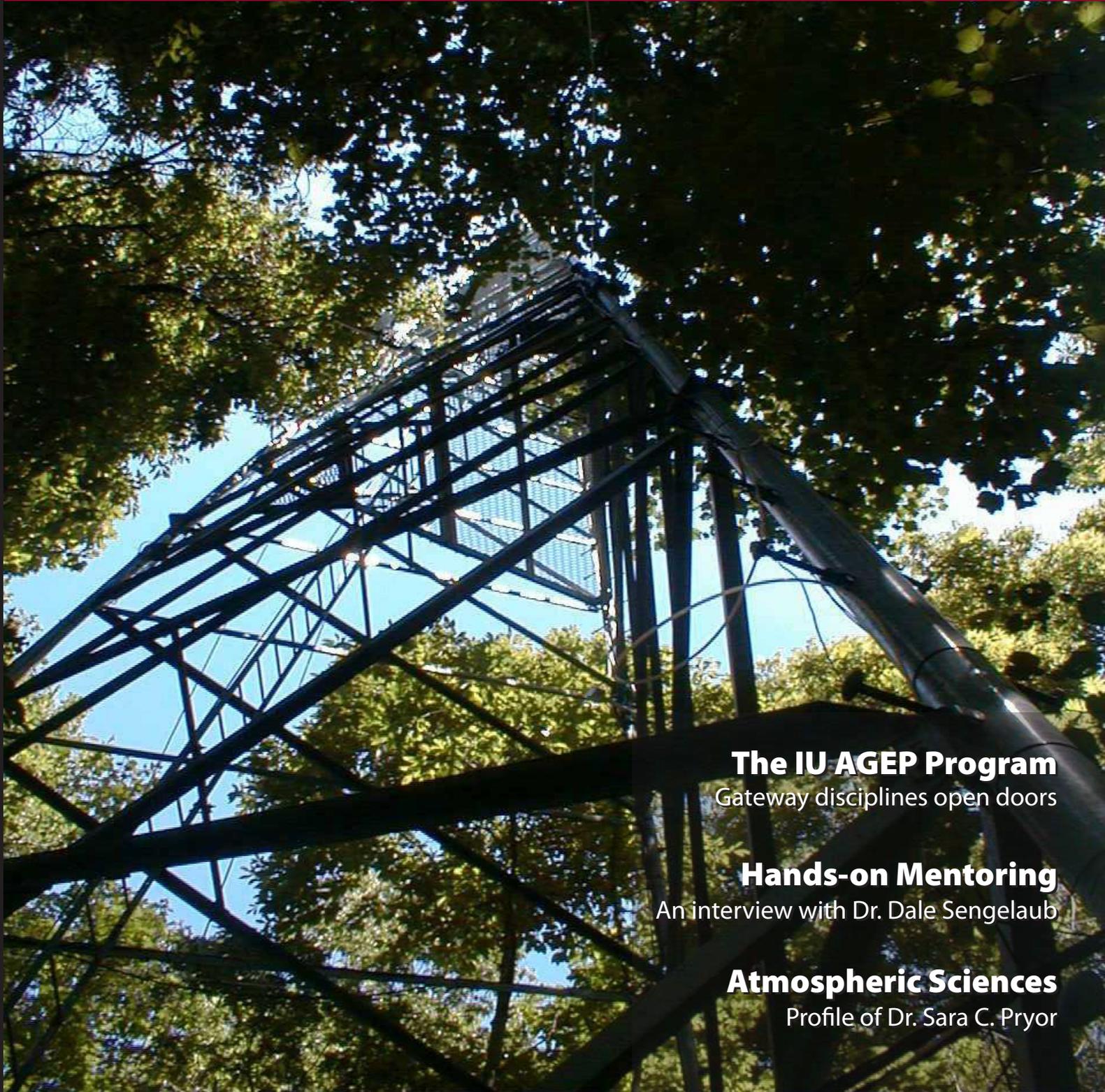


Indiana University's

# GRADUATE QUARTERLY

News & Information from the Indiana University Graduate School

Volume 3, Summer 2008



## **The IU AGEP Program**

Gateway disciplines open doors

## **Hands-on Mentoring**

An interview with Dr. Dale Sengelaub

## **Atmospheric Sciences**

Profile of Dr. Sara C. Pryor



A summer view up the meteorological tower used by the IU Atmospheric Science Program in the nearby Morgan Monroe State Forest

Focus on the  
Natural Sciences

# GRADUATE QUARTERLY

published by the Indiana University Graduate School

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# Graduate Education Day at the Statehouse

Indiana University, IUPUI and Purdue University joined forces on Wednesday, March 5, 2008, for the First Annual Indiana State Graduate Education Day at the Statehouse. The goal was to illustrate to Indiana State Legislators the value of graduate education and the contributions graduate education makes to the state of Indiana.

Legislators were able to ask questions – and to see and hear – about graduate education in Indiana through an exhibit featuring graduate students representing research themes important to the economy of Indiana.

Invited industry guests and key university administrators were briefly introduced and available for legislators to speak with over light fare. Speakers included IU Provost Karen Hanson, Purdue Interim Provost Victor Lechtenberg, and Purdue Alum Dr. Christopher P. Leamon who is Vice President of Research for Endocyte Inc.



Indiana Representative from District 40, Greg Steuerwald, met with IUPUI Graduate Student Megan LaMade. Megan is in a Master of Public Affairs program in conjunction with the SPEA Center for Urban Policy and the Environment, with a concentration in Policy Analysis. During Graduate Education Day, she answered questions about what we can do to make Indiana government more efficient.

## IU's Matching the Promise campaign has raised more than \$60 million for graduate fellowships

BLOOMINGTON—Indiana University and its fundraising partner, the IU Foundation, announced on June 11, 2008, that IU Bloomington's "Matching the Promise" campaign has raised more than \$60 million for graduate fellowships.

The fellowships are designed to make graduate school more accessible to low-income students and to retain top graduate students on IU's research teams.

