

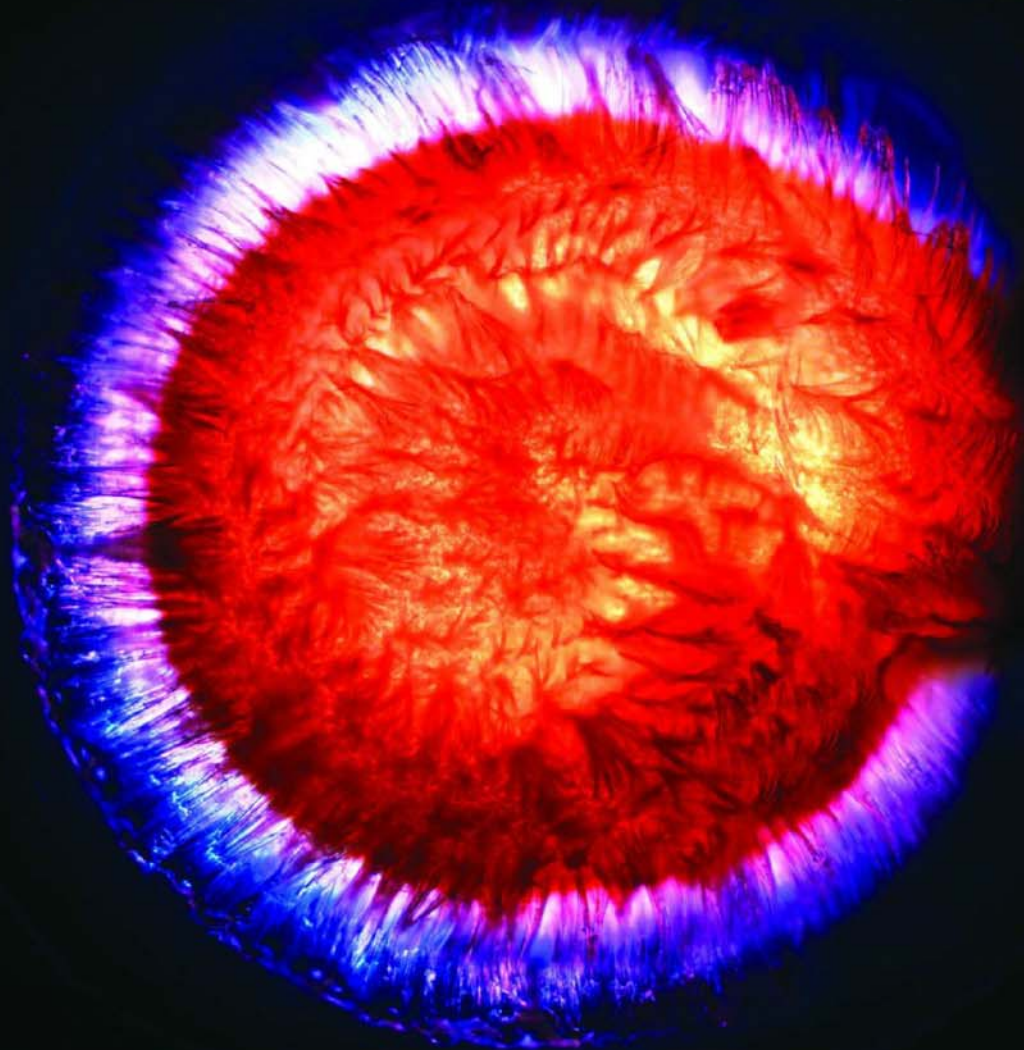
IN THE RING WITH FLOYD MAYWEATHER JR.

VEGAS

seven®

May 3-9, 2012

THIS WEEK IN YOUR CITY



NATURE'S EYE CANDY

Artist ROBERT BELLIVEAU sees fruits and vegetables differently than you do.
Inside the mind and work of a Las Vegas original.

FREE

Dr. Robert Belliveau with his
photograph of a red pepper.

