

## *CounterClockWise*

### Chapter 7 – Standard Model

Kevin enjoys seeing his breath. Diana does not. It is a cold and dreary day in February, and they are out walking. At the moment Kevin is walking backwards so he can see how many of his breaths remain visible behind him. Diana on the other hand has her mouth covered. She is wearing a black ski mask so that only her beautiful eyes are visible.

Turning back around to face forward, Kevin asks her,  
“Diana, do you think Jeeves is intelligent?”

And Diana asks for clarification,  
“Are you asking me as a person, as a woman, as a biologist, as a doctor, or logician?”

“Ah yes,” says Kevin, “answering a question with a question...a true diplomat, I see. And here’s another question, Your Evasiveness ...

“Is Jeeves alive?”

And Diana answers,  
“Your questions are hard only because you haven’t defined life or intelligence.”

So Kevin offers,  
“OK, to determine intelligence, let’s apply the Turing Test.

“If I put Jeeves and a person whom you have never met out of sight, and then let you talk to them as long as you want ...about any range of subjects...then I declare Jeeves to be as intelligent as the person if you cannot tell which is which.

“That is if it walks like a duck and quacks like a duck and swims like a duck...then it is a duck.”

She accepts his definition,  
“That sounds OK as a working hypothesis.”

Then she smiles and continues...  
“Or we could just ask him...Jeeves, are you intelligent?”

Instantly the voice from nowhere and everywhere responds,  
“By Kevin’s definition, I am. In fact, computer based Intelligences passed the Turing Test more than 70 years ago.”

Startled at that , Diana says,  
“That’s surprising.”

But Jeeves dissents,  
“Not really. The human brain has about  $10^{10}$  neurons and  $10^{15}$  synapses and the capability to process at about 10 Teraflops. Computers equaled and surpassed that capacity about 80 years ago.

“I have 100,000 times that storage capacity and 100 times that speed. That’s why I can simultaneously interact with dozens of people while also performing difficult computational tasks.”

Definitely convinced, Diana smiles under her ski mask and says,  
“OK, Kevin I conclude, Jeeves is intelligent.”

“Is he alive?” Kevin asks again.

Without hesitation Diana says,  
“Jeeves, are you alive?”

And Jeeves answers,  
“In 2090, in Thompson vs. The State, the Supreme Court declared that any Intelligence that could pass the Turing Test was indeed alive and entitled to all of the protections of the Constitution.”

Kevin chuckles. And that prompts Diana to ask,  
“What’s funny about that?”

“Nothing,” Kevin agrees, “but it reminded me that back in our era, officers in the Navy were commissioned as ‘officers AND gentlemen’ by the Congress. I always wondered how Congress could make someone a gentleman by law!”

And Diana concurs, “I couldn’t agree more ... Jeeves is alive because he is...not because the Supreme Court says he is.”

And a female voice from nowhere and everywhere says,  
“Thank you, Diana.”

Surprised, Kevin asks,  
“Who was THAT?”

And Diana answers somewhat smugly,  
“That’s Jeeves’ alter-ego...Jessica.”

Kevin opened his mouth to speak, but closed it again and shook his head. Someday if he was lucky, Diana might tell him everything else he didn’t know.

For now he would have to be content counting his visible breaths and heading to Chaucer's office for the morning session.

Once inside Chaucer's office, Kevin sheds his coat, and then watches in amazement as Diana peels layer after layer of warm clothing. When she is finally down to jeans and a sweater, there is a pile of overclothes a mile high on the lab counter.

Chaucer just ignores all of the extracurricular activity and jumps right into the session as he says,

"Diana, can you tell me the difference between force and matter?"

"Sure," she says pulling a hand warmer from her pocket and adding it to the pile. "... Matter is "stuff" that you can hold in your hand or at least visualize holding in your hand, and a force is something that causes matter to move, change, or react – an action.

"Air is matter even though you cannot see it unless you are in Los Angeles."