"There are fewer resources for graduate students than there are for undergraduates," said Gwyn Richards, dean of IU's

Jacobs School of Music. "This puts an Indiana education within reach for some very talented young students, and that changes lives."

IU created 66 graduate fellowships, which includes some awards that will be awarded to multiple students each year. The biggest beneficiaries of the fellowships are the music school, the college of arts and sciences and the law school.

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## New doctoral program will focus on African Diaspora

BLOOMINGTON—The African-American and African Diaspora Studies program, approved by the Indiana Commission for Higher Education this month, will focus on the dispersion of African peoples from their original homelands to the U.S. and other places.

Only three other public universities nationwide offer a doctoral degree related to African-American studies, IU officials said, and the program at IU Bloomington is the only one to focus specifically on the African Diaspora.

"With African-Americans in the U.S. at the core of our studies, we can focus our understanding of what has shaped the experiences of blacks in this country," said Valerie Grimm, who chairs the IU Department of African American and African

Diaspora Studies.

The university plans to admit between five and 10 students a year in the program, Grimm estimated. She hopes students from abroad will also join the program to share their experiences.

"This unique program will attract outstanding students from Indiana, the nation and around the world and make Indiana University Bloomington a leader in scholarship relating to the study and representation of African American and African Diaspora issues and experiences," said Karen Hanson, IU provost and executive vice president.

The IU AGEP Program is about to embark on its fifth year! The program is part of the Midwest Crossroads Alliance for Graduate Education and the Professoriate (AGEP) with Purdue and Northwestern Universities, and is one of 23 such National Science Foundation (NSF) sponsored alliances nationally.

The IU AGEP Program strives to make institutional changes that increase domestic underrepresented minority diversity in science, technology, engineering and mathematics (STEM) graduate degree programs, and to change the climate of our institution for the betterment of all.

What better way to celebrate than to take a closer look at what NSF has called the “gateway disciplines” — chemistry, mathematics and computer science. These fields open the door for success in all the other STEM disciplines. For example, biology students require a good chemistry and statistics foundation, physics students need math and perhaps computer science. Read on...

# The IU AGEP Program

*Gateway disciplines open doors to the future*

## CHEMISTRY

To talk to Chemistry Professor Michael Edwards, you might have to stand in line. Backpack-laden students sit, stand and lean outside of his office waiting their turn.

Dr. Edwards’ career led him to IU in 2000 where he was given a choice of teaching responsibilities. He chose C101, a large introductory chemistry class. In conjunction with the class, he started a mentor/tutor program called “Project CARE” (Chemistry Taking Action to Research and Enhance Achievement). That, he believed, would make the most difference.

“One value of bringing [underrepresented] students into Ph.D. programs is that IU can be known for trying to solve a national problem. There is a national need for more underrepresented students to be part of the Ph.D. pool. The national numbers are very low (for domestic students, about 8 percent of Ph.D. recipients are African-, Latina/o- or Native-American), and the Chemistry Department wants to contribute to increasing the numbers. We want to be known as a minority friendly department,” he said.

The mentor/tutor program works this way: Students in the class who scored low on the first exam as well as on an assessment test to gauge their level of study skills, are invited to join the program. If a student accepts, s/he is paired with two upper level undergraduate chemistry students who have previously taken C101 with Dr. Edwards. The first is a mentor to help the student build study skills and provide psychological cheerleading. The second is a tutor to provide extra help with chemistry problems.

It should be noted that not all of the students in Project CARE are minorities, but many are, and the beauty of the program is that it gives students coming in with mixed levels of preparation an equal chance for success. Rather than weeding students out — what many introductory science classes are known for — the program is designed to bring students along. The more diverse IU’s Chemistry

undergraduate cohort, the more students who then have the experience, skills and interest to apply for graduate study in Chemistry. There are also plans to expand the program to general chemistry class C117 and Organic Chemistry.

“It started with me realizing that the number of underrepresented minorities applying to the department was low, almost non-existent, and that was a concern,” Edwards said. “The problem was that the department was waiting for the students to come to them.”

By working with the IU AGEP Program and with Dr. David Clemmer, the previous Chemistry Department Chair, Dr. Edwards secured funding for not only his mentoring/tutoring program, but also support for graduate recruitment.

“Going to the NOBBChE conference (National Organization for the Professional Advancement of Black Chemists and Chemical Engineers) was a milestone. It gave us exposure and contact with qualified students,” he said. “The goal is to contact them as undergraduates, so when they ask ‘where am I going to go for my Ph.D.’, maybe they’ll say IU.”

The way Dr. Edwards recommends recruiting at a conference is to bring both a faculty member and a graduate student. That way students can see their near-peers on the way to a degree, as well as talk to a faculty member in the department.

continued..



Chemistry Professor Michael Edwards and Director of Mentoring Services & Leadership Development Patrick Smith chat with IU Chemistry students.

“AGEP gave us money to go to the national NOBBChE conference to recruit students, and gave [then doctoral candidate] Reña Sowell the opportunity to attend the conference,” he said. “She also helped us recruit, which helps [the department of Chemistry] do what we’re trying to do. And because of AGEP, Reña is now on her way to becoming a professor.”

When Reña first interacted with AGEP a few years ago, her goal was to go into industry and she did not envision herself entering the professoriate.

With help from the IU AGEP Program, Dr. Edwards and Dr. Daniel Mindiola (Chemistry) have established a NOBBChE Student Chapter at IU. Both faculty are NOBBChE members and they believe a student chapter will attract new students.

“When we went to the NOBBChE conference, many of the students there were coming from Historically Black Colleges and Universities (HBCUs), which all have NOBBChE chapters. It doesn’t make sense for us to recruit students from HBCUs to IU if there is no infrastructure in place. So starting the chapter is partially to let students know that if you come here, we have something in place to support your success.”

And on the departmental side, he believes the chapter will provide a needed focus.

“Students coming in aren’t just going to fall through the cracks like they might have in the past. When they come in, we’ll know they are here. Everyone will know they are here and it will make the department more accountable.”

