

## Hudson's Way

Carolyn Niehaus '09 helps bring math, science, and history to life on an innovative "floating museum."

By Karen McCally '02 (PhD)

IT'S EARLY ON A WEEKDAY MORNING IN SEPTEMBER, and **Carolyn Niehaus '09** is boarding a small wooden ship anchored in the Hudson River just south of Albany.

Transported to the ship by a small motorboat, Niehaus gains a foothold on the hull, climbs several feet, and jumps on to the deck where she joins a small crew and a gathering of middle school students and their teachers.

The group is participating in the Voyage of Discovery, a signature program of the New Netherland Museum, which Niehaus serves as program director. For almost two weeks, Albany area eighth graders, their teachers, and Dutch counterparts from a school in Heerenveen, the Netherlands, have been retracing the path that Henry Hudson traveled with a mixed English and Dutch crew in the fall of 1609. They've retraced that path aboard a 1989 replica of Hudson's ship, the *Half Moon*. The ship

itself is the site of the New Netherland Museum, which is why Niehaus describes it as an experiential "floating museum."

The students have been conducting experiments as part of a multidisciplinary curriculum in history and science that Niehaus helped design. And they've worked as a team on virtually every aspect of running and maintaining the ship: steering, keeping watch, cooking, cleaning, monitoring for fire hazards—an important role on this mostly wooden vessel.

As the predawn fog has lifted and the sun begins to shine, the group prepares to raise the anchor. It's a complex process, Niehaus explains, and a prime example of the

discipline and teamwork that the voyage instills. “It’s important to be quiet, so they can all hear each other, because they can’t see each other,” she says as the students divide into three groups and scurry off to separate stations on the ship.

When Niehaus graduated from Rochester, she didn’t expect she would be more than passing through her hometown of Albany. But when she was offered a job with the museum, she found it hard to resist.

William Reynolds, the captain of the *Half Moon* and director of the museum, made sure to make it so. He met Niehaus in 1999 when she was an eighth grade participant in a version of the program she now directs. “Right off the bat, she showed real leadership,” he says. She started giving dockside tours of the ship. In high school, she recruited friends to join her. After she went off to Rochester, Reynolds recalled a visit she made to the museum’s small office as her graduation was approaching. “I nabbed her,” says Reynolds.

“I really enjoyed working with my hands but also being mentally stimulated,” Niehaus says of her early connection to the *Half Moon*. “I really enjoyed being in this challenging environment and figuring out how to get things done.”

At Rochester, she majored in English literature and designed her own minor field in sustainability. Although she’s an experienced deckhand and has performed multiple roles on the crew, these days she spends more time in the office and on the road, managing virtually every aspect of running and continuing to build the museum.

A major focus of hers is working with K-12 educators to design hands-on, experiential curricula geared to New York State learning standards. It’s also a strength, she says, growing out of her broad liberal education and the ways in which she was encouraged as a college student to draw connections among concepts and disciplines. “That’s what I loved about Rochester,” she says. “I could study all these topics and connect them for myself.”

It’s not a surprise, Niehaus finds, that other Rochester friends have been drawn to playing roles in the Voyage of Discovery program. Among them are **Julia Cosgrove** ’11, who sailed on the *Half Moon* as a seventh grader, studied ecology and evolutionary biology at Rochester, and joined students in the summer of 2008 to work on shipboard science projects. **Sara DuBois** ’10, who majored in anthropology and Russian studies, played a similar role. And **Carl**

**Adair** ’08, who majored in English and is a doctoral student in English at Princeton University, sailed last summer on the *Half Moon*, serving as the ship’s cook.

Niehaus’s leadership has been critical in ensuring the *Half Moon* has an integral role to play in advancing learning across disciplines, touching on standards taught in science, math, social studies, and English.

During the Voyage of Discovery, students have learned about mechanical advantage, the way in which levers and pulleys amplify force, helping students lift and move heavy items. They’ve tracked the rise and fall of tidal heights, current speeds and direction, the rise and fall of celestial objects.

offers “a personal connection. It’s their peers who are collecting the data.”

