

Field Trip

By E.S. Strout MD

BOSON: Any of a class of subatomic particles such as the photon, pion or graviton that have no detectable mass and obey statistical rules permitting any number of identical particles to occupy the same quantum state.
Satyendra Nath Bose

God is a spectator, Scully. He just checks the box scores.

Fox Mulder

1.

NASA/SPACE CORPS RESEARCH DIVISION, CAPE CANAVERAL, FLORIDA. Monday 5
MAY 2008. 1730 hours:

“Phone, Professor,” the Space Corps Gravity Laboratory tech said, holding the instrument out to his boss.

Dr. Paula J. Lynch jotted notes on a clipboard. “Who is it, Fred?” she asked with an irritated toss of auburn curls. “I’m busy.”

“Dr. Leonard at Brookhaven National Laboratories on Long Island. Says it’s important.”

She grabbed the phone and snarled. “What do you people want from me? My postgraduate findings at your facility have proven correct. Much to your displeasure, I’m sure. Just leave me alone.” She slammed the receiver down hard enough to crack its plastic case as her technician stared, goggle-eyed.

“Long story, Fred,” she said with a shrug. She plopped down in her desk chair and kicked off her sneakers, massaged her insteps, then slipped into brown penny loafers. “Damn concrete deck in the lab really messes up my arches. See you tomorrow.”

2.

Ten days later:

“Visitor, Dr. Lynch,” the security guard announced over the intercom. “Dr. Barry Leonard. From Brookhaven National Laboratories. He has Omega level clearance.”

“Not on my appointment calendar,” she said, her voice low and menacing. “And not any time in this century. Tell him to take a flying . . .”

“He says he doesn’t share Brookhaven’s sentiments.”

She ran a fitful hand through tangled locks, jabbed at her computer keyboard, glared at the Brookhaven website appearing on the screen. Dr. Barry M. Leonard was listed as Projects Director, Relativistic Heavy Ion Collider Extension. “Okay, I’ll give him five minutes. Keep your weapon handy in case I yell.”

Barry Leonard was a nerdy professor type wearing wire-rimmed glasses and a tweed jacket with elbow patches. “Glad you could spare me a few minutes,” he said in a mouse like squeak.

“Sit, but don’t get too comfortable,” Dr. Lynch warned. “You are aware, of course, that Brookhaven rejected the results of my postgraduate studies four years ago?”

“I know that. But why?” he stammered.

“Antigravitons, they said, would disgrace the memory of Sir Isaac Newton.” She flung a metal ruler against the wall with a resounding clang as Leonard cringed. “What utter nonsense.”

He clasped both hands in a gesture of prayer. “They don’t know I’m here,” he admitted. “I’m new at the Brookhaven labs, fresh out of U. of Michigan’s subatomic particle lab.”

Paula squinted a dubious eye. “You’re kinda old for a hotshot quantum physicist.”

Leonard blushed. “I’m forty-three. Late bloomer, you could say.”

“And what brings you all the way to Cape Canaveral?”

“We’re upgrading the Relativistic Heavy Ion Collider.”

She squinted an eyelid. “I haven’t kept up with Brookhaven doings since my little problem a few years back. Why improve it? ”

“Are you aware of the projects underway at CERN’s Large Hadron Collider in Geneva and FermiLabs Tevatron in Illinois?”

She gave him a dismissive flick of a hand. “The Higgs boson, the so-called God Particle. Interesting concept. I read the literature, Doc. Millions of bucks down the rathole, nothing conclusive, chasing their tails. I think their approach sucks, but who asks me?”

Leonard fidgeted, twisting in his chair. “I’d like to,” he whispered.

Her eyelid lifted a millimeter, a spark of interest flashing from gray-green irises. “And why would that be, Prof.”

3.

Dr. Leonard stifled a cough with a handkerchief. “I know of your postgraduate studies at Brookhaven . . .”

