

FACULTY newsletter

CPMS Physical and Mathematical Sciences

Faculty Resource for Funding



Photo courtesy of Daniel Borman

If you're a faculty member with a good idea, but don't have funding to make it happen, a new college resource can help.

There is now a college research development website with resources, guidelines, and tools to help faculty se-

cure funding for that great idea. More than six months in the making, the site, resdev.byu.edu, is live and ready for faculty use.

According to Conrad Monson, who is leading the research development group (RD) for the College of Physical & Mathematical Sciences (CPMS) and the College of Engineering and Technology, the federal government distributes about \$100 billion annually to research and development projects, while private sources give more than \$1 trillion every year to fund a variety of activities including research and development.

Despite the availability of funds, identifying funding sources can be challenging. Tools on the new website, such as online database search engines, make it easier to find funding opportunities.

One goal of the website is to help faculty use the new tools and resources to their advantage. On the website, faculty members can catalyze the research funding process by requesting a funding search based on a brief description of their project.

After a faculty member requests a search, RD matches research interests with potential funding sources. Faculty can review the options of resources and work with RD to further develop funding opportunities.

"We recommend methods for funding capture that have been used with great success in today's challenging funding environment," Monson said. "We have tried to put a full range of resources into the website to help with all aspects of finding and securing research funding."

The website describes databases of funding opportunities, federal agencies, and non-federal organizations that provide research funds, tips for proposal writing and marketing, funding news, and additional helpful resources.

What were numerous scattered resources are now combined into one cohesive, user-friendly website helpful for all faculty. With exciting research occurring almost daily in both colleges, it will be interesting to see how this website will help hard-working faculty reach their research goals.

by: Alysa Kleinman

A Chemist without Borders

Though it was her husband's political science research that brought her to Uganda, chemistry professor Jennifer Nielson started a project of her own. She began with a simple question—What's happening with science in Uganda? What she found surprised her.

"The conditions teachers had to work in were pretty abysmal," said Nielson. "I couldn't believe how little resources there were, even at the university."

In many schools, they didn't even have waste disposal.

"I watched a high school principal, after we finished one demonstration, pour lead iodide [a toxic chemical] into a hole in the middle of the play yard."

This lack of resources wasn't the only problem teachers faced. What Nielson said teachers want and need more of is experimentation.

"That's what science is, right? Experimenting. And the kids aren't getting a

chance to do that."

Last summer, Nielson began working alongside her Ugandan colleagues to change that by bringing experiments to kids through "green" chemistry demonstrations. These "kitchen experiments" don't require a lot of toxic chemicals, and teachers can replicate them with the resources they have.

Next summer, her project will expand to two workshops: one for teachers and one for in-service teachers at the university (students who are getting degrees in order to teach science).

Nielson and one of her students, whose family is from Uganda's neighboring country Congo, will focus these workshops on bringing experimentation to the classroom.

"Right now we're preparing experiments where you don't need anything special. You don't need a special apparatus. You can handle them with gloves.



Photo courtesy of Jennifer Nielson

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The Quietest Planetarium



Photo courtesy of BYU Photo

Ten minutes before the Jean Massieu School of the Deaf (JMS) appreciation planetarium show began, the room was filled with complete silence. Was it anticipation for the upcoming demon-

stration? Not quite, though there was certainly a lot of that.

Rather, the room was abuzz with chatter and excitement, only you couldn't hear it. Hands and fingers flew in a flurry of motion as people communicated their excitement via sign language.

A great opportunity for the audibly impaired, the BYU Royden G. Derrick planetarium hosted a special show for students of the Jean Massieu School of the Deaf in Salt Lake City. The show was complete with closed-captioning and even a virtual translator on the screen.

David Oyler, the JMS science teacher who covered the event, was very excited about the planetarium show. "No other planetarium offers this kind of adventure," he said, "the experience here is just awesome."

The show taught about the formation of comets, planets, and stars in our solar system, and the response to the show was unanimous applause. Grant-

ed, that applause was made without actually clapping hands!

The planetarium plans on utilizing this specially designed ASL program and hosting events similar to this in the future. David Oyler and many other JMS students agree, they hope to be back soon.

Dr. Mike Jones, one of the BYU professors involved in organizing the event and creating the ASL translation for the program, shared the student's enthusiasm for the event. "It was a great event," he said, "and we are excited to repeat it."

