Think of a scientist.
What do you see? A frazzled brainiac? A goofy genius? A geek?

The Science Posse, a group of University of Wyoming graduate students whose primary goal is to raise awareness and understanding of science among middle- and high-school students across Wyoming, has heard all the stereotypes.

“I think a lot of people think scientists are just weird and nerdy,” Shawna McBride, a UW doctoral candidate in neuroscience who is neither weird nor nerdy, says. “And Scott Carleton is a regular guy who knows a lot about human and animal physiology, not to mention stable isotopes.”

“They could be your neighbors,” Laramie High science teacher Teresa Strube, who has invited the Science Posse to her classroom on many occasions, says. “They just happen to be absolutely passionate about science.”

As the members of the Science Posse travel this far-flung state—from Newcastle to Casper, Gillette to Torrington—they’re doing more than enhancing students’ knowledge of biology and physics at each stop.

“They’re breaking the stereotype of what it means to be a scientist,” says Kelsey Anderson, a student at Cheyenne Central High’s 10th-grade science class, student.

“A great experience
In August, McBride visited Laramie High as part of the Science Posse’s “Wanted: Science ALIVE!” a traveling outreach program designed to engage students through demonstration and experiment.

“When we were done, we just asked the students if they’d be interested in joining one of our labs,” McBride recalls. “And Han contacted me right away.”

A few weeks later, Han Li, 18, was working alongside McBride, helping her study the effects of salt-based diets during the pre- and post-natal periods of pregnancy. On average, Li spent six to 10 hours a week through the end of December in the UW lab.

“Neuroscience was kind of new to me, but I’d always been interested to learn how the brain controls the rest of your body,” Li, who balances his senior year at Laramie High with calculus classes and lab work at UW, says. “I thought, ‘Neuroscience would be a good place to look into the modern development of human bodies.’

“I’ve had a great experience with the Science Posse,” he says. “It wasn’t for Shawna, I wouldn’t have been able to learn about neuroscience with the depth that I have. I wouldn’t have even known there was a research lab at UW. I wouldn’t have had this opportunity.”

Li developed his own research project on salt manipulation during the early development stages of life for the Southeast Wyoming Regional Science Fair in February.

Li won his division and earned an automatic bid to the 2008 Intel International Science and Engineering Fair in Atlanta in May. The culminating event for a network of science fairs held around the world, it’s widely considered the Olympics of science competitions.

“It’s been a lot of fun having Han in the lab,” McBride, one of 10 members of this year’s Science Posse, says. “It’s fun to see people take an interest in science, to see that spark, that desire to learn.”

Li, who is captivated by experimentation and exploration, understands the importance of science in today’s ever-changing world.

Imagine, for a moment, the world without science. Disease would run rampant. The use of DNA for identification would be impossible. Groundwater supplies would be contaminated.

What Is the Science Posse?
The Science Posse, funded by the University of Wyoming Graduate School through grants from the National Institutes of Health and the National Science Foundation, brings together graduate students from various research fields.

The Science Posse has four goals:

- To increase Wyoming students’ appreciation and understanding of research complexities, knowledge, and issues.
- To increase Wyoming students’ interest in science courses and in choosing a related career in the fields of science, technology, engineering, and mathematics.
- To increase the sustainable expertise of Wyoming science teachers.
- To increase community awareness of research processes, complexities and outcomes.
with arsenic. High-rise buildings would collapse, luxurious cruise ships would sink, and the Boeing 777 wouldn’t exist.

Without science, Li says, our world would be but a shell of what it is today.

“Our society has developed because somebody came up with a question and said, ‘Why can’t this happen?’, and then later on proves that this can happen, and a new drug or machine is developed,” Li, who was born in China and lived in Israel before moving with his family to the United States when he was 11, says. “That’s the way the world works. In Columbus’ time, people rejected his idea of the world being round and, eventually, his theory was proved correct.

“Science,” he says, “makes our lives better.”

Still, Li says, a lot of students don’t care about science.

A world of hurt

Is it that students don’t care, or that they aren’t being given the opportunity to care?

The No Child Left Behind (NCLB) Act, passed into law in 2001, required educators in American public schools to place an increased emphasis on reading and mathematics. Science testing under the NCLB began only last year.

