Dr. Lopa Mookerjee blinked away her fatigue, and stared at the screen with frowning attention; the light from the monitor reflected in her black-framed glasses. Every twenty seconds or so, she would make adjustments with the keyboard or mouse, and then her large black pupils would adjust to what the refreshed image revealed to her. A pencil tucked behind her ear seemed to be more a tool for pointing and tracing in meditative speculation than an implement for writing; a fluid and unconscious gesture she made whenever a colleague approached her workstation. Lopa’s sleep patterns—never what she or her husband would have wanted—were one of the first things to be impacted further by the recent discoveries. Discoveries that she herself, along with her team, had made, but not yet officially announced to the wider world.

The image on the screen appeared to be some kind of monster, perhaps a movie-still from an old 1950’s Hollywood horror film: half malevolent insect, half mutated bird. The creature could conceivably be something a disturbed child might assemble for itself, locked away in a Victorian insane asylum, and obliged to forge its own bed-time companion out of grey felt, black buttons, yellowing leather, and bits of shattered ce-
ramic, porous bone, or bristling bamboo. Lopa clicked a new viewing option from a drop-down menu, and a different monster appeared; this one a vibrant and toxic green, apparently a hybrid of caterpillar and cactus. Rose-like thorns emerged from its rough mossy-textured surface, along with a cluster of talons, surrounding what was presumably a mouth, the shape and color of claw-tipped ginger root.

Lopa confronted these monstrous portraits without any sign of revulsion. Indeed, she had learned to find a certain fondness for them, now that the world’s most powerful electron microscope, Horus IV — of which she was in charge — had revealed them to her, in all their miraculous, diverse grotesquerie. Along with her immediate colleagues and assistants, Lopa was initially speechless at the detail provided by this new optical technology. These images were both repulsive and comic. But now she was preoccupied by bigger questions than morphology, at an unprecedented miniscule scale. Something about the bristling undeniability of their bodies suggested both the integrity, vision, and limits of whatever created them. The “intelligent design” in evidence here conveyed the impression that each specimen had been left behind by a talented Edwardian costume designer, fond of Hieronymus Bosch and working with a feverish ingenuity, but hampered by a restricted budget. Pink brain sponges sprouted a forest of serrated black spines. Bright blue figures resembling an elongated praying mantis boasted elaborate helmets of indigo slime. Ant-like creatures replaced their own face with the fanned-out fungus of what looked like shredded books. A fat caramel slug, draped in a tattered mink cape, tapered into a cross-eyed vampiric rooster. Lopa thought of them as her charges now, complete with nicknames inspired by their singular characteristics.

Indeed, this gallery of grotesques reminded Lopa of something Freud had once observed: that even in our dreams, or highest flights of fancy, we cannot imagine something wholly new or alien. That is to say, we are limited to hybrids, chimeras, and crossbreeds, since we cannot see beyond the horizon of terrestrial biological forms. In the case of these monsters, however,
magnified several hundred thousands of times their actual size, the forms originated from beyond both the terrestrial and the biological spheres. And yet they were still legible as living bodies.

Lopa swiveled to her left, in order to open a chatbox in an adjacent screen, on the other side of which was her opposite number, located in the original CERN, below Geneva.