According to Dr. Jeannette Lawler, the planetarium director, who worked with Dr. Jones on the program, the planetarium might be repeating the event sooner rather than later. They're already working tentatively toward another show in March.

For those interested in attending similar shows and other events hosted by the planetarium, a calendar of their upcoming events can be found [here](#).

by: Brian Shaw

Pioneering the Impossible

Forget the bonnets and handcars. Bring out the stem cells and microchips.

A modern pioneer came to BYU last week. Dr. Robert Langer from MIT shared his own experience and trailblazing wisdom in biochemistry engineering at the annual Izatt-Christensen Lecture.

"I definitely did it when it was unpopular, and I certainly did a lot of experimental work when people felt that chemical engineering was purely mathematics," said Dr. Langer.

Langer has a humble, sincere presence, despite having written well over 1,000 articles, having more than 800 issued and pending patents worldwide, and receiving over 220 major awards. There's a reason Time Magazine and CNN named Dr. Langer one of the 100 most influential people in the US in 2002.

Dr. Langer shared that when he received his PhD in chemical engineering from MIT in 1974, he didn't know what field he wanted to get into. The oil business was booming at the time, but he wanted to do something that would impact people's lives in a more real way.

"The first part of his presentation, in which he described the way he found

his career, I really identified with that because that's the position I find myself in now," Broadbent said.

Dr. Langer entered the medical field working with Dr. Judah Folkman, a scientist with the radical and unpopular idea of stopping blood vessel growth to halt the spread of cancer.

After substantial work, Dr. Langer found that many of his inventions remained on paper and in the lab, but were not recognized by the larger medical community. So he decided to start his own businesses to distribute the information.

"If you're not your own champion nobody else is going to be," Dr. Langer explained.

Dr. Langer's inventions have helped millions of patients—from microchips placed in people's bodies to release medicine in exact dosages to chemotherapy wafers that safely dissolve in the brain when placed near brain tissue that could become cancerous.

"My husband's cousin just died of brain cancer last year, so just watching the part about the brain tumor—you hear about these developments and it's going to change a lot of people's lives," said Sarah Hedengren, electrical engi-

neering alum. "I just thought it was like science fiction, but real!"

Dr. Langer's lab is currently working on a cure for paralysis through tissue engineering and the use of stem cells. So far, Dr. Langer's lab has been able to help paralyzed monkeys and rats to walk again.

Dr. Langer continues to mark the trail for biochemists and bioengineers as he moves forward into new and exciting frontiers.

by: Curtis Penfold



Photo courtesy of Levi Price

Correction

2013 Awards Banquet

We apologize to Kathy Lee Garrett who was not included in last month's article on the College Awards Banquet. Kathy Lee Garrett received a University Service Award for 25 years of service to the university. See the full list of awardees [here](#).

Dates to Note

Student Research Conference

Saturday, March 9
8 a.m., 1102 JKB

College Grants

Physics

[Gus Hart](#)

Sponsor: URS (DOE/NETL)

Title: Novel Alloys via a computational approach

[Timothy Leishman](#)

Sponsor: Institute for Scientific Research in Music

Title: Characterization of Musical Instrument Radiation Part II

[Lawrence Rees](#)

Sponsor: U Michigan (Homeland)

Title: New Detectors, Electronics, and Algorithms for Fast Neutron Spectroscopy

Research Development



The website is located at resdev.byu.edu. It can also be accessed through the College of Physical and Mathematical Sciences website by clicking on the "Research Development" link under the "Faculty/Research" tab (or through the College of Engineering and Technology website by clicking on the "Research Development" link under the "Faculty and Staff" tab).

Leaving a Legacy



Photo courtesy of Curtis Penfold

You might see Dr. Donald Robinson's name on a plaque in the Talmage Building, unaware of the legacy he left behind.

Born in 1928, this 84 year-old retired BYU professor was one of the first Mathematics PhDs to teach at BYU when he started teaching here in 1956.

The Math Department rewarded Dr. Robinson with a plaque that is now displayed in the Talmage Building and thanked him for his generous endowment that has allowed and will continue to allow four math students every year to have a full-ride scholarship for many years to come.

All of the students who have received scholarships are required to compete in the Putnam Exam, a yearly competition held among over 400 schools. Dr. Robinson's scholarship recipients' exceptional scores at this competition is putting BYU's math department on the map.