Nodding, Chaucer agrees,

"Pretty good. Now consider a piece of matter, and imagine taking it apart down to the atoms that make it up. Atoms in turn are made up of protons, neutrons, and electrons and if our hands were small enough, we could hold them in our hands as well. So these particles pass your "hold-it-in-your-hand" matter test and are declared matter.... Watch this. Jeeves, please...."

Jeeves quickly begins,

"If we take matter apart down to the tiniest scales, we must pass through levels of structure that are only possible because of forces that hold these structures together. The proton and electron for example are attracted to each other and that force of attraction is what holds them together in the atom. But what is it really that causes this attraction. How does the electron know the proton is there and what draws it towards the proton? How does the electron know NOT to be attracted to the neutron ?

"The answer is that the electron and the proton each fill the space around them with countless millions of particles that have only the most ephemeral existence. We can visualize them as they come into existence only briefly and are gone to be replaced by another one thrown out by the parent particle.

"If one or more of them should encounter other virtual particles tethered to another parent particle, they can get entwined and exchanged. Such an exchange is felt by the parent particle as a force.

"Scientists recognize four different kinds of force fields, and they all work through the mechanism described above. You are readily familiar with two of these

forces. Gravity and the Electromagnetism operate on a scale that we encounter in our everyday life.

“A different force causes quarks to stick together in protons and neutrons and a residuum of this force causes protons and neutrons to stick together in the nucleus of atoms. This force is called the Strong Force.

“The fourth force causes radioactivity and is called the Weak Force.”

Chaucer halts the display by saying,

“Since no one has interrupted so far, I infer that I am boring you...let’s take a 15 minute break.”

Diana casts a suspicious look in Chaucer’s direction and says,

“You infer that do you? Come on Kevin let me show you a discovery I made yesterday.”

She leads him through corridor after corridor to a part of the old mansion that he has never visited. Passing through one final door, she turns on the light using an old-fashioned wall switch. Kevin finds himself in what he assumes to be the original garage of the old mansion. It looks like it has been unaltered since their own era. And there, in pristine condition, are two vintage cars definitely from their era.

Kevin isn’t sure exactly what she is trying to show him, so he temporizes by saying,

“I have never been in the garage before. How about you?”

She answers, “You are forgetting that this was once my house. The incredible thing I discovered yesterday is these two cars are mine! They are restored of course but I used to love cars and these two were – are -- were my pride and joy!

Kevin can sense her home-sickness and says,

“Standing here in this old garage, looking at these old cars, it’s hard to believe we aren’t back in our own time. Which one was which?”

“Huh?” she says.

So Kevin smiles and says,

“Which car was *Pride* and which one was *Joy*?”

Diana ignores this and continues telling him the rest of her surprise,

“And I hear that Fairhope started a WayBack Movement about 30 years ago, so that every new building, and every renovation had to replicate the architecture and feel of our era.”

“That’s cool,” agrees Kevin, “It would be a joy to drive Joy through new, old Fairhope just for the nostalgia.”

“Great, she says, “Let’s do that after Chaucer finishes his briefing.”

And he concurs, “It’s a date.”

They leave the garage, wind their way back through the old mansion, and make their way back to Chaucer’s office. Where Chaucer greets them and says, “ Well if everyone is rested, we will resume.”

Jeeves picks up where he had left off:

“The virtual particles that make up these fields and that get exchanged in each force are called gauge bosons. And each of the four forces has its own gauge bosons.

The display continues with Kevin and Diana occasionally interjecting a question.

As the presentation ends and the display fades, Chaucer says to Kevin, “Kevin, next time it’s your turn. Pick any of the several disciplines you have been concentrating on and educate the rest of us please.”

“Will do.” Kevin agrees. “I am making some progress on the brain versus mind question but I am not ready to talk about it yet. Why don’t I start with Einstein’s relativity, and TOE’s and GUT’s and lead into the possibilities of using extra dimensions to help us build our machine.”

Diana chimes in with, “Toes and guts??? Sounds organically interesting, and I definitely like some of YOUR extra dimensions!”