As the *Half Moon* approaches its dock in downtown Albany, a crowd of parents, civic leaders, and reporters await, as they have each year since 2009, the 400th anniversary of Hudson’s journey and the year Dutch students began participating in the program. When the welcoming ceremony is over, Niehaus will return to the office to prepare for the publication of a brand new curriculum, “Indians of the Hudson Valley.” Like every other set of lessons she helps design, it’s an interdisciplinary mix—covering history, economics, cross-cultural exchange, and ecology and the environment.



**HANDS-ON DECK:** Niehaus (left), program director of the New Netherland Museum, promotes hands-on learning aboard the *Half Moon* (above), a replica of the ship by the same name that Henry Hudson sailed in 1609.

“These are topics we’ve chosen because they show repeatable, predictable patterns,” she says. “The students can collect this data and graph it and get curves that show them that if they take measurements in a way that is regularized or repeatable, they can predict what will happen.”

It’s a lesson that many children learn in textbooks. But Niehaus is working to make the *Half Moon* experience more broadly accessible.

“I’ve been working on a livestreaming program so that students can tune in and watch a live videostream of students presenting their projects,” she says. As classroom students see how their peers have collected data, they can use that data to form their own graphs and draw their own conclusions. Livestreaming, Niehaus says,

As winter approaches, she’ll coordinate the museum’s sizeable base of volunteers, as together they re-outfit the ship with replica artifacts for regular, public dockside tours as well as school tours.

She’ll be seeking more opportunities to share the museum’s resources with other kinds of audiences, such as corporate groups and incoming high school or college classes. “It’s a great way to build a leadership community,” she says, referring to the day-to-day teamwork required to operate the ship.

And she’ll be preparing for the next Voyage of Discovery. Interest in the program, she says, has been self-sustaining. “It’s driven by teachers—teachers who say, ‘This is great, we want to be a part of this’—and then help to make that happen.”

# When a Dead Language Is Cutting-Edge

Marcy Braverman Goldstein '92 makes an enterprise out of an interest she once thought "obscure."

By Karen McCally '02 (PhD)

IT'S NOT A TYPICAL PATH TO ENTREPRENEURSHIP: a bachelor of arts in religion, followed by doctoral study of religion with training in what's often considered a dead language to boot.

But the knowledge **Marcy Braverman Goldstein** '92 has painstakingly acquired, and which she shares with tuition-paying college students near her home in Charlotte, N.C., is knowledge she's discovered many other people in her community would like to have themselves.

"I realized the knowledge from my education—the actual content of it—was some-

which she offers Sanskrit workshops for yoga instructors and students. She's enjoyed as much demand as she can take on while still continuing to teach at the college level—something she has no plans to abandon.

Sanskrit words don't just name every pose—or, in Sanskrit, *āsana*. Their sounds are an integral part of the practice of yoga itself. Some instructors have begun to incorporate more Sanskrit into their lessons—replacing English names for poses, such as the "corpse pose," for example, with its Sanskrit name, *śavāsana*—but with few places to turn for accurate knowledge of the language, mispronunciations are common.

**"I realized the knowledge from my education—the actual content of it—was something that many people truly want to know. And they don't necessarily want to pay \$2,000 to take a course at their local university."**

thing that many people truly want to know. And they don't necessarily want to pay \$2,000 to take a course at their local university," Goldstein says.

Goldstein majored in religion at Rochester and developed a special interest in Hinduism and its scriptural language, Sanskrit. At the time, she says, "my interests seemed obscure." But she continued her studies, earning a doctorate at the University of California at Santa Barbara.

Among the world's most ancient languages, Sanskrit is rarely spoken. Yet it's the language of an increasingly popular activity in the West: yoga. Yoga is a multimillion-dollar industry in the United States alone. And as evidence has mounted for its benefits to physical and mental health, physicians and other health professionals have begun to integrate yoga in their treatment plans.

Yet the quality of yoga instruction is uneven, and an important element missing in much of it, Goldstein says, is Sanskrit.

