S03E11 - That “Lost” Asteroid That Might Hit Earth

The Multiverse Employee Handbook - Season 3

The Multiverse Employee Handbook has this to say about Missing Asteroids:

They are the celestial equivalent of someone clearing their throat, stepping briefly into the room, and then leaving without explanation—except this someone is several hundred meters wide and moving at regrettable speed.

Consider the case of **2007 FT3**, which announced itself to Earth’s telescopes in 2007, allowed a few hurried measurements, and then vanished back into the dark like a contractor who took one look at the job and decided it was spiritually incompatible. Astronomers did their best with the data they had—angles, velocities, polite assumptions—and then watched as the object slipped beyond detection, leaving behind probability cones, risk assessments, and a lingering sense that the universe had just winked.

The problem with missing asteroids is not that they are malicious. It’s that they are *casual*. They do not menace. They do not threaten. They simply exist on trajectories that intersect our planning horizon and then decline to RSVP. For a civilization that prefers tidy spreadsheets, this is deeply unsettling. We can track galaxies at the edge of time, yet a nearby rock can still wander off and force us to write “unknown” in a box that really wants a number.

The Handbook notes that this creates what orbital analysts refer to as **predictive discomfort**—the uneasy awareness that the future is mostly well-modeled until it isn’t. A missing asteroid is a reminder that certainty in celestial mechanics is often conditional, provisional, and dependent on whether something felt like being seen that week.

Eventually, most of these objects are found again. They drift back into view, sheepish but unchanged, as if nothing happened. And when they do, the calculations are updated, the risk drops to zero, and everyone exhales. Until the next one pops by, nods politely, and disappears, leaving humanity to stare into the sky and mutter about follow-up observations.

In summary, missing asteroids are not warnings. They are footnotes—cosmic annotations reminding us that the universe is under no obligation to remain where we last put it.

You’re tuned into The Multiverse Employee Handbook.

Today, we're examining asteroid **2007 FT3**, a perfectly ordinary space rock that achieved mild celebrity status by being discovered, briefly observed, and then immediately misplaced—rather like **setting an alarm for an important meeting, waking up on time, and discovering the meeting exists, the building exists, but nobody is entirely sure where either one is located.**

Its orbit is known with all the confidence that can be extracted from one-point-two days of data collected nearly two decades ago, which means we can predict its future… actually, we can't. The best we can do is calculate a **cloud of possible futures**—an expanding fan of orbital paths based on the very limited data. Still, this does look very impressive and colourful on a spreadsheet and humans love spreadsheets.

The episode, however, is not just about this asteroid, but about humanity's ongoing attempt to get better at noticing things before they hit us—an effort that is steadily improving, even as the universe continues to respond by inventing new ways to hide large objects in plain sight.

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But first, gather 'round the near-Earth object tracking terminal, my cosmically anxious colleagues, for a tale that would make even Carl Sagan question his faith in human preparedness.

In the fluorescent-lit realm of Quantum Improbability Solutions, specifically in the Department of Celestial Asset Tracking — which existed in a superposition of "critically underfunded" and "we'll get to it after Q4" — Darren Holloway was having what could charitably be called a cosmic inventory crisis.

It had started, as these things often do, with a spreadsheet.

Darren had been hired to "modernize the asteroid monitoring workflow," which in practice meant he'd inherited a filing cabinet full of unlabeled floppy disks and a list of celestial objects that the department had, in the technical parlance, "lost track of."

Most of these were harmless. Defunct satellites. The occasional wayward probe. Someone's lunch container that had achieved escape velocity during the Great Breakroom Microwave Incident of 2003.

But one entry kept Darren up at night.

2007 FT3.

The asteroid had been observed for exactly one-point-two days back in 2007 — fourteen data points across a two-day window — before slipping away into the darkness like an intern ghosting on their second week. The observations were enough to calculate an approximate orbit and a rough size estimate of three hundred fourteen meters.

They were also enough to generate eighty-nine potential Earth impact scenarios stretching across the next several decades.

Darren stared at the list. October 2013. October 2019. October 2024. March 2030. The dates read like tentative meeting requests from a vendor who might or might not show up to end civilization.

“I have concerns about this asteroid,” Darren said, approaching the square-haired boss.

“Which one?”

“2007 FT3. It’s on the Sentry Risk Table. Eighty-nine potential impact windows—”

“Is it going to hit us?”

“The probability is one in eleven-point-five million, but the energy release would be equivalent to two-point-six billion tons of TNT—”

“So, no.”

“Probably no, but—”

“Darren.” The square-haired boss deployed his patient smile. “One in eleven-point-five million means you’re more likely to be struck by lightning while being audited while winning the lottery while being attacked by a shark. Simultaneously.”

