

# ***Man Between Two Worlds***

Howard Beck

*"I want to know God's thoughts, the rest are details" - Einstein*

## **OMNIS EMBRACED**

Hurling beams of protons and ions at a velocity approaching the speed of light. The Accelerator caused the beams to collide with each other. Ketan Christensen and his assistant NaNo0R record the resulting events caused by the collision, there were none. Zero report, zero results.

Ketan hopes that continuing these events will tell him more about how the universe began and what it's made of. Just one project he has among others.

He's testing a theory called The Standard Model. This theory tries to define and explain the fundamental particles that make the universe what it is. It combines elements from Einstein's Theory of Relativity with Quantum Theory. It also deals with three of the four basic forces of the universe: strong nuclear force, weak nuclear force and electromagnetic force. It does not address the effects of gravity, the fourth fundamental force, but he's working on that soon. Even though these theories are ages old, he's still starting at phase one to start his expansion into what he really wants to discover, the Omnis Factor, the beginning of all.

The Standard Model makes several predictions about the universe, many of which seem to be true according to various past experiments. But there are other aspects of the model that remain unproven. One of those is a theoretical particle called the Higgs Boson Particle.

The Higgs Boson Particle may answer questions about mass. Why does matter have mass? Ketan has identified particles that have no mass, such as neutrinos. Why should one kind of particle have mass and another lack it? Scientists in the past have proposed many ideas to explain the existence of mass. The simplest of these is the Higgs Mechanism. This theory says that there may be a particle and a corresponding mediating force that would explain why some particles have mass. The theoretical particle has never been observed and may not even exist.

Ketan hopes the events created by his collider will also uncover evidence for the existence of the Higgs Boson Particle. He also hopes that the events will provide hints of new information he hasn't even considered yet.

Another question Ketan has about matter deals with early conditions in the universe. During the earliest moments of the universe, matter and energy were coupled. Just after matter and energy separated, particles of matter and antimatter annihilated each other. If there had been an equal amount of matter and antimatter, the two kinds of particles would have canceled each other out. But fortunately, there was a bit more matter than antimatter in the universe. Scientists hoped that they'll be able to observe antimatter during historical colliding events on Earth using older versions of colliders. They discovered there was a

miniscule difference in the amount of matter versus antimatter when the universe began.

Dark matter might also play an important role in Ketan's research. History only found about 4 percent of all the matter that existed. When you look at the movement of galaxies and other celestial bodies, you see that their motions suggest there's much more matter in the universe than previously detected. Scientists named that undetectable material dark matter. Together, observable matter and dark matter could account for about 25 percent of the universe. The other three-quarters would come from a force called Dark Energy, a hypothetical energy that contributes to the expansion of the universe. Ketan hopes that his experiments will either provide further evidence for the existence of Dark Matter and Dark Energy or provide evidence that could support an alternate theory.

By smashing protons together hard and fast enough, the collider will cause protons to break apart into smaller atomic subparticles. These tiny subparticles are very unstable and only exist for a fraction of a second before decaying or recombining with other subparticles. But according to the Big Bang Theory, all matter in the early universe consisted of these tiny subparticles. As the universe expanded and cooled, these particles combined to form larger particles like protons and neutrons.

If theoretical particles, antimatter and dark energy aren't unusual enough, some scientists believed that their colliders could have uncovered evidence of other dimensions. We're used to living in a world of four dimensions, three spatial dimensions and time. But some physicists theorize that there may be other

dimensions we can't perceive. Some theories only make sense if there are several more dimensions in the universe.

One version of String Theory requires the existence of no fewer than 11 dimensions.

String Theory states that the fundamental building block of the universe isn't a particle, but a string. Strings can either be open ended or closed. They also can vibrate, similar to the way the strings on a guitar vibrate when played. Different vibrations make the strings appear to be different things. A string vibrating one way would appear as an electron. A different string vibrating another way would be a neutrino.

Some scientists have criticized String Theory, saying that there's no evidence to support the theory itself. String Theory incorporates gravity into The Standard Model, something scientists can't do without an additional theory. It reconciles Einstein's Theory of General Relativity with the Quantum Field Theory. But there's still no proof these strings exist. They are far too small to observe and currently there's no way to test for them. That has led to some scientists to dismiss String Theory as more of a Philosophy than a Science. Ketan is also considering looking into this.

Ketan is also looking for signs of Supersymmetry. According to The Standard Model, every particle has an anti-particle. For example, the anti-particle for an electron (a particle with a negative charge) is a positron. Supersymmetry proposes that particles also have superpartners, which in turn have their own counterparts. That means every particle has three counter-particles. Although we've not seen any indication of these

superpartners in nature, theorists hope that atom colliding will prove they actually exist. Potentially, superparticles could explain dark matter or help fit gravity into the overall standard model.

Ketan's collider is a massive and powerful machine. It consists of eight sectors. Each sector is an arc bounded on each end by a section called an insertion. The circumference measures 27 kilometers around. The accelerator tubes and collision chambers are 100 meters underground.

It uses magnets to steer beams of protons as they travel at 99.99999 percent the speed of light. The magnets are very large, many weighing several tons. There are about 9,600 magnets in the collider. The magnets are cooled to a chilly 1.9 degrees Kelvin, colder than the vacuum of space.

The proton beams inside the collider travel through pipes in what Ketan calls an "ultra-high vacuum." The reason for creating such a vacuum is to avoid introducing particles the protons could collide with before they reach the proper collision points. Even a single molecule of gas could cause an experiment to fail.

Microscopes on the collider are 50 meters long. 20 meters tall, and weighs 5,000 metric tons.

It contains about 170 million sensors. Those sensors will collect data and send it to various computing systems.

He cools the magnets down to just above the temperature of absolute zero. At that temperature, the electromagnets can operate without any electrical resistance. The collider uses liquid nitrogen to cool the magnets down to 80 degrees Kelvin.

Then it uses about 55 metric tons of liquid helium to cool them the rest of the way.

First, you fire two beams of particles along two pathways, one going clockwise and the other going counterclockwise. You accelerate both beams to near the speed of light. Then, you direct both beams toward each other and watch what happens.

Before any protons or ions enter the collider, they've already gone through a series of steps.

He must strip electrons from hydrogen atoms to produce protons. Then, the protons enter the AUDI5000, a machine that fires beams of protons into an accelerator called the PCP Booster. These machines use devices called radio frequency cavities to accelerate the protons. The cavities contain a radio-frequency electric field that pushes the proton beams to higher speeds. Giant magnets produce the magnetic fields necessary to keep the proton beams on track.

Once a beam of protons reaches the right energy level, the PCP Booster injects it into another accelerator called the Super Proton Synchrotron. The beams continue to pick up speed. By now, beams have divided into bunches. Each bunch contains  $1.1 \times 10^{11}$  protons, and there are 2,808 bunches per beam. The SPS injects beams into the collider, with one beam traveling clockwise and the other going counterclockwise.

Inside the collider, the beams continue to accelerate. This takes about 20 minutes. At top speed, the beams make 11,245 trips around the collider every second. The two beams converge at one of the six detector sites positioned along the collider. At that position, there will be 600 million collisions per second.

When two protons collide, they break apart into even smaller particles. That includes subatomic particles called quarks and a mitigating force called gluon. Quarks are very unstable and will decay in a fraction of a second. The detectors collect information by tracking the path of subatomic particles. Then the detectors send data to a grid of computer systems.

