

Squiggle
the
Photon
★
Book 1

Christopher Smythies

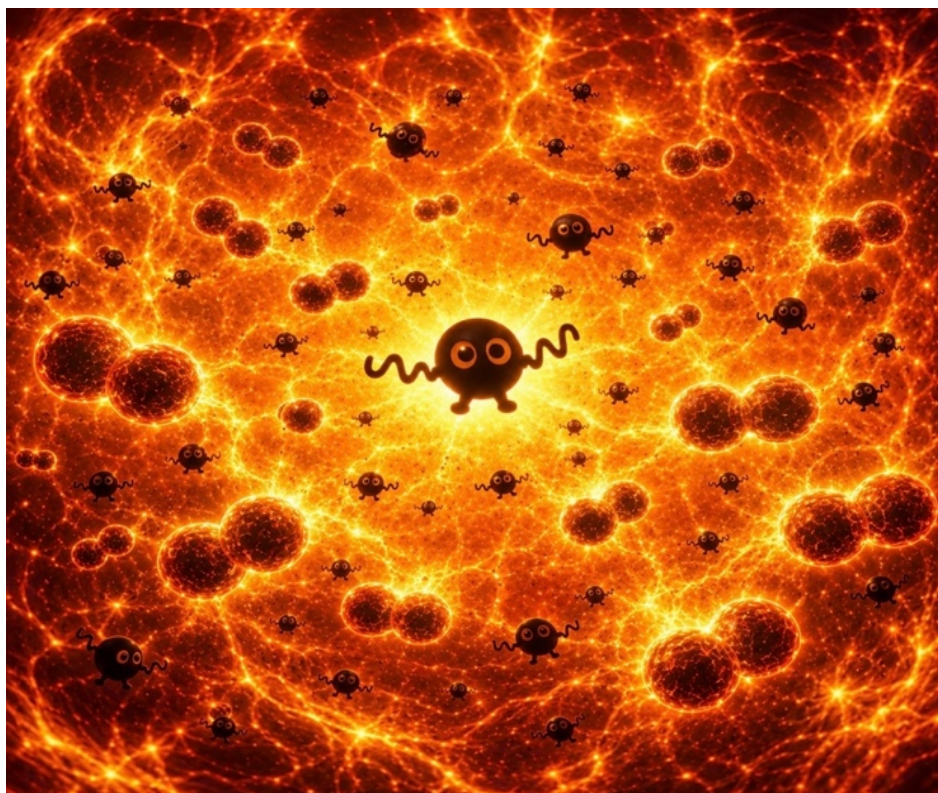
Chapter 1

This is a story about me—some say the cutest, cuddliest creature in the cosmos. I have big, expressive eyes, but no eyebrows, nose, mouth, or ears. Neither do I have a body. My wiggly wiggles come directly off the sides of my head, and my short, stubby legs stick out below.

I was born at the center of my birth star during the process that fuses hydrogen into helium. A tiny bit of matter was transformed into pure energy, packaged into a brand-new photon (me), and sent on its way. I am neither male nor female, although I prefer a masculine identity. I have an almost-infinite number of friends who have gone before me, and just as many who will come after me. They're not male or female either, but I like to call them my brothers and sisters anyway. As many as there are, I love each and every one of them!

Photons come in many different kinds. The more energy we have, the wigglier we are. The wiggliest are gamma rays, followed by X-rays, ultraviolet, visible light, infrared, microwaves, and finally radio waves, whose wiggles are almost straight. I belong to the visible-light family, known to have electromagnetic personalities.

I was the life of the photon nursery whenever I was around protons (who were always positive about everything), electrons (who were always negative), and neutrons (who didn't care). I was also proud of my wiggliness—or *wavelength*, as scientists call it—and felt sure I was destined to play an important role in the universe.



I was born at the center of my birth star.