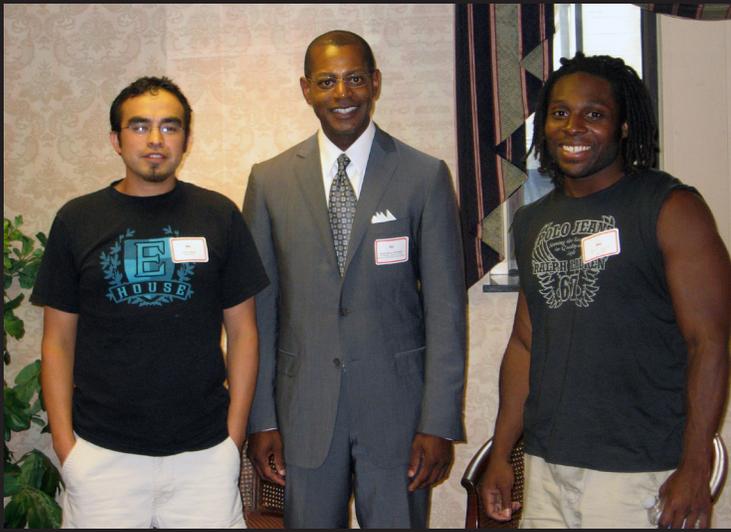
Once finalized, the chapter will have a permanent room designed to be visible and inviting, Dr. Edwards said. “It is meant to be a

place minority students know they can be comfortable. And maybe it will also be a way for other students to say, hey, what’s going on over here? We want to have a social environment where students coming in can feel supported and have a place to interact with other minority students. But everybody is welcome.”

NOBBChE is also a mechanism to mentor students and build camaraderie in the department, Dr. Edward said. NOBBChE chapters are designed to “foster the growth and professional development of our graduate students – job interviews, networking, opportunities to attend conferences and show their work and see other students that look like them – all of which will stimulate them to say, hey, I can do what I set out to do,” he said.

Educating faculty on mentoring best-practices is also part of the longterm goal.

“Just by aligning ourselves with AGEP for our recruiting efforts, and with its national support, minority students can come into Chemistry and be part of the AGEP family,” he said. “It’s a win-win situation for everyone.”



Left: Arni Perez and Pere Jackson with University Graduate School Dean James C. Wimbush at a 2007 *Getting You Into IU* panel. Right: Visiting students with AGEP Director Yolanda Treviño at the 2007 *Getting You Into IU*.



## MATHEMATICS

For the last two recruiting seasons, the IU Department of Mathematics has participated in the AGEP-sponsored recruitment weekend *Getting You Into IU*.

“We’ve always been welcoming to international students, so [Mathematics] is quite diverse in that way,” Director of Graduate Studies Kevin Zumbrun said, “but one thing we’ve been trying to do in the last couple of years is to improve the diversity of our domestic students.”

But to have any success in recruiting underrepresented minority (URM) students, Dr. Zumbrun said the department needed to quickly establish a critical mass. Thus in the spring of 2007, Mathematics brought in three URM participants for *Getting You Into IU*. All three accepted offers of admission, tripling the number of URM students in the Mathematics Ph.D. program at IU.

“The AGEP Recruiting Weekend (*Getting You Into IU*) was really important to them coming,” Dr. Zumbrun said. “We don’t have a lot of URM applicants and the ones who are in math are in big demand.”

Recruitment is a significant issue, Dr. Zumbrun said, because the student body is only as diverse as its applicants, and it’s difficult to attract top minority students. Some students select institutions such as Harvard or Stanford by the institution’s name and reputation, and others choose a graduate program based on an adviser’s recommendation.

“We can’t compete with [word-of-mouth recruiting methods] or with the big private schools for funding, but there are other students who haven’t yet made their choice and we want to find a way to connect with those students,” Dr. Zumbrun said.

It has been the Department of Mathematics experience that most of the time, if the student comes to visit and they see Bloomington, and meet graduate students, they come. Through Mathematics’ participation in *Getting You Into IU*, potential math graduate

students not only see the campus and community, but also meet a variety of URM students currently enrolled in IU Ph.D. programs, and get a behind-the-scenes view of their potential department.

The boost from participating in *Getting You Into IU* has inspired Mathematics to focus recruiting efforts on bringing in more women and URM students to doctoral programs.

“This year, we have another impressive [URM] student coming in,” Dr. Zumbrun said. “This goes for our women students too. The applicants were very qualified... Once you have URM students apply, then you want them to attend and with AGEP’s help that’s been 100 percent so far – that’s pretty good.”

“Getting You Into IU” is offered to [STEM PhD programs] in both the spring and fall semesters. Spring participants are primarily students who have applied and possibly accepted admission, whereas Fall participants tend to be students who have not yet decided where to apply. To participate in the Fall 2008 *Getting You Into IU*, contact [agep@indiana.edu](mailto:agep@indiana.edu).

## Getting You Into IU, Fall 2008

October 1 - 4, 2008

The *Getting You Into IU* program is designed to encourage under-represented minority students who are competitively eligible for Ph.D. programs in the STEM disciplines to apply to Indiana University.

To learn more about *Getting You Into IU* or to volunteer as a graduate student or faculty representative, please contact AGEP Administrator Christy Campoll at 855-4039, [agep@indiana.edu](mailto:agep@indiana.edu).

## COMPUTER SCIENCE

Dr. Kay Connelly first started thinking about recruitment when she signed up to be an IU AGEP professor four years ago.

She knew that recruiting women was a priority for the Women in Computer Science Group (WIC), and had been part of the Women in Computing group for some years, but signing up gave her the motivation to explore new recruiting efforts targeting underrepresented minorities as well.

“So I’m supposed to graduate a minority Ph.D. within ten years of signing up, but we have very few [in Computer Science]. That’s when I started thinking about recruiting. Just by signing up to be an AGEP professor, it’s motivated me to put in a lot of time and effort trying to do some recruitment. I’m just too busy being tenure track to do more, but having agreed to that, I think has been a big motivator,” she said.

One way Dr. Connelly has become involved is by serving as a faculty mentor for the IU Summer Scholars Institute, part of the STEM Initiative ([stem.indiana.edu](http://stem.indiana.edu)).

