KINSHIP

We are the universe experiencing itself
That's why we're here- Carl Sagan

From the time it first bathed the surrounding, embryonic darkness with searing radiance, the star had fused hydrogen in an unending struggle against gravity's crushing embrace- a defiance that would continue for millions of years, until its hydrogen supply was consumed. Then the heat and pressure long generated in its nuclear furnace would falter, forcing the star to burn successive elements faster and faster, transmuting them up the Periodic Table; helium, oxygen, carbon, silicon and finally iron- the end of energy producing fusion reactions. Fuel supply finally exhausted, furnace cooling, the doomed star would collapse and detonate. The resulting *supernova* would scatter these laboriously produced elements back into the galaxy for use by future stars, planets, and their rare progeny- living things, and finally, only with the most exquisite rarity- sentient beings. But the progenitor star, still in middle age and untroubled by time or fate, devoured its hydrogen greedily, as though it had all eternity. Gravity meanwhile, squeezed ever more tightly- and waited.

A photon, liberated deep inside the star needed a hundered millennia to leave the hot dense core. Radiated and absorbed through countless collisions in the dense interior, even an unthinking photon might lose hope of ever finding the star's surface and the freedom of interstellar space. But the frustrated photon, after a million years paying homage to the Second Law of thermodynamics was rewarded, and so reached the photosphere and long awaited transparency.

Free at last, the photon began its long journey. Others of its kind streamed alongside, some from the same star, and as the years went by and distance increased, from other stars, until finally, from the whole disk of the great spiral galaxy. For over two million years the little wave of light flew as straight and true as the gentle curve of space-time would allow.

Earth, meanwhile, in eternal pilgrimage, traced ellipses around the Sun. Ice caps expanded, contracted and expanded again. Continents shifted- their great plates grinding relentlessly over the Earth's mantle. And our primate ancestors, slowly emerging from the shadows of instinct, slept fitfully in pre-anthropomorphic darkness, troubled by wordless dreams of dim but growing awareness.

Early autumn had been dry, and the night clear and windless. The man and girl both carried red flashlights to protect their night vision, and as they walked carefully into the backyard, they spoke softly so as not to disturb the neighbors.

"No moon tonight," the man whispered.

"And no porch lights either", the girl replied. "We're lucky."

The telescope had been setup an hour earlier so that the optics could equilibrate with the temperature of the night air. The 12 year old, was normally full of questions,

but speaking seemed out of place in this dark, quiet world overarched with stars. Even so, she whispered expectantly, "what will we see tonight?"

The man spoke again. "Well now, It's been at least a month since we've been out, and as you may have noticed, the sky has changed somewhat. The summer constellations have departed- but there's a treat for us tonight. And you'll hardly need the telescope or even your binoculars." Reclining on the lawn chairs and gazing skyward, both were silent for awhile, lost in thought.

With starlight softly illuminating his features, he explained that in summer, the Milky Way arched high overhead, forcing a nighttime observer to look through its crowded plane. But as fall and winter approached, one looked out and away from the galactic plane, into a vast abyss- "The greatest void imaginable by the human mind. But the Milky Way has a neighbor to keep it company," he continued quietly. And with that he pointed to Cassiopeia. The bright constellation was shaped like a "W" resting on its side. "And now if you look to the right of the upper half of the "W" you will see a hazy smudge. It's called *Andromeda*."

Locating it took her a few minutes, but there it was- its distinctive oval shape glowing softly in the night sky. Even in her binoculars, it remained ghostly and unresolved, though nearby stars blazed clear and diamond hard. "It's composed of hundreds of billions of stars," he went on, "But even the brightest can be resolved only in the largest telescopes. *You are looking out over two million light years- to the most remote object that can be seen with an unaided human eye*", he said triumphantly, hoping to impress her. The lack of an immediate response was an indication that perhaps he had.

Lifting the binoculars back to her eyes, she marveled at the beauty of the soft iridescent form.

After more than two million years without interaction, the photon plunged through the earth's upper atmosphere. Striking nothing at first, it continued until it hit the optical glass of the binocular objective and refracted- changed direction- then again at the eyepiece- a short distance through air, and then the cornea of her eye. Again refracted but still at lightspeed, it finally touched her retina, and relinquished there, all of the energy it had so long ago acquired from the star of its birth. Its gift delivered, the photon, winked out of existence. But its final communion with matter contributed to an image of softly glowing, ethereal beauty, and to a rather startling idea now taking shape in the girl's mind.

Gazing upward, she inclined her head momentarily, in salutation, and acknowledgment of her newly discovered kinship- then shivering a little, whispered quietly, "Thanks daddy."