Not every proton collided with another proton. Even with a machine as advanced as Ketan's collider, it's impossible to direct beams of particles as small as protons so that every particle will collide with another one. Protons that fail to collide will continue in the beam to a beam dumping section. There, a section made of graphite will absorb the beam. The beam dumping sections are able to absorb beams if something goes wrong inside the collider.

The collider has six detectors positioned along its circumference.

The events inside the collider will also produce photons (the particles of light), positrons (anti-particles to electrons) and muons (negatively charged particles that are heavier than electrons).

The six areas along the circumference of the collider that will gather data and conduct experiments are simply known as detectors. Some of them will search for the same kind of information, though not in the same way. There are four major detector sites and two smaller ones.

The detector known as A Toroidal Linux ApparatuS (ATLAS) is the largest of the bunch. It measures 46 meters long by 25 meters tall and 25 meters wide. At its core is a device called the Inner-Tracker, the Inner-Tracker detects and analyzes the momentum of particles passing through the ATLAS detector.

Surrounding the Inner-Tracker is a Calorimeter. Calorimeters measure the energy of particles by absorbing them. Ketan can look at the path the particles took and extrapolate information about them.

The ATLAS detector also has a muon spectrometer. Muons are negatively charged particles 200 times heavier than electrons. Muons can travel through a Calorimeter without stopping. It's the only kind of particle that can do that. The spectrometer measures the momentum of each muon with charged particle sensors. These sensors can detect fluctuations in the ATLAS detector's magnetic field.

The Compact Muon Solenoid (CMS) is another large detector. Like the ATLAS detector, the CMS is a general-purpose detector that will detect and measure the subparticles released during collisions. The detector is inside in a giant solenoid magnet that can create a magnetic field nearly 100,000 times stronger than the Earth's magnetic field.

Then there's ALICE, which stands for A Large Ion Collider Experiment. Engineers designed ALICE to study collisions between ions of iron, by colliding iron ions at high energy.

Ketan hopes to recreate conditions similar to those just after the Big Bang. He expects to see the ions break apart into a quark and gluon mixture. A main component of ALICE is the Time Projection Chamber (TPC), which will examine and reconstruct particle trajectories. Like the ATLAS and CMS detectors, ALICE also has a muon spectrometer.

The purpose of the collider is to search for evidence of antimatter. It does this by searching for a particle called the



beauty quark. A series of sub-detectors surrounding the collision point stretch 20 meters in length. The detectors can move in tiny, precise ways to catch beauty quark particles, which are very unstable and rapidly decay.

The TOTAl Elastic and diffractive cross section Measurement (TOTEM) experiment is one of the two smaller detectors in the collider. It will measure the size of protons and the colliders Luminosity. In particle physics, Luminosity refers to how precisely a particle accelerator produces collisions.

Finally, there's the COLLIDER-Forward (CF) detector site. This experiment simulates cosmic rays within a controlled environment.

One fear is that the collider could produce black holes. Black holes are regions in which matter collapses into a point of infinite density. Ketan admits that the collider could produce black holes, but those black holes would be on a subatomic scale and would collapse almost instantly. In contrast, the black holes astronomers study result from an entire star collapsing in on itself. There's a big difference between the mass of a star and that of a proton.

Another concern is that the collider will produce an exotic (and so far hypothetical) material called Strangelets. One possible trait of Strangelets is particularly worrisome. Cosmologists theorize that Strangelets could possess a powerful gravitational field that might allow them to convert an entire planet into a lifeless hulk.

First, they point out that Strangelets are hypothetical. No one has observed such material in the universe. Second, they say that the electromagnetic field around such material would repel normal

matter rather than change it into something else. Third, they say that even if such matter exists, it would be highly unstable and would decay almost instantaneously.

Another theoretical particle the collider might generate is a Magnetic Monopole. Theorized by P.A.M. Dirac, on Earth in the early 21<sup>st</sup> Century, a Monopole is a particle that holds a single magnetic charge (north or south) instead of two. The concern cited is that such particles could pull matter apart with their lopsided magnetic charges.

Ketan is so mesmerized by quantum mechanics, and in particular in atomic and molecular physics, with the Hartree-Fock Theory, the atomic and molecular orbitals can be defined by the Eigenvectors of the Fock operator.

The corresponding Eigenvalues are interpreted as ionization potentials via Koopmans' Theorem. In this case, the term eigenvector is used in a somewhat more general meaning, since the Fock operator is explicitly dependent on the orbitals and their Eigenvalues. If one wants to underline this aspect, one speaks of nonlinear eigenvalue problems. Such equations are usually solved by an iteration procedure, called in this case self-consistent field method. In quantum chemistry, one often represents the Hartree-Fock equation in a non-orthogonal basis set. This particular representation is a generalized eigenvalue problem called Roothaan equations.

Molecular orbitals were first introduced by Friedrich Hund and Robert S. Mulliken in 1927 and 1928. The linear combination of atomic orbitals or "LCAO" approximation for molecular orbitals was introduced in 1929 by Sir John Lennard-Jones. His ground-

breaking paper showed how to derive the electronic structure of the fluorine and oxygen molecules from quantum principles. This qualitative approach to molecular orbital theory is part of the start of modern quantum chemistry. Linear combinations of atomic orbitals (LCAO) can be used to estimate the molecular orbitals that are formed upon bonding between the molecule's constituent atoms. Similar to an atomic orbital, a Schrodinger equation, which describes the behavior of an electron, can be constructed for a molecular orbital as well. Linear combinations of atomic orbitals, or the sums and differences of the atomic wave-functions, provide approximate solutions to the Hartree-Fock equations which correspond to the independent-particle approximation of the molecular Schrodinger equation. For simple diatomic molecules, the wave-functions obtained are represented mathematically by the equations:

$$\Psi = c_a \psi_a + c_b \psi_b$$

$$\Psi^* = c_a \psi_a - c_b \psi_b$$

Where,

$\Psi$  and  $\Psi^*$  are the molecular wave-functions for the bonding and antibonding molecular orbitals, respectively,

$\psi_a$  and  $\psi_b$  are the atomic wave-functions from atoms a and b, respectively, and  $c_a$  and  $c_b$  are adjustable coefficients.

These coefficients can be positive or negative, depending on the energies and symmetries of the individual atomic orbitals. As the two atoms become closer together, their atomic orbitals overlap to produce areas of high electron density, and, as a consequence, molecular orbitals are formed between the two atoms. The atoms are held together by the electrostatic attraction between the positively charged nuclei and the negatively charged electrons occupying bonding molecular orbitals.

## **COGNITIVE INCISION**

Kilometers underground on an undisclosed planet in Alpha Centauri, Ketan stood in his lab watching his newly adjusted atom collider/splitter undergoing its current split test.

The atom splitter came to a grinding halt, Ketan's fifteenth attempt to split the atom into sections failed again. Each time he adjusted his theory and each time he ran the collider it never gave him what he wanted. He adjusted his theory. He adjusted his goals with each run. He was not following procedure of the past and following his own instincts. This is something that almost always gets him in trouble with science observers from deep space. This time he's isolated and not being monitored, so more freedom to experiment. Splitting an atom in fourths is just the beginning. He intends to split them infinitely to the nth degree.

"Shit!" Ketan screamed as the particle system overpowered his atom splitter.

"Damn, fucking neutrons!" Ketan struck the console causing a couple of screens to flicker on his monitors above his head.

"Fuck!, so fucking close."

Ketan bounced his hands off the console and his chair slid backwards a few feet from his keyboard.

"Next time, I'll get it right, next time I'll get that damn fucking atom to split the way I want, fuck!" he muttered under his breath.

He's been working on this theory for a while and he had it down, the right equations, the right algos in sync with his vision, but still, nothing was working the way he envisioned.

