



SCULPTORS AT WORK

Interviews
About the
Creative
Process

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Janet Echelman

Janet Echelman (born 1966) builds enormous conical volumetric forms from curved steel armatures and knotted high-technology fiber that she suspends outdoors in urban locations. Flexible and layered with color, the sculptures move fluidly in response to wind, rain, and snow. They capture natural light as the sun moves across the sky and look spectacular when they are lit at night.

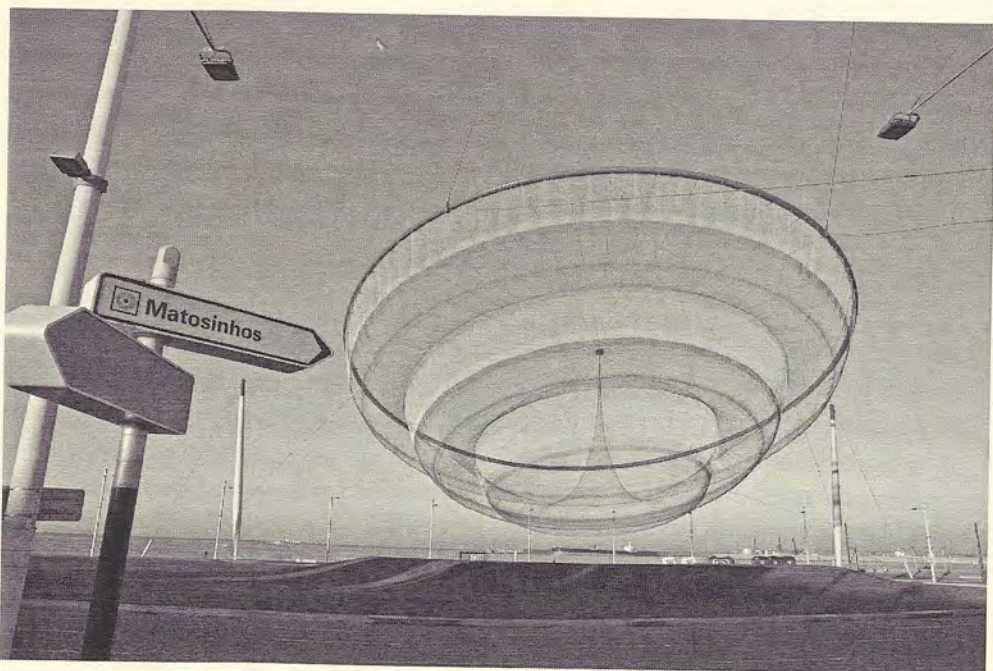
Echelman started out to be a concert pianist but became a painter and graduated in visual and environmental studies from Harvard College, Cambridge, Massachusetts, in 1987. She continued her education in the United States, Europe, and Asia, earning an MFA degree from Bard College, New York City, in 1995. Two years after that, she won a Fulbright grant to teach painting and study Indian textiles at the National Institute of Design in Ahmedabad, India.

As Echelman tells in the interview, she made her first sculptures in India from netting tied into bronze armatures. She functioned as designer and project manager, recruiting local people to fabricate the nets and armatures. Up to nine feet tall, this body of work, Bellbottoms, was exhibited in spring of 1997 at galleries and museums in Ahmedabad, Mumbai, and Calcutta.

Since 1997, Echelman's work has grown enormously in scale, complexity, and cost. She is today an artist who designs monumental outdoor public sculptures and then works with studio assistants, consulting engineers, city planners, materials manufacturers, and teams of fabricators to get them up.

An example is She Changes (2005), which hangs above the waterfront in the Portuguese cities of Porto and Matosinhos. Suspended on three diagonally placed poles that measure 82 to 164 feet high, She Changes is a 149-foot diameter, 20-ton steel ellipse, which holds a one-ton red and white knotted net. The steel ellipse is tilted diagonally, with its lowest point 44 feet off the ground and its highest point 89 feet up. Made from Tenara, a 100 percent UV-resistant architectural fiber, the net is comprised of 36 individual mesh sections in different densities that are hand-joined along all sides into a multilayered form. She Changes was a three-year project that cost \$1.66 million.

Echelman and her assistants work on computers in a high-ceilinged studio near Boston, Massachusetts. Project photographs decorate the walls of the main workroom. In its center, a maquette for an Echelman sculpture hangs beneath clerestory windows. The artist has a separate side studio, but she constantly jumps up and walks into the workroom to confer with assistants. At the time of our visit, she had seven projects going at once.



She Changes (2005). Tenara PTFE architectural fiber, 160-ft. × 300-ft. × 240-ft. Porto and Matosinhos waterfront, Portugal. Courtesy Janet Echelman Inc., Brookline, Massachusetts. Photograph by Joao Ferrand.

