

FACULTY IN FOCUS

Cosmic Chemistry

Although Karen Kwitter says her research is not as “sexy” as the Mars Rover or Cassini’s exploration of Saturn, her work assessing carbon abundances in planetary nebulae gets to the heart of one of our oldest and most fascinating questions: Where did we come from? Through “cosmo-chemistry,” Kwitter, her colleagues and students are piecing together the story of how the conditions necessary for life came to exist.



Karen Kwitter

To better understand how carbon, nitrogen and other building blocks for life evolve, the Ebenezer Fitch Professor of Astronomy focused on “unassuming stars like the sun,” whose modest size typifies the majority of stars in the Milky Way Galaxy. With a grant from the National Science Foundation, Kwitter and a colleague from University of Oklahoma began analyzing the chemical composition of planetary nebulae, the expanding, glowing gases “burped off” of dying stars. By examining the nebulae’s visual light spectra, Kwitter was able to measure levels of nitrogen and oxygen produced by the stars to determine how their abundances have grown in

our galaxy and solar system.

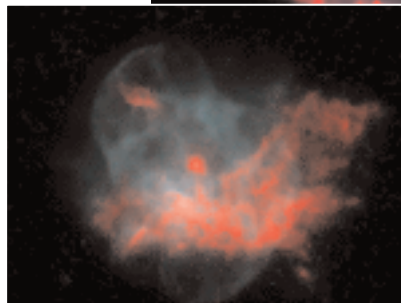
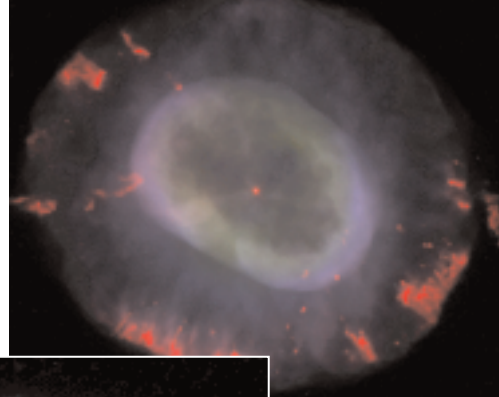
Because carbon does not reveal itself in the visual part of the spectrum, Kwitter turned to

ultraviolet spectra, which are obtainable only from above Earth’s atmosphere.

She and two colleagues, with a 2003 grant from the Space Telescope Science Institute, are using the Hubble Space Telescope to collect these data.

Kwitter and student researcher Joseph Gangestad ‘06 began work this summer comparing archived ultraviolet spectra of several planetary nebulae with new Hubble images. Her students learn the methods and computer skills necessary to decode and understand astronomical data in courses such as Astronomy 211 and then apply the tools in independent study projects, during summer internships and on research trips with Williams faculty to observatories around the world.

By studying visual and ultraviolet data, Kwitter and her colleagues are validating a method for improving estimates of carbon levels, comparing



Images of planetary nebulae can be analyzed to calculate the amounts of different chemical elements they contain, including carbon, oxygen and nitrogen, which are necessary for life. Each color represents an element in a particular state of ionization.

carbon distribution with that of doubly-ionized oxygen—an element easily observed using ground-based telescopes. Their technique is crucial for future generations of astronomers, as federal support for small- and medium-sized telescopes shrinks, major research facilities are privatized and the Hubble program comes to a premature end.

Kwitter received a bachelor’s in physics and astronomy from Wellesley in 1972 and a PhD from UCLA in 1979, the year she came to Williams. In addition to numerous publications on her research, she has co-written several books with her husband Steven Souza, observatory supervisor and instructor of astronomy, for J. Weston Walch’s *Hands-on Science* series for junior high and high school students. Among other courses, she teaches “Extraterrestrial Life in the Galaxy: A Sure Thing, or a Snowball’s Chance?”

Understanding Self-Consciousness

A student carrying a tray in the dining hall trips and sends her dinner flying. Everyone notices, right?

Not exactly.

According to psychology professor Kenneth Savitsky, other people don’t pay as much attention to us as we believe they do. Nor do they judge us as harshly for our blunders and mishaps as we expect. A recent study Savitsky conducted with Harvard’s Nicholas Epley and Cornell’s Thomas Gilovich helps bear out this theory.

In conducting the study, the researchers divided 260 Williams and Cornell students into three groups. Students in one group were asked to imagine they had committed a faux pas, such as accidentally setting off a security alarm in the library or being the only guest at a party who didn’t bring a gift for the host. These students were then asked to predict how severely their peers would judge them for their behavior.