“Lotta good that does me,” Paula grouched. “Sonsabitches kicked me out, called me a charlatan. I’m even persona non grata at Cal Tech and MIT. Caught on here at Space Corps when I convinced the Air Force brass my antigraviton discovery might be applicable to spacecraft propulsion.”

Leonard fidgeted. “Does it work?”

Dr. Lynch gave him a Cheshire Cat grin. “Classified. No need to know. You’re almost out of time, Prof.”

“The upgrade can whip CERN and Tevatron,” he said. “Hands down.”

Paula tapped a No. 2 pencil on the desktop. “Continue.”

The Professor blotted sweat from his forehead with a handkerchief. “No press release as yet, but we can ram subatomic particles together at ten times the speed Tevatron can achieve. Forty mile long underground oval track, runs just outside the city limits of Patchogue,” he admitted with a nasal snicker. “And what’s more . . .”

“Cool it a sec, Prof,” Paula said. “Just what does this have to do with me?”

“I think your antigraviton search methodology may hold the answer. If you could somehow see you’re way clear to . . .”

4.

Paula twirled the pencil in her fingers, broke it in two with a savage snap, eyed her visitor with an incredulous stare. “You’re proposing I return to Brookhaven, Professor Leonard? I’d sooner strip naked and climb one of those launch gantries at high noon.”

“That bunch of cloistered ivory-tower fogies would toast each other with cyanide Kool-Aid cocktails before they’d reinstate me. They told the press I’m a terrorist, sent a major New York law firm and a federal judge to indict me on trumped-up charges.” She paused for a deep breath, did a slow exhale. “Did you know they tried to get the Swedes to take back my Nobel Prize?”

“I know they consider you a pariah.”

A sour grimace. “You’re a college man, Prof. Can you guess why?”

“You retrieved your data, fed false findings to their database, then scrambled all their password codes,” Leonard replied in an almost inaudible whisper.

Paula allowed a covert grin to slink across her face. “Wrote my own software programs, too. Took ‘em a year and a half to regain access. They still didn’t get everything.”

“I’ve read and reread your stuff, Professor Lynch,” Leonard prompted. “You can sit right there at your desk and come up with an experimental model. Just like you did with the antigraviton experiments.”

“Give me one good reason why I should do that.”

“Because you have an axe to grind, Professor Lynch. You would love to see a nobody like me find the Higgs boson using their Supercollider.”

“Hah,” she snorted. “They would own the discovery. That’s in your employment agreement.”

A rodent-like twitch of his nose. “I never signed the agreement.”

“You’re putting me on, Prof. How can that be?”

Leonard loosened his tie, undid his collar button. “Bureaucracy in action, Dr. Lynch. I fell through a crack.”

Paula closed her eyes and hummed a few off-key bars of Robert Schumann’s *Waldszenen* while her cerebral cortex percolated. “What mass can it reach? Your Extension?” she asked.

“280 billion electron volts,” Leonard stammered. “Without it they could only get to a hundred fourteen.”

Paula grinned. “You’ll find what you’re looking for somewhere between 260 and 275 billion.”

“How can you know that?”

“Because I’m a hell of a lot smarter than those cretins you’re working for.”

Leonard shook his head in puzzlement. “You had this all figured out? Why didn’t you pursue Higgs’s theory?”

“Too busy, Prof. I just told you, I’m developing a gravity drive propulsion system for spacecraft. You guys looking for the God particle won’t find it. You’re a hundred-eighty degrees off course.”

“I’d like to try.”

“I’m sure you would.” Dr. Lynch motioned with a hand for silence. She sat still, eyes closed as her cortical synapses fired billions of times per second. Her eyelids flew open and she snapped her fingers.

“You would run the program, Professor Leonard? In the Collider Extension? They must not know where the idea came from.”

“Guaranteed, Dr. Lynch. My word.”

Skepticism permeated her gaze. “B.S. I’ve known you for less than half an hour. Your word and two dollars will buy me a small cup of black coffee at Starbucks. You’ve gotta give me more.”

