

Great local minds of the Capital Region

Wow, we're lucky to live in a place like this. We're surrounded by schools and universities, theaters and museums, galleries and art everywhere. We also have some of the smartest people in the world living and working among us. Authors, poets, architects, scientists, activists. And they're all accessible to us here, which is why we wanted to showcase just a few of the many, many brilliant members of our community. Here are just 10 of the smartest people in the Capital Region.

[Sujatha Sankaran:](#)

Sujatha Sankaran's parents were both doctors while she was growing up in India so the pressure for her to do the same was intense. But she thought otherwise. "That was not the field for me," she says. "Just the thought of it made me queasy."

"Working with numbers and equations was a lot better for me," she adds. "It sounds a little crazy but I've actually wanted to be a physicist from the time I think I was 10 or 11."

Luckily, her older sister went on to become a surgeon and Sankaran was supported in her studies in physics.

Her work has a pervasive influence in the marketplace and she loves the pace at Global Foundries, where she leads 140 people. She now develops products that will go into the market five years from now. "My job is to enable all the semiconductor processes to help the future products," she says. "It's a lot of conceptualization followed by trying things out and actually making things happen." She can be overseeing 15 to 20 major projects at a given time. "It's a challenge. And it's a very fast-paced environment. There are a lot of unknowns," Sankaran says. "The other piece I really enjoy is the team I work with. It's great to have some really sharp people working toward a specific end goal and being part of a winning team."

It's a field mostly dominated by men, but she sees that changing. And she has this advice for girls looking to enter her field: "Don't let anyone tell you you can't. There will be many instances where you will feel like you're the odd one out but it's OK. There's a lot to be gained by being the odd one out."

As for downtime, she spends a lot of time outdoors. "And this year, I bought myself a Corvette."

Sujatha Sankaran

AGE: 41

TITLE/COMPANY/CITY: Global Foundries, director of technology development in Fab 8, Malta

FIELD/INDUSTRY: physicist

EDUCATION: Ph.D. from University at Albany, master's degree from [University of Madras](#), bachelor's degree from [Stella Maris](#)

PROUDEST ACHIEVEMENT: Her work at IBM involving important technology that went into the Xbox and PlayStations that's also been used in wireless and high-end servers. "Prior to that it was always difficult to explain to people what I did. Then when you start talking to 10-year-olds who are sort of attached at the hip to their Xboxes I always say, 'Oh yeah, I made the stuff that goes in there.'"

[Jonathan Wolpaw](#) and [Gerwin Schalk](#):

Coming from a family of physicians, Jonathan Wolpaw always knew he wanted to go into medicine. But it was caring for a patient with severe amnesia during medical school that sent Wolpaw on the path to studying the physiological mechanisms of memory.

Today, Wolpaw's work at the [Wadsworth Center](#) — along with that of fellow scientist Gerwin Schalk — has been recognized by [the National Institutes of Health](#) for outstanding achievements in brain and spinal cord research. A major grant was awarded by NIH to establish the [National Center for Adaptive Neurotechnologies](#).

For a long time, it was rather radical to think of the spinal cord as a route to study memory. Although some early studies had been done in this area in the 1920s, it had largely been forgotten by the time Wolpaw began doing his research in the 1970s.

"It was viewed as not only ridiculous, but also unimportant," Wolpaw says. This was because people believed the spinal cord was hardwired, unable to be changed. "If you had a spinal cord injury, you were stuck with what was left."

After clinical training in neurology and postdoctoral training at NIH, Wolpaw turned down offers from both NIH and Stanford to take a research position with the Army. Wolpaw's department head in the Army recognized the potential of his work and allowed him to pursue his studies.

Wolpaw's early research landed him a grant from the [Cerebral Palsy Foundation](#) when he

joined the Wadsworth Center. Wolpaw was now able to develop his spinal cord model, assemble a small research group to work on it, and within a few years received the support of the NIH.