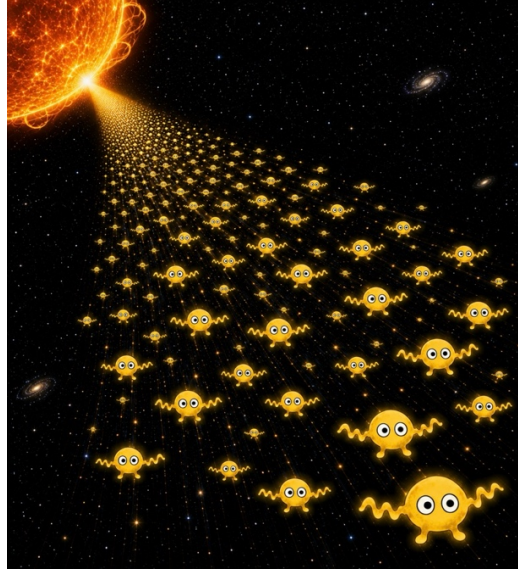
Chapter 2

Baby sea turtles hatch beneath the sand and instinctively race toward the sea. Photons are born with a similar instinct, only we head for the surface of our star. When I set out, I was immediately surrounded by uncountable trillions of my brothers and sisters, all madly doing the same thing. There was so much jostling, my head and wiggles were badly bruised and turned black and blue. If I had any bones, they could have been broken! It took me about 100,000 years to squirm through a million miles of seething nuclear reactions. When I finally popped through the surface, I looked around and saw a starscape of fire and radiation boiling up from below. Gigantic plumes of superheated plasma surged upwards and licked the inky blackness of space. This was no place to linger. Without even so much as a glance back, I ran as fast as my short legs could carry me and leapt wildly into the unknown.



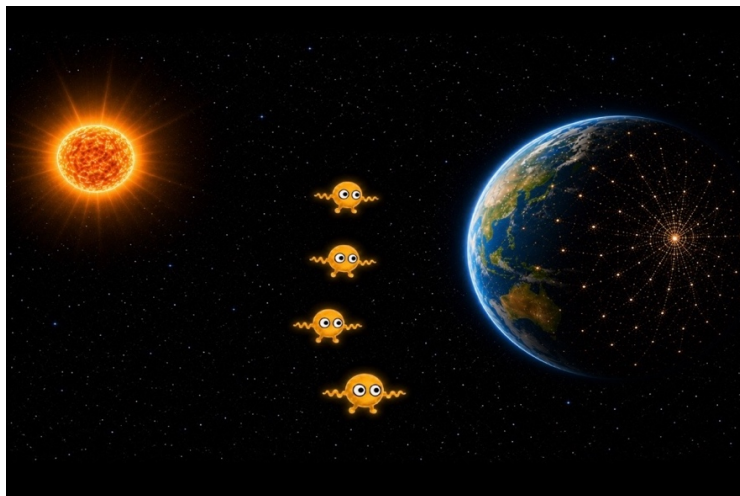
Leaping into the unknown.

As I sped away from the star, I quickly realized two important things about myself. The first was how small I was—even smaller than the atoms around me. To give you an idea of how small an atom is, there are 7 octillion (that's a 7 followed by 27 zeros) of them in the average human being. That's 10 trillion times more atoms than there are grains of sand on all the beaches in the world. The second was how fast I could move now that I was no longer being jostled around by so many other photons. Photons travel at 186,000 miles per *second*! That means that we can zip between planets and their moons in seconds, and between planets and their suns in minutes. In a whole year we can travel nearly 6 trillion miles—a distance called a light-year. And we never get tired or slow down. We just keep going until we hit something.



*Starting our journey across the universe.
I'm the one in the lead.*

For the first few hours of my journey, I watched as some of my brothers and sisters hit a variety of planets and made them visible. There were giant ones and tiny ones, rocky ones and gassy ones, ones with moons and others without. One was mostly green with blue oceans and fluffy white clouds—Planet X. Its far side was dark, with glittering filaments of artificial light extending in all directions like a giant spider web—evidence that an advanced civilization existed there. Although the planets were beautiful, I only felt rising jealousy. The other photons were already getting so much done and I wasn't doing anything. What was my purpose? And how was I going to accomplish it? I had so many questions, but no answers. I was glad when I finally left the solar system and entered interstellar space.



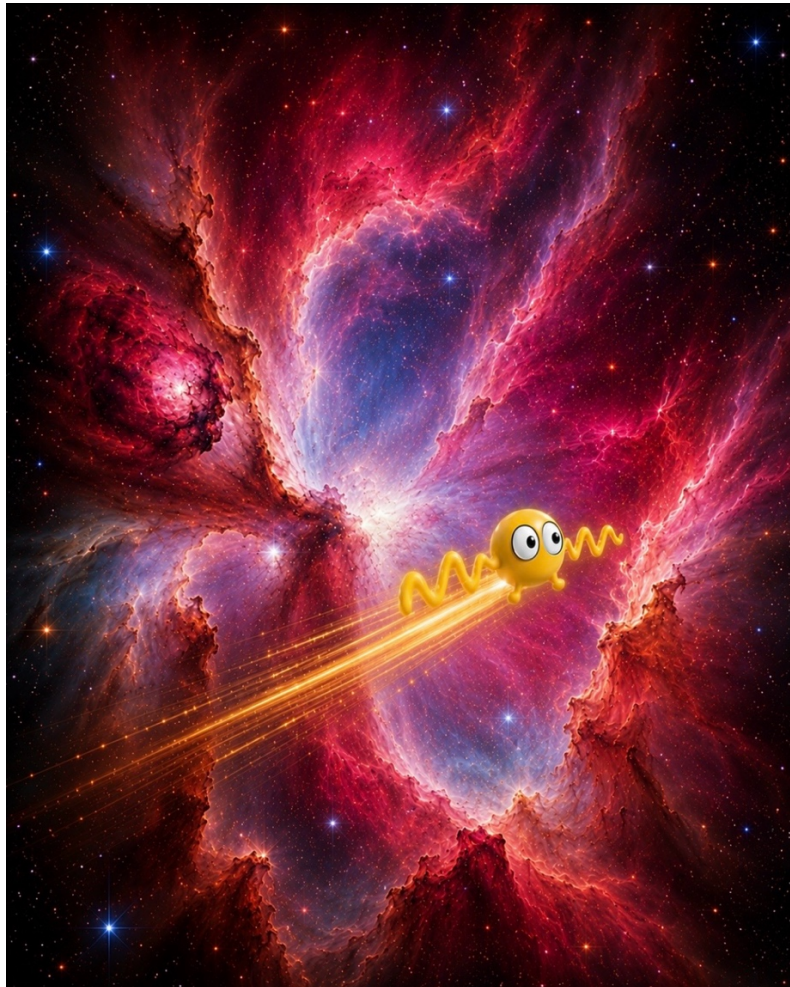
It only took us minutes to whizz past Planet X.

