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## Fall 2012 e-CERTI Newsletter

Center for Educational Research and Teaching Innovation

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Hello S&T instructors: The fall semester is here and with it a time of saying farewell to Vice Provost Harvest Collier. Read a tribute to him [here](#). Also, read about how [Hank Pernicka](#) teaches rocket science and consistently garners teaching awards, plus, find out little known facts about S&T's [Woman of the Year](#) and details of this year's [Curators' Teaching Summit](#). Welcome back!



**CERTI  
NEWSLETTER**  
Center for Educational  
Research and Teaching  
Innovation at Missouri S&T

## How He Teaches *Rocket Science*

Hank Pernicka might be a rocket scientist by training, but, "I'm not *really* a rocket scientist," he says with a grin. "I'm not that smart."

The associate professor of aerospace engineering at Missouri S&T describes himself as having average intelligence, which helps him relate to B and C students who don't immediately grasp the concepts he teaches.

Pernicka's teaching, however, has been anything but average. He has received Outstanding Teacher Awards at Missouri S&T every year from 2004-2010, and was one of eight faculty members to receive the 2011 campus Teaching Award last year.

Here are some of his "success secrets" for the classroom:

**Promote a cooperative atmosphere:** A self-described introvert, Pernicka, surprisingly, does not find teaching particularly difficult but also adds that he has learned a lot through trial and error. He cut his eyeteeth in teaching at San José State, where students hailed from 63 countries and from a broad range of socioeconomic backgrounds. Some barely spoke English. In his 11 years there, teaching four courses a semester, he found that connecting with students and building an atmosphere of cooperative learning were imperative.

*Above, Hank Pernicka holding a mock-up of the MR SAT spacecraft that is used in the Space Systems Engineering Lab.*



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## Fall 2012 Faculty Events Calendar

A [calendar of faculty development events](#) for fall 2012 is available for download on the CERTI website.



"I tell my students on the first day of class: You are not competing with the student next to you," he says. "You can all get A's, if you all learn the material and do well on the tests." And, "If none of you learns the material, you'll all get F's. I don't have a preconceived notion of the spread."

Pernicka feels this approach makes for a win-win situation for everyone, allowing students to work together and help their peers, as well as giving them a comfortable environment in which to dialogue.

**Be purposeful about engaging students to ask good questions:** Pernicka makes it his goal to get the majority of his classes, which are often comprised of 50 to 60 mostly junior-level students, engaged in asking questions or discussion by the end of the semester.

Good rapport is what engenders good questions, he believes, and a key to success is being able to ask the right questions. In trying to build rapport from day one, his first homework assignment is a request for an email with biographical information. Do you have a nickname? A job? What interests you about aerospace engineering? What do you want to do when you graduate?

Pernicka reciprocates with an email a couple of weeks later about his

*Pernicka wants students to learn how to ask good questions, because he believes that is a key to their success. He is intentional about building rapport with students so they will feel comfortable speaking up in class.*

background, family, hobbies and research. Students soon find out that he coaches his younger daughter's soccer team and has a passion for sports cars, among other things.

This divulging of information is strategic on his part. While students think they have an angle that can be used to "divert" him during class, he deliberately allows himself to be led into brief tangents. "If they get me off on a tangent talking about my daughter's soccer team, that will last about 15 seconds, but that's part of my approach." He has found that even these brief moments help students connect with him and feel as though they can talk in class more easily. And if the diversion can be linked to class content and extend for a bit

longer, so much the better. By the end of the course, typically two-thirds or more of the class has joined in discussion in one way or another.

**Be approachable and available:** Most of the time, Pernicka finds the students reciprocate the care and interest he invests in them. When one of his family members was seriously ill a few years ago, he shared that information with students and asked for their patience if their graded homework was a little slow getting back to them or if he had to miss class at times. "The students were great," he says, which made a very stressful time a little easier to handle. Happily, the family member is fully recovered.