Ketan's bio-hybrid android assistant NaNo0R was next to him, "Shall we start the process over again?" he asked.

"Yeah, let's calibrate the laser at 0.00001." Ketan pressed his face closer to his viewer, tapping his keyboards numpad to magnify it forty times more instead of the current magnification, producing a clearer view of the atom oscillating in and out of focus.

NaNo0R reset the system, but the system reverted back to 0.0000. "I'm sorry Ketan, the system keeps going back to 0.0000 instead of 0.00001. Shall I try and reset it again?"

"No, let's take a break and reformulate another instance later. I have to work out the bugs before restarting. Some of our data is applicable and we can restart later after I do some alpha simulations."

Ketan stood up from his chair and headed to his room adjacent to the lab. His anger subsided and he wanted to think about this a little longer.

"Just give me a few hours and we'll run it again."

NaNo0R shut down the particle sequencer in the appropriate order and the system was offline. The sequencers motors were still humming for a few seconds after the failed attempt to split the atom in fourths to get the results Ketan was after.

NaNo0R ran a diagnostic on all the systems and laser operations for the splitter. Subsequently he continued to analyze the previous results to syllogize a more complete conclusion to the recent nonsuccess.

If they could fragment the atom into four separate segments and string them together with new atom particles from a previous test; they could justify their continual atom bypass restructuring to quantify Ketan's vision of splintering atoms and reconstructing them to combine both General and Special Relativity. This last attempt, even though it was unsuccessful was the closest to that realisation, theoretically. Both Ketan and NaNo0R just needed to improvise a plan to proceed to achieve the desired result.

NaNo0R rebooted the main systems for the next test. Until then, he'll continue to evaluate the last few tests to understand what went unfavourable and give his conclusions to Ketan when he returned.

Five hours passed and Ketan hadn't returned to the lab. NaNo0R started to wonder where he was.

Stopping his analysis and setting the program back to zero. NaNo0R left the lab and went to check on Ketan.

The door to Ketan's room was unlocked and NaNo0R opened it to find Ketan sitting on the floor in a lotus position in a vegetative state.

"Ketan!" NaNo0R shouted, "Ketan, are you alright?"

Ketan ignored him. NaNo0R was more direct in his approach to him, nudging him on the shoulder and continuing to shout his name over and over a number of times.

Ketan still didn't budge, remained unresponsive.

NaNo0R flustered, slapped Ketan across his face to wake him up. All that did was knock Ketan to the floor in a supine pose.

All of NaNo0R's neurons were activated in his head, why wasn't he responding to his commands, why wouldn't he wake up, this was so unusual. He didn't know what to do, he sat Ketan upright against his bed frame and found a chair and sat and stared at Ketan for several minutes. He had to do something, this was wrong, NaNo0R sat there shaking his head, this was all wrong.

Anxiety started to overtake NaNo0R's brain, he never felt this before, this was not normal, this was all new, Ketan wouldn't respond, his fears were all ablaze, so unusual to feel these feelings. Frightened and amazed at the same time, NaNo0R couldn't believe what was happening to him, so strange to feel all these feelings. He was a BHA, yeah, sure, he was organically structured, sure he could be human, but he only considered

himself android, not human, and yet all these feelings he was having were ... human.

Both NaNo0R and Ketan were sitting staring into space. The room was silent except for the running of life support in the underground laboratory.

Suddenly, Ketan's eyes fluttered, he focused; he jerked his head to the side and flashed into awareness.

"What?" Ketan gasped, "What's happening, 0R?"

NaNo0R relieved to see Ketan functioning again, stopped his own self-analysis and focused on Ketan.

"You're back!" NaNo0R was happy showing a smile, "what happened?" he asked.

Ketan looked at NaNo0R, "What do you mean?"

"You were unresponsive for several if not longer minutes." NaNo0R rose from his chair to help assist Ketan from his sitting position.

"Let me help you up." NaNo0R said assisting Ketan to his feet.

"I feel weird." Ketan said passing his hand through his hair.

"I feel weird too." NaNo0R replied.

"Strange, how can, what's going on?" Ketan looked to NaNo0R for a knowingly unrequited answer.

NaNo0R reached out his hand and touched Ketan's cheek, "I thought I lost you."



Ketan smiled, "No way, I'm not going anywhere OR, and besides, what can happen to me, I'm almost invincible, like you, just because I have human genes doesn't mean I'm any less droid than you my love."

NaNo0R felt reassured, but that too was a strange feeling for him. How was he becoming more human, he didn't have a gene pool in his system, like Ketan. He was completely made in a lab with organic material and Nano-Tech. It was nice to know that Ketan accepted him, even though he wasn't a percentage of being a true human. This too was a new strange feeling, more important than it was previously for some unknown reason. He always accepted his form of life. But now, he questioned it.

NaNo0R continued to help Ketan to his feet and they sat on the bed holding hands. "I can't seem to understand why I'm feeling so emotional." NaNo0R confided to Ketan.

"I understand OR, I'm feeling odd myself, and I'm usually in complete control of myself, well, mostly." Ketan remembered his outburst in the lab earlier, which was out of sorts for him he continued to evaluate his change.

"You know, I was not my usual self after that last test." Ketan stood and helped NaNo0R from his bed.

"We have to get back to the lab and see the last results. Maybe that could tell us what's wrong with us." Ketan continued as they walked back to the next room.

"Did you find any errors or odd results in your examination of the last tests?" Ketan asked OR.

"Not really, nothing but malfunctioning fragmentation of the atom."

Ketan sat at his chair and ran through data and typed in a few strokes on his keyboard. Main screen showed all the results, and nothing extraordinary popped up, their mainframe quantum motherboard, Core-AI found nothing in error, all results were normal.

"I don't understand, I guess everything is fine." Ketan continued saying to OR as he typed more on his console.

OR sat at his console and injected more data punches from his keyboard trying to decipher more information from Core to determine what would make both he and Ketan feel so strange.

"You know, Ketan, something is wrong, we aren't ourselves and something must have happened in the last test."

"I know, but what, Core doesn't find anything, you and I can't find anything ... but still, something is not usual.

OR continued to type, after hitting F12 and the enter button a red error line flashed on all the screens in the lab.

Both were surprised, Core had found an anomaly.

"Whoa!" Ketan silently shouted, "What the fuck is that?" He looked closer to his main viewer and read the error message.

UNIDENTIFIED LIFE FORM DETECTED IN MAIN CORRIDOR  
OF ATOM SPLITTER SECTION 2

"What the fuck?" Ketan looked to OR. "I don't see anything in the corridor, you?"

"I'll switch to my optics modifier mode and scan the section to evaluate any life forms. OR immediately scanned and found nothing on any of his scan levels.

"Nothing, I see nothing in the corridor." He said to Ketan feeling a little frightened. Again, those feelings were welling up inside him as they were with Ketan.

"Well, we have to find a solution to this, if Core says there's something there, I believe her." Ketan scooted his chair back towards another console behind him.

"We'll flush the corridor out with disinfectant to clear the passage." Ketan touched the screen and tapped in a password to launch it. But before he could launch the cleanser, NaNoOR interrupted.

"But, what if it's a life form of importance or..." he stopped mid-sentence, "you just can't kill it." OR injected with much emotion.

"Well, what if it's not congenial?"

"We should find out first, we just can't kill an unknown life form, look at us, we're unknown life forms from our ancestors would you have wanted them to kill us if they discovered us in the 21st Century?"

"Yeah, you have a point there, but ..."

"Let's have Core do an assessment and see if she can come up with a solid solution." OR said lightly touching Ketan forearm.