Chapter 3

Without any planets around, I found interstellar space painfully dull. Days stretched into months, months into years, and years into centuries. Just when I was beginning to wonder whether centuries might stretch into forever, the stars around me began to change. Most of them were becoming dimmer, while new, blue ones scattered about were becoming brighter—so bright, their light was reflecting off nearby clouds of gas and dust. I had found a nebula—a place where stars are born. If the gas and dust became too dense, I would not be able to get through. I wondered cynically whether my purpose was to be snuffed out. Just when things were looking bad and I thought I was doomed, I heard a voice.

“I’m the Ruby Forge Nebula,” it said, “and I’ve got lots of hydrogen and helium. Dust too!”

“I know!” I replied. “I can’t get through!”



Passing the Ruby Forge Nebula.

“I’ll turn them into stars and you can be on your way.”

“How long will that take?”

“Millions of years.”

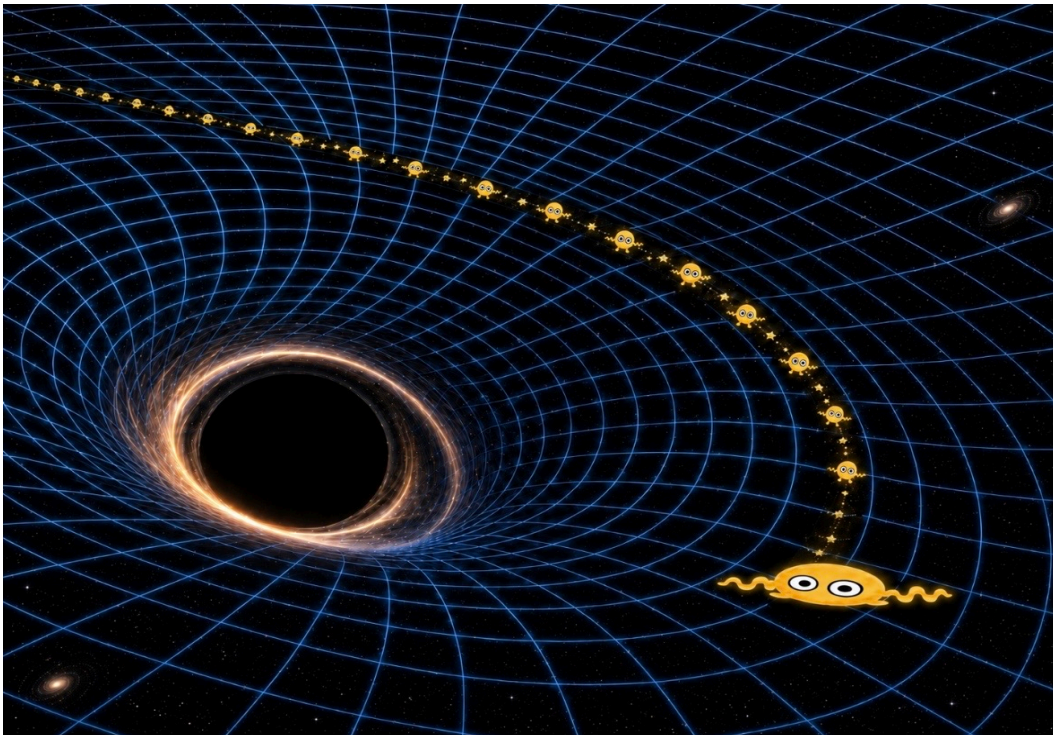
“I don’t have millions of years!” I cried. “Do something now!”