His guiding philosophy is to treat students more as adults and peers than inferiors. He eschews the "sit still while I dispense my knowledge to you" approach. "If I can't answer a question, I tell students, 'I don't know,'" he says. "I like to be available to students, but they have to meet me halfway. I'll read emails late at night, or I'll sit in my office and work problems with them to the

## *2012 Curators' Teaching Summit Planned for Fall*

The annual fall Curators' Teaching summit will be held for the fourth year this coming semester.

This year's topic is "**How Do You Know Your Students Are Learning?**"

Luncheon sessions will be held at noon at the Havener Center on Sept. 17, Oct. 15 and Nov. 12.

Discussion will tackle issues such as:

- How do you determine what you want your students to know?
- How do you assess student learning?
- What teaching strategies and assessments work best together?
- How do you assess individual and group work differently?

Also planned are two Faculty Learning Communities that will dovetail with these sessions, "Tips and Tools for Assessing Student Learning," at noon Oct. 5 and Oct. 19.

To RSVP for any of the sessions, contact Diane Hagni at [hagnid@mst.edu](mailto:hagnid@mst.edu).

“nth” degree,’ but they’ve got to walk in my office or send that email.”

“Approachable” and “available” are the words he wants to see written on the student comments, he says, for the end-of-course evaluations.

**Engage students with your research:** Pernicka’s research focuses on orbital trajectories, specifically, how to use less fuel to get spacecraft where they need to go more efficiently. This dovetails with his research on spacecraft design and the Missouri S&T Space Systems Engineering Lab located in Toomey Hall, which he founded. His Missouri S&T Satellite research team is composed of freshman through Ph.D. students, mainly from the aerospace engineering program but including other majors as well, such as computer science, electrical, mechanical and computer engineering. Pernicka often assigns projects or homework problems to his classes that are inspired by his research. Occasionally, an undergraduate student will take one of these projects and turn it into a research topic for their graduate studies.

**Take student feedback seriously:** Pernicka takes to heart the comments made on end-of-course evaluations, even the ones that he is powerless to change. For example, students have commented, “This class should not be at 8 o’clock in the morning!” A comment like this is easy to dismiss, but he doesn’t do that.

In teaching the course the next semester, he might bring up the topic and concur about the difficulty of taking early morning classes, encouraging student to bring coffee or food to help be more alert. “Understanding where the students are coming from helps,” he says.

While he admits that understanding students becomes more of a challenge the older he gets, he can draw on his experiences coaching sports, which involves a degree of mentoring as well as instruction. “I take seriously not just teaching aerospace engineering,” he says of his role as a professor, “but hopefully (integrating) some life skills and maybe some ethics as well.”

## Five Ways to Improve Student Attendance



Students can’t learn as well if they skip class, so how do you encourage attendance? Here are [five tips](#) provided by Faculty Focus newsletter:

1. Prepare learning contracts for students to sign at the beginning of the semester.

2. Give unannounced quizzes.
3. Provide handouts in class, but do not post them on your course website.
4. Collect contact information from students at the beginning of the semester, and call or email students who are frequently absent and encourage them to attend.
5. Think of ways to keep class morale high, including learning students’ names as quickly as possible.

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## Nationally Recognized Expert in Student Success to Speak at S&T

[Ray Landis](#), Dean Emeritus of Engineering, Computer Science, and Technology at California State University, and a keynote speaker for the [ASEE Midwest Regional Conference](#) to be held at S&T, will present the workshop, “Facilitating Student Success,” at 2 p.m. on Friday, Sept. 21, in the Ozark Room of the Havener Center.

The event is free and open to the campus and conference attendees; ASEE conference registration is NOT required to attend. Landis will discuss student development and how instructors can bring about change in student attitudes and behaviors that are needed to help them persist in their disciplines and be successful.

While Landis’ focus is primarily on engineering students, he notes that the principles he will discuss apply to new students in all types of disciplines.