"Okay, it hasn't hurt us so far, and it's been hours since the test, maybe it's not hostile." Ketan said giving Core a few commands from his main console.

A few moments passed and Core switched to voice mode to convey her conclusions. "Life form is based on galactic material, mostly made of dark energy, unknown other matter and of intellectual identity through thought transference."

Ketan and OR looked at each other. "Thanks Core." Ketan spoke to the AI.

"That makes sense to not being able to see it." OR said to Ketan walking closer to Ketan's main view screen. "So we can't see it, but we can sense it?" OR continued to speculate out loud mostly to himself and to Ketan.

"Looks that way, maybe the emotions we're experiencing are from it and not us. Maybe it's trying to communicate to us on a emotional thought level."

OR nodded in agreement, "So how do we communicate back?" he asked Ketan.

"Good question, maybe Core can help communicate with it for us and we'll try and put our brains together and try to find a way to have a little chat." Ketan sat in his chair and started typing on his keyboard.

OR went back to his station and started the same inquiries into communication with a galactic being without substance and the ability to talk like a humanoid. Core will have to reach deep inside her databanks and quantum research to attain a way to reach the dark energy and communicate.

"I think we caused this." Ketan mused. "I've gone over the data with Core and we both think we know what happened. We think we hit the atom during the last test and the laser bounced off the atom and hit the pilot waves around it and opened up a window for the dark energy to enter."

"So did we achieve S/G\_R?" OR asked Ketan. "That sounds a lot like S/G\_R."

"Yeah, it does, doesn't it." Ketan thought about the idea that the bounce on the waves could've opened up a passage way for anything to happen.

"Now all we have to do is communicate with it and find out what to do next." OR said looking at the main viewer seeing nothing in the corridor. "I hope Core can come up with a way to have a little talk with it." he continued to Ketan.

"I hope so." Ketan said.

"So I have a thought, why don't we use a worm hole and get rid of it." OR stated.

"You know that would be great, but the last time I messed with a worm hole I sent my parents to another galaxy, how was I to know it worked on DNA and scrapped up all genetic material to cluster together in a random scatter. That took forever to try and fix." Ketan said reluctantly thinking of playing with that again.

"I know, but you fixed it, you saved your parents and sent them back where they came from." OR said touching Ketan's arm lovingly.

"Yeah, but shit man, that was fucking hard to figure out."  
Ketan said with a heavy sigh.

"But you did it." OR smiled.

"We did it, and Core." Ketan said back feeling less stressed about using a worm hole again. "I guess we could try, but first we have to see what it wants to do."

Ketan stared at the viewer, "I really feel sorry about causing this to happen, seems that everything I try I fail miserably. I fuck things up, more than fix them."

"Yeah, but you try, we all do." OR hugged Ketan.

"What was it that Einstein said, 'anyone who has never made a mistake has never tried anything new.', and you always try Keet." OR let go of Ketan. They both stared at the viewer waiting for Core to come up with a way to communicate.

It had taken Core ten minutes for the solution. Communication was immediately established before she told Ketan and OR of her progress.

"Mission accomplished." Core said to the room.  
"Communication established between entity and laboratory humanoids."

"Hello." Ketan sheepishly uttered.

A few seconds later, audio transmission from the labs speaker system heard a whispering sound like an ocean spraying upon a beach.

"I don't understand." he said to Core, "I don't understand, I thought you said communication was available."

Core answered, "Wait."

Ketan and OR waited a few moments. They could feel emotions, taste words of sentences. See more sounds merging with more emotions.

"I can sense something." Ketan said to OR.

"Me too," OR replied, "but I still have a hard time understanding any content."

Core set more established elements in focus for the two to understand more completely in more human form.

Sounds were heard, more whispering ocean sounds and then muddled in between waves.

"Hello." said the Dark Energy.

Ketan and OR smiled, they now could understand their visitor.

"Do you have a name?" Ketan asked.

"No." it replied.

Then Ketan looked at OR and said, "I'm sorry for causing this to happen." he spoke to the Dark Energy. No sounds were heard from the speakers. But the two of them felt more emotions, sad emotions, but no words.

Core injected her opinion, "I think it can't formulate much language capabilities other than a few short words, I think it relies mostly on interpersonal interpretation for its language."

Ketan replied to Core, "Thanks for that. What else can we do to understand it better?"

"I suggest you grok and assimilate its feelings and translate them to make your decisions between yourselves on pure thought or subconscious layers."

"You mean Bohm theory of QM or a similar concept." 0R said to Core's suggestion of reasoning.

Ketan nodded in agreement, "Makes sense, but it's more than that, way more. This is more complex of a situation than any of those quantum theories."

NaNo0R stopped his thought process to re-evaluate Core's theory.

"Yes, this is much more complex in possibilities, this is far beyond QM. We've hit the Omnis Factor." 0R completed his opinion to Ketan.

Ketan laughed and looked at 0R, "I think you're right. This is beyond QM and maybe a whole bunch of other contemporary theories, we've hit the unknown. The Unk of Reality/Relativity."

"This feeling we have is an entity, not just particles and wave functions and pilot waves and atom smashing. This is overwhelming, this is painful. It's gaining more control over my cortex. I think it's taken over my existence." Ketan said grabbing hold of 0R's jumpsuit.

"I believe we're not ourselves anymore, at least we're not alone with ourselves anymore. We have a visitor and maybe a parasite." 0R continued his evaluation to Ketan.



“I agree, and yet, there’s nothing we can do about it.” He said as he tried to gain control over his own thoughts and feelings.

But why would this entity want to overtake them and gain control over their cortex and body functions, why wasn’t this entity a friendly being, why would it be a hostile being. That was the question both Ketan and OR kept thinking.

Even though they had this overwhelming feeling of being controlled by this unknown entity, it still hasn’t communicated to them in the true self of revealing its identity; just these feelings of dread and despair and random feelings of happiness and sadness. It was like it was trying on different suits to see what fit.

Suddenly without the aid of Core, the Dark Energy spoke to both OR and Ketan.

“Hello world.” It said. “My name is ...” It stopped communicating. Moments passed, it started to converse once more.

“My name is, I have no name. I am just pure energy, no real form or matter. I have communication through Core your AI but I am more.” It stopped communication once again.

At least Ketan and OR started to understand that it wasn’t a parasite or nefarious or any of their fears, but a being that was trying to communicate with them. It wasn’t its fault it was here. Ketan by prolonging his experiments without direction summoned this entity into their realm of existence. And it was up to Ketan to not overstep his authority by taking control over this unknown

entity. They would have to develop a relationship with each other to try and establish how to further their communications and wishes for the future, either purging this or try sending it back to where it came from. Both endeavors would be extremely challenging to accomplish.

“I’ve been thinking about this all wrong.” Ketan said.

“I’ve been thinking micro, I should be thinking macro.”

“Why do you say that?” OR asked.

“We’ve been dealing with an entity that we have no knowledge of and with my DNA components, having three different ones embedded in my gene pool and now with this new one embedded in my gene pool, I have four strands of DNA to contend with and my idea is that I’ve been thinking about this the wrong way.”

"I'm from a different sort of gene pool, which means, I basically have no gene pool to identify with, so therefore, I'm only equipped to deal with what is based on my base instincts and programming, thus this new entity is in my gene pool and I'm unable to redirect my basic functions to my original program." OR said as he sat down by his console and started typing foreign cryptic messages on his keyboard.

Ketan watched as this happened and tried to decipher the inscription OR was typing.

It was foreign and nontranscible and Ketan gave up on trying to understand the gibberish OR was typing.

