

HOW THE UNIVERSE GOT ITS SPOTS – JANNA LEVIN

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Do I recount the move itself, the motivation, the decision? It doesn't matter why we moved, because the memory is paling with the wear. I do remember the yard sales on the steps of our place in San Francisco. All of my coveted stuff. My funny vinyl chairs and chrome tables, my wooden benches and chest of drawers. It's all gone. We sit out all day as the shade of the buildings is slowly invaded by the sun ... Giant coffees come and go ... as the neighborhood parades past and my pile of stuff shifts and shrinks, and slowly disappears. We roll up the cash with excitement, though it is never very much.

When it gets too cold or too dark we pack up and go back inside. I'm trying to finish a technical paper and sort through my ideas on infinity. For a long time I believed the universe was infinite. Which is to say, I just never questioned this assumption ... but if I had given the question more attention, maybe I would have realized sooner. The universe is the three-dimensional space we live in and the time we watch pass on our clocks. It is our north and south, our east and west, our up and down. Our past and future. As far as the eye can see there appears to be no bound to our three spatial dimensions and we have no expectation for an end to time.

The universe is inhabited by giant clusters of galaxies, each galaxy a conglomerate of a billion or a trillion stars. ... Probably, hopefully, there is other life out there and background light and maybe some ripples in space. There are bright objects and dark objects. Things we can see and things we can't. Things we know about and things we don't. All of it. This glut of ingredients could carry on in every direction forever. Never ending. Just when you think you've seen the last of them, there's another galaxy and beyond that one, another infinite number of galaxies. No infinity has ever been observed in nature. Nor is infinity tolerated in a scientific theory – except we keep assuming the universe itself is infinite.

LOVE AND MATH - EDWARD FRENKEL

When I was growing up, I wasn't aware of the hidden world of mathematics. Like most people, I thought math was a stale, boring subject. But I was lucky: in my last year of high school I met a professional mathematician who opened the magical world of math to me. I learned that mathematics is full of infinite possibilities as well as elegance and beauty, just like poetry, art, and music. I fell in love with math.

Dear reader, with this book I want to do for you what my teachers and mentors did for me: unlock the power and beauty of mathematics, and enable you to enter this magical world the way I did, even if you are the sort of person who has never used the words "math" and "love" in the same sentence. Mathematics will get under your skin just like it did under mine, and your worldview will never be the same.

Mathematical knowledge is unlike any other knowledge. While our perception of the physical world can always be distorted, our perception of mathematical truths can't be. They are objective, persistent, necessary truths. A mathematical formula or theorem means the same thing to anyone anywhere –no matter what gender, religion, or skin color; it will mean the same thing to anyone a thousand years from now. And what's also amazing is that we own all of them. No one can patent a mathematical formula, it's ours to share. There is nothing in this world that is so deep and exquisite and yet so readily available to all. That such a reservoir of knowledge really exists is nearly unbelievable. It's too precious to be given away to the "initiated few." It belongs to all of us.

THE IMMORTAL LIFE OF HENRIETTA LACKS – REBECCA SKLOOT

There's a photo on my wall of a woman I've never met, its left corner torn and patched together with tape. She looks straight into the camera and smiles, hands on hips, dress suit neatly pressed, lips painted deep red. It's the late 1940s and she hasn't yet reached the age of thirty. Her light brown skin is smooth, her eyes still young and playful, oblivious to the tumor growing inside her—a tumor that would leave her five children motherless and change the future of medicine. Beneath the photo, a caption says her name is “Henrietta Lacks, Helen Lane or Helen Larson.”

No one knows who took that picture, but it's appeared hundreds of times in magazines and science textbooks, on blogs and laboratory walls. She's usually identified as Helen Lane, but often she has no name at all. She's simply called HeLa, the code name given to the world's first immortal human cells—her cells, cut from her cervix just months before she died.

Her real name is Henrietta Lacks. I've spent years staring at that photo, wondering what kind of life she led, what happened to her children, and what she'd think about cells from her cervix living on forever—bought, sold, packaged, and shipped by the trillions to laboratories around the world. I've tried to imagine how she'd feel knowing that her cells went up in the first space missions to see what would happen to human cells in zero gravity, or that they helped with some of the most important advances in medicine: the polio vaccine, chemotherapy, cloning, gene mapping, in vitro fertilization. I'm pretty sure that she—like most of us—would be shocked to hear that there are trillions more of her cells growing in laboratories now than there ever were in her body.

TRESPASSING ON EINSTEIN'S LAWN – AMANDA GEFTER

I was working in a magazine office when the lie was born. That was the idea, anyway—“working” in an “office.” In reality I was stuffing envelopes in the dusty one-bedroom apartment of a guy named Rick. The idea was that I worked for Manhattan magazine. The reality was that I worked for Manhattan Bride.

Manhattan covered New York's socialite charity-event circuit, but the magazine was bordering on extinction when I first took the job, and it was laid to rest shortly after.* Rick's newly launched glossy bridal magazine, on the other hand, was alive and well. So even though I spent most days fielding calls from florists and cake decorators, and one long afternoon scowling in an obscenely puffy wedding gown.

I continued to tell people that I worked for Manhattan magazine. It sounded better. I was there in the office, wondering if I could use the rubber-band ball to fling myself back to Brooklyn, when I spotted the article in The New York Times. John Archibald Wheeler, leading light of theoretical physics, poet laureate of existence, had just turned ninety and physicists from around the world were heading to Princeton to celebrate. “This weekend,” the article read, “the Really Big Questions that Dr. Wheeler loves will be on the table when prominent scientists gather at a conference center here in his honor for a symposium modestly titled ‘Science and Ultimate Reality.’”

As it happened, I was burning to ask Wheeler one particular Really Big Question. If only I were a “prominent scientist.” I slumped back in my seat and gazed absentmindedly at an old Manhattan cover hanging on the wall.

And then it hit me.

I waited until Rick left to get lunch, then picked up the phone, called the people in charge of publicity for the conference, and told them, in the most professional voice I could muster, that I was a journalist calling from Manhattan magazine and I was interested in covering the event. “Oh, of course, we would love you to come,” they said.

“Great,” I said. “Put me down plus one.”

I was utterly certain that these kind public relations people had never heard of Manhattan magazine. Most people in New York, let alone the rest of the world, had never heard of any such publication, but when I told people I worked for Manhattan magazine they always said, “Oh, of course!” Manhattan magazine is just a name that everyone thinks they know. Only they don't. And that, I realized, was my ticket to Science and Ultimate Reality.

ANTHILL – E.O.WILSON

It was true. The Trailhead Queen was dead.

In the first days there had been no overt sign that her long life had ended. There was no fever, there were no spasms, no farewells. She simply sat on the floor of the royal chamber and quietly died. As in life, her body was prone and immobile, her legs and antennae relaxed. Her stillness by itself failed to give warning to her daughters that a catastrophe had occurred for all of them. She lay there in fact as though nothing had happened. She had become a perfect statue of herself.

The deception was the result of the way the bodies of insects decay after death. Where humans and other vertebrate animals have an internal skeleton surrounded by soft tissue that quickly rots away, insects are encased in an external skeleton. Their soft tissues shrivel inwardly into dry threads and lumps, but their exoskeleton around them remains, a knight's armor fully intact long after the knight is gone.

Hence the workers were at first unaware of this mother's death. Her quietude said nothing, and the odors of her life, still rising from her, signaled, I remain among you.

She smelled alive.