Leonard rummaged in his scuffed imitation leather briefcase, surfaced with a half-inch thick folder of hardcopy. “My confirmation of your antigraviton project. I made this early on. Before the Board of Regents deleted all records of your work.”

“Imbeciles.” Paula hefted the folder, dropped it to the desktop with a resounding thud, and flipped the cover open. “Good thing I’m a speed reader, Prof. Give me a couple of minutes.”

5.

Paula sat back in her swivel chair, rocked forward with elbows on the desk. “Pretty astute, Prof. As you’ve certified, the graviton and antigraviton are mass less subatomic particles associated with the weak nuclear force. They do, in fact, produce universal gravitational forces. Anyone who believes gravity is a weak force should try jumping off a five-story building and land without comminuting both femurs and rupturing every internal organ.”

“The Higgs boson must be such a mass less particle.” Dr. Leonard exclaimed in a high-pitched peep.

Paula rewarded him with a grudging smile. “You’re smarter than you look, Prof. Keep talking.”

“Its mass-producing effect is exerted on other subatomic particles in its vicinity, or field as it passes through. The effect will then be cumulative, affecting atoms, then molecules, larger structured bodies such as planets and galaxies. Without the Higgs boson all other particles, atoms and molecular structures would be mass less. We couldn’t exist.” He mopped his forehead with a handkerchief. “All theoretical, you understand.”

Dr. Lynch speared him with an inquisitive eye. “Your new particle accelerator. Is that 280 billion electron volts a hard figure?”

“Checked and verified. We don’t have anyone who can do the math for particles of the size it would generate.”

“Watch this.” She booted up her computer and massaged the keyboard. Five minutes later she leaned back and tapped the screen with a clear polished fingernail. “I think this is an accurate simulation.”

Leonard shook his head in confusion. “It’s black.”

“Not for long.” Dr. Lynch tapped another key. A solitary silver speck traversed the screen. A trailing cloud of bright dots followed. “Quarks and leptons attracted, like a room full of guests when a celebrity arrives. Now they have mass and can overcome inertia. Asymmetry disrupting a zero-mass system. The Higgs field. A universe-encompassing effect.”

Dr. Leonard's lower lip quivered. "Universal? Then it really is the God particle."

Paula shrugged. "If you believe that sort of thing."

Leonard's eyes widened in surprise. "Even Stephen Hawking believed that the Big Bang was an act of God. You must believe in . . ."

"I believe in me," Paula said, adding an emphatic verbal exclamation point. "If there is some supreme entity, I'm sure he or she is amused or perhaps dismayed at the many ways we've managed to screw up our little dot in space."

"You're an atheist, then."

"Whatever." She punched DOWNLOAD.

"All you need is here, Professor," Paula said as she handed him two CD's in a double plastic sleeve. "Be careful not to blow Long Island away."

"If this works out, there's a Nobel Prize waiting for us, Dr. Lynch."

"You keep it. I've got one."

Professor Leonard scribbled on a scrap of note paper. "I'll need your e-mail address. Here is mine."

"pjl@scsp.gov," Paula told him. "Let me know when these parameters are set up. You'll need some specific guidance on field limitations."

Leonard gave her a rabbit grin. "They won't have a clue."

"I'm counting on it, Professor Leonard."

6.

Wednesday 6 August. 1440 hours:

Paula read his first e-mail with a purr of amusement. She typed: "Remember my warning about the locals, Prof. The Patchogue City Council won't take kindly to any more three-hour power outages. Better reinforce the magnetic coil shielding. Cost a couple more hundred grand, but just

think of your Nobel Prize in quantum physics.”

Two months passed. Dr. Leonard wrote: “New shielding in place. City intact. Full power run tomorrow. Green boards all systems.”

“Keep the experimental field small. No more than ten centimeters across, as I’ve directed. You will be surprised, Prof.”