The early research was the basis for an uninterrupted 35-year career at the Wadsworth Center. Here Wolpaw has been studying, elaborating on, and describing the characteristics of memory induced by training a spinal cord-mediated reflex.

While the initial purpose of this work was basic research, the findings now give hope to those who have suffered spinal cord injuries or strokes. "Our center is developing ways to improve and restore function that were not thought possible 20 to 30 years ago," he says.

Additionally, Wolpaw's group has led the development of brain-computer interfaces (BCIs). BCIs can restore communication in people paralyzed by disorders like ALS. His role as a founder of this flourishing new field was recently recognized by his election as the first president of the newly formed [Brain-Computer Interface Society](#).

When asked how his lab differs from others, Wolpaw said, "We are good at retaining people who are extremely good at what they do and we enable them to work productively together." The core members of the current group hard at work in downtown Albany have been together for 15 to 30 years.

Gerwin Schalk had no idea he wanted to be a scientist. With a background in engineering and computer science, he considered himself a "curious computer geek."

And yet, along with fellow scientist Jonathan Wolpaw, Schalk and his work at the Wadsworth [Center in Albany](#) has been recognized by the National Institutes of Health (NIH). The two scientists have been researching new ways to restore function in people with spinal cord injuries, stroke or other neural disorders. Schalk and Wolpaw now run the NIH-sponsored National Center for Adaptive Neurotechnologies — the only center of its kind in the country.

Schalk follows a two-pronged approach in his work: First, he strives to better understand the brain. Second, he says, he makes use of that understanding by creating new devices that can diagnose or treat nervous system disorders. For example, along with collaborators at [Albany Medical Center](#), Schalk invented and patented a device that can rapidly identify those brain areas responsible for different functions, which is highly useful for surgeons when performing complicated brain surgeries.

G.Tec, an Austrian neurotechnology company, licensed the rights to this technology.

Encouraged by the important promise of this approach, G.Tech opened an American subsidiary in Albany so that they can continue to work with Schalk and his team at Albany Medical Center.

Schalk says he's excited to pursue a new class of medicine not based on pharmaceuticals, but on electricity. That is, electrically stimulating specific parts of the brain, rather than chemically.

Sound crazy? Consider this: Schalk points out that while pharmaceuticals are important, they have limitations. Pills can often take a toll on the brain or body with side effects, which can be "all over the place and not very specific," he says.

In contrast, by interacting with the brain electrically, very specific regions can be targeted, leaving the rest untouched. This new method could improve walking in those with a spinal cord injury, or help to restore hand movement functions in people after a stroke.

Schalk feels strongly about establishing the Center in Albany as a hotbed for neurotechnology research and development. "Not only the center," he says, "but the Capital Region as a whole."

JONATHAN WOLPAW AGE: 70

TITLE/COMPANY/CITY: director of the National Center for Adaptive Neurotechnologies, Wadsworth Center, [New York State Department of Health](#); Department of Neurology, [Stratton VA Medical Center](#)

FIELD/INDUSTRY: neuroscience

EDUCATION: M.D. from [Case Western Reserve University](#); B.A. from [Amherst College](#)

MOST BRILLIANT ACHIEVEMENT: Using the spinal cord to study learning and memory

GERWIN SCHALK AGE: 44

TITLE/COMPANY/CITY: research scientist at the Wadsworth Center, Albany; deputy director of the National Center for Adaptive Neurotechnologies, Albany

FIELD/INDUSTRY: neurotechnology

EDUCATION: Ph.D. and M.S. from [Rensselaer Polytechnic Institute](#), M.S. and B.S.

from [Graz University of Technology](#) in Austria

MOST BRILLIANT ACHIEVEMENT: "To begin to understand the language of the brain"

[Barbara Smith](#):

Listen to Barbara Smith talk about the black feminist movement and you will shiver. You will feel it. She's a natural storyteller and a passionate community voice.