“Are you there, Matteo?”
There was only a short pause before the reply came.
“I am indeed. How are things going over there?”
“Just fine, thank you. Are you seeing this?”
Matteo’s words fired back.
“Just a moment. I’m running some numbers. Let me pull up your screen.”
There was another pause, and then confirmation of visual connection.
Lopa continued.
“I’ve been looking at our latest subpopulation.”
“Pin 57, yes?”
“Correct. I’ve focused down to 80 picometers. So far I’ve found six different species, arranged into about four hundred different choirs.”
“And the other MOs?” Matteo asked, referring to microorganisms.
“A dust mite or two, surfing a sea of bacteria. Firmicutes especially.”
Lopa had no sense at all from Matteo’s blinking cursor that he was suddenly having a highly self-conscious moment: one of those occasions of deep and renewed appreciation for the scientific community in which he was embedded, and its ability to describe the miraculous and profoundly enigmatic in technical terms.
“So we’re still in Elohim level, it seems,” he typed, without giving an indication of his mini-epiphany.
“Indeed,” agreed Lopa, with a hint of frustration. “We’ve had no luck accessing Seraphim or Hashmallim, let alone Malakim.”
When it had been confirmed that the new technology now allowed humans to peer, for the very first time, into an angel-
ic dimension—or the “Metatronic scale,” as they decided to call it—Lopa understood that it would be necessary to bring in top-tier theologians from all the major faiths (and indeed, some of the more marginalized ones), in order to coordinate the research project; along with its messaging to the public. Given the historical antagonism between religious faith and the scientific method, she had prepared herself for endless debate, but communication turned out to be less of a challenge than she originally thought. Indeed, everyone was so excited about her team’s discovery, that they were humbled into a shared sense of purpose and resolve. Apparently the more our advanced tools afford us access to the hidden structures and populations of the world, the more these two fundamentally human endeavors or instincts seek to reconverge. Both are, after all, engaged in decoding the environment. Both attempt to identify and explain hidden laws. Both strive to figure out our place and role in the universe. And both have a deep interest in the lessons learned through revelation and enlightenment. Truth, it turns out, is a common goal and destination, with more than one pathway.

Lopa would never forget that first meeting, in a crowded conference room in the CERN 2 facility outside São Paolo. Each tribe wore their traditional garb, whether these be robes, white coats, or business suits; and each individual soul signaled the validity of their presence to the others via the laminated ID cards hanging around their necks. The head of the facility, Dr. Musaki, who had studied both particle physics and the history of world philosophy at MIT, was especially qualified to frame the conversation; and did so with reference to Democritus, who had anticipated modern atomic theory by two-and-a-half millennia, and without the benefit of advanced machines. Dr. Musaki then moved to the twelfth-century European Scholastics, who not only perfected the discipline of Western angelology, but introduced subfields, such as “emotionology,” which involved speculation concerning the love lives of the angels, especially between ranks. Dr. Musaki then made reference to Raqib and Atid, the two recording angels known as *kiraman katibin*, who are said to make detailed note of each of our thoughts and acts, plac-
ing them in either the column leading to salvation, or the one leading to damnation. Indeed, he somehow managed to make at least passing reference to each of the cosmologies represented in the room, without losing collective attention, implicitly suggesting that all the different perspectives present were merely different blossoms on the same branch.

It is true that in follow up meetings there was some debate which tradition should be used for the taxonomic nomenclature, given how many religions talk of angels. (Practically all of them, if we take the definition as “spiritual mediator between worlds.”) But even the representatives of Islam were surprisingly sanguine about using the Jewish angelic hierarchy for the phylum, provided the models for the genus were sourced from the Quran.

The consensus seemed to be that physics had reached so far that it had become a positivist form of metaphysics: unifying several scattered projects in the process, and now approaching some kind of Zenith.

Lopa continued to toggle between the image and the data her postdocs were generating in response, so Matteo could see the emerging correlations.

“There’s one you haven’t seen yet, Matteo. I’ve been saving it for the right moment.”

He replied immediately.

“Stop holding out on me!”

“Ok,” she smiled. “Prepare yourself.”

She then clicked to the next specimen, a tiny creature which looked a bit like a crimson lizard embryo in utero. It had six sets of silky wings. The top pair sprouted from its neck, and covered its eyes. The bottom pair were curled around its feet, in a tender gesture of auto-affection, while the middle pair were spread in the manner of a yawning bat. In addition to all these appendages of flight, the critter had the arms and hands of a humanoid, albeit with more claw-like fingers.

“Oh. My. God,” typed Matteo.

“I know,” replied Lopa. “Can you believe it?”

“Is that what I think it is?”
“It can’t be anything else, right?”
Lopa used her pencil to point to the object which had astonished them so, even though Matteo was on the other side of the world. The graphite tip circled this angel’s jealous hands, in which was clutched a golden trumpet, the mouth piece never far from its sleeping mouth.

“Incredible,” he wrote back, eventually; all the adrenaline and shock of the last few weeks distilled into one word. “I know I say this every time,” he eventually continued, “but I still can’t believe we are actually counting how many angels are on the head of a pin.”