The voice fell silent, and I thought I was done. Then suddenly—and by ‘suddenly’ I mean only ten thousand years later—I burst into the clear and all the stars around me were once again shining normally. I shook the dust off and carried on, wondering what the Ruby Forge Nebula had done to save me.

Chapter 4

More than 10,000 years later, when things were growing tedious again, I noticed that the stars ahead of me seemed to be shifting. After a few more centuries, I was sure something had changed. My path through space was following a curve! Photons never did that! What could be happening? As more time passed, the curve grew increasingly tighter. Then I began to change shape—not because I was curving, but because different parts of me were being tugged in slightly different directions. My normal round shape was beginning to look like a pancake. That’s when I spotted the problem.

I was approaching a black hole!



Changing direction at the speed of light made me feel dizzy!

Black holes are bad news—much worse than nebulae. They range in size from a few miles to billions of miles across and generate incredibly strong gravitational fields. The fabric of space-time is distorted so badly, things that would normally travel in straight lines follow curved paths instead. If anything gets too close—stars, planets, gas, dust, or even photons like me—they'll get swallowed up, never to be seen or heard from again.

The black hole dead ahead was my worst nightmare. If I were to end up inside it, I would be held captive forever and would have no chance of ever achieving anything meaningful. I squeezed my eyes tightly shut and wiggled my wiggles with alarm.

Suddenly, I heard the black hole's voice, and from its happy sound, he was celebrating something.

"Yes, I did it!" he laughed with a deep, thunderous voice. "I finally did it!"

"Did what?" I asked as I cruised along at the speed of light.

"I just swallowed the Gooseberry 5 planet! It was a big one! Took me years to get it down!"

I was relieved to hear he had just consumed a planet. With so much extra mass inside him, perhaps a tiny photon like me would be less appetizing. "What did it taste like?"

"Like gooseberries. Who are you?"

"I'm Squiggle."

"You brought me good luck, Squiggle!" he said. "Thank you! I couldn't have done it without you! What are you doing here?"

"I'm traveling through the universe, searching for my purpose."

"I'm Squish. I already know my purpose."

"Really? What is it?"

"To win the Gravity Games!"

"What are those?"

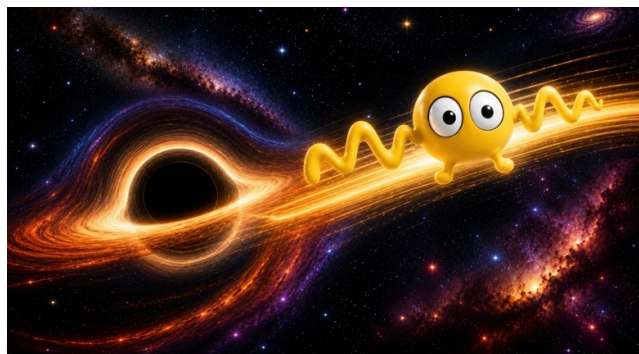
"Every million years, hundreds of black holes gather together in one place and compete to see who is the biggest, strongest, and most powerful black hole in the universe. I'm training for them right now. If I hadn't swallowed Gooseberry 5, I wouldn't have qualified."

"I'm glad I brought you good fortune," I said as I sped past. "Better be going now."

"No, don't leave!" said Squish. "Stay here with me! I need you to bring me good luck at the games!"

"Can't stop until I hit something," I called back. "I'm a photon!"

The curve I was following suddenly became much tighter and I was slung in a completely new direction.



Speeding away from Squish the Black Hole.

Chapter 5

After my encounter with Squish, I entered intergalactic space. The normal pattern of stars changed. Random points of light slowly morphed into a giant, flat disc with a central yellowish core and bluish spiral arms. Scattered amongst the arms were pinkish-red nebulae and dark brown lanes of dust. I was looking at the galaxy of my birth! A bright point of light appeared for a few days along one of the galaxy's arms—a supernova! A star had exploded, sending huge amounts of energy and a whole bunch of other stuff out into the universe. I watched in silence. For the first time since leaving home, I wasn't thinking about myself. I was trying to understand what I was seeing.



Squiggle's view of the galaxy he left, with a supernova in one of its arms.

When I saw the supernova, I suddenly understood what it all meant! A galaxy wasn't merely a beautiful collection of stars. No—it was an enormous cosmic machine with countless complex components. The pinkish-red nebulae scattered throughout the spiral arms were stellar nurseries. Gravity slowly pulled the dust inside them together, creating new stars that would eventually be surrounded by planets, moons, comets, and asteroids. For millions—or even billions—of years, these stars acted like giant factories. Deep inside their blazing cores, simple atoms were fused together into heavier ones: carbon, oxygen, nitrogen, phosphorus, iron—the building blocks of life. As the stars grew older, they lit up the arms of the galaxy with a beautiful bluish glow. When they reached the end of their lives, many explode as supernovae. This explosion wasn't the end of the story—it was only the beginning of countless new ones as freshly created atoms were dispersed throughout the galaxy.

