about 2,800 words

The Laws of Motion

"Dr. Burns, do you have a minute?"

Burns turned toward the source of the voice. It was Dr. Gordon from the Psych Department. With him was a young, blonde man Burns did not know.

"Burns, this is Dr. Jansen, new to the department this semester. Jansen, Dr. Burns, Astrophysics."

Burns shook the man's hand. It was unusual for colleagues to approach him, especially in social situations like this reception.

Gordon continued. "I thought you might clear something up for us. It seems to me counter-intuitive that the expansion of the universe could be accelerating. Jansen, here, is of the same mind."

That someone would ask a question pertinent to his field was even more unusual, a considerable compliment in an atmosphere in which people, including many of his students, seemed to think he had nothing to offer.

"I might be able to help. It may take a bit more than a minute..." He laughed as he wondered where to begin. "There are two things that misinform your intuition on this matter, that in effect lead you astray. The first is that you think of the universe as being full of inert material objects separated by varying amounts of empty space." He waved his hands vaguely at the universe, wishing he had grabbed a drink on his way in. He never knew what to do with his hands.

"That is what Isaac Newton thought – the Newtonian view – what I call the billiard-ball universe. Newton thought that in the beginning someone gave the whole thing a push – like the break shot on a pool table. He had a certain "Someone" in mind," Burns threw in some air quotes, still struggling with what to do with his hands, "a certain someone no longer welcome in scientific discussions." He looked from Gordon to Jansen and back, wondering if they got the joke. His hands were still raised, like he was half-way through a chin-up. Jansen smiled.

"The push," Jansen said, "isn't that what the Big Bang was supposed to be?"

"If you mean in the Newtonian sense, no, not at all. The Big Bang creates the space in which thermodynamic events like games of billiards can take place, and that space is still being created. But before we get mired in the Big Bang, consider this." Burns waved a hand like he was dispersing a cloud of smoke. "You probably learned that matter – those billiard ball things – is made of atoms, and atoms are made of sub-atomic particles – electrons, protons, neutrons. If you didn't cut too many classes, you probably heard that protons and neutrons are made of smaller particles called quarks."

Gordon and Jansen both nodded.

"Quantum Field Theory gives us a different picture. First of all, those three quarks that "make up" the proton?" He hoped they wouldn't get tired of air quotes. He was finding them

handy. "They account for less than one percent of the proton's mass. All the rest comes from the binding energy of the gluon..."

Gordon had looked away, then back at Jansen.

"The President just came in," Gordon said. "Burns, could you excuse us for a sec?" He rested a hand on Jansen's shoulder. "I want to give my boy here some schmooze time with our Fearless Leader before she's overrun with peons. Interesting, that quark stuff, though. Hold that thought."

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Paula searched the room from her vantage near the entrance. No sign of Miriam. Why had she come here? This was a mistake. Late afternoon receptions at the University were no place for a secretary. Wine, cheese and eggheads. There wasn't a single person from clerical besides her. And no Miriam. Miriam was the chair of the Psychology Department, Paula's boss, though not technically. Paula's supervisor was the academic dean, but Miriam and the other professors in the department kept her busy, gave her daily tasks. Miriam was nice, friendly even, although she sometimes made Paula feel like part of some psychological experiment.

You should go to the reception, Miriam had said. Mix with people. There are some people worth knowing here, she said. Now Paula was stuck by herself in a room full of strangers.

She looked around the room. People stood in knots among the over-stuffed chairs and potted plants, wine in hand, chatting animatedly. There was Dr. Gordon, in a group toward the far end of the room. A familiar face, but Gordon was the least friendly person in the Psych Department. He never acknowledged her presence. He never asked her to do anything either, which afforded him a certain balance in her mind. The new guy, Dr. Jansen, was with him. Kind of cute, but he never talked to her either. She wondered if Gordon was teaching him the basics of

clerical invisibility. The third person in the group seemed to be doing all the talking. Paula didn't recognize him, but she could tell he didn't know what to do with his hands. They fluttered around randomly, like pigeons – like they were demanding something to eat. He should have grabbed a drink, she thought.

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Psychologists, Burns thought. They probably didn't understand a word. He watched them work their way toward the President. She was moving away from the entrance toward the center of the room. Billiard balls. They were moving around like billiard balls. A little behind the President stood a billiard ball at rest – a young woman in a white dress. Attractive, the first thought that came to Burns.