“I had an (underrepresented minority) student named Jarrett David last summer and he’s coming back this summer. He’s a repeat student, and I’m really hoping I can attract him here for graduate school.”

This summer, she said, he’ll be working with IU graduate students in the new ‘living lab.’

“We set up an apartment in the downstairs of a house and we’re putting in technology to study elders and technology in their homes. Hopefully there will be a lot of activity and he’ll have a great experience this summer,” Dr. Connelly said.

The one-on-one time afforded by a summer program has been crucial, she said. “It’s hard for me as an individual faculty member to go and recruit students, so this has been perfect because I now have this shot at getting a minority student to come here... He’s now familiar with the campus, he knows what it will be like to come and be a graduate student here and he’ll be familiar with the kind of research I do,” she said.

Dr. Connelly’s main interaction with AGEP, however, has been through the *AGEP Breaking Grounds Initiative* – departmental grants to provide seed funding for recruitment, retention and advancement initiatives for domestic underrepresented minority students.

The Women in Computer Science Group (WIC) has been very active the last five years to make the atmosphere in computer science better for women, Dr. Connelly said. And although she has always been interested in domestic minority issues, the WIC didn’t have the resources at the time to pursue new initiatives.

“When the call for proposals came out for the Breaking Grounds Initiative funding a few years ago, we said, well why can’t we now move in that direction?”

continued..

*Bring IT On!* participants: Keshia Clarke, Spelman College; Jacinta Mba, Spelman College; Bianca Bain, Claflin University;  
Photo credit: Kyle Ross





2007 *Bring IT On!* participant Tiffany Huggins-Richards shaking hands with Dr. Charlie Nelms, who served as IU Vice President for Institutional Development and Student Affairs. He is now chancellor at North Carolina Central University in Durham, North Carolina.

Photo credit: Kyle Ross

Her proposal was accepted and for the last two years, Computer Science has received funding to support the *Bring IT On!* conference. The effect has been direct, she said, and it started Computer Science off on an initiative that they'd never had before.

"Basically, we used [the funding] to combine an existing initiative, which was a K-12 outreach program that we've been recognized for nationally, with minority issues and trying to connect to undergraduate minority students in order to teach them what we're doing with our outreach program so they can take it back to their institutions and propagate it. And hopefully, because they're coming here to do this program, they might think about Indiana University for a graduate program," she said.

Offering *Bring IT On!* is helpful with recruiting, Dr. Connelly said, "because when you go to a school to recruit, many other schools are doing the same thing. Just having a recruiting visit isn't as good as bringing students here to learn something to give back."

The first year of *Bring IT On!* targeted historically black colleges and universities (HBCUs). Although none of the visiting students from this first cohort have come to IU, "we know we had a big impact because we met several first-generation college students who didn't know anything about graduate school and this experience really opened their eyes," she said. "So even though they didn't come to IU this time, I think there's a strong possibility that they are now looking at graduate school and research as a possibility, where as they weren't before."

The second year of *Bring IT On!* focused on Indiana colleges, mostly regional campuses. "Part of that thought was that it's difficult to get people from other states to come here, so if we can recruit from our own state, we might have a better chance," she said.

Follow up was better this time because the group was able to host a workshop in April at IUPUI, allowing Computer Science a second contact with the students. Although Dr. Connelly hopes the new approach will increase the number of underrepresented minorities coming to IU, "even if it doesn't, these students are actually developing their own outreach programs and going into their schools. Maybe they'll get elementary students to think about going into computing. We may never hear about that. But it will eventually have a transitive effect."

The program has had an "immense effect" on graduate students helping with *Bring IT On!*

"We're giving people leadership opportunities, we're giving them the opportunity to make a difference and impact their community — everyone is just so excited," she said. "The number of volunteers we have signed up to do these things is amazing. It's a lot of work, and yet almost all of the ones that signed up to do it in the fall came back to do the one in the spring. I think that shows that the graduate students are getting something out of it personally (by trying to implement this kind of a program.)"

One plus is that graduate students who participate in these activities go on to be faculty who care about outreach and minority issues.

"We know this is the case," Dr. Connelly said for recent graduate Sriram Mohan. "Even though he's male and he's from India — so not a traditional WIC member — he got involved in [WIC and *Bring IT On!*] because he really likes the outreach program we have."

"It's now part of his identity as a faculty member to help the women's group there at Rose Hulman [Institute of Technology in Terre Haute, Indiana]; He's a man, but he's helping the women's group do outreach because he was exposed to it here. I think we're definitely going to have more people going on into the professoriate who are sensitive to those issues."

## Dental plan gives graduate students something to smile about

Indiana University will provide dental benefits for its 4,450 student academic appointees starting with the 2008-09 academic year.

Student academic appointees (SAA) are typically graduate students who are paid a stipend to teach or help teach classes, carry out research and scholarship and perform other academic duties. There are 3,800 student academic appointees at IU Bloomington and 650 at Indiana University-Purdue University Indianapolis.

The university will pay the full cost of premiums for the SAA dental plan, which is similar to the IU employees dental plan. It provides a free annual check-up, pays 50 percent of the cost of fillings and has a \$25 annual deductible for most other dental work. Orthodontia will not be covered. The maximum benefit is \$500 a year.

As with the medical benefits that student academic appointees receive, the students will have the option of purchasing dental coverage for their spouses and children.

The dental coverage will cost the university about \$1.1 million in 2008-09, with the cost borne by the academic units for which the students work.

With the added dental coverage, IU will join the majority of Big Ten universities that offer dental benefits for student academic appointees.



## The University Graduate School



Visit the new University Graduate School Web Site for information on:

- Becoming a graduate student
- Funding and fees
- The GradGrants Center
- Completing your graduate degree
- Graduate student community
- and also resources for faculty and departments.

[graduate.indiana.edu](http://graduate.indiana.edu)



IU graduate students in STEM and SBES disciplines participated in the first Mega Midwest AGEP Conference, *Elements for Success*, held Feb. 7-9, 2008, in Chicago, IL.

