that it is not all work and no play. I try to spend as much time as I can away from school. My philosophy is work hard, then play hard.

Congratulations Kyle!!!

Biophysicist Profile: Linus Pauling

Born in 1901, Dr. Pauling contributed greatly to the field of biophysics. Pauling was a quantum chemist and molecular biologist who discovered the alpha helix and beta sheet structures in proteins. Dr. Pauling also won two Nobel Prizes, one for his work in chemistry and the other for his efforts to secure world peace.



SPECIAL THANKS TO: Professor Zhu and members of his lab for their continuing support, Erkan Tuzel, Sylvio May, and the rest of the NDSU biophysicists, Mike Halter and his colleagues at NIST, Augsburg College and URGO, Dean and Amy Sundquist, Research Corporation, The Eppley Foundation for Research, and MN Space Grant Consortium.

GET INVOLVED! We have many great projects and students here in the lab. If you're interested in becoming involved, please contact:

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