Two years ago, she founded Sanskrit Revolution, a sole proprietorship through

Does it matter? That depends, Goldstein says. "For some people, yoga is just a physical fitness routine, and that's fine." But in her workshops in the Charlotte area, on the road, and at national conferences, she has identified a large community that wants a lot more out of yoga. "For many people," she says, "it's a way of life."

This latter group is an eager audience for what Goldstein offers.

"Sanskrit is a language of sound, rhythm, and melody," she explains. "What Sanskrit says about itself is that each sound has a particular vibration that is healing in a particular way." Whether one accepts that argument or not, Goldstein says, most people agree that some sounds are inherently more peaceful than others. Although she notes that scholars generally reject the notion of a "pure Sanskrit"—a single, correct, and unchanging set of pronunciations—Goldstein also says, "There are some absolute mispronunciations."

"I sometimes say to people, 'How do you soothe a sleeping baby? Do you go to the


baby and say, 'kuh kuh kuh kuh'? Or do you say 'shhhh'?" she says.

In her workshops, she goes over the most commonly mispronounced *āsanas*, exploring their meanings by breaking the words down into their roots, and discussing the shades of meaning implied in each syllable. Participants in her workshops earn what's called a CEU, or continuing education unit, part of an effort by the national governing body the Yoga Alliance to professionalize—a development Goldstein embraces, particularly given the increasing interest in yoga by health practitioners who've undergone rigorous training in their own fields.

She says Sanskrit Revolution wasn't hard to get started. It grew out of something she was already doing. "I started teaching Sanskrit casually at some of the big yoga studios in L.A.," she says, recalling her years as a graduate student in Santa Barbara. "People just kept coming back."

As is the case for many entrepreneurs, digital tools have made it possible for her to reach a wide audience. She traces the start of her business to the day she bought the domain name for her website, [www.sanskritrevolution.com](http://www.sanskritrevolution.com), and has since added a Facebook page. In addition to a schedule, information, and links, Goldstein is working on a Sanskrit dictionary that will be downloadable as an app. She envisions adding to her website an online store for the purchase of study materials and Sanskrit Revolution gear. And she's exploring online teaching as well.

On her website, Goldstein welcomes visitors by telling them the story of how she got interested in Sanskrit in the first place: as a student in the course Asian Search for Self, taught by Rochester professor of religion Douglas Brooks. Brooks, who also teaches outside the academy, says that in addition to her scholarly credibility, Goldstein is offering "accessibility to a very difficult and usually inaccessible subject." And if yoga instructors were to learn "just enough Sanskrit—and they will if they study with Marcy—they bring credit to the traditions of India and to their own profession."

For Goldstein, accessibility is perhaps the highest aim of Sanskrit Revolution. "I want to make this accessible," she says. "It can only go so far in the confines of a university setting." 



**IN DEMAND:** Based in Charlotte, N.C., Goldstein takes her Sanskrit workshops on the road, to places such as Willow Street Yoga Center, in Silver Spring, Md., where she conducted “Sanskrit: The Language of Yoga in Texts, Āsana, and Kirtan,” in November.



**SCIENTIST AND ACTIVIST:** Cooper, a chemist and local civil rights leader, was recognized by the Rochester Area Community Foundation.

## Highest Honors

**Walter Cooper** '57 (PhD) has been awarded the Rochester Area Community Foundation's highest honor for philanthropy, the Joe U. Posner Founders Award.

The first African American to receive a doctorate in chemistry from the University, Cooper began his career as a research scientist at Eastman Kodak, working his way up to manager of research innovation and obtaining multiple patents in polymerization during his three decades with the company.

An activist during the civil rights movement in the 1960s, Cooper became associate

director of Action for a Better Community, was a founding member of the Urban League of Rochester, and served on the New York State Advisory Committee of the U.S. Civil Rights Commission.

In later years, he helped found the city of Rochester's urban-suburban transfer program and served as a New York State regent.

He continues to work with the regents, advocating for educational rights for the children of migrant workers.