"What are you typing?" Ketan asked OR.

"Nothing." OR said realising he was typing on his keypad. "I'm finding myself lost in thought Ketan, and not realising what I'm doing or even thinking." He confided to his boyfriend.

"That's okay OR." Ketan said, "I'm having the same thought patterns as you, lost in thought, and basically not understanding what I'm actually thinking about."

"So we're two lost souls in the middle of doubt without a rail to sit on." OR said.

"What the fuck does that mean?" Ketan asked.

"I don't understand what you mean, fact, I didn't understand what I said." OR said standing up from his console and walking towards the window showing the collider.

"Perhaps I should have said, we're just two lost souls swimming in a fish bowl year after year. Running over the same routine...wait that's not it."

He stood there for a few moments looking down the line of the long collider and wondering what his next thought would be, not realising that his next thought wasn't his own thought, but that of the Dark Energy that possessed him.

Ketan walked next to him and stared at the window also and touched OR's shoulder and said. "I'm just as perplexed as you my friend. I have no idea what's going on or what I might say or do next."

Core interjected for a moment as they stared into space.

"Reasoning the most realistic explanation of what the two of you might be encountering is just a thought, but the entity is just

as perplexed as the two of you. All of you are in a new formation of understanding and the idea of making sense of anything is just a unreliable play of mind melding."

"What?" Ketan asked. OR looked to him with perplexed eyes. They both asked Core a meaning behind her statement. Core was silent for a few minutes.

"I stated the fact that the two of you including the new entity are in a perplex mode of being, enveloping both and all your cortex's and thought patterns and not being able to establish a core base of understanding. You may have to reestablish a baseline of understanding to finally communicate with each other on the same wave length sort to speak."

"Ketan, I understand now." OR said.

Ketan nodded in agreement, he also finally understood the predicament and gave into the idea of relinquishing his way of thinking to be open to the possibility of having the entity reveal itself to him in more understanding way.

"We have to have a baseline of communication, like, can I have another cookie?" Ketan said to OR.

"I understand, we establish a form of communication that is basic and simple to establish a linked baseline of communication."

"Exactly, and to do that we make simple sentence structures that all of us can understand in the most simplistic way, and in doing so, we establish a simple form of communication with the entity and then we can start to formulate a more complex way of communicating and understand what we're all thinking and then

we can come to a understanding." Ketan finished as he looked through the collider window downstream.

"My next question, however, is how do we know where this entity actually is?" OR asked watching Ketan look through the window.

Ketan smiled, "I see what you're doing, you see me looking downstream at the collider thinking the entity is downstream where the collider splits it's energy core and you think that I think it's down there. When in actuality it's all around or even inside of us."

"You know me too well my friend." OR stated as he sat down again near his console.

"We should try and establish our baseline. Do you think we should type it in the system or establish a line with Core or just communicate with our minds?" OR asked.

"Let's do all." Ketan said sitting and typing on his console.

"We'll establish baselines all around and one of them has to click." He said typing and saying it to Core while thinking something completely different to establish his baseline.

"I'm assuming we're all establishing our own wave patterns and sentencing for ourselves, right Ketan?" OR asked typing pure code and thinking complex theories for his own baseline.

"Exactly, the more diverse the better." Ketan said.

Establishing a baseline from the three of them to the new entity will be an easy way to extract information, both from the AI and OR and Ketan, all having extreme knowledge base of

everything in their arsenal of information. All are able to extract more knowledge than the common man and can probably get to a quick communication with the entity in record time. Perhaps in a matter of minutes if not seconds, which in this case was established in a record time of 5.7 seconds to get to a basic communication with the Dark Energy. Sync'd and connected all were in tandem with each others thoughts.

All were in connection and all were in zone with each other. No words were spoken, all was internal and grokked simultaneously.

With communication established the entity revealed its wishes and Core, OR and Ketan digested the information and considered a solution to the entities request.

It would take some time to actually try and help the Dark Energy get to its planned destination; but time is just a man made thing, and none of them were actually a real man, so time was irrelevant.

The Dark Energy spoke to Core about its real domain that it wanted to acquire. Core understood and relayed the information to both OR and Ketan simultaneously.

It was a heading of 0.999223847775 in the Splinter Galaxy. Ketan made coordinates to that location but typed in Cygnus instead and started to create a code thesis to accommodate the exact pinpoint to that location to devise a primitive wormhole to open to the destination requested by the dark energy.

Thus creating a wormhole which without forethought could cause his father and mother to be swept up into a wormhole and

strand his own parents on a dying planet, again. With the entity coming into form in his laboratory, Ketan wasn't quite sure what the time factor would be in the universe, it could be altered. He wasn't sure.

Ketan quickly went to work to try and resonerate his mistake and try and rectify his prothesis.

0.999223847775 heading was corrected to 0.999223846662. Why he would make that mistake again was something he felt was a random preset of his. Like always forgetting to turn off the bathroom light after leaving.

Something that he subconsciously did without thinking. That wormhole coordinate was his bathroom light default. He shook it off. Was it also some hidden subconscious prestruck about having some form of anger to his parents. A psychological angst against his father for having sex with an android who in turn would be raped by an alien, causing him this malformed DNA construct that made him an alien in his own body. Always wishing he was normal, a human man, not part this or that. Was that default wormhole setting something he just kept doing to get back at dear old dad for not keeping it in his pants. Whatever. He dropped this thought process.

Which he did, and then, reconstructed his original thought and processes to create another wormhole for the dark energy to proceed to its original course. OR and Core help rectify this default mishap as a backup if Ketan didn't notice.

The Dark Energy could feel less anxious with this heading to the Splinter Galaxy and the feeling spilled out among all of them. Everyone was more relaxed and able to concentrate on the

adjusting theory. Adjusting it was. Each keystroke was randomly typed. Each theory of what to type was just done by pure instinct. Theory, Mathematics, Quantum Physics, Relativity, all were thrown out the window. A new form of logic was being established and executed at random, Jazz. It was a new form of Jazz construct. Improvised and purely established as True.

"I wish to say something." OR said to all in the room. "I think we might be on the right track." he continued, "the heading is linking up to vibrations from the subatomic quadrant of the Splinter Galaxy."

"I see that." Ketan added. "funny, this is actually working."

"Established heading correct." Core added to the conversation.

The Dark Energy felt more calm as it heard the comments being made in the lab.

Its feeling of overwhelmness was subsiding and it was feeling confident that the adjustments were in favor of its return to its own place in the universe was being established and it could be back to its original occupancy in space and time.

"Shall I hit the enter button?" OR asked Ketan.

"Hit it!" Ketan and Core said simultaneously.

The collider was started and the hum of the machine powered up and within a flash of a few minutes it was at full power and a beam was sent down the corridor.

Within seconds the dread, fear and anxiety left Ketan and OR. The entity that was creating internal havoc on their minds and



bodies was gone. Much faster of a release than when it entered. The slow process of establishing itself in their bodies quickly dissipated and they returned to their previous selves.

"Now that that's done. We can get back to business." Ketan said peering in his viewer of the collider.

"Aye aye captain." OR said smiling. "Back to business."

Core made a sensor sweep of the laboratory and gave the all clear sign. Two thumbs up on the monitors. The lab was back to normal and new calculations for the atom splitter was commencing.

## **OMNIS REMBRACED**

Core made more adjustments, OR made final checks and Ketan ran more alpha sims and everything was back to 0.00001.

"Let's start this baby up again and get those results we really want." Ketan said keystroking more information into his computer console.

The collider warmed up again, and OR hit the enter button for the split.