Lopa smiled, also incapable of fully assimilating this new and disorienting reality into her understanding of who she is as a scientist, and — beyond that — as a being among other beings, most of which are invisible to the human eye. She wondered what Plato or Aristotle might have discovered, and deduced, if they had access to even a rudimentary nineteenth-century microscope; let alone this exquisite instrument, extending deep underground, which had taken more than a decade, and several fortunes, to build. The Horus IV, named in honor of the Egyptian falcon-headed sky god — he of the all-seeing eye — captured reality on registers that now began to call reality itself into question. Particle physics was a branch of the sciences that seemed to presume that the Euclidean world had been smashed into atoms. And yet here she was, an Indian-American woman who grew up in New Jersey, unexpectedly patching it back together again; albeit in ways that would make Newton, Einstein, and Feynman scratch their heads. The original CERN, which she now considered Matteo’s shop, thought it had found the “God particle,” only to find out it was a false alarm. But unless some highly sophisticated prankster was leaving fake entities on the end of sharp objects for her to find, this was no joke. The proof was undeniable: at the molecular level, numinous beings shared para-quantum spaces with dust mites, fungal spores, cyanobacteria, and viruses. The choral-structure of their appearance, along with the eerie songs of eternal praise, captured by the ComCAT acoustical imaging systems, put this beyond a shadow of a doubt. And even as
the angels looked closer to demons than the cherubs of medieval oil paintings, they seemed to exhibit the kinds of behaviors described in all the holy writings of the world.

Lopa had always been a staunch atheist, and became impatient with colleagues who believed there was a divine being behind the design of the universe. Somehow the discovery of angels did not shake this atheism, but enlarged it, to now—paradoxically—include the sacred. After all, Spinoza argued for the immanence of a unified substance, in all its temporary manifestations. Whether we call this substance God or not was not as important to Lopa as taking a census of its incarnations. The fact that some actual, verifiable beings are theologically derived was a new conundrum to her: a new paradigm shift, certainly, but not necessarily a shattering of her worldview.

So, God exists after all. Then again, as the debates raged in the corridors around her, is the existence of angels absolute proof of God? Perhaps these spirits are but Divine residues. Until Matteo captured a face in a Higgs boson, she was not going to drop to her knees and pray. Instead, she ate cereal at home in her pajamas, watching loop after loop of video footage of these angels, while her husband snored in the next room; to the extent where her fitful dreams were full of them. Staring into the screen, she sometimes felt like a female Narcissus, captivated by the grotesque reflection in front of her; radically alien, and yet somehow expressing a secret affiliation. A new way of being-in-the-world.

Dr. Lopa Mookerjee, living underneath a volcano like some kind of fairy tale princess, in proud possession of the world's largest magnifying glass. Or like Alice, stepping through the mirror.

“Hello? Are you still there? Geneva to São Paolo? Do you read me?”

Matteo’s message shook her out from this latest insomniacal reverie.

“Sorry. Yes, I’m here,” she typed in response. “It’s true. We are counting angels on the head of a pin.”

“Time to hedge my bets,” wrote Matteo. “I’m genuflecting in between equations.”
“Well,” noted Lopa, getting ready to call it a night, and trade her lab coat for pajamas once more. “If history is anything to go by, this isn’t the settling of anything, but rather the beginning of ever-more hair-splitting arguments.”

“Too true,” confirmed Matteo. “For instance, you claim that on the head of Pin 49, a standard one-inch safety pin, you identified a total of 498 angels. My calculations have you short by at least a dozen!”

“Impossible,” Lopa replied, smiling. “You couldn’t count beer bottles on a wall.”

“I’ll drink to that,” wrote Matteo, known for his fondness for a pint or three.

After signing off, Lopa checked for her keys and her phone, and then reached to switch off the monitor. The lizard-angel shifted in its slumber, and she hesitated a moment, as it brought the trumpet to its lips. Her breath caught in her lungs, and her heart skipped a beat, as she watched this creature’s leathery lips and little sharp teeth prepare themselves. But instead of blowing, it just sucked the mouthpiece like a nipple for a while, and then spit it out again, in the midst of an unpleasant dream.

Exhaling deeply in relief, she turned off the monitor, and headed to the parking bay.