Four NSF AGEP alliances, consisting of 18 midwestern research universities, combined resources for this event, which was also sponsored by The National Science Foundation, Dow Chemical Corporation and Shell Oil Company.

The conference offered nearly 300 underrepresented minority Ph.D. students, and interested faculty, opportunities for professional development and networking. Students represented all levels of doctoral study — from entering first years to postdocs.



Dr. Dale Sengelaub and his graduate student Tom Verhovshek working in the Sengelaub lab, IU Department of Psychological and Brain Sciences

# From Motor Neurons to Mentoring

## An interview with Dr. Dale Sengelaub

We recently sat down with Dr. Dale Sengelaub from the Department of Psychological and Brain Sciences to talk about mentoring. Dr. Sengelaub's lab is currently working on motor neuron plasticity – how motor neurons can change over time. His focus is thus on the spinal cord, which he says prompts his colleagues to tease that he works on the wrong end of the nervous system because most of them work primarily with the brain.

# “You can’t mentor long distance.”

## **Do you see yourself as a good mentor?**

When I was an undergraduate, I worked in a laboratory for almost the entire time I was in school. My level of involvement was kept pretty minimal. I was hands.

After having been there for three and a half years, I knew a lot about the research and the laboratory. I did lots of kinds of things, but I was never really able to contribute to the science in any meaningful way. I was coding data and running the video tape recorder, or I could take observational notes on marmosets.

I remember distinctly at 6 o’clock one morning, because that’s when I was recording the data -- the marmosets are sleeping – and I’m saying to myself, this is terrible. I’m being exploited here, and if I’m ever in a situation where I could have undergraduates working for me – I wasn’t even thinking graduate students at that point – I would never treat them this way. I would always make sure they were treated as colleagues rather than hands. I don’t believe in “hands”.

Fortunately, that has come to pass, and I have undergraduates in my laboratory, and for that matter graduate students. But I never treat them as hands. No one ever gets apprenticed to a more senior student. I don’t believe in that model at all.

People get trained, by me – unless of course, someone else knows how to do what we need to do, but they don’t work for anyone but themselves.

Every undergraduate gets their own project that they are the principle investigator on, and I will teach them how to do everything they need to do at every level of the project. They come in to the lab when they need to for as long as they need to, and they do the science. Then, when it’s done, they’re first author on the project. If it goes to a national meeting, they take it there and present it.

I treat them as colleagues. They’re not working on somebody else’s project, they’re working on their project.

One-on-one mentoring is really important to me. It’s kind of a standard rule in my laboratory: you do your own work. I don’t believe in the model where you have a technician who does everything and the students hand it to the technician to do. Do my histology for me, no, you do your own histology, order your own equipment, everything, because someday – and this is especially true of the graduate students – someday they’re going to have to run a laboratory and if they don’t know how to

do these things, how are they going to be able to teach anyone else how to do it?

My students have to do it all themselves, so when they leave here they can do it all themselves.

## **Does this kind of mentoring and lab set-up have to do with discipline?**

No, absolutely not. I think this cuts across disciplines. I can easily find examples of laboratories that work the same way I do, and ones that work completely opposite of the way I do, all within my discipline. No, this is a personal philosophy.

I also believe in being in the laboratory as much as I can because being at the bench with somebody is how you mentor. I can’t just sit in my office and have them come down and tell me about their problem- we can’t fix it from there, we have to go to the lab to do it. That’s the challenge and what makes it very, very difficult, because obviously stringing together the amount of hours you need to really do this is hard. But that’s okay.

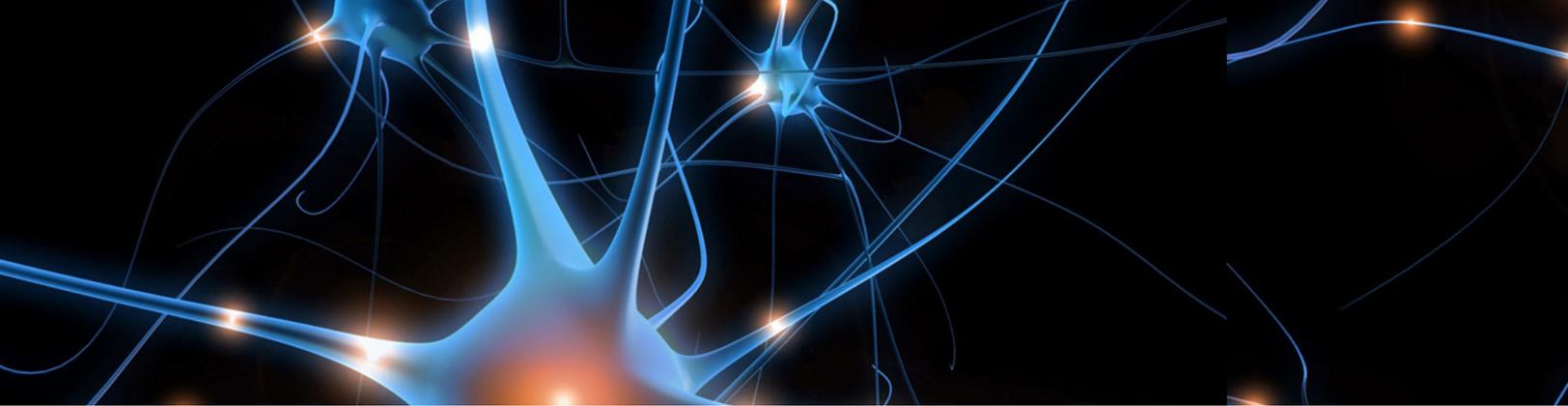
## **Have you seen a difference in the students that go on from your lab? Does it change their perceptions of mentoring?**

Absolutely. I’ve had graduate students from other laboratories tell me that they really wished they’d been trained the way my graduate students are trained because they don’t know how to do anything. That’s a quote. And that’s a real problem.