“Curtailed science-related education concerns Kim Parfitt, a science teacher at Cheyenne Central High.

“Science literacy is key for our country. And I don’t mean that kids can say ‘stomata’ for a leaf opening. What they need to know is how to take a claim and evaluate it and make sure that they have valid evidence to link it to broader scientific understanding. That’s science literacy to me,” Parfitt, says. “Whether that’s being done in astronomy or biology or chemistry, there are elements of critical thinking and problem-solving that are key to life.

“If we have students walking out of schools who aren’t able to former information, then they’re not going to be able to work in today’s workforce where jobs change constantly,” she says. “They’re not going to be able to understand half of the stuff that’s going on with the media. Look at global warming. Part of the problem of why it took so darn long [no address] is because nobody understood it. People still don’t understand it.”

Statistics bear out Parfitt’s concern.

ResearchAmerica, the nation’s largest non-profit public education and advocacy alliance working to improve health research, conducted a poll in 2007 that found 85 percent of Americans believe science is extremely important in their lives. But 52 percent of those polled didn’t believe the United States is performing well in science education compared to other nations.

The National Assessment of Educational Progress’ 2005 report card was also disturbing. The percentage of students performing at or above basic level in science fell in every grade but fourth. The organization provides the only continuing assessment of what U.S. students know and what they can do in many academic subjects.

This year, the Wyoming Department of Education began testing science literacy through the Proficiency Assessments for Wyoming Students, a system used by the state’s Department of Education to track individual student growth and performance.

“I think you’re going to see a huge decline,” Strube says. “We’re not inspiring students, and we’re not asking questions because of testing. Science has been put on the back burner. I am really concerned about what we’re going to see in the next five or 10 years, because the elementary students coming up now have had no science background, and their interest in science has not been stimulated at an early age. I think we’re going to be in a world of hurt.”

Wyoming is already hurting. Science Posse program coordinator Jesse Anderson says.

Of the thousands of students who enroll at UW each year, Anderson says, “only a very small percentage” go into a science-related field of study.

“The state of science in this country is at risk,” she says, “and in Wyoming, especially.”

Science can be fun

Science Posse members hope to help swing the tide in Wyoming by strengthening youngsters’ knowledge of science and by altering inaccurate perceptions.

“I think people believe science is really complicated,” McBride, of Buffalo, says of a common misconception. Not all experiments are complex.

Since January 2006, the University of Wyoming’s Science Posse has visited schools in these communities.

Debora Ranch, Lander, Cheyenne, Lander, Dubois, u/Wyo

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“You don’t have to do a big, complicated experiment to answer every question, but I think people see science as this wild, scary, complicated thing. It can be fun. We can design all kinds of cool experiments.”

The second misperception: Asking questions is dumb.

By the fifth grade, Strube believes many students keep to themselves because they feel asking questions is a sign of stupidity or weakness. It’s not, she says, particularly in science, a field of study based on question and experimentation.

Li credits his willingness to openly quiz teachers and challenge theories as being instrumental to his development as a scientist.

“I like to ask a lot of questions, especially in mathematical fields and science fields,” he says and smiles. “I always go, ‘Why is this?’ I don’t trust what the book says, nor do I trust some of the teachers. I have to look into it myself. I usually go into some professors and say, ‘Can you prove this formula for me?’

“Just because somebody has a different theory or asks questions, that’s not wrong,” he says. “That’s how we can develop a better world.”

Then there’s that other wrong-headed perception—the one about scientists being absent-minded, strange, and neurotic.

When a lot of people think of a scientist, I think there’s the element of the mad scientist, somebody who is trying to create Frankenstein’s monster all the time,” Adrianos, of Kemmerer, says. “When the students see a real scientist in the classroom and see that we’re not the messy-haired, tongue-sticking-out Einsteins that some people will associate with scientists, I think that helps them feel more comfortable with the idea of science.

“I think a lot of students feel that science is just too hard,” she says “But it’s not. Science can be fun.”

Anderson, the Central High 10th-grader, agrees. “I enjoyed the Science Posse coming into the classroom,” Anderson, who aspires to be a forensic scientist, says. “I learned a lot, and it was a lot of fun.”