Faith Schmitt in a warehouse at Illumina's San Diego headquarters. Photo by Kristy Walker

Happy International Women in Engineering Day!

Illumina honors the bright minds innovating and improving genomics technology every day

ILLUMINA EMPLOYS MULTIPLE kinds of engineers across the globe. On International Women in Engineering Day, we're recognizing those employees who build things, get a thrill out of solving problems, and live for innovation. We spoke with three women in three countries who are all proud Illumina engineers.

Designing the perfect package

When Faith Schmitt was an Illumina intern in 2013, she "instantly fell in love with the culture of the company and the mission we represent." After graduating with a degree in chemical engineering from the University of California, Riverside, she returned to Illumina and joined the packaging engineering team, which designs the packaging and labels for all Illumina products, ensuring each item gets to customers safely and in the right condition.

Schmitt's team must think through the many ways a product could be handled. What will affect it as it's being placed in the warehouses, and then shipped to the end user—from oxygen and moisture to shock and vibration? What might change as the customer unpacks, stores, and interacts with it? "We go through a lot of different design iterations and testing to make sure we're protecting the product as much as possible, and also communicating what it is and what it does to the customer."

When creating a design, they consider style, material, physics, safety, and cost, among other factors. They also work extensively on the environmental impact of product shipping and delivery.

For the NovaSeq X Series, Schmitt was part of the team who helped develop a protocol to test the sequencer's reagents for ambient shipping. Their goal was to be able to ship all the materials that the new sequencers use all over the world without using dry ice containers or gel packs. "We knew that would be a huge win for the customer and the environment," she says. Ambient shipping would save money, waste, unpacking time, and more. They tested the packaging in a range of possible scenarios, such as sending them on multiple flights plus ground transportation through a hot climate to a customer's lab in Saudi Arabia.

Schmitt loved that project, but her favorite was her team's 2020 launch in the US of a material replacing the polystyrene containers used in Illumina's cold-chain shipments. They released a cellulose-paper-based insulation material that is recyclable and can be broken

down flat. "Customers were super excited about it," she says. "Packaging obviously gets a bad rap because it's going to be turned into waste. But the Illumina packaging team is passionate about sustainability and wanted to be early in the industry to achieve that." They've now launched similar containers in Europe.

Schmitt explains that many packaging engineers don't receive a formal education in the discipline, and very few universities offer a program in it. She was able to earn her master's degree in packaging engineering through Michigan State University, over the course of three years while working full time at Illumina.

The work itself is very physical, in the sense that they receive prototypes as they're being developed and design the packaging with that product in mind. "We do a ton of hands-on testing where we actually pack the product like it would be shipped to the customer and then put it through the paces of what it's going to experience in the distribution environment."

She recently took on an all-new role at Illumina that sits between the commercial and supply chain organizations. She'll be interacting with customers and building a customer success program, while still using her engineering skills. "Being engineers, we have to try different solutions to improve how we're doing things," she says.

Illumina Staff Information Data Governance Engineer Priyanka Sinha in Bengaluru, India.

In the pioneering field of data governance

Priyanka Sinha joined Illumina in July 2024 as a staff information data governance engineer. She works in Bengaluru, India.

After earning her bachelor's degree in electronics and communication engineering, she began her career in data integration and data quality projects. This gave her a strong technical foundation, but she had always been more interested in understanding how data is used in business and managed end-to-end, from the source layer through to the analytics. "That curiosity led me to data governance, which sits at the core of data management and provides the structure to oversee and align all aspects of data," she says, "from quality and ownership to security and compliance."

> "Engineering is not just about math or machines; it's about building solutions, improving lives, and thinking creatively."
>
> —*Priyanka Sinha, Illumina*

In her day-to-day work, she often uses software-as-a-service solutions along with shell scripting, Python, and Java. She also takes advantage of business analytics tools like Power BI and Tableau.

Sinha explains that the data governance field has been around since the early 2000s, and it wasn't very popular at first. But she's been working in data governance for seven years, and as the amount of data grows exponentially every year, there is a growing imperative to govern it—in fact, handling data ethically and responsibly is one of Illumina's corporate social responsibility commitments.

She notices comparatively fewer women engineers working in the field—about a 2-to-5 ratio—but she asserts that this shouldn't stop anyone: "If you have an analytical mindset, a natural curiosity about how things work, and enjoy solving problems—even the tricky ones life throws at you—then you're already thinking like an engineer. My advice is to explore that passion fearlessly. Engineering is not just about math or machines; it's about building solutions, improving lives, and thinking creatively. Believe in yourself—you belong in this field, and you can thrive in it."

(Article continues)

Illumina's Iwona Shields, on holiday with family in Poland. Outside of engineering, she loves the outdoors, running, lifting weights, and gardening. She especially enjoys challenges such as climbing very high trees with loads of obstacles.

The joy of dismantling a million-dollar machine

"As an engineer, I remember every step of what I'm doing. My brain can recall where every single tiny screw should go," says Illumina Staff Field Service Engineer Iwona Shields. "Last week, I was working on a NextSeq 2000 System, and the part I needed to replace was the very bottom module. The customer couldn't believe I had to take every component off. When I got to the bottom, they said, 'Wow, it's just a base!' Then I put everything back together, calibrated all the new specifications for the instrument, tested it, and gave it back to the customer."

Every type of Illumina instrument is unique and incredibly complex, Shields explains. The NovaSeq X System, for example, combines many powerful laser, fluidic, optical, motion, and thermal systems. "If something goes wrong, we need to troubleshoot, and it's like peeling an onion."

Shields will visit a customer to help them install a new platform or fix an issue. She travels around her home of Cambridge, UK, as well as Norwich, and, occasionally, North London.

Now a 10-year veteran of Illumina, Shields grew up on a farm in rural Poland. She loves cars and can talk about them all day long. When she was a teenager, her father bought her an Audi 80. She remembers: "When it broke, my dad said, 'There is a garage. You want a car, you have to fix it.' With my brother, I was able to. Since then, I spent many afternoons and weekends with my dad and brother working on cars or farm equipment."

Shields studied bookkeeping and agriculture, but she was always good at math and working with her hands. She wanted to be an engineer so she could solve problems. She moved to the UK in 2005, where her first job was working on conveyors and cranes. As the only female technician, she had to deal with the other engineers' "old-school" attitudes and jokes. But she soon proved herself. "When they realized I could solve stuff quickly, they were more willing to help me. After one year they said, 'Can you please slow down? Because we cannot keep up with you.'"

At Illumina, in addition to installation and troubleshooting, she also assists customers in assessing site requirements to receive a new instrument. But her face lights up when she describes dismantling a machine, as though it's a performance—and it's always to the delight of the customer, her audience. She smiles as she describes how she gets in the zone and loses track of time while she's working. "I love my customers. I build very good relationships with them, and every day is different. It's awesome. I wouldn't change the job for anything." ◆

Illumina is committed to promoting an inclusive environment where employees feel valued and empowered to contribute. For the sixth consecutive year, Illumina has confirmed a zero net gap in pay regardless of gender, race, age, ethnicity, sexual orientation, national origin, or any attribute that does not relate to the employee job and contribution. Read more in our CSR Report, here:

illumina.com/company/about-us/corporate-social-responsibility.html