

BREAKTHROUGH

An error of judgement?

BY JOHN GILBEY

After years of fairly pointed silence, it was a surprise to get an e-mail from my old institute. When I retired, everyone told me to keep in touch — “don’t be a stranger” — but sadly the invitations to research seminars quickly dried up. The message turned out to be from one of my old students, who I was glad to see had now risen to the lofty heights of research director.

One of her postdocs was running some data-mining operations on the huge catalogue of archived material from the early life of the accelerator and had run across some problems. Would I be able to help out? If so, a flight and hotel would be booked and I’d be picked up on Monday. Sure enough, a car — and a human driver, no less — turned up on cue.

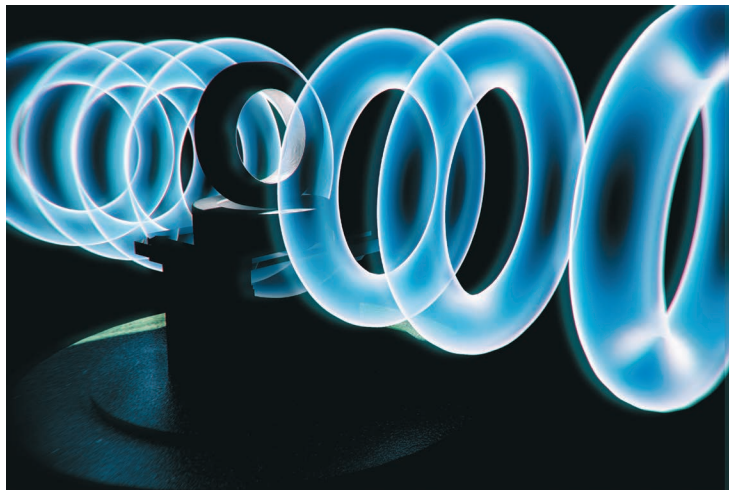
“I was only expecting a shuttle,” I pointed out as Becca met me at security. She laughed.

“I wasn’t sure how old and vague you’d got — I figured it’d be safer to make sure you caught the flight ...”

Her genial banter flowed over me like a warm bath — it was good to be back. The seminar room was much slicker than the last time I’d seen it, and the coffee was infinitely better. Jeff, the postdoc, was already there with a raft of paperwork and screens spread across the table.

Jeff was jovial, keen and very excited — and a degree of arm-waving illustrated his background talk. His problem was interesting, and showed how much had changed since I retired. For the first time in its history, thanks to a generational shift in quantum devices, the computing capacity of the institute exceeded the rate at which the vast fire-hose of raw data gushed from the detector arrays. This freed up some resources for folk, like Jeff, to go back over old, archived material to see what had been missed.

Looking into the immersive display, even my unpractised eye could see the anomaly that was exciting them. The cloud of data points was from an early test run, part of the engineering tests where we had fought hard to drive some of the gremlins from the system. As Jeff scrolled the time-line back and forth, he pointed out the curious banding that had first attracted his attention. In the saturated false colour of the visualization, it



looked oddly like the moving ring patterns you get in the glow discharge of an old fluorescent tube — something Jeff was too young to have seen.

When Jeff spun the image into three dimensions, the full glory of what he’d found was revealed — and I swore, loudly and repeatedly. “That looks like ...”

“Structure,” Becca interrupted with a grin. “Unexplained, repeated structure ...” I thought for a long moment, trying not to let the old madness flood back in. They had clearly excluded the obvious answers or they wouldn’t have called me, but what could give results like these? Equally importantly, had they been sustained? Was there more?

“Nope. Sadly, this is the only test in which the patterns appear.” Jeff began shuffling through the papers in front of him. “The tests were stopped immediately after this run, and the system was offline for over a year.” He slid a set of meeting minutes towards me. “It seems the decision was yours ...”

I looked at the document, and the bland reporting of the meeting secretary triggered a series of panic responses as I recalled something I’d blanked out for years — the story of C57a.

“C57a? What’s that?” asked Becca. Wiping the sweat from my palms, I related the tale of my first cosmically massive mess-up as construction director. I maintain it wasn’t my fault, but it happened on my watch, so it was mine to resolve. For some reason, the contractor who built the coils for dipole C57a

delivered a mirror image of the winding pattern that was specified. Nobody noticed at installation, but the

commissioning tests exposed the error as an anomaly in the external magnetic field. Testing stopped abruptly and the contractor slunk off to build another one.

Becca and Jeff exchanged glances. “I think we can say that it’s a great pity we didn’t know about the data patterns at the time,” said Becca. “We’ve talked to some of the theoretical folk and they got really excited ... Like, tap-dancing excited ... One even suggested ... No, it’s ridiculous ...”

I pressed her to explain. Becca sighed deeply and looked at me. “One even sug-

gested that the patterns might be crosstalk,” she paused. “Crosstalk — *from somewhere else ...*” That brought me up short. Nobody was even going to say the word — but she was talking multiverses. The potential, and the consequences, awed me into silence. Something that doesn’t happen often.

In the quiet that ensued, Jeff muttered: “If only we had the old dipole we might be able to recreate the conditions. The paperwork just says the original was decommissioned and when we checked, the contractors didn’t have any record. We wondered if you might know, as you were there at the time?”

I said I’d have to think about it and suggested lunch, to give myself some breathing space — I needed to be sure. When I asked if the cafe on site was still open they said yes, but wouldn’t I prefer to go out somewhere? “No thanks, the cafe will do fine.”

The grilled swiss-cheese sandwich was as good as I remembered. Looking out through the long glass wall across the sculpture garden, mostly arty representations of fundamental particles, I saw that the trees had grown up but little else had changed.

“So,” said Becca, “has lunch given you any ideas?” I smiled, and pointed across the lawn. On a granite plinth labelled ‘Chirality’, half hidden by shrubs and still in its impervious Kevlar casing, the huge double doughnut of the rejected C57a dipole magnet stood in the summer sunshine, patiently waiting for its moment of glory to arrive. ■

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