You call yourself a sculptor of place. What does that mean?

I sculpt the place, the air, the movement of the wind, the way the sunlight moves, the different seasons. The place, that's where I'm sculpting. My place is not where I make the sculpture. It's where the sculpture lives in the world, where it is part of people's lives.

The work that I do here in the studio doesn't have to be here. What I create is a place, not an object. It's an experience that you must be inside of—that's why it's hard to write about and hard to talk about. You must experience it.

My work interacts with the community. It's like a dialogue where you and I have a conversation and I learn what your vision and interests are and you learn about mine. That is community interaction for me, where I bring who I am to the place, and people bring who they are, and the place interacts with us. You should have a unique interaction each time you experience my work. I think of my work as a relationship and want it to be dynamic.

If your city has one of my sculptures, I want you to feel a personal connection to it, such that your experiences with it are yours, just as you might recall how you met your love in February and remember how the sculpture looked at that point in time, just as you might remember a beloved tree or landscape in a particular season.

My art is in the city because that's where I want to speak. I don't see any segregation or difference between art and public art. The thing that I want to share happens to

unfold in a space where people lead their daily lives because that's the kind of experience I'm talking about.

I'm interested in this interaction with our world, like with the buildings and the pavement and the wind. What engages me is our world. I like to sculpt in the world, not in a white box.

You never trained as a sculptor.

I was a painter for more than a decade. I was trained as a painter, and before that I was a classical pianist. But it's true that I was never trained as a sculptor. That was exciting for me.

I remember my first drawing class at Harvard College, which was my first drawing class ever. I'd never really made art until I discovered it from an inspired teacher named Carole Bolsey.

In figure-drawing class, Carole talked about creating a spatial envelope around the figure. I liked the idea that I could drag my charcoal from the toe to the knee through the air to the head and back to a fingertip — and that is what I do in the city now. Now my canvas is the world. That's why my work is in public space.

You've said that yours is a discovery process.

Some artists have certain ideas that they want to illustrate in their work. I'm not like that. My working process is about discovery. That's what draws me to being an artist. Otherwise I would become bored, and then I ought to go do something else.

I find things out by doing them. I can sometimes look back and understand how it happened, but usually I don't. I find what I need to say from the place where my work will be. It's a whole discovery process, which is much like a relationship, or my experience of marriage.

I wanted to become an artist because it's a life where you're always challenged. I remember as a young college student being told about Matisse and how, late in his life, he was confined to bed and reinvented himself by making his cutouts. Art is a life that's always unfolding, where no one can fire you and you never retire. Look at Louise Bourgeois reinventing herself at every period of her life! Those are the people who inspired me to want a life of art. That is the vision — the life I want.

There's no separation between my inner life and my professional life. Many people fragment themselves with work that is ego-dystonic — where the way you spend your days is somehow different from your internal life. It's a beautiful thing to be able to have a professional life that is linked to the growth of my internal life. I don't have the pain caused by having them at odds with one another.

My process is always exploratory. Sometimes I go to a place and ask myself, "What is lacking here? What does this place need? What do I find painful here, and what would counteract that?" So mine is very much a sculpture of place, but it is also a dialogue of one person with another.

What distinguishes your work from the other sculptors in this book?

My work is not fixed. Others make solid forms that you can pick up. My work is always changing, almost like a memory. You touch my work and it moves. It's not there. That fluidity is very important.

My work is hard to talk about, hard to get at. You see straight through it, so it's there and not there at the same time. It's bold in scale and color, never timid. But it's yielding, it's adapting, and it blocks nothing out.

A key aspect of this dynamic moving quality of my work is that it illuminates its softness. Part of the reason why I make sculpture in urban areas is because there's so little softness there. When my work is in the city, the hard edges of buildings emphasize my work's softness, while the softness of my work makes the buildings' solidity more apparent.

Tell me about your *Bellbottoms* sculptures.

In 1997, I traveled to India on a Fulbright grant. After teaching at the National Institute of Design, I went to Mahabalipuram, a small fishing village near Madras, which is famous for its ancient stone temples and sculpture. Those temples were very interesting to me because they were carved of stone, and the interior and exterior shapes were different, making them hollow in a way. They were like X-rays with distinct outer and inner surfaces.

I was scheduled to give a large exhibition of my paintings and had shipped materials from the U.S., expecting to make the work in India. Time was growing short, and my materials had still not arrived. So I decided to learn how to cast bronze in the small local foundry and explore whether I might exhibit these bronze sculptures.

But I didn't have enough money to make the forms I was exploring at the scale they needed to be. And it wasn't going to be possible to buy that amount of metal and transport it. I just didn't know what to do.