She could sense his exhilaration the next day as he typed: “As you predicted, Dr. Lynch. 275 BEV mass. The Higgs Boson. The God particle! Attracting hundreds of subatomic particles. Inertia overcome. They have mass!”

“Congratulations, Dr. Leonard. I want to try something now. It’s not on your disks, just an afterthought. Kick the Collider extension up to top speed for just a few seconds.”

The screen remained blank. Paula wiped sweaty palms on her lab coat. “C’mon, Barry. Humor me,” she typed.

“I don’t understand . . .”

Paula’s fingers attacked the keyboard in a flurry of strokes. “Sorry, Prof. You’re wasting my time.”

7.

An urgent beep of Paula’s phone extension. Professor Leonard’s tone was frantic. “Dr. Lynch, what’s happening? My computer port is out of control. Collider Extension is running ten percent over design limits. Nearing 300 BEV! The field is changing . . .”

“Calm yourself, Barry,” Paula said in a reasonable, reassuring voice. “I’ve reactivated my old password. Hiding it in their mainframe was a piece of cake. There are a few new innovations, too. I can take control of your computer. Told you they didn’t get everything.”

The atmosphere of panic was palpable. “Why would you . . .?”

“Please describe the field changes.”

There was a buzz of urgent voices in the background as the Brookhaven computer technicians attempted to reassert command. “There’s another particle,” Dr. Leonard’s harassed voice

screached. “Good God! You’re expanding the field. Why?”

“In time, Professor. Please define the activity of the new particle.”

“The Higgs boson is . . . Gone! The other subatomic particles have been released to their massless state. They are dispersing.”

“Thank you, Barry. If you will recall my graviton-antigraviton data correctly you’ll understand. For every subatomic particle there must be an antiparticle.”

“An anti-Higgs boson? But there are so of them,” Dr. Leonard screamed.

“Be cool now, Barry” Paula soothed. “You could be in line for two Nobel Prizes. Tell me about the new field.”

His voice quivered with panic. “It encompasses the entire Brookhaven National Laboratories complex, stops just short of the city limits.”

“The field is finite, then. You’re certain of that? Patchogue is free and clear of it?”

“Yes, Dr. Lynch. Now please tell me what’s . . .”

Her voice was composed, rational. “What do you suppose would occur, Professor Leonard, if that field were suddenly permeated with the flood of anti-Higgs bosons your overextended Collider Extension is now spewing forth?”

“Total disassembly of all matter within the field. Oh, God . . .”

“Not to worry, Professor,” Paula reassured him. “The field phenomenon is self-contained and self-limiting. Confined only to the area within its prescribed limits.”

There was a loud crash in the background. Shouting voices. Dr. Leonard’s was loudest. “Brookhaven security forces are disconnecting the mainframe from all power sources. You won’t succeed . . .”

“Too late, Professor. The process is irreversible and self-perpetuating once initiated. You have thirty minutes to get your ass outside the perimeter. Go now.”

“I don’t understand,” he shouted to overcome the background cacophony. “Why . . .?”

“My father is an ex-Navy SEAL, Barry. Know what their motto is? Don’t get mad. Get even. It’s payback time. You have twenty-five minutes.”

“There are hundreds of innocent personnel, Dr. Lynch. You must reconsider.”

“I understand,” Paula said. She tapped a series of keys. “I have activated your radiation alarms. The reactor is fine but your people don’t know that.” She held the phone away from her ear as a piercing Klaxon howled. A canned voice warned: EMERGENCY. NUCLEAR INCURSION. ALL PERSONNEL MUST EVACUATE THE GROUNDS AT ONCE. “That should get them moving.”

His voice was a stifled sob. “You are crazy, Dr. Lynch. You won’t get away with this.”

“Those disks have been erased. No record remains. Now please go. I have no problem with you.”

Leonard’s last transmission was an almost unintelligible shriek. “God strike you dead, you maniac . . .”

“Please, Professor. If there is a God, he, she or it will deal with you and I in some other place and time. You have twenty minutes . . .”

The End