Landis is a nationally recognized expert in engineering student success and is the author of the best-selling introduction to engineering textbook “Studying Engineering: A Road Map to a Rewarding Career.” Those who RSVP for the event by Sept. 12 will receive a copy of his book in advance.

Please contact [Diane Hagni](#) to RSVP or for more information.

In honor of

# Harvest Collier

It appears that Harvest Collier's approach to his new job will not be any different than the one he has adopted for the past 30 years at Missouri S&T: *"Let's leave it better than how we found it."*



Those who are accustomed to seeing Collier impeccably dressed in his suit and tie every day might be surprised to hear that his new position will involve maneuvering a John Deere tractor. He plans to manage his son's 600-acre farm in Middleton, Tenn., population 602, taking a sustainability approach. Collier and wife, Shirley, are retiring to Collierville, Tenn., close to Middleton, where the couple will have easy access to their two grandchildren.

Collier leaves behind a campus culture that has been deeply influenced by his passion to see students succeed and persist to graduation, no matter what type of academic obstacles they face.

His journey started as an assistant professor of chemistry in 1982, fresh from industry where research was the single priority. Early teaching experiences in his chemistry classes taught him that students struggled mightily with the material, which was foundational to many of their other studies. He made it his personal goal to find out how he could help them learn more effectively, and he continued on this quest even as he moved up the ranks to full professor.

As chair of the chemistry department and then as associate dean of the College of Arts and Sciences, he began to see a wider range of students, many having similar struggles. He continued to teach full-time while serving as an administrator in order to keep his finger on the pulse of student learning and explore more effective ways to teach.

*"He is the very embodiment of undergraduate education and research at S&T."* Daniel Tauritz, associate professor, computer science

His efforts during the last decade led to the adoption of "clickers" (personal response devices) on campus, a teaching tool that helps both students and instructors have a clearer idea of what students are mastering. He personally saw his class' exam grades jump 20 percent through the use of clickers during his chemistry lectures, and his enthusiasm for how learning could be enhanced through the technology influenced many other instructors. Today, clicker adoption is widespread among the various disciplines, and approximately 49 percent of the S&T student body utilizes this tool.

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## Educational Research Mini-Grant Winners Announced

Nine educational research projects developed by Missouri S&T faculty representing eight academic departments have been funded for 2012-2013 as part of a mini-grant program co-sponsored by the Office of the Vice Provost for Academic Affairs and the Center for Educational Research and Teaching Innovation (CERTI).

The Academic Affairs office is providing \$22,010 for the projects. This is the second round of funding with five projects previously funded in 2011.

The 2012-2013 funded projects are:

- **"Design and Implementation of a Study to Determine if a Cell Model Project Attains Desired Learning Outcomes,"** Katie Shannon, assistant professor of biological sciences, \$1,410.
- **"Developing Self-Assessment Tools to Improve Technical Presentation Skills of Engineering Students,"** Mary Reidmeyer, associate teaching professor of materials science and engineering, and



When Collier was asked to serve as vice provost for graduate and undergraduate studies in 2001, he received the charge to improve student first- to second-year retention, which was at 84 percent. Under his leadership, the division developed a wide assortment of programs designed to help students succeed. On the faculty side, he wrote a proposal to implement the Center for Educational Research and Teaching Innovation (CERTI), the first faculty development center on campus, dedicated to helping instructors excel in the classroom.

When his title was changed to vice provost for undergraduate studies in 2007, his passion for student success remained the same, and new programs were implemented, such as Hit the Ground Running summer camp, Honors Academy, On-Track Advising Program, Voyager Learning Community, Opportunities for Undergraduate Research Experience (OURE) and a number of others.

***“If your actions inspire others to dream more, learn more, do more and become more, you are a leader.”***

– John Quincy Adams

First- to second-year retention at Missouri S&T reached an all-time high of 88 percent in 2008.

