

# The Only Coral Reef in Los Angeles

STORY BY  
Arnie Cooper

Few people know it, but a series of neon-bright coral reefs has sprung up just a few miles from downtown Los Angeles. Viewing it requires neither scuba gear nor wet suit, and, miraculously enough, visiting it brings guests nowhere near water. But perhaps that's to be expected. This coral reef doesn't make its home in the ocean; rather, it owes its existence to crochet needles and is evolving in the living room, dining room and kitchen of Margaret and Christine Wertheim's 1890s craftsman home in Highland Park.

The project is unique, not simply because it marks the first time anyone has attempted to crochet a coral reef, but because it represents an extraordinary confluence of disciplines. Spanning the realms of geometry, ecology, marine biology, feminism and the fiber arts, the reef project reflects the interplay between craft, science and the

environment. And the Wertheim sisters bring a remarkable blend of scholarly talent and credentials to their task—Margaret is a noted science writer and the host of the PBS program *Faith and Reason*, while Christine, with a doctorate in philosophy and literature, lectures and publishes on the arts, experimental literature and language. They are co-directors of the Institute for Figuring, an organization dedicated to the poetic and aesthetic dimensions of science, mathematics and the technical arts.

Like many great ideas, this one was hatched at the coffee table. It was Christmas 2005 and the sisters were experimenting with an obscure form of crochet called hyperbolic. Margaret laughs as she tells the story. "Chrissy said, 'This looks like a coral reef,' which it did. And she said, 'Why don't we crochet a coral reef?'" They had stumbled on a new form of artistic expression



Photos/Alyssa Gorelick, Institute For Figuring



*Using typical materials like wool, cotton and synthetic yarns, as well as more obscure items like plastic gift wrapping ties and plastic bags made into string, Margaret and Christine Wertheim have created a crocheted reef that rivals the real thing.*

Left:  
Over 100 people contributed to a Chicago show that includes the Wertheim sisters' *Hyperbolic Crochet Brain Coral and Urchins*.

Opposite Page:  
Marianne Midelburg, one of the many contributors to the project, created *Hyperbolic Crochet Corals and Anemones with Sea Slug*.

and a novel way to bring attention to one of the biggies on the hit list of those determined to save the ocean environment—the devastation of one of the marine world's greatest natural wonders.

Of course, the 49-year-old twins' woolly wanderings didn't arise out of thin air. The sisters were raised in Queensland, Australia, home of the world's largest coral reef system. "Growing up, it was the topic of conversation," Margaret says. "When we were children, the reef was facing devastation from the crown-of-thorns starfish but the big issue now is global warming." Scientists estimate the reef could be dead in 30 years.

Though the goal of the work is to educate the public about an impending tragedy, getting at the essence of the project requires considering one of the most important "episodes" in mathematics history—the discovery of hyperbolic space (HS) at the beginning of the 19th century. To understand HS, picture a sphere, a space with negative curvature. "In spherical space," Margaret says, "you take a flat plane and wrap it around on itself so all space curves in on itself. You do the opposite thing to get hyperbolic space." Think of the ruffled edges of a curly lettuce leaf.

As Margaret explains in her book *A Field Guide to Hyperbolic Space*, the discovery was controversial because it broke with the then

seemingly infallible axioms of Euclid, the father of geometry. And though the discovery of hyperbolic space came after 2,000 years of mathematicians trying to disprove it, it wasn't until 1997 that Daina Taimina, a Latvian mathematician who teaches at Cornell University, created a physical model of the concept. Taimina, who like the Wertheims grew up steeped in "feminine handicrafts," employed the unique properties of crochet to construct a crenellated, ruffled form that, for the first time offered a tangible expression of HS.

Yet as profound as Taimina's discovery was, putting it into practice was a no-brainer, Margaret says. "There's only one insight in this and that is to increase stitches. For instance, you crochet five stitches then increase one, crochet five stitches then increase one. That's the totality of the insight. What's interesting is that how often you increase affects the overall shape and look of the piece."

The result: a mind-numbing rainbow of sea creatures; anemones, sea slugs, kelps and corals. Using typical materials like wool, cotton and synthetic yarns, as well as more obscure items like plastic gift wrapping ties and plastic bags made into string, the Wertheims have created a crocheted reef that rivals the real thing.

Initially, they had hoped to involve a bunch of women in a collective project that

would one day make it into a gallery and provide them with a basis for talking publicly about the issue. But the response has been greater than they ever expected. Just a few weeks after posting the project on their web site, the Andy Warhol Museum in Pittsburgh asked to use it for its spring 2007 show on global warming. The reef and its various sub-reefs are now being shown at the Chicago Cultural Center through December 16th. In early 2008 they will be at Los Angeles Contemporary Exhibitions (LACE), where a "plastic" reef will be featured to highlight the "tsunami of plastic" threatening the ocean.

As if that weren't enough, the project's use of hyperbolic space can also be linked, Margaret says, to one of the major issues in astronomy today, determining the shape of the cosmos, a notion that shares the coral reef project's appeal—the interconnectedness of seemingly unrelated things. "I think it's rare to have fields that cut across political, technical and domestic practice. You've got women of all ages sitting around crocheting hyperbolic space, and this may actually be the structure of the universe." ♣

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