In 2008, the University awarded Cooper the Frederick Douglass Medal.

## Calling Dr. Cove

An unprecedented and lifesaving procedure performed at Strong Memorial Hospital in 2010 by Rochester cardiologist **Christopher Cove** '89M (Flw), '89M (Res) was the inspiration for an episode last fall of the ABC television medical drama *Grey's Anatomy*.

Fans of the show tuned in October 24 as a fictional medical team injected a form of medical superglue into a man's heart to halt the growth of a rare type of cardiac tumor. It was a dramatization of the procedure Cove had performed three years ago on a 30-year-old woman from Wayne County, N.Y.

After several unsuccessful attempts to destroy a tangle of vessels pulling blood away from the woman's heart, Cove consulted with Rochester neurosurgeon Babak Jahromi. Jahromi had treated similar tumors in the brain by injecting a glue-like substance called Onyx into the vessels, shutting off blood supply to the growth.

Producers of *Grey's Anatomy* contacted Cove after reading about the procedure. Cove served as a consultant during the making of the episode, ensuring the medical accuracy of the dramatization.

## In Sync with Frank Lloyd Wright

The new owners of Frank Lloyd Wright's 1952 Brandes House, in Sammamish, Wash., commissioned fine artist **Rosalyn Engelman** '78 (MS) for a centerpiece painting.

At a reception held at her Manhattan studio in October, Engelman unveiled the diptych painting, which she designed in context with the home's Japanese-inspired interior.

Engelman developed an interest in Japanese art as a master's degree student at Rochester.

The Brandes House is listed on the National Register of Historic Places.



**SHOWCASED:** Work by Engelman will adorn the 1952 Frank Lloyd Wright home known as the Brandes House.

## An Asteroid of His Own

**Bill Golisch** '80 has his very own asteroid—or at least, an asteroid that bears his name.

Upon Golisch's retirement after 30 years as a telescope operator at the National Aeronautics and Space Administration Infrared Telescope Facility, the International Astronomical Union gave asteroid number 8457 a

new official name: Billgolisch. The new name comes with a citation to Golisch, whose "expertise and dedication to observers have helped facilitate observations used in hundreds of planetary research projects." The NASA facility is located atop Mauna Kea in Hawaii. Golisch has retired to San Diego.

# Sound Science

Acoustical consultant Matt Roe '07, '08 (MS), official measurer of a record-setting roar, delves into the complexities of noise.

Interview by Karen McCally '02 (PhD)

AT THE SEATTLE FIRM SSA ACOUSTICS, acoustical consultant **Matt Roe** '07, '08 (MS) says his typical work “really runs the gamut.” To help control noise, Roe advises on the design and construction of virtually every type of building—multifamily residences, commercial buildings, and lots of K-12 schools.

But this past fall, Roe found himself with a wholly different kind of assignment. A fan group of the Seattle Seahawks football team set out to lead Seahawks fans in a record-setting stadium roar. As the Seahawks prepared for a September match-up against the San Francisco 49ers, the group invited a representative from Guinness World Records to the game, as well as Roe, who would conduct measurements to pass muster with Guinness.

Following a game-changing play by the Seahawks, Roe measured an instantaneous maximum sound level of 136.6 decibels. It was a record, surpassing the old record of 131.76 decibels, set in 2011 by Turkish soccer fans at the Ali Sami Yen Sports Complex in Istanbul. Kansas City Chiefs fans would top the Seahawks record within weeks, but Roe returned in December as the Seahawks fans achieved a new record of 137.6 decibels.