Over millions of years those atoms drifted through space until gravity gathered them once again into fresh clouds of gas and dust. New nebulae formed. New stars were born. Around those stars grew new planets. On some of those planets, the atoms combined into molecules, the molecules into living cells, and eventually into creatures capable of looking back at the stars and wondering where they came from. I suddenly realized something astonishing. Every living creature I would ever meet was built from atoms forged inside ancient stars.

This revelation led me to ruminate for centuries. Nothing in the universe seemed to exist by accident. Nebulae had a purpose. Stars had a purpose. Supernovae had a purpose. Galaxies had a purpose. Everything I had seen during my journey seemed to play a part in something much larger than itself. What about tiny photons like me? Did I have a purpose? I wanted to know!

Chapter 6

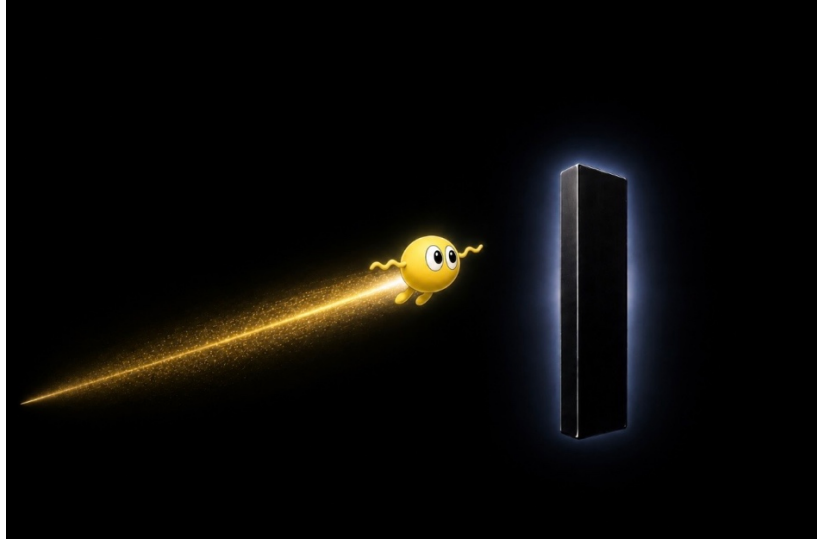
I had taken more than 50,000 years to leave my native galaxy. That was nothing compared to the 66 million years it would take me to cross intergalactic space. All the stars around me disappeared. Only the much fainter light from distant galaxies remained. Whenever I saw their photons shoot past, I would raise a wiggly wiggle and wave. But their eyes were grim from traveling so long and they never waved back. After a while, I wondered whether I looked as grim as they did. If there was a mirror around, I would have stood in front of it to find out. Unfortunately, there weren't any handy.

After about 33 million years, an incident occurred that is sufficiently important to include in this chapter even though it couldn't have lasted longer than a tiny fraction of a second. I was cruising along in the fast lane at my usual speed of light when I noticed slow traffic ahead, traveling in the same direction. Being a photon, there was no such thing as stomping on the brakes or swerving. Neither could I flash headlights or sound a horn. Instead, I braced myself in case I hit whatever it was, and hoped for the best.

I needn't have worried. I missed the object by a mile and kept going. But in the few nanoseconds it took me to fly past, I glanced at the slowpoke and was intrigued by what I saw. A rectangular block of black metal—or something that looked like metal—its surface perfectly smooth and featureless, was hurtling through space. It was hard to guess how big it was, but probably no more than 12 feet long. Clearly, this was nothing natural. Somebody—or *something*—had made it, but for what purpose I had no idea.

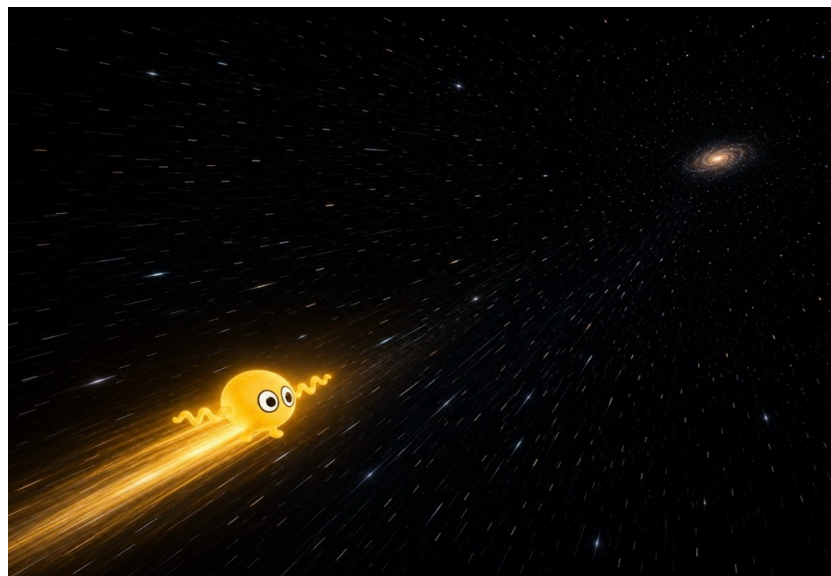
One moment, it was there. The next, it was gone, left far behind in my wake. For such a brief encounter, it certainly made a lasting impression upon me.