“Without a doubt Dr. Collier has been responsible for a change in the campus culture to a greater commitment to student success,” says Larry Gragg, Curators’ Teaching Professor of history and interim vice provost for Undergraduate Studies. “His impact will be felt for decades because of all the students at S&T he has helped succeed.”

Laura Stoll, vice provost and dean of enrollment management, says she finds it difficult to quantify the enormous impact of her colleague, having served with him at Missouri S&T during all of his 30-year tenure. However, she offers this assessment: “Harvest Collier came to campus every morning, and when he left that evening, Missouri S&T was a better place.”

“His contributions at S&T will have a lasting impact and I don’t believe words can describe their importance,” says Bob Schwartz, former S&T vice provost for Academic Affairs and current chief of staff for the UM System president’s office. “We will be forever grateful for the many things he has done to facilitate the success of students and the betterment of the institution.”

“He is very capable, a top-class intellectual and at the same time exhibits a great sense of compassion and humility,” says Lokesh Dharani, Curators’ Professor of Mechanical and Aerospace Engineering. “I wish him all the best.”

In honor of the Colliers’ contributions at the university and in the community, a [scholarship fund](#) was established in the couple’s name to continue to benefit S&T students in the years to come.

“He has always been an inspiration to me and so many other faculty, staff and students,” says Lynn Stichnote, Missouri S&T director of admissions. “He will be a hard act to follow.”

*Don’t think that Collier will be riding a tractor and hanging out with his grandchildren all of his spare time. He has applied for emeritus status with the university in order to be able to finish up some projects at Missouri S&T. He also plans to write a book about what he has learned about student success.*

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Richard Brow, professor of materials science and engineering, \$2,500.

- **“Development of Free Data Base for Modern Physics Homework Problems,”** John Greg Story, associate professor of physics, \$1,700.
- **“Evaluation of Electronic Flashcards as a Tool to Improve Exam Readiness”** Susan Murray, professor of engineering management and systems engineering, \$2,000.
- **“Implementing Real-World Design Examples Into the Main Framework of Design Courses,”** Chien-Chung Chen, assistant teaching professor, civil, architectural and environmental engineering, \$3,000.
- **“Improving Success in General Chemistry by Enhancing Learning Enhancement and Reviving the Fallen”** EmmaLou Satterfield, assistant teaching professor, chemistry, \$4,068.
- **“Integrating Effective Learning Techniques to Accommodate the Needs of the Solitary Learner,”** Cynthia Bolon, lecturer, chemistry, \$2,632.

# S&T's Woman of the Year:



## Irina Ivliyeva

For the 16<sup>th</sup> consecutive year, Missouri S&T has recognized a female faculty member dedicated to student success and diversity. The 2012 Woman of the Year award went to assistant professor of Russian, Irina Ivliyeva.

Born and raised in Moscow (that's the former U.S.S.R., not Moscow, Mo.,) Ivliyeva understands at least eight languages. What you might find more surprising is that she never earned a bachelor's degree and confesses to having a

handicap when it comes to figuring out plumbing fixtures at hotels and opening small catsup packages. Read on to find out more interesting facts about her:

**Her Education:** At the time Ivliyeva attended the Lomonosov Moscow State University, Russian higher education did not recognize bachelor's degrees. After four years of schooling, she had to complete another year of master's work, in addition to completing a thesis and unpaid internship, in order to receive a diploma.

She said that Russian higher education system has since changed to a more Western approach, but there is still little regard in her country for obtaining only a bachelor's degree.

Her Ph.D. in linguistics in 1997 from the Russian Academic of Sciences is actually designated as a science rather than a humanities degree by the National Science Foundation. Her research interests include comparative semantics, word formation synthesis, methods of foreign language teaching and second language acquisition, and teaching with technology.