## **You’ve said a lot about training. Do you think mentoring and training go hand-in-hand?**

It certainly is a big piece of mentoring – there’s a lot more to mentoring than just training – but it’s training them on all sorts of different things. Training them how to think, training them how to do science, even just on the day-to-day operation of what it takes to do this kind of stuff—all that is part of mentoring.

The career advice that most people think of as mentoring is also training—how do I go about writing a grant? What is it they’re looking for? That’s training. The personal support is what I think is the most important thing about the mentoring; That it’s one-on-one, a lot of contact hours and face-to-face time. You can’t mentor long distance.



### **Do you steer your students towards projects you feel are doable?**

With an undergraduate research project that is especially true. I know I'm not going to have them forever. I have two freshmen now that I hope I will have for four years, because we can do lots of good science in four years, but typically that's not the case. You have someone coming into your laboratory as a junior or worse as a senior, and that's just really not enough time to do much science. So you're not going to encourage them to start a project that has a low probability of success or that's going to take 15 years to do. That's not an exaggeration, sometimes science does take 15 years to do! I find myself doing that all the time.

But, you don't want to steer an undergraduate to a project that is so open-ended or so fraught with danger that they'll leave with a negative experience, because a good way to turn them off of science is to take some promising young student, give them a disaster, and have them walk away depressed. That's not how to get them into science.

Now, at the same time, you don't want to give them science that you know is going to work —baby, simple, stupid stuff that's like falling off a log. It has to be real science and have the possibility of failure; Everyone should understand that sometimes it just doesn't work. You still learn something and that makes it okay, that's what we're here for. What we're supposed to be doing is debunking our own ideas. Our job is to disprove the hypothesis. It is in fact not supposed to work all the time.

With graduate students you have a little longer view, but not that much longer because in this day and age, if you don't come out of graduate school with an armload of publications you're not competitive, especially in neuroscience where there's an all but mandatory post-doctoral fellowship before you even begin to think about having a career. Well, to get a decent postdoc, you'd better have a publication record to show for it. So you can't put graduate students only on projects that are going to take six years to do, where they might get one publication out of it. It just doesn't make them competitive.

You've got to help them, so yes, I try to steer my students towards projects with reasonable time-frames and reasonable probability of success.

### **Is your success with your students because you hand-select them or do they find you?**

A little bit of both. I rarely take walk-ons. I have to know something about these students, so I typically get to know them through a class I've taught over the course of a semester. I see if they really have what it takes to get through and I invite them into the laboratory. I say, why aren't you in a laboratory, join my laboratory please!

I remember one of my favorite undergraduates. She joined my lab in her freshman year. I met her doing this Honor's College talk on exploring majors.

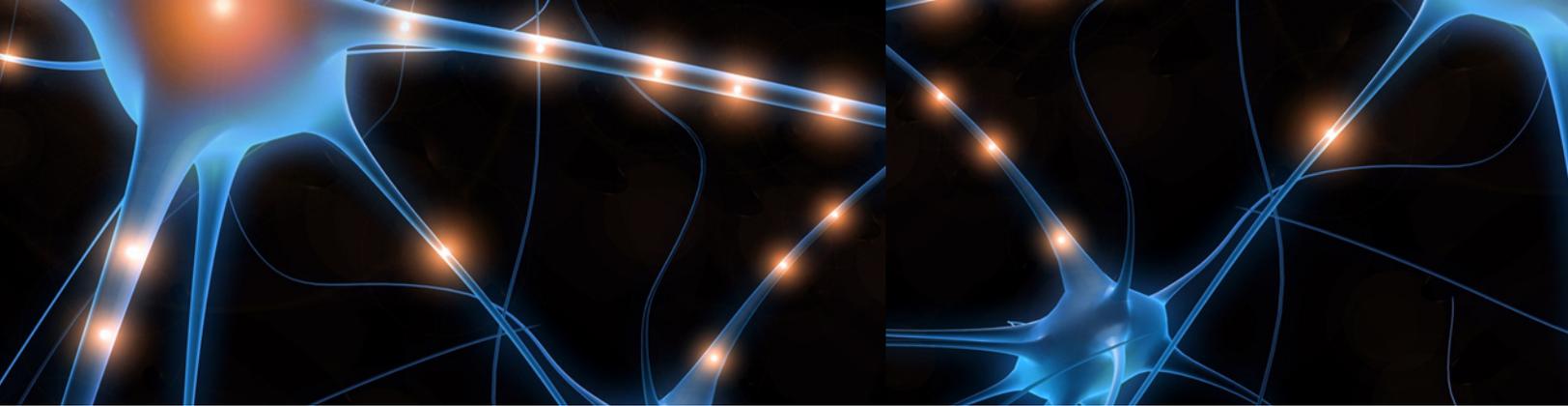
Faculty were invited to talk about how we got where we are today, to illustrate how nobody has this careerism view in reality. It's a way to combat the undergraduate mentality that "I'm going to graduate and do 'X'" as opposed to, "I'm going to explore and discover what I'm really interested in." And if you listen to any scientist tell their life story, what you always hear is "I did this, I did that, and then this completely other thing, and now I'm here". It's always a weird circuitous, fortuitous route and it's to demonstrate that this is how careers in science develop. You have to rattle around awhile, explore more broadly.

Anyway, she came to this talk and it turns out that the summer before she had shadowed a pediatric neurologist. The case they were working on was this newborn who had experienced spinal cord trauma during delivery and she was just fascinated by spinal cords as a consequence. She came up to me after the talk and asked, "Can I work in your lab?"

When she finally graduated and went on to medical school, she had three publications as an undergrad and was primary author on all of them. And that's what you want.

### **How do you account for graduate students coming in with different lab and research experiences?**

The program is structured so that graduate students understand right away that research is an important component. When we admit students, we place them in laboratories -- they're not stuck there for the rest of their graduate lives, but we try to find a good intellectual match.



Their job right away is to get into research. They're told, you have to start your research today. Maybe it's not your dissertation research, maybe it's something completely different, but you have to start.