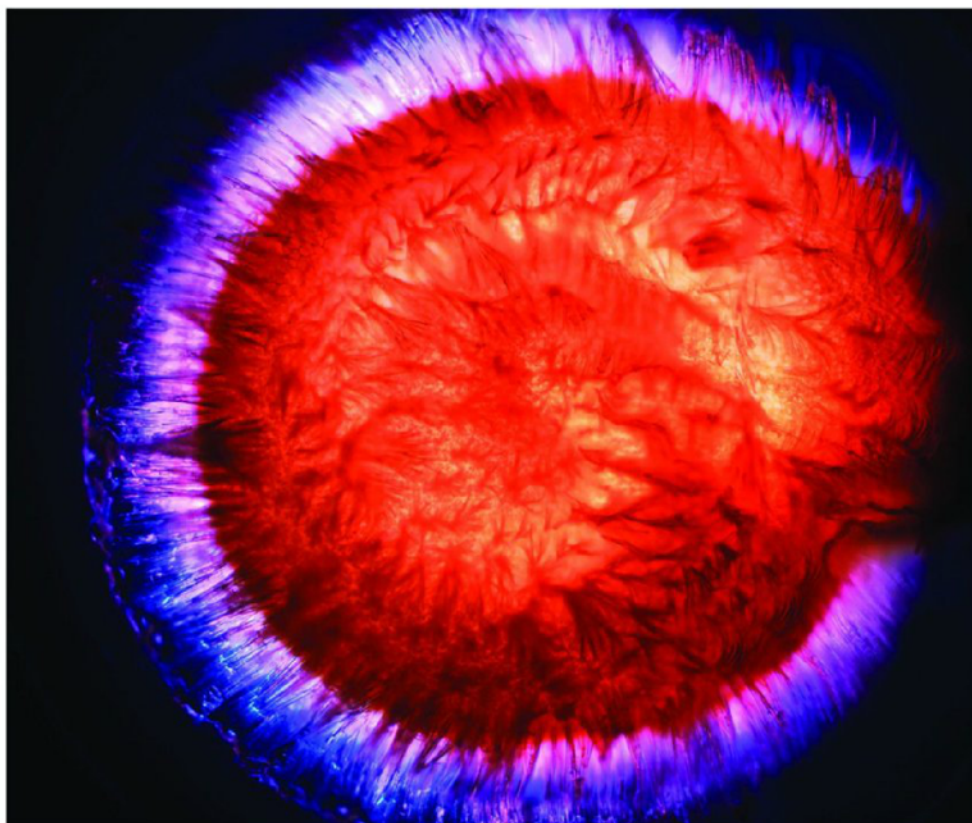


THE Man WHO PHOTOGRAPHS PRODUCE

How a doctor-turned-artist
discovered the wild and kaleidoscopic
natural order of things

BY BOB WHITBY

Dr. Robert Belliveau sits hunched over a small white-plastic cutting board, kitchen knife in hand. He's slicing a fresh green pepper into quarter-inch-long strips, and the earthy smell momentarily turns his lab into a kitchen.



Belliveau selects a strip and flips it over, revealing the fleshy, moist, inner lining of the pepper, called the endocarp. That's what he's after. He trades the knife for a razor blade and hunches a little closer to his work. This is the tricky part, and it's rare to get it right the first time.

Like the world's most fastidious chef, he trims away a fingernail-size sliver of the endocarp so thin it's translucent. "That's a reasonable slice," he mutters, placing it gently on a specimen slide. Then he scoots a few feet over to a microscope, the wheels of his chair rattling on the tile floor. He places the slide on the viewing table and looks through the microscope's eyepiece, twisting knobs on the side to bring the sliver into focus. But the pepper slice isn't thin enough. "You really need the tissue to be more or less 30 microns thick," he says, rattling back over to the cutting board to scrape the slice thinner. "A red blood cell is seven microns in diameter. I guess a sheet of paper is about 60 microns."

It might take a few minutes, or it might take a few hours, to get it to the right size. Time is irrelevant, really, because what matters is the result. Belliveau, an 80-year-old retired pathologist, has discovered a means of photographing ordinary fruits and vegetables in an extraordinary way, a technique that transforms them into phantasmagorical landscapes of texture and color, art on a slide. Under his polarizing microscope—a tool used by geologists to examine rock samples—the skin of a young cucumber becomes menacing, with sacks of poison and razor-sharp tentacles ready to inject

it into anyone or anything unwise enough to take a bite; a tomato seed turns into a blood-red supernova covered in hair; a slice of a blueberry is transformed into an army of baby-blue centipedes marching through a river of blood.