And there it is, he thought, as he looked at the woman more closely. Gordon and his bunch probably had all sorts of complicated psychological theories to account for attraction, but – bottom line – all attraction is a matter of physics. Sure, people talked about chemistry in relationships, but chemistry is just a higher-order expression of elementary, even quantum, processes.

The woman's complexion was light, but darker than the white of the dress. The colors were a result of differential absorption of certain wavelengths of light. The dress ended just above her knees. It was a wispy, summery frock. Her movements in it were fluid, graceful. Her auburn hair hung loose and moved slightly in the air currents created by invisible machinery somewhere in the building.

He could use physical laws to take advantage of attraction. For example, Bernouli's Principle or the Coanda Effect – both were examples of mechanical attraction in a fluid medium. If the velocity of his approach were great enough, his own movements fluid, Bernouli dictated

that his passage would cause a drop in pressure, drawing her to him. Or perhaps the Coanda Effect could apply – get close enough to her and his mere proximity would draw that fluidity toward his surface.

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Paula watched as Dr. Gordon and Dr. Jansen abruptly turned from the man who had been doing all the talking. His fluttering hands were in mid-gesture, frozen, like a paused video. She watched as Gordon and Jansen approached the President of the University. That explained the abrupt end to their conversation.

She turned her attention back to the other man. He was staring at her. Paula was used to that. Most men thought she was attractive –hot was how they put it – and they stared. It was a fact of life, tedious and irritating at times, that had followed her since she was thirteen. She looked away, then back. The man was still staring. It looked as though he had positioned himself for a clear view of her through the crowd. He was short, slim, balding. He wore glasses and his eyes looked enormous, perhaps an effect of the lenses. It made the staring more obvious and a little intimidating. Most men looked away if you looked at them. Clearly he wasn't looking at her face.

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There was a certain tidal majesty to her sway, which made him suspect that some lunar gravity was at work. Gravity was a whole different ballgame, the fundamental attractive quality of every mass. Or if you preferred the topological approach, the distortion of space in the neighborhood of massive objects. Burns moved closer, imagining himself distorting the space through which he passed. Gravity was tricky for a mass in motion. Trajectory and velocity were the key factors, and both were influenced in a granular fashion by gravity. Granularity was a

private theory of his, meant to echo at the macroscopic level the quantum discontinuities of elementary particles. He would have brought it up to Gordon if he'd had the chance. He had yet to develop a robust theoretical basis for it, but his intuition told him that once his theory was made public, it would rock the scientific community to its core. Not to mention this room full of so-called colleagues who were politely oblivious to his presence this afternoon. Just as they were ignoring the woman in the white dress. The two of them already had something in common.

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Paula was getting nervous. The man had moved closer, nearly halving the distance between them. He was still staring. She had moved away from the entrance to the room and close to the bar, a kind of protective bastion for her back. She turned to the bar. Two young men from campus food service were pouring glasses of wine and setting them out where people could help themselves. Paula took a glass of red and held it in both hands up toward her chin, shielding her breasts. Why did men find women's breasts so fascinating? She would have to ask Miriam that. Psychologists probably studied that sort of thing.

Breasts weren't the only thing men liked. Some men were obsessed with ankles or hands. It was called a fetish. Ankles made sense. If you were obsessed with naked bits of flesh, you had a better chance in public of seeing some naked ankles than a naked breast. She thought of her own ankles and the expanse of bare flesh above them, all the way past her knees. The white dress had felt perfect when she put it on this morning. Now it felt inadequate. She should leave. But, no, this creep was not going to drive her out of the room, rule her life with his creepiness. She sipped her wine and wished Miriam would show up.

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Trajectory must be calculated precisely. Trajectory and velocity. The slightest error could mean a complete miss, or worse, a catastrophic collision. But what if she was a black hole? Any attempt to get as close as he hoped would trigger an inexorable spiral. Unable to escape, he would cross the event horizon and disappear in one last gasp of radiation. They would be united forever, lost to the rest of the universe. He didn't want that. Just get into her orbit for awhile, touch down, explore her surface for a bit. That surface looked worth exploring. He should stop worrying. No light escaped from a black hole, and this woman was radiant. The more he looked, the more infatuated he became. He moved closer still.

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The creep had moved closer, angling toward her. It seemed like he hadn't taken his eyes off her once, although she couldn't be sure. That would require staring at him. She couldn't do that, but she stole yet another nervous glance. He was wearing one of those corduroy sport coats with leather patches on the sleeves. Weren't those from like fifty years ago? And penny loafers. Maybe he was a pervert who dressed up like some twisted version of a college professor and snuck into these receptions. Maybe that's why Dr. Gordon left him so abruptly. Maybe he realized the guy was an imposter.