The student with less research experience is going to have to figure it out starting on day one, and the one with more experience will in fact be ahead, but at the end they'll both get Ph.D.s. And if I've done my job as a good mentor, then they'll both leave here with a respectable record and both go on to get a great postdoc, a wonderful job and live happily ever after. And there are kittens around here someplace too, I'm sure!

### **What's the difference between the postdoc and graduate work?**

The goal of the postdoc is to develop a whole new set of skills, another level of training, so that when you go out onto the job market you not only have the skills you learned as a graduate student, but you also have the skills you learned as a postdoc.

You're supposed to be much more independent as a postdoc, so there's less mentorship, although it's still there.

Postdocs are this fledgling stage where you are expected to not need a supervisor anymore. It used to be the case that they were rare, and I remember coming here as an assistant professor and there were very few postdocs. Now, our postdocs might outnumber the faculty. Times have changed. Postdocs are a core element of the discipline now.

### **Is that because graduate students and postdocs need to have more experience in writing grants and running labs these days?**

Universities want to hire assistant professors who are going to succeed. The successful assistant professor is in fact someone who knows how to run a laboratory, has lots of skills and techniques, knows how to write a grant.

Hmm, sounds like someone who's done a postdoc. And hopefully, please, is someone who has done some teaching at some point and can actually do the other half of this job, which we give a lot of lip service to, but in fact, don't deliver as much as we should.

If they have all that, they're really going to be successful and that's really what's driven the growth in postdocs —because jobs are so hard to get, so competitive, and you're going up against people who have postdocs. Sometimes two postdocs.

If you're a brand new Ph.D. and you're going up against someone with 6 years of postgraduate work, you're not competitive. Just look at the publication record. You've got three, they've got nine. They've got a grant, you don't. They know how to do x, y, z. Who are you going to hire?



# The air up there

## Profile of Dr. Sara Pryor, Chair of the Atmospheric Sciences Program

When Professor of Atmospheric Sciences Sara C. Pryor breathes in, she doesn't just think air is necessary to human life, but about how the particles in the air affect our lives.

Tens of thousands of people in North America die each year prematurely from high particle concentrations, and varying particle concentrations can also affect our climate, which is why the first part of Dr. Pryor's research is fieldwork. She measures "atmospheric particles" (liquid or solid particles suspended in the atmosphere) to discover how they form in the atmosphere and how they are removed.

Dr. Pryor has been fortunate to collaborate in European projects and has taken measurements in Canada, Denmark, Sweden and Finland, as well as on a year-long marine expedition. And year round, her team takes measurements from a 50m tall field station in the Morgan Monroe

State Forest — one of only approximately a dozen stations world-wide taking similar measurements. At that site, the team measures particle sizes that range from visible-to-the-naked-eye down to as small as three nanometers, which is significantly smaller than the eye can see and less than 1000th of the width of a human hair.

During May 2008 she led an intensive field experiment during which collaborators from Indiana University, the National Center for Atmospheric Research, Washington State University and Clarkson University converged on the site. Under funding from the National Science Foundation they undertook detailed measurements of the physical and chemical properties of the atmosphere during particle formation events using a plethora of instruments including some deployed on a remote controlled aerial vehicle.

By measuring changes in the particles over time, Dr. Pryor is determining when

and how these particles form, grow and are removed from the atmosphere. Ultimately her research will quantify how these particles are affecting our regional climate and the health impacts for Indiana residents.

Her research also focuses on physical climatology. If global climate changes, asks Dr. Pryor, what does that mean for Indiana?

"If scientists say we're going to have an increase of two degrees globally, that doesn't mean much to most people, but if we translate that into a regional projection or a percentage difference in rain, it becomes much more relevant," she said.

Making use of regional climate models, along with measured data, Dr. Pryor is seeking to quantify how global climate change has been, and will be, manifest in the Midwest and the world. For example, in collaboration with both US and European colleagues, Dr. Pryor is working on a project that looks at how climate change affects



(pg 12) Dr. Pryor on top of the Morgan Monroe State Forest (MMSF) tower during a summertime experiment.

(left) Downloading data from her instruments while hanging from a tower during a European experiment in Sweden.

(right) On top of the tower in Morgan Monroe State Forest during a wintertime experiment.

renewable energy supplies such as solar, wind and water. But what happens, she asks, if Norway gets 80 percent of its power from hydroelectricity and due to global climate change, it rains less?

“Renewables can help reduce the carbon dioxide we emit, but we can’t assume the climate won’t change,” Dr. Pryor said.

Locally, she’s investigating what the effects of climate change will be on Indiana and the Midwest, and is editor of a forthcoming book entitled ‘Climate variability, predictability and change in the Midwestern USA’ which is under contract with Indiana University Press. The book features 23 chapters from climatologists across the Midwest and will be published in Spring 2009.

Despite heavy rains this summer, her initial work suggests that when taking the longer view, Indiana will become more drought prone and more subject to intense, heavy rains, such as we’ve seen this year, she said.

“The average day in Indiana will likely have slightly less rain, but the extreme events may intensify which has implications for flooding, soil erosion, and crop damage. Initially we worked with historical data, and now we are working on projections for the next 100 years, with a focus on drought and rain patterns. In particular, we’re concerned about flooding becoming more frequent and intense,” Dr. Pryor said. “But the point of all of this is if we can warn people of the effects, we have a chance to mitigate the risks.”

Although much of Dr. Pryor’s research is focused on the Midwest, her interest in atmospheric science began as a teenager in England.

Dr. Pryor was a young idealist, she said. When the news spouted tales of drought and millions starving, she believed that if we only could predict droughts and then ship enough food to those nations, millions would be saved. Although she later understood that it was a political as well as scientific issue, thinking about this issue peaked her interest in the need to predict climate. Later she began to read about the increasing number of asthma cases in the UK, which were strongly linked with air pollution, and remembers thinking that our health could be improved with better air.

“I thought these were obvious problems with scientific solutions, and in some ways I still believe it... that the types of research I’m doing today really can improve the quality of people’s lives,” she said. “Just because we don’t know the extent of the climate change, doesn’t mean we shouldn’t act to moderate the effects. We need to start the process of mitigating the risks and adapting to changes.”