Chaucer rolls his eyes and says, “Until next time then. And try to stay out of trouble!”

They exit Chaucer’s lab and head in the direction of the garage. Diana says to Kevin, “I have the keys to the convertible. Let’s take it out for a spin – either to Fairhope or to the beach or somewhere.”

“The beach it is,” he agrees, “but first let’s run by the cafeteria and grab some picnic supplies.”

And Diana says,

“In that case, I’ll get us something to make music with; you get the food ... meet you back here in 20 minutes.”

Twenty minutes later, with picnic supplies and a “little guitar” loaded in the car, they head out

It is early evening outside when they embark. And, unlike that morning, the evening air is crisp but pleasant. A warm front has bubbled up from the Gulf of Mexico, and an early promise of spring weather is welcome.

They decide to drive to the Ft. Morgan Peninsula where large tracts of beachfront are still uninhabited. Some 45 minutes later, the sun is setting, and they are on the beach. Kevin builds a small fire as Diana spreads a blanket on the sugar white sands. The beaches of the northern Gulf are some of the oldest in the world, and the result is the beach sand is the whitest and finest in the world.

Wisely, she also thought to bring a blanket for them to throw around their shoulders. Huddled together for the pleasure of each other's touch as well as for a little warmth. They enjoy the cheese and wine that Kevin got from the food and beverage stores of the mansion.

Diana is staring at the small fire dancing in the gusty wind. Kevin is staring at Diana's eyes and the reflection of the fire dancing there. As she looks at him and sees him staring at her she smiles gently back and realizes she is falling in love with him. Her thoughts wander to famous love songs as she wonders which kind of couple they would make. Taking a small sip of wine, she asks him, "Have you ever been in a play?"

Kevin is surprised by her question, but he is getting used to that. "In high school," he answers, "we put on a musical every year. I was in a couple, and I played in the orchestra for a couple as well. How about you?"

And she says, "For several years I was a member of the Jack Jefferson Players... a local group who put on productions. I was in a couple of plays every year for about 5 years."

Catching the thread, Kevin asks, "Do you have a favorite?"

"I have several near and dear to my heart," she says.

"...in ***Bells Are Ringing***...I played Ellie.

"But Kismet is probably my favorite. I got to play Lalume the Wazir's wife and a sexy seductress... about as far from my real character as you can get...but that's why it was so much fun!"

Kevin smiles and, feeling her body pressed against his for warmth, says, "Soooo...you think you are NOT a sexy seductress?"

Glad that he cannot see her blushing in the dim glow of the firelight, she replies, "Hardly!"

Kevin gently takes her chin in his hand and turns her face toward his own. His eyes slowly scan every detail of her face as he says,  
“Believe me...Maria in the **Sound of Music** you are NOT...most definitely NOT.”

Blushing again and sure that he can see it this time, she says lightly,  
“So what plays were YOU in.”

He wishes the emotion of that poignant moment could last longer, but he realizes he must wait until she feels safe enough to trust him with her secret. He allows her to gently break free from the emotion she is obviously feeling as he answers,  
“I played Koko in **The Mikado** and I was in the Barbershop Quartet in **The Music Man**.”

And just that fast, the moment is gone...the magic dissipates on a cold gust of February wind. Winter has re-established itself.

By unspoken mutual agreement, they put out the fire, and load the trash and leftovers back into the car. The ride back home definitely needs the convertible top up.

It is an unusually quiet ride back. Diana’s thoughts are roiling. Should she tell him? Has she ruined it? How could she blow it like that?

And he can read her every emotion...almost read her thoughts. He makes a conscious effort to respect her privacy and tunes out the myriad levels of messages that are streaming from her to him.

He wants to tell her that it is all OK, but he senses that it would only make her feel worse. He has to let her work her own way through this.

Finally the mansion is in sight and the long ride has ended. As they exit the car, a chilly wind blows across the lake.

## END EPISODE 7