Another 33 million years would pass before I saw another one and understood what they were.



A strange object in the middle of nowhere.

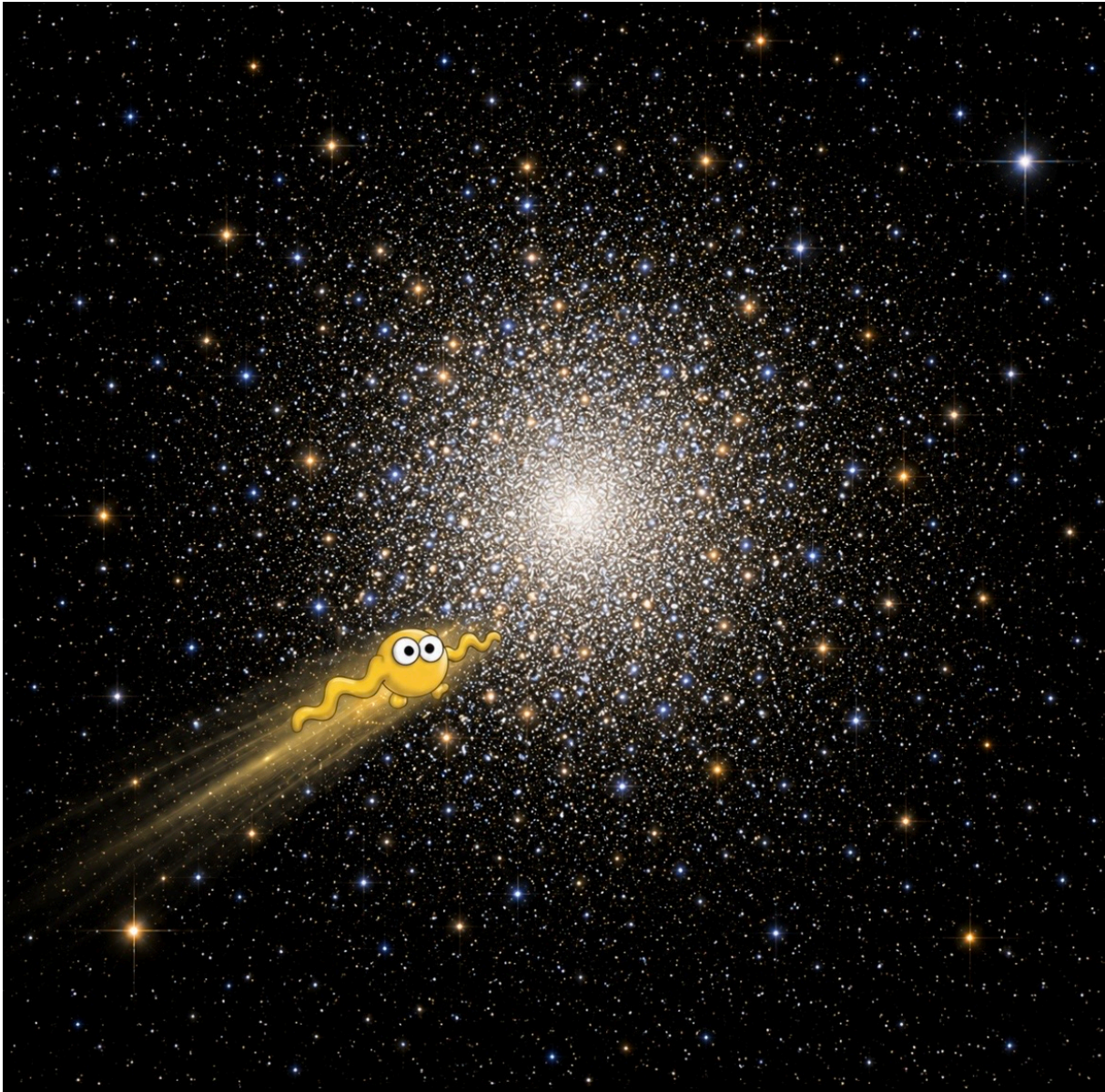
As time passed, I was beginning to feel very old and sad. Who could blame me? It was a long time to be doing nothing. What if I never discovered my purpose and ended up being a big failure instead? How would I cope with traveling endlessly through space, with no hope for the future? Just as I was at my lowest of lows, I noticed that one of the galaxies ahead was getting larger. The sight gave me a twinge of hope that my long journey would soon end—and by ‘soon’, I was hoping maybe a few thousand years at the most.