Every evening after I'd worked at the foundry, I'd walk the one block to the beach and go for a swim. This was the time of day when the fishermen were bringing in their nets and bundling them up. The nets were such beautiful hulking forms lying on the beach. It occurred to me that this was a different approach to making massive volumetric form without mass, without weight. So I decided to drill holes around the perimeters of each of my bronze pieces. Then I asked the fishermen to help me continue the line of my forms with hand-knotted netting.

I was sleeping under mosquito net every night in a simple little room with a fan. So I bought a bolt of cotton mosquito netting and asked the local tailors to sew my shapes. This became my first series of sculpture, called *Bellbottoms*, which was exhibited in three Indian cities.

The response from the public was very positive, and sometimes personal. One man said, "You don't realize this, but my entire sexual life occurred within mosquito netting, so when I look at your sculpture, it brings a wealth of associations." I would

never have imagined that. There was a lot of “I don’t understand this,” but it wasn’t an angry “I don’t understand this.” It was an interested response. These were early prototypes, but the response was very interesting and personal. It’s one of the few times that some of my sculptures were stolen. I took it as a compliment that someone wanted to have them.

The *Bellbottoms* sculptures were between 6 and 12 feet tall. You designed the work and worked with people to fabricate it. It seems like your work is inevitably collaborative — and that design and fabrication have grown in complexity along with your scale.

When someone becomes a filmmaker, they shoot and edit their first films. As they progress, they need a larger group of people to make things happen, and the artwork becomes a larger collaborative endeavor. I almost always collaborate with others, especially with engineers and architectural design-build firms. They take responsibility for safety and construction.

My studio works more like a design firm now. We design the work and supervise the fabrication. I can tie knots, which is how I was able to tell other people how to do it; but that’s not my strength, and I recognize that crafting isn’t either. But the physical exploration of form and design I need to do with my own hands.

Because my sculptures are in the city and the world, they must meet local building codes. Artists who make something for a gallery don’t need to make construction drawings that are stamped by an engineer — and don’t have to worry about the liability that goes with it. Every sculpture of mine is designed to withstand wind at 90 miles per hour or more, depending on the local building code.

New to our studio is JNet software, which I commissioned a computer scientist from the Massachusetts Institute of Technology to develop. It supports the way I build large netted forms. Previously we wasted much time and energy adapting ourselves to existing digital engineering software that didn’t exactly fit the way that we work.

My work is about dynamic movement, and I’m interested in how the work flows in response to wind from every direction. Engineering software for textile architecture or fabric architecture assumes minimal movement and so is not helpful for my work.

My art practice is collaborative in every sense of the word. I draw upon the expertise and talents of many different people in many different fields to realize what I envision. I could never have all the abilities — aeronautical engineer, mechanical engineer, architect, industrial craftsman. So many are required to make my sculptures possible. My practice is like a symphony orchestra. You can’t play all the parts yourself or sing the sound a symphony orchestra makes.

As I’m working, collaborators may warn me away from doing certain things. They might say, “You may want that element to be thin, Janet, but it has to be this thick to withstand the wind.”

We design for the once-in-fifty-years storm. In 2009, when we were working on

Water Sky Garden for the Richmond Olympic Oval for the Vancouver Winter Olympics in British Columbia, I designed the sculpture so winter snow falls through its holes. Richmond has ice storms too, and in a particular kind of weather on a particular day that happens infrequently, the ice sticks, hardens, and won't fall through. Suddenly the sculpture's weight is many times normal.

A brilliant engineer from Buro Happold suggested that, instead of building the sculpture 20 times stronger, we make it such that the steel links that hold it will yield and let go when the ice-covered net reaches a certain weight. So we designed *Water Sky Garden* with a layer of steel rings that will let the net down in an ice storm before it grows too dangerous. And once every 20 years or so, if such a storm comes and it descends, they just wait until the storm is over and put the net back up. That costs much less than building the sculpture 20 times stronger, not to mention sacrificing its light airy quality and having a beefy, ugly, overbuilt piece.

So that's an example of where an engineer worked with me. It was a real collaboration between two bodies of knowledge. Isn't that an interesting solution?

You get commissions with seeming ease — all over the world. What's your secret?

I stick to my vision, and I'm grateful that it travels. It seems the world is hungry for whatever it is that I'm offering and I satisfy a very specific need.

I don't do proposals because my work is an iterative interaction with a place and a client. It develops with feedback. It takes a long time. There's a level of trust that results when you meet someone and decide that you want to work with them. I'm not delivering an object. I'm offering a process of working with me to create something.