Paula swept the room with her eyes. Where was campus security? Where was Billy Kilmer, that swaggering cretin who liked to lean on her desk and leer at her like there was some major security threat in the reception area of the Psych Department? They weren't even cops, and you still couldn't find one when you needed him.

She reached into her purse and found her phone. It greeted her with a glowing red low-battery message. Hadn't she had it plugged in today? It wasn't holding a charge. Probably some stupid app sucking the life out of the battery. She put the phone back into her purse and turned to

the bar. She recognized one of the bartenders from the cafeteria. She smiled at him. He smiled back as he shoved a corkscrew into another bottle of red.

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Magnetism could take over from gravity at close quarters. It was yet another consideration. Magnetism was a powerful force. A refrigerator magnet the size of a credit card was able to withstand the gravitational field of the entire mass of the earth. Burns could see that magnetism was no metaphor where this woman was concerned. She was irresistibly attractive. She might be a strange attractor, he thought. He might not be the only one spiraling into her orbit. Every factor must be taken into account as he prepared for the final approach.

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The smile was all she got before cafeteria-boy turned and walked to the other end of the bar. No help there. She turned back to the room, and the creep was on the move. She felt his focus like some sort of vibration in her body, like she was being engulfed in a sticky liquid. Just then, she saw Miriam at the entrance. She raised her arm straight into the air, almost frantic, feeling foolish and grateful at the same time, waving vigorously. Miriam saw her, smiled, waved, and came toward her just as the creep passed in front of her and crashed into Miriam. His glasses flew off, but remarkably, he caught them two-handed, cradling them in his arms like a football. Miriam stumbled against the bar, but didn't fall.

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Velocity, check. Trajectory, check. He would pass just in front of her – first contact – and reach the bar, then casually rebound for the face-to-face. From his left, beyond the scope of his glasses, and therefore just a vague, dark blur, an uncalculated movement, a third body. They collided. His glasses flew from his face, but somehow landed in his arms, crossed in front of him

in a reflex of protection. The classic Three Body Problem. In his mind, the blaring capitals echoed his disgust. His left hand tingled from the impact. He squinted in the direction of the interloper while trying to get his glasses back in service.

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Paula was paralyzed. She wanted to reach out to Miriam, but the creep was right between them. Miriam was looking down at her chest, her arms curved out in the pose of someone who's just been delivered a lap full of scalding coffee. The creep was fumbling, rotating his head about blindly, she thought, without his glasses. Paula became aware of the silence around her as people turned toward the disturbance.

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People stopped their conversations, turned to stare. A sphere of silence grew around Burns, then collapsed like a quantum wave function at the instant of measurement. For a moment he had been visible, but now they were oblivious again, back in their own jabbering vortices. All except Miriam Ungar, who gazed at him hostilely.

"Dr. Burns. How nice to run into you." Miriam's tone was not friendly.

Where was the strange attractor? Or attractrix, he thought, remembering some vague rule about gender from his high school Latin class.

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"I suppose introductions are in order," Miriam said. "Willis, this is Paula. She's the... she's a good friend of mine."

Miriam had slid her hand down the back of Paula's right arm, stopping just above the elbow. "Paula, this is Dr. Burns, Professor of Astronomy."

"Astrophysics, actually, and I do some survey courses." He jabbed his right hand toward her and smiled, his magnified eyes looking voracious.

"We're all condemned in that, Willis," Miriam said

As Paula reached to shake the creep's hand, she felt Miriam's hand slide across the small of her back. Miriam pressed her mouth against Paula's ear. Paula felt Miriam's nose burrow into her hair, warm breath in a whoosh. "Let's just get out of here," Miriam whispered. She turned to Burns, her hand low on Paula's hip now, and said, "Paula and I have to be going. Sorry we can't stay and chat."

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Was Miriam a lesbian? Had he ever seen a hint of that? Wasn't all attraction ultimately a matter of physics? And the other one, what was her name? Paula? The apostate Paula who would turn her back on the elementary laws of physics to leave with Miriam. He felt confused, as analogy, metaphor and fundamental principles jumbled together in his head. His left hand still tingled, and he thought with some satisfaction that he had touched Miriam Ungar's body. Somewhere. He groped for a drink from the bar, not caring what it was. He looked around. Still early. There would be other worlds to explore.

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