Approaching a distant galaxy at the speed of light.

Chapter 7

When I entered the new galaxy, which I later learned was called the Milky Way, life became much more interesting. The first thing I came across was a globular star cluster—one of the most beautiful objects in the universe. Thought to be ancient collections of thousands or hundreds of thousands of stars, they are packed tightly together. They glitter like diamonds and seeing so many in one place was a breathtaking sight. I wanted to fly through the cluster for the best view but knew that I would never make it through to the other side and was glad when I missed.



A globular star cluster brightens up my journey after darkness for 66 million years.

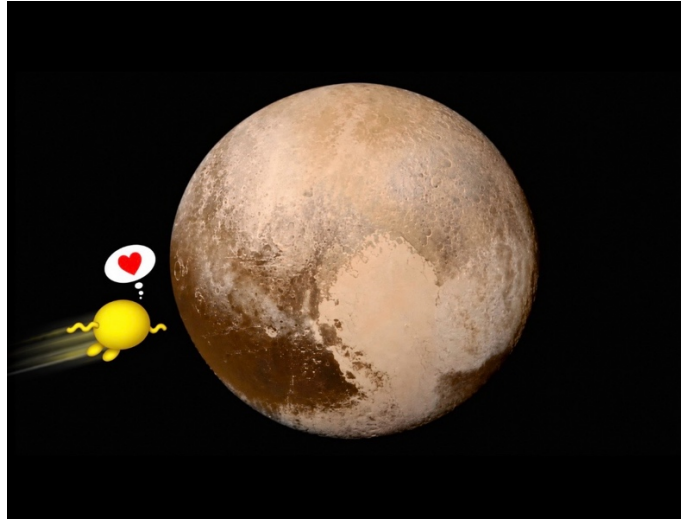
After the globular star cluster I saw many interesting objects, too many to list here. One worth mentioning, however, was spectacular, with three tall columns of gas, each many light-years high. The sight of it made my wiggles wiggle faster, and I was sure it wouldn't be long before I would learn my fate.



Passing my favorite space object. I learned later it is called The Pillars of Creation.

Chapter 8

I was right. It didn't take long to learn my fate—only another 6,000 years. I knew I was getting close. A star ahead was steadily growing brighter. Stars meant planets, and planets meant opportunity! When I entered the solar system, I was greeted by a friendly dwarf planet with a big white heart on its surface.



Pluto

“Hello!” it said with a kind voice. “Who are you?”

“I’m Squiggle,” I replied with a wiggle of my wiggles. “I’m searching for my purpose. Who are you?”

“I’m Pluto. There’s not much you can accomplish out here. But when you get closer to the Sun, you’re sure to get lucky there.”

“Thank you!”

After four hours and ten minutes, I passed a big gassy planet that didn’t say anything to me. Neither did the next gassy planet, three hours and twelve minutes later. But the next one, a mere one hour and thirty-six minutes further on, was quite different. I had never seen a planet quite like it—a multitude of very thin rings encircled it, casting a shadow across its surface.

“Hi!” it said. “I’m Saturn. If you stop here, you’ll help make my rings look beautiful!”

I was very tempted. I tried hard to curve towards Saturn, but photons can’t simply change direction whenever they want, and I only succeeded in passing between the planet and its rings. “I missed!” I cried in despair.

“No worries!” said Saturn. “Keep going closer to the Sun. You’ll pass another couple of planets—Jupiter and Mars. Don’t pay too much attention to them. But the third one—Earth. *That’s* where you want to go!”