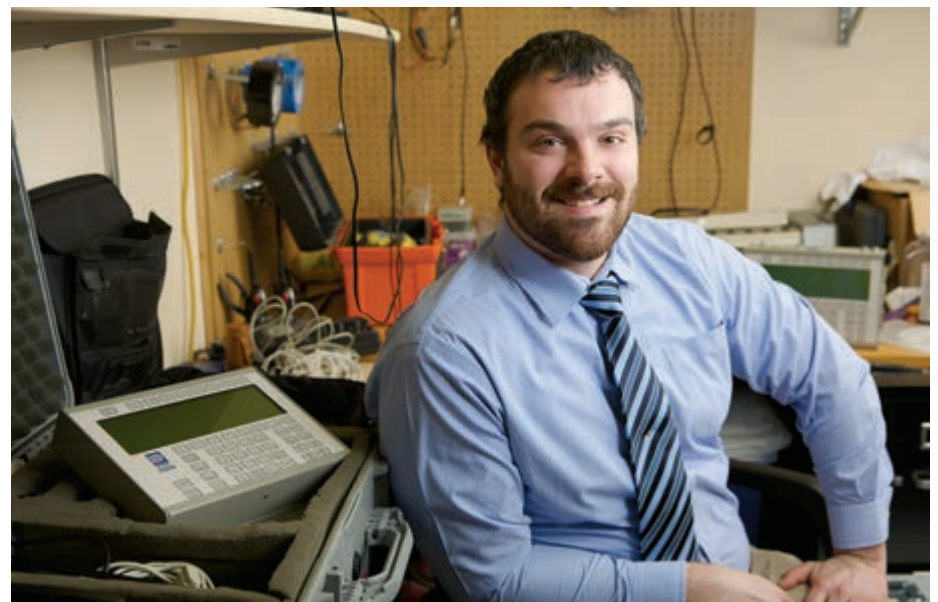
## What equipment did you use to measure the record-setting cheers?

We used a real-time spectrum analyzer. It's a pretty complex piece of machinery, measuring sound in a multitude of different ways. In this case, we were looking primarily for a peak sound level, which is what Guinness World Records specifies. Every time you start up the spectrum analyzer, you have to calibrate it to a known level with a certified calibrator. It's not something that can be reliably done unless you have practice with the specific piece of equipment. So we all train and practice with the equipment that we have in our office.

## Does the peak sound level measurement reflect what laypeople might simply think of as volume?

Not exactly. The complicated thing about noise is that there are a lot of different ways

to describe it. Sound can be broken down both by frequency, which corresponds to pitch, and level, which is described by the decibel rating. But there are different types of decibel ratings. Some ratings weigh various elements of sound to account for the way our ears process pitch as well as level, reflecting our perception of loudness. The 137.6-decibel measurement refers to what's called a dbA, or A-weighted decibel rating. A-weighted decibel ratings weigh mid to high frequencies more heavily than low fre-



quencies, generally corresponding to how our ears perceive sound.

## Not all stadiums are created equally in helping to amplify sound, are they?

In general, that's the case. The previous record had been set at a stadium in Turkey that was almost entirely enclosed. All of the seating was covered underneath an awning. Geometrically, that's sort of similar to the way Seahawks Stadium is set up, with large reflective surfaces covering the main crowd areas. And that promotes additional reflection of sound back toward the field. It's said that there have been the highest number of false starts at Seahawks games

▲ **TAKING MEASURE:** Acoustical consultant Roe sits beside his spectrum analyzer, the complex machine he takes on the road to measure various aspects of sound.

in CenturyLink Field of any stadium in the country. And that can pretty well be attributed to those reflective surfaces. Not to diminish anything from the fans. They're also really loud.

## It's been reported that the record-setting roars were as loud as a jet engine. True?

Not exactly. You're not comparing apples to apples, and in the general vernacular, that isn't really recognized. Typically, when we describe noise, we use a metric called the

LEQ, which is the equivalent continuous sound level. It's an averaging out of peaks and valleys. So when you see a number like 120 or 130 decibels quoted for a jet engine, that's an LEQ rating. We were measuring what's called a peak, or instantaneous, maximum. That's the loudest part of the whole sound that we measured. The LEQs that we were measured were significantly lower than the 137.6 decibels that we measured for the record.

## This contest has faced some criticism, including from many football fans. Is it unsafe?

If you were exposed to that kind of level of sound regularly, that would be a concern. We were wearing hearing protection, and a number of the fans were wearing ear protection. They were giving it out at the stadium. Ⓜ