**Languages:** Ask her how many languages she knows, and get ready for a longer answer than you bargained for. "It depends on how you define the word, 'know,'" she says. In the Russian language, of course, she is native; in English, near native, and in French, fluent. In German and Finnish, she is proficient, as well as in Old Church Slavonic and Old

- "Student Usage and Perceptions of Virtual Office Hours That Extends Beyond the Traditional Face-to-Face Setting," Nishant Kumar, assistant teaching professor, mechanical and aerospace engineering, \$500.
- "Using Course Collaboration and Inductive Learning to Enhance Student Team Effectiveness," Bonnie Bachman, professor of business and information technology, and Yingchou Lin, assistant professor of business and information technology, \$4,200.

Members of the review committee included Phillip Whitefield, interim vice provost for Academic Affairs, and Harvest Collier, vice provost for Undergraduate Studies, as well as members of the CERTI steering committee.

Results of the research will be shared with the campus at the Missouri S&T Teaching and Learning Technology Conference in March 2013.

For more information about the program, go to <http://certi.mst.edu/education/research/>.

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Russian, meaning she can read, write and listen in these languages. Additionally, she has a working knowledge of classical Latin. (That's eight, if you're counting.)

Surprisingly, she notes that the most difficult language in which to become proficient is whatever is closest to one's native language due to "linguistic interference." For that reason, she believes any other Slavic language would be difficult for her to master, such as Ukrainian, Bulgarian or Polish.

**About her homeland:** Ivliyeva likes being able to "decompress" after work, and the public transportation system in Moscow allowed her to do just that as well as watch other people, which is one of her favorite pastimes. She misses that now that she is in the American Midwest and must drive herself everywhere, keeping her eyes on the road. She commutes to Normal, Ill., on the weekends, where her husband and son live.

She does appreciate the U.S. highway system, though, which she calls "very user friendly," as opposed to the roads in Russia, which are "notoriously bad." She chalks the latter up to the penchant of foreign invaders coming into Russia over the centuries; nobody wanted to help them out with good roads, she says. "Why make it easier for them?"

**What she still can't get used to in America:** Ivliyeva has been in the United States since 1997, but there are some things she hasn't taken to very well. First, there's those maddening catsup and other condiment packets that are supposed to be opened with one's fingers. So far, she has not been successful. Then, there is the wide variety of plumbing fixtures in hotels or other public places to try to navigate. Do you turn, lift, clap or put your hand under the faucet to get it going? In Russia, "things are boring and much simpler," she says. When visiting Moscow, she never has to call down to the hotel front desk to ask how to run her bathwater.

**What she likes about teaching:** Ivliyeva enjoys being in the middle of intellectual, constantly moving forward "action," she says, and interacting with various generations and groups in academia and beyond. She adds that having the opportunity to evolve constantly, learn new facts, acquire new skills and "make a difference" keep her stimulated and interested in her work.

**What is her next big goal?** "There always was and will be one simple goal," she says. "Every day do the best you can." That can be challenging, she admits, because sometimes students aren't cooperative, and there are times she doesn't feel up to par physically or emotionally to strive for excellence in the classroom. "Do a good job anyway," she says. "Keep your eyes on doing your best each day – that's my goal."

## NEWS & ETC.

### ASEE MIDWEST SECTION CONFERENCE

The American Society of Engineering Educators' (ASEE) Midwest Section 2012 Annual Conference will be hosted by Missouri S&T Sept. 19-21 at the Havener Center.

Go here to [register](#).

### ONLINE ACADEMIC DISHONESTY REPORTING FORM

Instructors are invited to take advantage of online resources to promote academic integrity found at the UGS website: [ugs.mst.edu/academicintegrity](http://ugs.mst.edu/academicintegrity).

A password-protected online reporting form is also available.

### TEACHING STUDENTS THAT COLLEGE ISN'T LIKE HIGH SCHOOL

*It's week 12 of a 15-week-semester and a student shows up during office hours asking, begging, for some way that he can raise his grade. ... For most college professors, it's an all-too-familiar scenario ... (read more at [Faculty Focus online](#)).*

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