For his photography, Belliveau won honorable mention in *Science* magazine's International Science and Engineering Visualization challenge each of the past two years. "They had 200 to 300 submissions from 60 or 70 countries," Belliveau says. "And some little guy doing this in Las Vegas was honored."

If Belliveau's work sounds abstract, three steps removed from reality, it is. There are no visual clues to help viewers bridge the gap between the subject and the result. To see his photo of what looks like a hand grenade, and then learn that it's a blueberry seed magnified 200 times, is to wonder at the intricacy of nature. But the abstraction is so profound that your thoughts are more likely to turn to the cosmos than to the humble berry.

That dichotomy between the casually observed and the meticulously photographed—and the excitement of discovery that goes with it—is what keeps him peering through the eyepiece hour after hour. "What we look at with the naked eye is something that looks totally bland and uninteresting," he says. "Under the microscope ... it just blows me away."

A lot of people take pictures through microscopes—Nikon's Small World competition for photomicrographers has been held annually since 1974. But Belliveau's

medical background, subject matter and use of the polarizing microscope make his work both stunning and original. "I think he's doing something unique," says William Fox, director of the Center for Art and Environment at the Nevada Museum of Art in Reno. "He's looking at very common objects that everybody handles all the time and showing us some really, really interesting things."

Belliveau is tall with a wiry build, white hair and a gray beard. On a recent afternoon he was dressed in a blue sweater and jeans, the outfit of someone too preoccupied to worry about fashion.

He lives with his wife, the noted artist Rita Abbey, in a two-building compound off Ann Road not far from Interstate 215. The place is dense with the products of two lifetimes of creativity. One structure is their home; the other, which looks like a sprawling garage, is a gallery filled with Abbey's painting, sculpture, drawing and stained glass. Sunlight streams in through skylights overhead, and the walls soar in angular repose, each hung with Abbey's art. She was a founding professor at UNLV's Department of Art, and her steel sculpture "Spirit Tower" adorns the entrance to the Summerlin Library.

Belliveau's own work is largely confined to several binders and a few large prints stacked in the corner of his lab. He's deep in the inquiry process and doesn't seem overly concerned about displaying his work at the moment.

He knew as a child growing up in Worcester, Mass., that he wanted to be a doctor.

His first thought was family medicine, to become a general practitioner carrying a black bag who made house calls. It was during his second year in medical school—about the time that students perform their first physical examinations on real patients—that he realized he didn't want to spend his career diagnosing illness by palpating an abdomen or feeling for an enlarged liver. He wanted to see disease at work.

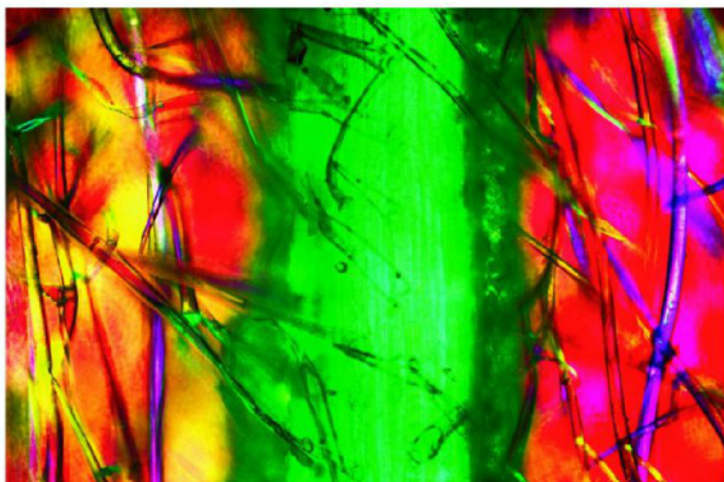
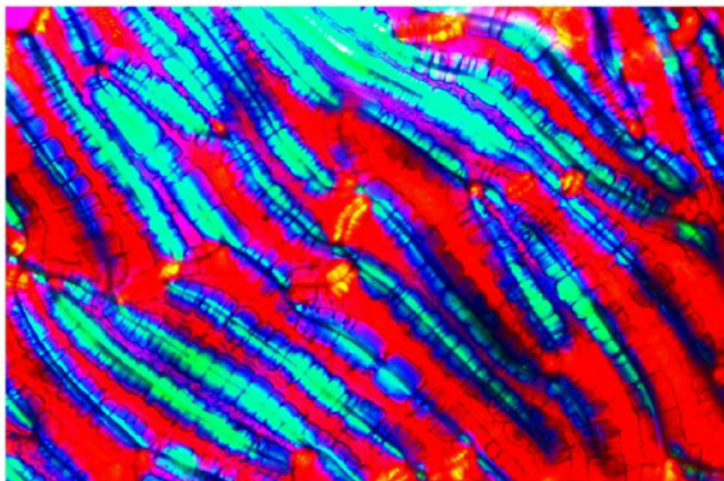
"I took a class in pathology, and I was hooked," he recalls. "I could see what the disease, what the bacteria was doing."