Asked to describe herself, she says she "consistently works for justice." And she works hard. Always has. As a child, she excelled at school. As a writer, she founded Kitchen Table: Women of [Color Press](#). As a professor and when she was on the city council in Albany. And as a black feminist activist and part of the Combahee River Collective. That group named themselves after the South Carolina river where Harriet Tubman led Union soldiers on a raid that freed 750 slaves.

"I always felt that I had a purpose," she said. "It's how we were raised. We were raised to have a social consciousness and a social conscience both and we weren't supposed to be idle," she said. In 2005, she was nominated for the Nobel Peace Prize.

"I was involved in building the black feminist movement in this country at a time when it was considered to be absolutely verboten," she said. "It was a time in the 1970s where black nationalism and black color were the order of the day, where black political thought was. And in general when people talked about black issues during that period and for many decades following they basically meant issues that applied much to men, to black man and no distinctions were made. We worked very hard to assert that we had a right to have a political analysis and practice that reflected our own lived experiences, that reflected our own actual social economic statuses. That was the root of intersectionality."

Now, Smith is working for Albany as special community projects coordinator.

"My major responsibility is to implement an equity agenda." The major focus is jobs, economic stability and quality housing, she said. "You can't really have a fully successful city if you have large pockets of inequality, of racism, poverty."

Barbara Smith:

AGE: 69

TITLE/COMPANY/CITY: special community projects coordinator for the city of

Albany

FIELD/INDUSTRY: activist, author, scholar, feminist

EDUCATION: bachelor's degree from [Mount Holyoke College](#), master's in English from [University of Pittsburgh](#), course work for doctorate, University of Connecticut, honorary doctorate from the University at Albany.

MOST BRILLIANT ACHIEVEMENT: Laying the political groundwork for the concept of intersectionality, the study of interactions between systems of discrimination. (The term was later coined by legal scholar Kimberle Crenshaw.)

[Earl Zimmerman](#) and [Igor Lednev](#):

Earl Zimmerman and Igor Lednev of the University of Albany have recently been recognized for their monumental advancements with Alzheimer's disease at the Alzheimer's Center at Albany Medical Center.

Being able to use a blood test to diagnose Alzheimer's is the "holy grail" for Zimmerman. Current testing for Alzheimer's is complicated and cumbersome, sometimes even invasive, as with spinal testing. "Blood tests are simple and non-invasive," he says, and, further, significantly cheaper than other tests. Think \$10 versus \$2,000.

A blood test would allow the chronic disease to be caught early on, which is vitally important. Often when patients reach a moderate stage of Alzheimer's they start to experience behavioral issues, sometimes even psychosis and hallucinations. With a blood test, the disease can be caught and managed — before patients get to that dangerous point.

Currently, the center has made significant strides toward this blood test, but further funding will be needed to continue in the research.

Zimmerman's interest in Alzheimer's and related diseases happened by accident, when Sen. Mark Hatfield of Oregon recruited him. "He basically called me and said, 'We want you to come out here and have an Alzheimer's research center.'"

Zimmerman got this center funded in 1987. In the early 2000s, he had the resources in the Capital Region to move back to the area and start his own center here.

"These centers are really important," he says. "They teach doctors how to diagnose and take care of patients, they're involved in the community, and they're plugged into the

international scene with this stuff."

Funded by the Goldberg Center, the Alzheimer's Center at Albany Medical Center was started by Zimmerman himself in 2002, and it serves a wide area in the Northeast and beyond. "There's nothing else like it around," Zimmerman says proudly.

Who can use lasers to essentially diagnose Alzheimer's? Who can use gunshot residue to potentially trace what type of firearm was used in a crime? Igor Lednev.

Lednev, along with Earl Zimmerman of Albany Medical Center, is perhaps best known for his efforts towards an earlier diagnosis of Alzheimer's disease through laser spectroscopy. This technology is being used to diagnose Alzheimer's through a blood test, something that has not been done before.

"It's not easy to find something new when so much has already been discovered," Lednev says. And yet that's exactly what he's done.

