

## KINSC

## NEWSLETTER-FEBRUARY 2010

Issue No. 5, Volume 2

KINSC SPRING  
CALENDAR**Biology**

3/15/10-2:30 pm, Sharpless Aud., Mitch Lewis,  
University of Pennsylvania  
3/22/10-2:30 pm, Sharpless Aud., Matt Stremmlau,  
University of California San Francisco  
3/29/10-2:30 pm, Eric Hughes, Merck

**Chemistry**

2/19/10-4:00 pm, BMC, Chemistry Seminar, Scott  
McN. Sieburth, Temple University  
4/16/10-3:00 pm, Hilles 109, Chemistry Seminar,  
David McCamant, University of Rochester,  
"Photochemistry of DNA"

**Math Bi-Co Colloquium (all talks @ 4:15, tea @ 4:00  
pm in KINSC H208)**

3/1/10-BMC-Jonelle Hook, Lehigh University

**Physics**

4/1-4:30pm , Sharpless Aud. Physics Distinguished  
Visitor, Peter Blair, "America's Energy Future:  
Technology and Transformation:

**Psychology**

2/25-4:30 pm Sharpless Aud. Psychology  
Distinguished Visitor, Veronica Benet-Martinez

KINSC Director  
Rob Fairman

As I head towards the end of my tenure as Director of the KINSC, I am seeking feedback about what has worked well in the past year, what areas we may want to improve, and what new projects we want to develop. This feedback can then be passed on to the next Director in order to ensure a productive transition.

You should be receiving a survey via email that asks whether this newsletter is something that you read and/or find useful. We will use your responses and response rates as a measure of the newsletter's worthiness. Later this semester, the provost's office and I will be calling a meeting of NS Division Chairs to talk about other ways that the KINSC can work to support the Natural Science Departments and continue to

improve resource support. I look forward to collaborating with you on this effort.

The funding of student and faculty projects is still underutilized. The Steering Committee is not sure why. It might be that students and faculty are still not fully aware of our funding opportunities, or it may be that we are saturating the market, given all of the other funding opportunities available through the provost's office and HHMI, for example.

Other current projects include acquiring more artwork for the KINSC and increasing the use of technology to navigate the Center and announce upcoming events. For example, we have just completed a very significant revamping of the KINSC website to improve access to important information. We hope to publish one more newsletter before

the end of this fiscal year, and I will use that opportunity to make additional comments about our progress and to thank those who have worked so hard to make our past year so productive and exciting!

Faculty Profile  
Stephon Alexander

When I was a student at Haverford some 17 years ago, I took the highly anticipated introduction to quantum mechanics by Professor Lyle Roelofs, who is my mentor till this day. I remember Lyle telling us that "quantum mechanics will forever alter your mind". He could not have been more correct, and I became a quantum addict after his class.

The scary thing is that quantum mechanics works. Much of my research has focused on the use of

(Alexander, cont.)  
cosmology as a tool to study quantum gravity (string theory in particular). So, do we have a theory that unifies quantum mechanics with gravity? We have ideas, but I feel that we still have to confront the foundational problems of quantum mechanics.

I find that it's never too early to get research students thinking about these foundational issues. This past summer I went to Santander, Spain with Martin Blood-Forsythe '10, Alex Cahill '11, and Garrett Vanacore '11 to conduct research and eat paella. Alex and Martin spent much time learning the ins and outs of General Relativity, especially the new formulation developed by Petr Horava at Berkeley. General Relativity in a sense is too relative because the theory has no preference for a flow of time. Moving backwards in time is just as fine as moving forward in time – a major obstacle for quantum mechanics. Horava fixed this problem by modifying Gravity to have an “arrow of time.” Alex and Martin were able to rewrite Horava's theory in new variables (the so-called Ashtekar Variables), which could potentially make the theory amenable to quantum mechanics. Garrett had to spend a lot of time teaching himself the physics of polarization in the

cosmic microwave background radiation, a fossil imprint of radiation in the early stages of the universe's expansion. Some of this physics is usually confronted in grad school, but I think that Garrett embraced the project and got something out of it despite its complexity.

I will be working with students again this summer, continuing a project that connects some curious math that shows up in string theory (orbifolds) with music cognition.

### HHMI/KINSC Update

On January 28<sup>th</sup>, the Writing Center held a workshop for students applying for the KINSC and HHMI summer internships. Kristin Lindgren, Director of the Writing Center, and Harper Hubbeling '11 (Biology) organized and led the workshop, which was attended by nine students. Kate Heston began the workshop by describing the (HHMI Update, cont.) HHMI and KINSC programs and what the committee reviewing the applications would be looking for in

the written statements. Kristin and Harper then asked the students to think carefully about the prompt for their essays and led the students in an informal writing exercise. Kristin was pleased with the turnout for the workshop and found the students eager to chat about their ideas.

Kristin plans to hold this workshop annually, but wants everyone in the KINSC to be aware that students can seek assistance from the Writing Center for summer internship applications and written work outside of the classroom. The Writing Center is also seeking additional science majors to be part of the Center's student staff.

The MAST (Mentoring and Student Teaching) Program has gotten off to a strong start this year, despite the recent onslaught of snow, which meant that one Saturday session had to be canceled. The mother of one sixth-grade student said that her son had asked if “maybe we could move MAST to Friday instead” because he knew that Saturday's weather was going to be bad. She said “...he is so excited about doing science experiments at MAST that he doesn't want to miss a single day.”

### Top Ten List!

Since Cris and Corrie shared little-known facts about themselves in the last newsletter, I was persuaded to include my list as well (Natalie):

1. I am Canadian. Go Canucks!
2. If someone were to bribe me with candy, a 100 Grand Bar is the only kind I would accept.
3. My two-and-a-half year old son wakes my house up every morning by mooing like a cow.
4. I would love to travel to Africa.
5. I do not eat fish and hate raw tomatoes.
6. I've read all 3 books of Dante's Divine Comedy.
7. I performed in all my high school musicals; my favorite role was playing Sara Jane Moore in Sondheim's Assassins.
8. I don't know if I believe in ghosts, but I would like to meet one sometime.
9. My favorite Dairy Queen Blizzard is a twist (chocolate and vanilla) with Heath Bar.
10. When I was 15, I slept over at Alison Castel's (CPGC Coordinator) house for a youth convention.