Pathologists are among the most highly trained of all physicians; they have to be able to diagnose some 10,000 diseases and conditions, Belliveau says. But the science is direct and immediate. The tissue samples and bacterial cultures are right there in front of your eyes.

"I spent six, seven, eight hours a day looking through a microscope," he says. "I just fell in love with the microscopic world. Even cancer has its own beauty."

Belliveau came to Las Vegas in 1963 after getting out of the Air Force. He liked it here and wanted to stay, so he asked around and found that University Medical Center was "desperate" for a pathologist. He signed on and worked there for 38 years before retiring in 2000.

He's always been restlessly curious and inquisitive. In his 30s, Belliveau had the idea to patent a design for an airplane wing. "I was watching a fly in the room one day, and I was just astounded by the aerodynamic ability of that fly to move in any direction instantaneously. I got a dead



fly and I looked under the microscope and I see these 200,000 barbs coming off of each wing. Mother Nature doesn't create 200,000 of anything without a purpose or without a function. So I was convinced that gave the fly the ability to do these things."

Unfortunately, the idea had been patented by someone else in 1929.

After Belliveau retired from medicine, he took a botany class at UNLV and started studying wildflowers under the microscope. "Wildflowers, they would make you crazy," he says. "Some things in wildflowers you can't believe. They look otherworldly, from another universe."

They're also ephemeral in the desert, coming and going quickly with the seasons and the rain. Our prolonged drought made them even harder to source. Belliveau needed a more easily acquired subject—and he found in common, grocery-store vegetables.

He moved on from botany to geology classes, also at UNLV, where he was introduced to the unique characteristics of the polarizing microscope. A conventional microscope, the kind he used as a pathologist, illuminates specimens from below. Polarizing scopes do that too, but can also illuminate from above. And both sources of light can be passed through polarizing filters, which in layman's terms means

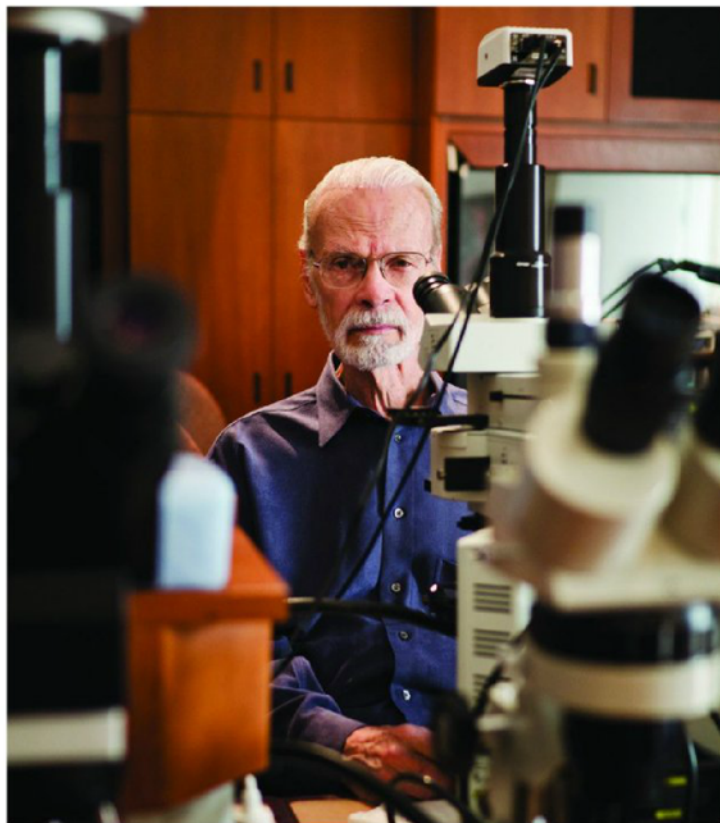
that the object you're looking at shifts color as you rotate the filters, highlighting contrasts in the specimen. That's helpful for identifying the component minerals of a rock sample, and for producing outer-spacey images of food.