It's incredibly generous that a retired professor would give such a substantial sum of money to create this endowment.

Those who know Dr. Robinson speak highly of the close relationship he had

with his wife, Helen, who died of cancer in 2002. The endowment is named after her.

Dr. Robinson has written fifty-seven research publications, served as chair of the math department, participated as a member and leader of various mathematical fraternities and organizations, and taught mathematics at BYU until his retirement in 1998.

Though he taught challenging courses, Dr. Robinson was known for teaching things clearly and without diverging from the subjects. Those around Dr. Robinson could see that there's something special about him.

Besides mathematics, Dr. Robinson also was an avid performer in the Hale Theater. Lonette Stoddard, the math department secretary, would often attend his shows. Stoddard shared a comical story about a time when Dr. Robinson played a character that got murdered in *Dr. Jekyll and Mr. Hyde*.

"The people that [sat] in front of us asked us why we were there and we told them how Dr. Robinson was in the play and which character he was," said Stoddard. "And when he got killed the girl sitting in front of us said, as loud as could be, 'There's the fulfillment of every math student's dream.'"

Dr. Robinson has certainly left a legacy here BYU and in Utah valley. With his endowment, his legacy will be felt for many more years. He will be remembered as a good man who always wanted to do things the way they were supposed to be done.

"He always tries to stand for what is right and what is best," said Allen Robinson. "He tries to do everything great. He not only tries to do great at mathematics, but he also tries to live a good gospel life."

by Curtis Penfold

Uganda

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There's no special equipment, and most of the waste can be poured down the drain," said Nielson.

She hopes that these workshops will offer teachers new ways to actively involve their students in their lessons with experiments that inspire students to ask questions. If the project is successful, it will also be self-sustaining.

"If we can get a core set of teachers experimenting, then they can better prepare students, and some of them

can become the science teachers who later go back out."

These programs have the potential to change the way science is taught in Uganda, and the teachers are eager for that change.

"I think Uganda really wants this technology. Changing their science teaching with more experimentation and critical thinking activities will help them get there faster."

by: Carly Huchendorf

College Publications

Chemistry and Biochemistry

[J. L. Andersen](#), S. Kornbluth, "The Tangled Circuitry of Metabolism and Apoptosis", *Molecular Cell*, 2013, volume 49/issue 3, pp. 399-410

C.J. Buntel, D.P. Hansen, [M.R. Linford](#), B.M. Lunt, C.M. Miller, R.T. Perkins, M.O. Worthington, "Optical Data Storage Media Containing an Encapsulated Data Layer", *U.S. Patent No. 8,361,585*, 2013

H.G. Lee, J.H. Lee, S.P. Jang, I.H. Hwang, S.J. Kim, Y. Kim, C. Kim, [R.G. Harrison](#), "Zinc Selective Chemosensors Based on the Flexible Dipicolylamine and Quinoline", *Inorganic Chimica Acta*, 2013, volume 394, pp. 542-551

N. Li, L. J. Allen, [R.G. Harrison](#), [J.D. Lamb](#), "Transition Metal Cation Separations with a

Resorcinarene-Based Amino Acid Stationary Phase", *Analyst*, 2013, volume 138/issue 5, pp. 1467-1474

Computer Science

R. Jammalamadaka, R. Gamboni, S. Mehrotra, [K. Seamons](#), N. Venkatasubramanian, "A Middleware Approach for Outsourcing Data Securely", *Computers & Security*, 2013, volume 32, pp. 252-266

[B.S. Morse](#), D. Thornton, [M.A. Goodrich](#), "Color Anomaly Detection and Suggestion for Wilderness Search and Rescue", *Proceedings of the 2012 7th ACM/IEEE International Conference on Human-Robot Interaction*, 2012, pp. 455-462

[B.S. Morse](#), J. Howard, S. Cohen, B. Price, "PatchMatch-Based Content Completion of

Stereo Image Pairs", *2012 Second International Conference on 3D Image Modeling, Processing, Visualization, and Transmission*, 2012, pp. 555-562

Statistics

S.L. Wilde, [S.D. Grimshaw](#), "Efficient Computation of Generalized Median Estimators", *Computational Statistics*, 2013, volume 28/issue 1, pp. 307-317