Alzheimer's is a difficult disease to diagnose. For the most part, we can only observe it through a behavioral context.

Lednev and Zimmerman came up with the idea to use lasers to get a specific vibrational signature of biological samples. Basically, this results in a blood test. Or as Lednev describes it, the unique signature of the blood "reports on its biochemical composition and can be used for a non-invasive disease diagnostics."

Their study involved three groups of patients: those with Alzheimer's, those with other types of dementia and healthy controls. Not only did Lednev and his partner find they can diagnose Alzheimer's with blood samples, but they can also pinpoint the disease at its various stages — this allows for earlier diagnosis, which is critical.

"There is no actual cure [for Alzheimer's]; however, there are methods that allow us to slow down the disease development, so it's very important to get an earlier diagnosis," Lednev explains.

Not only has Lednev accomplished such a breakthrough with Alzheimer's, but he's also made significant strides with gunshot residue in crime scene forensics. Specifically, he's worked to recognize what type of firearm has been discharged based on gunshot residue alone.

"Gunshot residue was before only used to establish that a shooting took place, or that a gun was shot recently, but we can do more," Lednev says. "We can characterize chemical

composition of residue to identify a specific firearm."

Lednev and his team experimented with different guns. They found they could determine which gun the residue came from — from only a single particle. Keep in mind, this technology hasn't been developed for all ammunition and all guns, but what it can do right now is to eliminate certain firearms as having been used at the crime scene.

Although the fundamental research is clearly an area of Lednev's expertise, he says as he gets into the later stages of his career he's really moving toward "doing something useful and practical for people" — taking his discoveries and applying them towards real life situations. This basic idea of helping people certainly applies to his students.

Lednev proudly talked about the fantastic — and local! — jobs many of his students have gone on to get. Former students of his went on to work at Albany Molecular Research Inc. in Albany and Rensselaer; Regeneron Inc. in Rensselaer; Global Foundries in Malta; the Wadsworth Center in Albany; and the New York State Police Crime Laboratories in Albany.

Last year, one of Lednev's former students, Dr. Dimitriy Kurouski, was presented the award for Best Junior Researcher at the International Conference on Raman Spectroscopy in Germany, the highest honor in the world for that particular prestige.

EARL ZIMMERMAN

AGE: 78

TITLE/COMPANY/CITY: professor of neurology, Albany Medical Center, Albany

FIELD/INDUSTRY: neurology

EDUCATION: M.D. from University of Pennsylvania, residency and fellowship at Columbia University

MOST BRILLIANT ACHIEVEMENT: "Being an excellent physician and sought-after consultant"

IGOR LEDNEV

AGE: 58

TITLE/COMPANY/CITY: professor of chemistry, University at Albany, Albany

FIELD/INDUSTRY: laser spectroscopy

EDUCATION: from the Moscow Institute of Physics and Technology: Ph.D. in physical chemistry, B.S. in analytical chemistry; postgraduate work at University of Durham and University of York, U.K., and University of Pittsburgh

MOST BRILLIANT ACHIEVEMENT: Building new instruments that allowed him to discover new phenomena in protein folding and aggregation, the development of new methods for disease diagnostics and for forensics, and being appointed an advisory member for the White House Subcommittee for Forensic Science

[Lydia Davis:](#)

Here's "The Fly," an entire story by Lydia Davis:

*"At the back of the bus,
inside the bathroom,
this very small illegal passenger,
on its way to Boston."*

The fly, cows, a husband's opinion of dinner choices, letters of complaint. These are the moments Davis turns into what the MacArthur Foundation called literary miniatures in their description of her work when she won their "genius grant" in 2003.

"I've always liked becoming really absorbed in a situation or a moment, observing what's going on, thinking about it. ... I do enjoy just watching and just thinking, without distraction. I would also notice a fly because I have a lot of empathy for other creatures," she said in an interview conducted via email.