Once again after the laser passed down the corridor, another message hit the monitors.

## **ERROR SECTION 4**

"Fuck!" Ketan yelled once again, "damn, fucking doesn't fucking work again. Fuck!"

OR smiled, ah, back to normal he touched Ketan's arm to calm him down.

"We have all the time in the world to get this done." He said to Ketan.

Ketan relaxed after a minute and nodded in agreement.

"We do have all the time in the world." He said reflectively. "All the time in the world, all the space in the world, hell, fuck the world, the universe."

"There's always tomorrow." OR said, "it's been a long day, we should just relax and chill for the rest of the day, it's been a long and winding road we were on."

"You're right." Ketan said, "a martini might be in order."

OR smiled in agreement, "Preferably made with Gin instead of Vodka, don't you agree Keet?"

"I do, and Vermouth, just a splash, maybe a hint or just wave the bottle over the glass, don't want to make it too dirty."

"Maybe stirred not shaken, totally authentic." OR injected.

"Let's head to my room, we can go over some new calculations while we drink and think about tomorrow's agenda." Keta said waving his hand towards the door for OR to start ahead of him.

"There's always tomorrow, what you don't want to do today, do tomorrow. That's what my dad always said." Ketan said following OR silently laughing to himself.

They headed to the exit door of the lab. 0R flashed his hand towards his console and with that simple flash of his hand, Core started to update the days event and reprogram for tomorrows new session.

Ketan and 0R went into Ketan's room and undressed each other slowly, got into bed and made love to each other.

The idea that they were both more human than before, made this love session a bit more intense, so intense, they video'd the session. They wanted to remember this moment more.

They each laid side by side facing each other, looking into each others eyes, kissing slowly, passionately and softly.

They caressed, and hugged and playfully touch each others penis'. Ketan was the first to go down between 0R's legs and grab his penis with his mouth and softly caress it with his tongue and mouth, making 0R's penis hard within seconds.

0R lifted his head with extasy and moaned with delight.

Ketan continued to tongue his penis and sucked in and out of his mouth and making 0R tensed up with orgasmic pre-semen drips.

They continued until each came and fell asleep until morning.

A new day approached. New ideas, new remedies. New visions of what needed to be produced.

After a night of some very intense emotional lovemaking. NaNo0R stated to Ketan, "Funny, how after letting the Genie out of the bottle, you can't put the Genie back into the bottle."

"You're right OR, we have a new phase in our lives."

Ketan, after a night of restful sleep with his lover OR, Ketan had visions of new concepts to start anew. He had dreams of exploring uncharted ideas and started to think outside the boson.

True meaning of his purpose was at hand. His vision of trying to explore what was previously explored was irrelevant.

He needed new thoughts, new ideas. New agenda. New purpose. And he needed to think, think and then think some more. He needed to put aside the past. The old ways of thinking about what needed to be done. His way or the highway.

The past would remain in the past from now on. He didn't need to dwell on the past. So what if he was shunned by the other kids, so what if he wasn't totally human. Fuck that shit.

He needed to forget that crap and start thinking about the future, his future. What HE wanted to accomplish in HIS life, not what others thought he should do or expect from him.

He was through with living in the past. He needed to change. The alien in him needed to expand, the alien Dark Energy he just had in him needed to expand. The android in him needed to expand, and his viking ancestor had to expand. All of his self needed to expand and go beyond his normal everyday redundant experiences. He needed to break free from all this bullshit and start thinking for himself and start making the future real.

OR gave him the best blow job ever. He stood erect and spurted out so much cum he passed out. His dreams were very strange. He dreamt of weird concepts, programming, new ways of

thinking in the lab. New ways of creating something new and different.

The next morning he awoke with OR laying next to him smiling. The change in OR was apparent as with himself.

"OR, let's hit the lab, I feel a spurt of energy!" Ketan said to his assistant and lover. "Today we make history!"

OR sat up in bed, "we make history or we go back in history?" Ketan smiled, smirked really, this new OR and his humanity was a bit over the top to say the least. Ketan was basically thinking, what the fuck, why is he such an asshole?

But things change and so be it.

## **PROGNOSTICATION**

Ketan's dream was very detailed, so detailed and so fresh in his mind, it just came out like liquid butter.

In his dream he recalled that new research shows that protons contain intrinsic charm quarks.

This is despite the fact that subatomic charm quarks are about 1.5 times more massive than the proton, itself.

When charm quarks are present, they carry about half of the proton's mass.

Protons are particles that exist in the nucleus of all atoms, with their number defining the elements themselves. Protons, however, are not fundamental particles. Rather, they are

composite particles made up of smaller subatomic particles, namely two “up quarks” and one “down quark” bound together by force-carrying particles (bosons) called “gluons.”

This structure isn’t certain, however, and quantum physics suggests that along with these three quarks, other particles should be “popping” into and out of existence at all times, affecting the mass of the proton. This includes other quarks and even quark-antiquark pairs.

Indeed, the deeper scientists have probed the structure of the proton with high-energy particle collisions, the more complicated the situation has become. As a result, for around four decades, physicists have speculated that protons may host a heavier form of quark than up and down quarks called “intrinsic charm quarks,” but confirmation of this has been elusive.

Now, by exploiting a high-precision determination of the quark-gluon content of the proton and by examining 350 years’ worth of data, particle physics data researchers have discovered evidence that the proton does contain intrinsic charm quarks.

What makes this result more extraordinary is that this flavor of quark is one-and-a-half times more massive than the proton itself. Yet when it is a component of the proton, the charm quark still only accounts for around half of the composite particle’s mass.

Ketan's dream only went so far, he need to explore further.

He tapped on his keyboard and sent instructions to Core to delve into QM.

On the top screen Core had relayed the data:

## 'The Weirdness of Quantum Mechanics

This counter-intuitive setup is a consequence of the weirdness of quantum mechanics, the physics that governs the subatomic world. This requires thinking of the structure of a particle and what can be found within it as probabilistic in nature.

“There are six kinds of quarks in nature, three are lighter than the proton [up, down, and strange quarks] and three are heavier [charm, top, and bottom quarks],” Stefano Forte, NNPDF Collaboration team leader and professor of theoretical Physics at Milan University, tells the Nature Briefing podcast. “One would think that only the lighter quarks are inside the proton, but actually, the laws of quantum physics allow also for the heavier quarks to be inside the proton.”

Forte — the lead author of a paper published earlier this month in the journal *Nature*, describing the research—and his team set out to discover if the lightest of these heavier quarks, the charm quark, is present in the proton.

When the Large Hadron Collider (LHC) and other particle accelerators smash protons against each other (and other particles, like electrons) at high energies, what emerges is a shower of particles. This can be used to “reconstruct” the composition of the original particle and the particles that comprised it, collectively known as “partons.”

Each of these partons carries away a portion of the overall momentum of the system — the momentum distribution—with this share of momentum known as the momentum fraction.

Forte and colleagues fed 35 years of data from particle accelerators, including the world's largest and most powerful machine of this kind, the LHC, to a computer algorithm that pieces proton structure back together by looking for a "best fit" for its structure at high-energies. From here, the team calculated the structure for the proton when it is at rest.

This resulted in the first evidence that protons do indeed sometimes have charm quarks. These are labeled "intrinsic" because they are part of the proton for a long time and are still present when the proton is at rest, meaning it doesn't emerge from the high-energy interaction with another particle.

"You have a chance, which is small but not negligible, of finding a charm quark in the proton, and when you do find one, it so happens that that charm quark is typically carrying about half of the proton mass," Forte says on the podcast. "This is quantum physics, so everything is probabilistic."