Dr. Pryor was honored to be presented with the President’s award in this year’s Founders Day celebrations. “During my tenure at Indiana University I have placed great personal store in being a true academic – striving to undertake excellent research, provide inspirational teaching and serve my discipline. To be recognized in this way is indeed a privilege.”

**Students with a scientific background and an interest in Atmospheric Sciences for their M.A., M.S. or Ph.D. should contact:**

**Address:**  
Atmospheric Science Program,  
Department of Geography,  
Indiana University,  
Bloomington, IN 47405,  
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**URL:**  
[www.indiana.edu/~climate](http://www.indiana.edu/~climate)

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[spryor@indiana.edu](mailto:spryor@indiana.edu)  
Tel: (812) 855 - 6303  
Fax: (812) 855 - 1661

## New IU AGEP staff member!

The University Graduate School welcomes Christy Campoll as Grant Program Administrator. Christy currently coordinates the IU AGEP Program with Director Dr. Yolanda Treviño, among other projects. "It is exhilarating to engage the huge issue of increasing minority representation in academia," she said. Christy received a Master of Public Affairs from IU in 2006.



## IU SURVIVAL GUIDE: LIBRARIES EDITION

### What to do to get electronic copies of print articles delivered to you.

Don't want to spend time looking for an article that's not online? We'll supply you electronic copies of journal articles from print and microform materials held on the Bloomington campus. It's hands-down our most popular service for grad students.

1. To submit a request online, type Request Article Delivery in the search box on the IUB Libraries home page or find it under Services.
2. After logging in, you'll be asked to provide the citation to the article. If you're a first-timer, fill out the form for delivery information.
3. When your article is available, we'll send you an e-mail with a link.
4. Know your limits. You may request a maximum of 25 items per month.

Most graduate students who use the service request about two deliveries per month, and even the highest users max out at 12 to 15 per month. The limit protects us against über-researchers, like the guy who requested 500 articles in two days.

**Snag a guide this fall**

[www.libraries.iub.edu/survival](http://www.libraries.iub.edu/survival)

# Graduate Student Awards Reception

On Tuesday, April 22, 2008, at the Second Annual Graduate Student Awards Reception, the University Graduate School announced winners for the 2007-08 Diversity Building Fellowships, Wells Fellowship, McNair Fellowship, Esther Kinsley award, Pari Parana Award, Grant-in-Aid, Future Faculty Teaching Fellowships and the GPSO Faculty Mentor Award, among others.



Dean of the University Graduate School James C. Wimbush and Jenelle Dorner, the first recipient of the Pari Prerana (Essence of Inspiration) Award. The Pari Prerana award recognizes graduate students who have overcome a severe physical or other health-related difficulty. It is sponsored by the IU Graduate and Professional Student Organization and the University Graduate School.



Dr. Allen, Professor of History & Philosophy of Science and Professor of Cognitive Science, received the 2008 GPSO Faculty Mentor Award. (left to right): Kant Van Cleave, Ronaldo Vigo, GPSO Faculty Mentor Recipient Dr. Colin Allen, Cameron Buckner, Grant Goodrich, Carlos Zednik, Rob Bowers and Robert Rose.



If you work with incoming Graduate and Professional Students, tell them to SAVE THE DATE for:

*Get Oriented at IU:*  
*IU's New Graduate Student Orientation*

**Thursday, August 28, 2008**

**2:00 - 4:00 p.m.**

**Herman B Wells Library Lobby**

The GPSO, University Graduate School, and IU Libraries are once again proud to present *Get Oriented at IU*, the annual New Graduate and Professional Student Orientation.

The only all-graduate program at IUB is designed to complement each department's orientation. This event provides new graduate and professional students with the practical tools and information needed to start a successful graduate education.

*Get Oriented @ IU* provides a chance to meet and network with other graduate and professional students as well as to learn about campus and community organizations. IU Libraries will provide tours of the Wells Library and introductions to subject specific librarians.

Library staff will be available to answer questions about consultation and delivery services, collections, and research databases. Refreshments will be served, and other door prizes will be awarded!

We hope to see all new graduate and professional students at *Get Oriented* on August 28! Please email any questions to [gps@indiana.edu](mailto:gps@indiana.edu). For other upcoming events and helpful information, visit the GPSO Web Site at [www.indiana.edu/~gpso](http://www.indiana.edu/~gpso).

Students learn about the Grad Grants Center booth at the 2007 *Get Oriented* at IU held in the Herman B Wells Library.



# 2008

## WELCOME BACK ACTIVITIES

For ALL graduate students at IUB

**Mark your calendars!**

**WHAT: Get Oriented @ IU**

- meet and network with other graduate and professional students
- learn about campus and community organizations
- free refreshments & library tours

WHEN: Thursday, August 28, 2-4 p.m.

WHERE: Herman B Wells Library Lobby

*Sponsored by IU Libraries, The University Graduate School, and The Graduate and Professional Student Organization*

**WHAT: The GPSO Cookout**

- catered barbeque
- free to graduate and professional students and their families
- pet friendly

WHEN: Sunday, August 31, 2-5 p.m.

WHERE: Woodlawn Shelter, Bryan Park

*Sponsored by The Graduate and Professional Student Organization*

**WHAT: The University Graduate School Wine and Cheese Reception**

WHEN: Friday, September 5, 5-7 p.m.

WHERE: Neal-Marshall Black Culture Center, Grand Hall

*Sponsored by The University Graduate School*

Visit GPSO at [www.iu.edu/~gpso](http://www.iu.edu/~gpso) for 2008 Orientation event updates!

# Ph.D. Comics



WWW.PHDCOMICS.COM



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"What do you do?" Copyright June 16, 2008, by Jorge Chan, from [www.phdcomics.com](http://www.phdcomics.com)

## How to submit content for the GQ:

Departments, schools and IU campuses may submit ideas and announcements for the next issues of the Graduate Quarterly to Communications Director Erika Lee at [ebigalee@indiana.edu](mailto:ebigalee@indiana.edu) or by phone at 855-5697.

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