Kenneth Savitsky

Students in the second group were asked to indicate how harshly they, as witnesses, would judge their peers’ faux pas. The third group was asked to predict how the witnesses would judge the offenders.

The study found that offenders expected to be rated on the most severe end of an 11-point scale—more than double the average rating from the other two groups. Savitsky says that in many other studies the same findings emerge



Helga Druxes

Do you MOO?

Helga Druxes is hiding in a broom closet, eavesdropping as students in her German 104 class discuss the concept of utopia with each other and their counterparts at Vassar College. Only the broom closet is really a virtual space, and Druxes is “listening in” via a transcript that will be e-mailed to her later for review. And the entire discussion—which is happening at midnight—is taking place in a powerful Web-based learning environment known to its users as the “MOO.”

Not Just a Chat Room: Free and accessible to anyone via the Internet, the MOO, which stands for “Multi-users Object Oriented,” is hosted by Vassar. In addition to being able to converse with each other in real time in German, visitors can enter “rooms” created by students using photographs and essays to explore concepts such as space and utopia. Last spring one Williams senior created a “cave” based on Franz Kafka’s short story “The Burrow.” Another student built a utopia modeled on J.R.R. Tolkien’s Middle Earth. Each of the rooms—and the accompanying commentary and critique from classmates and Druxes—draws upon literary and cultural materials studied in class.

Advancing Language Learning: Intermediate learners like those in German 104 typically don’t have the tools to “read philosophy texts or serious fiction,” Druxes says. But allowing them to explore and discuss manageable chunks of material posted on the MOO builds their linguistic skills—and their confidence. “The only way to get to the next level of language comprehension is to make mistakes,” Druxes says. That the mistakes are made in writing, instead of out loud in front of the entire class, lowers inhibitions and allows students of all abilities to mingle comfortably. It’s important, she adds, “to have this experience of confusion and being bogged down a little bit, but also being able to help each other past these impasses.”

A Noisy Classroom:

When students begin using the MOO about halfway through the semester,

Druxes notices an increase in the level of classroom “noise.” She’s not referring to the sound of furious typing in Weston Language Lab as conversations fly across the Internet, but rather the shift that occurs when students begin defining the course of discussion, asking and answering questions for each other. As a professor, Druxes says, she is “there to intervene, but we don’t have such a central role, which I think can be deadening to the flow of ideas.” And although students sometimes tell her they prefer the structure and predictability of textbooks and traditional oral drills, she adds, “Drilling is not real life.”

Expanding the Community of Learners: Developed six years ago with a \$700,000 grant from the Andrew W. Mellon Foundation, the MOO has allowed three Williams professors and two at Vassar to collaborate on a strong intermediate-level curriculum. “We gain new colleagues this way,” Druxes says. “We all have different ideas.” A native of Wuppertal, Germany, she studied teaching at Westfälische Wilhelms-Universität Münster and earned a doctorate in comparative literature from Brown in 1987, the year she joined Williams’ faculty. She also teaches “Berlin—The Metropolitan Village Between East and West” and “Everyday Life in Literature and Film,” among other courses.

Visit the German-language MOO at moo.vassar.edu:7000 or the English version at moo.vassar.edu:7666. Type in the user name “Guest,” and leave the password field blank.

when participants actually commit, as opposed to imagine committing, a mild blunder as part of the experiment.

“When we commit a faux pas and imagine how others see it, we seldom stop to consider how we would see them in the same circumstance,” Savitsky says. “It’s probably the case that in the midst of an embarrassing moment, when we find ourselves focused inward and mired in our own chagrin, we simply lack the cognitive resources to see ourselves as others see us.”

Savitsky likens these perceptions to an optical illusion. Our self-centered view of the world isn’t “wrong,” he says, but it is something we should take into account in our social interactions.

Savitsky first became interested in social psychology when he read Gilovich’s “How We Know What Isn’t So” (1991) as an undergraduate at Indiana University. He received a doctorate in social and personality psychology from Cornell in 1997 and joined the Williams faculty that year. Courses he teaches include “The Self

and Social Judgment,” “Perspectives on Psychological Issues” and “The Pursuit of Happiness.”

He has received several awards and honors, including a Kellogg Teams and Groups Fellowship from the Kellogg Graduate School of Management at Northwestern University. He has been published in numerous scholarly journals, including the *Journal of Personality and Social Psychology* and the *Journal of Experimental Social Psychology*.