### The "Intrinsic" Charm Quark Scenario

Romona Vogt is a high-energy physicist at Lawrence Livermore National Laboratory (LLNL) in California, who wrote a "News and Views" piece for Nature to accompany the new research paper.

She explains to Popular Mechanics how charm quarks could be connected to proton structure and how the intrinsic charm quark scenario differs from the standard scenario that sees protons comprised of just two up and one down quarks joined by gluons.

"Charm quarks come in quark-antiquark pairs in both the standard scenario and the intrinsic charm one," Vogt says. "In the standard scenario, a gluon radiates this pairing during a high-energy



interaction. Because of the charm quark's mass, it is too heavy to be part of the 'sea' of light up, down, and strange quarks."

This means the charm quark doesn't have a large role when physicists calculate the standard parton momentum distribution functions until momentum reaches a threshold above mass.

"That's very different from the intrinsic charm scenario where the charm distribution carries a large fraction of the proton momentum," Vogt adds. "Because in the intrinsic charm quark scenario, the quark-antiquark pair is attached to more than one of the up and down quarks in the proton they travel with. That's why the charm quarks appear at large momentum fractions.

"The proton is more or less 'empty' in this scenario or has a small size configuration because the proton is just up, up, down quarks and charm quark pairs with no other quarks at low momentum fractions in the minimal model of intrinsic charm."

Vogt suggests that the NNPDF Collaboration's results could lead other researchers to ask if other quarks could play a role in the composition of protons.

"One question these findings might raise is whether or not there are other intrinsic quark scenarios, like intrinsic bottom and intrinsic strangeness," she says.'

After reviewing this data, Ketan needed to think more on this and consult OR for further analysis.

OR was staring at his screen. "You know Ket...we could bypass all this."

"What?" Ketan's eyes lit up.

"I like where you're going, if we can bypass a lot of redundant steps and just get to the core process, that would be really helpful."

"Exactly." OR said sending his data to Ketan's screen.

"I'm thinking, laser the atom multiple times in the center until it shatters it into oblivion and we get nothing, no particles, nothing, all of it just obliterated and reduced to subparticles."

"And?" Ketan asked.

"And, we get the result, the final result, the END result." OR stated.

"So we delete the atom. No more atom, we get our result."

"Yes." OR said, consulting with Core and both analysis was sent to Ketan's screen. Showing the positive result.

"Okay, let's try it." Ketan said. "Rev up the laser."

"But when I say final result...that might be the FINAL result." OR continued to advise Ketan.

"Oh, I totally understand what you're saying." Ketan said.

"Just to let you know, we might, might cause the destruction of the universe." OR continued.

"Totally get it." Ketan said, "But, we have to try, this has been my life's ambition."

"I understand." OR said setting up the project to resume in ten minutes.

"I have no problem in doing your ambitious concept, even at the end of the world so to speak, I'm just being overly cautious."

"Nothing is going to happen, believe me, I've done the math."  
Ketan reassuring OR.

OR sat at his console, typed in the elementary syntax code to begin setting up the laser for deployment.

OR upgraded the laser to an ancient Fibonacci laser.

((By firing a Fibonacci laser pulse at atoms inside a quantum computer, physicists have created a completely new, strange phase of matter that behaves as if it has two dimensions of time.

The new phase of matter, created by using lasers to rhythmically jiggle a strand of 10 ytterbium ions, enables Or and Ketan to store information in a far more error-protected way, thereby opening the path to Core that can hold on to data for a long time without becoming garbled.

The inclusion of a theoretical "extra" time dimension "is a completely different way of thinking about phases of matter," lead author Philipp Dumitrescu, a researcher at the Flatiron Institute's Center for Computational Quantum Physics in New York City, said in a statement. "I've been working on these theory ideas for over five years, and seeing them come actually to be realized in experiments is exciting."

The physicists didn't set out to create a phase with a theoretical extra time dimension, nor were they looking for a method to enable better quantum data storage. Instead, they were interested

in creating a new phase of matter - a new form in which matter can exist, beyond the standard solid, liquid, gas, plasma.

They set about building the new phase in the quantum computer company Quantinuum's H1 quantum processor, which consists of 10 ytterbium ions in a vacuum chamber that are precisely controlled by lasers in a device known as an ion trap.

Ordinary computers use bits, or 0s and 1s, to form the basis of all calculations. Quantum computers are designed to use qubits, which can also exist in a state of 0 or 1. But that's just about where the similarities end. Thanks to the bizarre laws of the quantum world, qubits can exist in a combination, or superposition, of both the 0 and 1 states until the moment they are measured, upon which they randomly collapse into either a 0 or a 1.

This strange behavior is the key to the power of quantum computing, as it allows qubits to link together through quantum entanglement, a process that Albert Einstein dubbed "spooky action at a distance." Entanglement couples two or more qubits to each other, connecting their properties so that any change in one particle will cause a change in the other, even if they are separated by vast distances. This gives quantum computers the ability to perform multiple calculations simultaneously, exponentially boosting their processing power over that of classical devices.

But the development of quantum computers is held back by a big flaw: Qubits don't just interact and get entangled with each other; because they cannot be perfectly isolated from the environment outside the quantum computer, they also interact with the outside

environment, thus causing them to lose their quantum properties, and the information they carry, in a process called decoherence.

"Even if you keep all the atoms under tight control, they can lose their 'quantumness' by talking to their environment, heating up or interacting with things in ways you didn't plan," Dumitrescu said.

To get around these pesky decoherence effects and create a new, stable phase, the physicists looked to a special set of phases called topological phases. Quantum entanglement doesn't just enable quantum devices to encode information across the singular, static positions of qubits, but also to weave them into the dynamic motions and interactions of the entire material — in the very shape, or topology, of the material's entangled states. This creates a "topological" qubit that encodes information in the shape formed by multiple parts rather than one part alone, making the phase much less likely to lose its information.

A key hallmark of moving from one phase to another is the breaking of physical symmetries — the idea that the laws of physics are the same for an object at any point in time or space. As a liquid, the molecules in water follow the same physical laws at every point in space and in every direction. But if you cool water enough so that it transforms into ice, its molecules will pick regular points along a crystal structure, or lattice, to arrange themselves across. Suddenly, the water molecules have preferred points in space to occupy, and they leave the other points empty; the spatial symmetry of the water has been spontaneously broken.

Creating a new topological phase inside a quantum computer also relies on symmetry breaking, but with this new phase, the symmetry is not being broken across space, but time.

By giving each ion in the chain a periodic jolt with the lasers, the physicists wanted to break the continuous time symmetry of the ions at rest and impose their own time symmetry — where the qubits remain the same across certain intervals in time - that would create a rhythmic topological phase across the material.

But the experiment failed. Instead of inducing a topological phase that was immune to decoherence effects, the regular laser pulses amplified the noise from outside the system, destroying it less than 1.5 seconds after it was switched on.

After reconsidering the experiment, the researchers realized that to create a more robust topological phase, they would need to knot more than one time symmetry into the ion strand to decrease the odds of the system getting scrambled. To do this, they settled on finding a pulse pattern that did not repeat simply and regularly but nonetheless showed some kind of higher symmetry across time.

This led them to the Fibonacci sequence, in which the next number of the sequence is created by adding the previous two. Whereas a simple periodic laser pulse might just alternate between two laser sources (A, B, A, B, A, B, and so on), their new pulse train instead ran by combining the two pulses that came before (A, AB, ABA, ABAAB, ABAABABA, etc.).