Living in a small village in Rensselaer County inspires her. "It's a good place to work." She wrote a little book with observations about the cows across the street. She hears owls, weeds her garden and is a village board member.

"Oh, I suppose I keep returning again and again to the little incidents and encounters of everyday life, little interactions between strangers or married couples, that sort of thing," she said. "People are so quirky and interesting, and the language we all use is also so odd, sometimes."

Some might be surprised that Davis, who also won the Man Booker international Prize, wasn't always the best student. "I was quite good at English, Math, and languages (As and Bs), but not so good at History, Current Events, and other subjects (Cs, Ds, and Fs). ... So

my grades were always very uneven, right through college. I liked to write, as a child, but even more I liked to read. I also loved to play the piano, sing, read music. Music was my great passion, really, and writing came second, or rather third, after reading."

Lydia Davis:

AGE: 68

TITLE/COMPANY/CITY: writer, professor at University at Albany, East Nassau, Rensselaer County

FIELD/INDUSTRY: writing and translating

EDUCATION: B.A. from [Barnard College](#)

MOST BRILLIANT ACHIEVEMENT: Translating "Swann's Way" by Marcel Proust from the original French. She calls it "the most extended and most thorough piece of work I've ever done."

[Adam Frelin](#) and [Barbara Nelson](#):

Frelin wasn't just curious about an event that took place for about 100 years at Yosemite National Park that ended in the 1960s. Workers would send burning embers cascading down a cliff like a waterfall on fire. He knew he had to see it for himself, but the only way was if he did it.

So at a stone quarry in Ravena, he did. Fire flowed down a cliff before an audience of 400. "You feel like you brought something to life that's bigger than yourself."

Frelin's constantly observing and what he calls "referencing." A section on his website shows notebooks with hundreds of ideas penned in. Click on his visual references, and you'll see photos from news stories, old pictures, captured videos, things that spark something.

"All of us wear different hats," he said "I'm in artist mode more than other modes. You're picking up things as you go. That inventory of references -- that I do all the time. ... And that's become super crucial at the way that I work. It's a way to help me recognize patterns. It tells me what I'm interested in."

Frelin will take on his most ambitious project over the course of the next year – illuminating 500 vacant buildings in Albany, Schenectady and Troy – along with architect Barbara Nelson. The project, dubbed "Breathing Lights," received a \$1 million grant from

Bloomberg Philanthropies.

The origin of "Breathing Lights" goes back to when he was doing some work in St. Louis. Prior to that he was teaching in Vienna, Austria, and while staying across the street from a building he noticed people watching TV at night with the blue light filtering out of the windows.

"It become this amazing sort of little bit of a light symphony ... There was this predictability mixed with randomness that was really hypnotic," Frelin said.

"What happens with a lot with art making is that it's not so much about what you invent out of your head because your head's full of stuff that came from somewhere else. It's about selecting."

For his St. Louis project he found complexes where residents agreed to move TVs to the windows.

In "Breathing Lights," the idea is to allude to life in a dormant place.

"So simply by creating the presence of something breathing and the warmth of incandescent colored light in a place that had had been abandoned we felt like that produced a really effective metaphor."

It seems like Barbara Nelson and Troy were made for each other. The architect's made an indelible mark on this city with her preservation and public art efforts and her work at RPI.

"So I came to Troy in '75 and started architecture school and never left," she said. "I stayed because I got an offer at TAP. But also, it felt like a place where I could make a difference. Troy had been through many decades of decline and slow steady growth. I've seen and participated in a lot of that. I just love this funny little city."

Her passion for public art and community revitalization played a part in receiving a \$1 million grant for "Breathing Lights," a project she is overseeing with artist Adam Frelin. They will illuminate 500 vacant buildings with pulsating lights to bring attention to the area's problem with abandoned buildings. The project also involves policy makers, artists and urban planners.