Not every client or every place is right for my work. I've learned that at the beginning if a client can understand my process and work with me, everything goes smoothly. If their constraints can't accommodate my process, say if they need a prepackaged design for a freestanding object delivered in advance, then it's best for everyone to wait for a better fit. I'm grateful — there's a sense of finding wonderful clients who understand my vision and who are willing to work with me and the site to make things happen.

In Portugal, for example, we had to create a joint venture company with a Portuguese engineering firm in order to be able to provide the kind of liability for *She Changes* that the government required. As an American who at that time had no experience building a major capital infrastructure project in another country, I had to find ways to make it work. On every project, I need an engineer of record who stamps the drawings. I also work with lighting designers, aeronautical engineers, water systems specialists, and landscape architects.

What is 1.26?

That piece is really important to me — it's the first I've done working with data!

The City of Denver, Colorado, invited me to create a monumental yet temporary work for the inaugural Biennial of the Americas in July of 2010. Its theme was to be

the interconnectedness of the 35 nations that make up the Western Hemisphere. So what do you do with that as an artist?

They asked me to tell them what the sculpture would be like, and I said, "I'm willing to take that on as a challenge." I'd read that the NASA Jet Propulsion Laboratory announced that the February 2010 Chile earthquake had shortened the length of the earth's day — by 1.26 microseconds — by slightly redistributing the earth's mass. Next, I discovered a National Oceanic and Atmospheric Administration simulation of the earthquake's ensuing tsunami and used the three-dimensional form of the tsunami's amplitude rippling across the Pacific Ocean as the basis for my sculpture.

I had very little time to work, with and the installation was temporary so I couldn't use a permanent steel armature. So *1.26* pioneered a tensile support matrix of Spectra fiber, which is more than 15 times stronger than steel, pound for pound. My low-impact, super-lightweight design made it possible to attach the temporary sculpture directly to the façade of the Denver Art Museum.

You're excited about the Dilworth Plaza Project in Philadelphia.

Yes! Dilworth Plaza is a 2.8-acre site next to the Philadelphia City Hall, a beloved work of American architecture built in the 1870s. It's the largest masonry structure in the United States — using no steel, the stone walls holding it up are sometimes 22 feet thick — and will likely remain so since nothing else will be built that way anymore.

The Center City District of Philadelphia invited me to come for an interview and asked if I were willing to do something completely different than I'd ever done. That was *exactly* the kind of invitation I wanted! All I knew at that point — and I said so in the interview — was that I felt that a sculpture should not compete with City Hall and that the material that seemed to be complementary and not competitive was water.

The history of the site is complex and layered. It was the first waterworks of the City of Philadelphia. Later, a grand old railroad terminal was built for the Pennsylvania Railroad, which was the world's largest corporation then. The railroad changed the world through the connections it made. Today, three subway lines run beneath Dilworth Plaza, which I think of as the modern city's circulatory system.

The Dilworth Plaza project continues my interest in making visible existing forces and systems that cannot be seen by the naked eye. My sculpture will function like a continuous X-ray of Philadelphia's circulatory system, tracing aboveground the pathways of the three subway lines that run beneath Dilworth Plaza. The movement will occur in real time, using a data feed of train arrival and departure. I am tracing the pathways in five-foot-tall curtains of atomized water illustrated by colored light.

The material I'm sculpting with is created by combining atomized water droplets with compressed air flow to create a new kind of "dry fog" that responds to wind, and also human touch. You and the material can have a dialogue. You can actually move the material around your hand, but you don't get wet. It's pure water, but because of the air flow, it's dry. You can be in a business suit and yet walk right through it. It interacts

with wind much like my sculptures with netting, but the material of this sculpture is fog.

So I'm still making the unseen world visible, and the sculpture allows you to contemplate nature. I don't think of nature as exclusive to forest or mountains. It can be that, but the nature of what's happening around us in the movement of the air and the sun is also nature.

I'm just so excited to have found another material that I can sculpt with in front of this historic architecture, without competing or blocking it.

What's coming?

Temporary projects are an interesting new development. I'm working on several new pieces at sites around the world where I may want to build. I'm not sure that they're going to get built. Normally a place approaches me and I learn about their place and develop ideas, like the Philadelphia project I just described, but sometimes ideas come to me first. Here's a picture of the Louvre in Paris and the glass pyramid that I.M. Pei designed for its entrance. Do you know the Delacroix painting *Liberty Leading the People*? My idea is to transform the Pei pyramid into Maryanne's breast. It's a project that would temporarily subvert the meaning of a public place.

I've been asked by the Times Square Alliance in New York City to develop an idea for Times Square. We'll see what happens in New York, and a project for Sydney, Australia, and other cities on other continents.