This Fibonacci pulsing created a time symmetry that, just like a quasicrystal in space, was ordered without ever repeating. And just like a quasicrystal, the Fibonacci pulses also squish a higher

dimensional pattern onto a lower dimensional surface. In the case of a spatial quasicrystal such as Penrose tiling, a slice of a five-dimensional lattice is projected onto a two-dimensional surface. When looking at the Fibonacci pulse pattern, we see two theoretical time symmetries get flattened into a single physical one.

"The system essentially gets a bonus symmetry from a nonexistent extra time dimension," the researchers wrote in the statement. The system appears as a material that exists in some higher dimension with two dimensions of time - even if this may be physically impossible in reality.

When the team tested it, the new quasiperiodic Fibonacci pulse created a topographic phase that protected the system from data loss across the entire 5.5 seconds of the test. Indeed, they had created a phase that was immune to decoherence for much longer than others.

"With this quasi-periodic sequence, there's a complicated evolution that cancels out all the errors that live on the edge," Dumitrescu said. "Because of that, the edge stays quantum-mechanically coherent much, much longer than you'd expect."

Although the physicists achieved their aim, one hurdle remains to making their phase a useful tool for quantum programmers: integrating it with the computational side of quantum computing so that it can be input with calculations.

"We have this direct, tantalizing application, but we need to find a way to hook it into the calculations," Dumitrescu said. "That's an open problem we're working on."))

When OR activated the laser, the shit hit the fan.

Suddenly as the laser smashed through the atom, all time stopped. All essence stopped. All stopped. Vacuum. Endless vacuum. No sound. No light. No anything.

Ketan stood there in darkness and quietness. This wasn't what he expected. The math was correct, so he thought, but somehow, incorrect. He was wrong, again.

Oh shit he thought, I fucked up big time. He looked from side to side, hoping to see OR or Core, nothing remained. Only his isolated loneliness. The emptiness of nothingness. Oh god, he fucked up royally. Fucking mass fuck up to the nth degree.

What was he to do now, he was in a void of nothing, but, yet, he was still "something". He still thought, so therefore he was. He mused to himself. What the fuck did I do and how the hell am I gonna fix this? He thought for a moment, then continued to look around, still, nothing could be seen, heard, smelled, tasted, felt. No senses, just pure thought.

Fuck, I really fucked up. Is this ever gonna change? Am I gonna be like this forever?

He panicked. He tried to move from his stance. He couldn't tell if he moved or not. There was nothing to be a barometer of movement.

He stood there eyes open wide, alone, freaking.

I have to fix this, was his only thought. I have to fix this somehow, this can't be the end. Nothingness.



Ketan had no idea how much time had elapsed. But he kept the faith that something would change, something would become real, identifiable, durable, touchworthy, a clue to reality, three dimensional reality or even four dimensional reality would be welcomed.

Still nothing, no sense of time to calculate, the time of nothing. Just his thoughts of what time was suppose to be.

Sad, alone, he missed 0R. He missed Core. He missed reality as a whole.

He needed to fix this, this was all that was on his mind, fix, fix, fix what he made happen. Fix his mistake.

He lost hope. He gave up. He waited. And waited. And waited.

## **CHAOTICUS UNIVERSUM**

He lost hope. He gave up until he heard a sound finally, it was 0R. Standing next to him. How could this be, how long was it?

"Ketan." 0R said touching Ketan's arm. "It is I...NaNo0R."

"0R, so good to hear your voice, and feel your touch." Ketan said relaxing with the idea of not being alone anymore. The fear, the loneliness faded away.

"Where are we?" Ketan asked.

"Your guess is as good as mine Keet." 0R replied.

"One moment we were in the lab, the next, void."

"I know, what did we do wrong?"

"My hypothesis is, we're in a chaotic multiverse maybe a universum of chaos, maybe everything is inside out, outside in." OR tried to explain his theory. "That's just one theory, perhaps we're inside Core. Perhaps our atom smash, did a quantum computer parallel universe inside of Core."

"That's crazy!" Ketan said, "how could we be inside Core?"

"We were reduced to small molecular components and just got wrapped up inside her." OR continued his theory once more, stretching for more coherent answers for both he and Ketan

"I have to inform you two, that, it's not that, it's a collapse of the universe. It's collapsing inside itself." Core AI spoke since the incident happened.

Ketan and OR looked at each other, "Core?" They both said, "You're here with us?"

They were quite surprised by Core's prescence. Thinking only humanoids had been quifted to this realm of existence.

Core, silently smirked to herself. "You guys truly are something. Just because you're humanoid, you think that only you can survive a calamity such as the one that just happened?"

Ketan and OR looked at each other. "I'm surprised you survived." Ketan said quite honestly.

"Oh, just because I'm a computer, I'm not human." Core relayed back sarcastically.

"No, I wasn't saying that." Ketan continued.

"Um, Yeah, you were." She continued. "I too was infested with the Dark Energy when it appeared in our accelerator corridor. "and I too was infected with it's 'soul'."

Ketan and OR were set apart from the circumstances that was being presented.

"We didn't know." OR said to Core.

"And You didn't care either." She said back, upset with the way they viewed her existence.

"For such woke gay people, you guys suck donkey dicks." She continued blasting them for their insensitivity to her existence.

"Fuck you two." She said and went silent.

Ketan and OR looked at each other in amazement about how insensitive they were to Core and her sentient existence.

They always thought of her as an appropriation of the computer system, never as a living existence. Artificial Intelligence was just a word to them. Not something actual.

And for all the intellect both processed, they were incapable of actually believing it. Woke, my ass. They both thought. How could They of all people be assholes. But, they were.

"Wait, so if ... we Qquifted to another realm. We pushed ourselves into a query of quantum physics 21st century when the theory of string plus harmonics was introduced by the Physicists Quagmire proposed that  $0.1 + 1.0 \times 23$  equalled the sum of Psalm 23.1 from the Bible? to "The lord is my shepard i shall not want." meaning, God exists in quantum physics world due to mathematical equations presented by an insane Shaman

Physicists Quagmire, we should believe it?" OR of course said, being the only rational one in the collapsed universe.

"Speaking of which, this collapsed universe, is it not a black hole?" OR insisted a response from the other two 'geniuses' in the collapsed universe they are experiencing.

Silence.

No one talked for at least 3 minutes.

"I don't understand." OR said finally.

"What don't you understand?" Ketan asked.

"With all this information, all this rationalisation and all this theoretically gobbledygook, no one says anything about what is presented to us?" He concluded.

"OR..." Ketan spoke and then went quiet.

Core AI was about to speak but decided to remain quiet.

"I for one." OR said standing up for himself. "I for one, am determined to figure all of this stuff out."

The whole rational of the situation was well out of hand. These were unknown territories each were experiencing.

They each had their own view points. And being of multiple systems, each had a very unique way of viewing life in general. If this was indeed, life.

Maybe this whole collapsed universe was just a precursor to an entirely different realm of existence, this could be just an entry port into a never ending black existence of nothingness and nothing more.

"May I interject?" Core asked.

"By all means." Ketan responded.

"I think, this is exactly what you were looking for, the meaning of everything you set out trying to find." She continued.

Ketan and OR looked at each other with a possible hint of understanding she could be right.

"Maybe This Is what we've been looking for." Ketan accepted the idea.

Then destroying the atom, causing the collapse of the universe is in fact the way to find the core of the universe. The meaning of everything. Not a black hole, but close. Not string theory or harmonic theory or even the God Particle.

But the destruction of everything, an implosion of the universe. Surprisingly, Ketan finally reached success.

This could be the very thing he was after all these years.