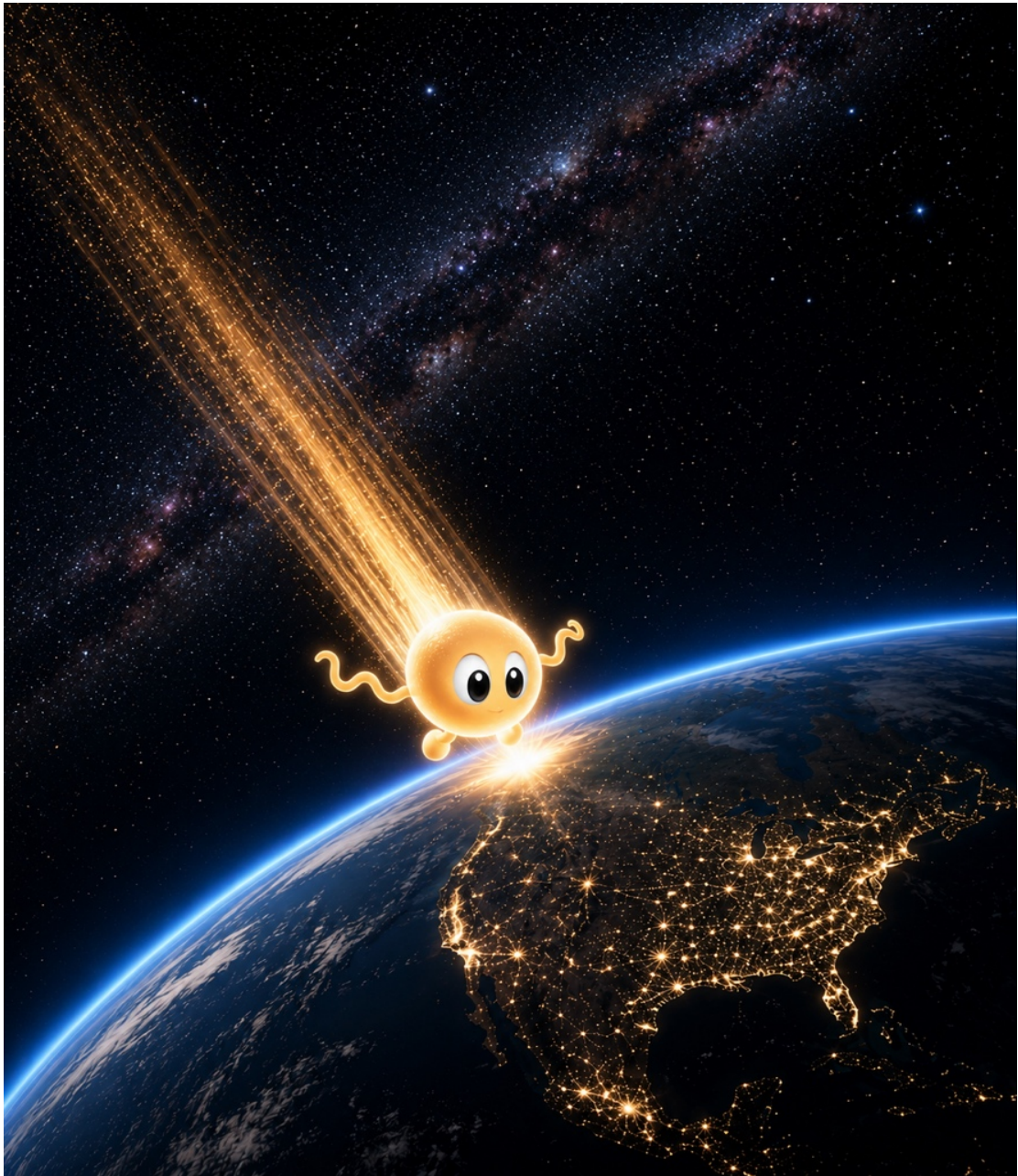
Saturn was a near miss.

I wiggled my thanks and kept going. It only took me 42 minutes to reach Jupiter, which turned out to be a giant gasbag with an ugly red pimple on its face, and another 37 minutes to reach Mars, which was a rocky planet for a change. A mere six minutes later, I was approaching Earth. The significance of the past ten hours since Pluto did not escape me. After spending 66 *million* years—think of the dinosaurs!—traveling from my birth star to this solar system, it was taking me less than 11 hours to cross the solar system and reach one of its inner planets! What does that say about the size of the universe?

I became positively excited when I overtook a spaceship that was traveling about a tenth of my speed. Its gleaming white hull was illuminated by the photons from the Sun. I saw a window in front, and a pilot inside whose extremities weren't attached to a head like a photon's are, but to a body instead. Strange! Never seen anything like it!

Chapter 9

Planet Earth was mostly green with blue oceans and fluffy white clouds, just like Planet X back home. Half of it was illuminated by the Sun and half was in darkness. My trajectory sent me to the dark half where there was a large area without any clouds. I shot through the



Squiggle's arrival

atmosphere and spotted a teenage girl. She was looking through a long metal tube pointed towards the sky. I took careful aim and headed straight for a round piece of glass at the end of the tube. In one trillionth of one trillionth of one second, I passed down the length of the tube, went through another piece of glass, and entered her eye! That's when I heard her shout with excitement, and what she said stunned me so profoundly my wiggly wiggles stopped wiggling altogether and twitched instead!

“WOW!” she cried. “I can see a galaxy! That's *a-MAZING!*”



Entering the girl's telescope.

Yes—it *was* amazing! After worrying for millions of years about my purpose in life, I had become an image inside somebody's brain and a memory that would last forever! Not just any image. Not just any memory. By the sound of her enthusiasm, I knew that I had made an impression that could change her life forever.

For a tiny photon, it was the perfect outcome!