...

Belliveau's photographic journey to these alien landscapes begins with a trip to the grocery store. There's nothing unusual about his shopping; these are the same ingredients you'd put in a salad. He photographs the specimens with a 32-megapixel camera mounted on top of the microscope. At high magnification the depth of field—the area of the image in focus—becomes extremely small. To get large, crisp images he has to stitch together dozens of smaller ones. His shot of the inner skin of a banana is actually 42 images assembled in Photoshop; the process took more than two days.

Once finished, each shot gets printed and put in a binder, along with a paragraph explaining what it is and how he took the shot. He's got a couple hundred finished pictures, which he'd like to publish in book form someday, though he's yet to shop his work around to publishers. He doesn't have a website, and his work isn't on display anywhere. For now, he's content entering the occasional contest.

FOR VIDEO, GO TO
WEEKLYSEVEN.
COM/PRODUCE.



Clockwise from left, Belliveau's photos of a tomato seed, a blueberry and a corn husk. His work has won international recognition the past two years from *Science* magazine.

...

When you think in microscopic terms, a peach becomes an expedition, the skin of the fruit as distant and distinct from the pit as the equator of the Earth from the poles. What delights Belliveau are the surprises he finds on the journey. A specimen-size slice of the inside of a peach pit, for example, looks smooth and shiny in your palm, like polished wood. Magnify it 2,000 times and you see the hand of God, in the Einsteinian sense of the term; not necessarily the work of an intelligent designer, but evidence of order and purpose, of a "spirit manifest in the laws of the universe," as Einstein put it.

"See those lines running each way?" Belliveau says, offering up the eyepiece of his microscope. "These one, two, three are running this way. These one, two, three are running that way. What they are doing is forming a meshwork, very much like plywood. What this does is give structural integrity to the seed of the peach. Mother Nature says, 'No matter which way stresses are put on it, I will have barriers that protect this from breaking.'"

The endocarp of a pawpaw has similar qualities, and for the same reason.

The protective outer skin of a clove of garlic looks like granite. The trichomes—hair-like appendages—of a tomato seed secrete mucus that keeps it from drying out and helps it

stick to the ground so it can take root. The trichomes of a small cucumber are needle sharp and protect it by injecting extremely bitter toxins into anything that tries to eat them. Different methods, same purpose: propagation. There is a purpose, a reason, for everything—and the closer you look the more astonishing the similarities become, and the more the art reveals itself.

His work straddles a line between art and science. It is both beautiful and informative. The function of a trichome is abstract until you see it in eye-popping color and suddenly understand why tomato seeds are slimy.

Rita Abbey sees her husband's work with an artist's appreciation for color, perspective and composition. She's watched him develop from someone interested primarily in the anatomical into an artist working toward an aesthetic. "To see that exposed in what he is doing now," she says, "I think it is an amazing contribution to art."

Belliveau still refers to himself as a scientist, though, and what blows him away are the mechanisms and structures, the engineering at work all around us everywhere that we'll never see unless we really, really look. He's at the microscope six to eight hours a day looking, and there isn't enough time to see it all. "I feel sad I don't have another 80 years. I know I could spend another 80 years on this and still leave a lot undone." 🍷