"The basic premise is to illustrate, show artistically, to give a visual to the community life force that lives beneath the ground in these neighborhoods that really seem lost. They seem distraught. They're stressed out. They're full of vacant buildings. If we can make art out of those things that so many of us have learned to not look at and we've trained

ourselves to stay away from those neighborhoods."

Even Nelson's downtime meshes with her philosophy. She walks her beagle, Buzz Lightyear, in her Troy neighborhood, lives in a century-old house and has been encouraged to bike by her RPI students since they work on ways to make the community more walkable and bikeable.

"I wear a lot of hats because it's all so doable," she said.

Adam Frelin:

AGE: 42

TITLE/COMPANY/CITY: artist, Troy

FIELD/INDUSTRY: large-scale public art projects

EDUCATION: B.F.A. from [Indiana University of Pennsylvania](#), M.F.A. from [University of California](#), San Diego

MOST BRILLIANT ACHIEVEMENT: "Firefall," 2012

Barbara Nelson

AGE: 58

TITLE/COMPANY/CITY: architect, executive director TAP (Troy Architectural Program)

FIELD/INDUSTRY: architecture, teaching, community activism, public art advocate

EDUCATION: B.S. in architecture and building science from RPI

MOST BRILLIANT ACHIEVEMENT: The work she's done with RPI for the last 24 years, particularly the completion of the East Campus Athletic Village. She recently left to head TAP.

Ted Krueger:

Ted Krueger can't remember a time when he wasn't interested in architecture. He's been building stuff since he was a kid. But architecture, he says, isn't just about building things. Krueger's work combines architecture with something called "perceptual prosthetics."

How does architecture relate to prosthetics? Krueger finds most people believe architecture is simply the construction of buildings. But for him, buildings and people are not so different; they're part of a continuum. He describes architecture as a sort of second skin, moved out a few feet from the body.

"For me, it's not too strange to move from a relationship where we're working with the body to working with a machine or a building," Krueger says. "Is the cellphone a prosthetic? ... When we're removed from them, we feel like we're diminished, just like we would if a hand was removed." Building buildings and constructing a prosthetic arm or leg require the same set of skills and experiences, just with different applications.

Krueger says he finds architecture to be one of the most engaging fields. He spends about an hour a week per student with one-on-one time. "Some students can show up to class, take notes, not speak to anyone, and ace the tests," he says. "Not in architecture. Architecture is a conversation."

When asked what his most brilliant achievement has been, Krueger jokes, "It's coming! I can feel it coming!" After thinking on it a moment, he adds he doesn't really see people trying to extend human perception.

Years ago, Krueger says he was inspired by research he saw at the University of Wisconsin by the American neuroscientist Paul Bach-y-Rita. Specifically, Krueger saw a special kind of camera that could project a picture onto a blind man's back using vibrations. The subject could "read" the text of the image and recognize the images' objects and figures.

This research, called "sensory substitution," transformed the input of one sense so it could be perceived by another. And that's exactly the sort of stuff that gets the wheels in Krueger's brain spinning.

If a blind man can acquire a new sense through technology, why not Krueger? "What if I could? What if I could perceive magnetic fields?," he says. Krueger is, in fact, working on just that.

Part of his research includes extreme environments and, in particular, how humans react to these environments. He explains that humans can technically have everything they need to survive biologically in a particular environment, but they can't live in it — like living in space or in a deep sea submarine. "They go crazy," Krueger says. "We're more complicated organisms — we don't just need to survive, we need much more."

Currently, Krueger is collaborating on a project in Brazil, assembling multidisciplinary teams of artists, scientists, doctors, and designers to work on social environment problems.

Ted Krueger

AGE: 60

TITLE/COMPANY/CITY: associate professor of architecture, Rensselaer Polytechnic Institute, Troy

FIELD/INDUSTRY: architecture

EDUCATION: Ph.D. in architecture from RMIT, master of architecture degree from Columbia, undergraduate work at University of Wisconsin at Madison and the School of the Art Institute of Chicago

MOST BRILLIANT ACHIEVEMENT: "extending human perception"