“That’s not how probability—”

“It means it’s not in the budget. If we can’t see it, it’s not our problem.”

The problem, Darren thought, returning to his desk, was that the asteroid wasn’t gone. It was simply unobserved. Somewhere out there, 2007 FT3 was completing its orbit around the sun, utterly indifferent to departmental budgets.

And then July 25th, 2019 happened.

An asteroid designated 2019 OK passed within forty-five thousand miles of Earth — one-fifth the distance to the moon. It was the size of a football field. It had been discovered the same day it flew by.

The same day.

The object had actually been photographed weeks earlier by telescopes in Hawaii. It appeared in images on June 28th. And July 7th. But it had been moving almost directly toward Earth, so slowly against the background stars that the automated systems hadn't flagged it. It had been sitting in the archive, unrecognized, like a warning letter filed in the spam folder.

One NASA scientist was quoted saying: "I wonder how many times this situation has happened without the asteroid being discovered at all."

Darren printed that quote and taped it to his monitor.

"The 2019 OK incident proves our detection systems have blind spots," he told the square-haired boss. "Objects approaching from certain angles can evade detection until—"

"Did it hit us?"

"No, but—"

"Then the system worked."

Over the following years, the alerts kept coming. March 2022: asteroid 2022 EB5, discovered two hours before impact over Iceland. February 2023: asteroid 2023 CX1, discovered seven hours before it became a fireball over France.

The systems were improving. They were finding small objects now — meter-scale rocks that burned up harmlessly. But 2007 FT3 remained lost. Seventeen years of orbiting the sun. Eighty-nine potential impact dates ticking by one by one.

Darren requested a budget increase. Denied. New equipment. Denied. He requested an intern to help monitor overnight. The square-haired boss approved this, then reassigned the intern to the coffee supplier audit.

"The thing about asteroids," Darren said to his empty office, "is that they don't care about fiscal years."

Somewhere out there, 2007 FT3 continued its silent orbit. Observed for one-point-two days. Calculated for eighty-nine potential impacts. Officially classified as "not our problem."

And so Darren continues his vigil, refreshing the Sentry Risk Table, sending calendar invites titled "Potential Extinction-Level Event — Tentative" that are, without fail, declined.

The universe, meanwhile, continues to not check its email.

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"Hide and Seek at 88,500 Kilometers Per Hour"

And that brings us to the fascinating science behind asteroid detection — or more accurately, the fascinating science behind losing a fifty-four-million-ton rock and then hoping it doesn't come back angry.

Unlike Armageddon, where Bruce Willis gets eighteen days of warning and a nuclear warhead, or Don't Look Up, where scientists have six months and a government that doesn't believe them, real asteroid detection follows the cold, indifferent math of orbital mechanics. And orbital mechanics, it turns out, is perfectly happy to let things slip through the cracks.

Here's the problem: to calculate where an asteroid is going, you need to know where it's been. The more observations you have, the tighter your predictions. Three observations give you a rough orbit. A week of observations gives you something useful. A month gives you confidence.

One-point-two days gives you… eighty-nine potential impact scenarios and a lot of uncertainty.

That's what happened with 2007 FT3. Astronomers spotted it, tracked it for roughly twenty-nine hours, gathered fourteen data points, and then watched it fade into the darkness as it moved away from Earth. They knew it existed. They knew approximately where it was going. But "approximately" covers a lot of space when you're projecting decades into the future.

So yes, the odds of impact on any given date were one in eleven-point-five million. And yes, we're still here, so clearly October 2024 wasn't the day. But here's the thing about those odds — they're not reassuring, they're just incomplete. We don't know 2007 FT3 won't hit Earth. We know we don't have enough information to say it will.

And that's assuming we can find all of them in the first place.

When we return from this brief orbital perturbation, we'll dive deeper into how humanity went from "an asteroid the size of a football field showed up with same-day notice" to a global detection network that can spot a two-meter rock hours before impact — and why we're still not quite where we need to be.

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Welcome back, my orbit-calculating observers!

Deep Science Dive: "Planetary Defense: From Oops to ATLAS"

First Section: "The Art of Losing Things in Space"

To understand how we lose asteroids, we first need to understand how we find them.

Asteroid detection is, at its core, a game of connect-the-dots. Telescopes scan the sky, taking repeated images of the same patch of stars. Software compares those images, looking for points of light that have moved. Star, star, star, star — asteroid. That moving dot gets flagged, reported to the Minor Planet Center, and added to the global tracking list.

Simple enough, right?

The problem is that asteroids don't always cooperate.

To calculate an orbit, you need a minimum of three observations. But three observations give you enormous uncertainty — a fuzzy cone of possibility stretching millions of miles into the future. More observations tighten that cone. A week of tracking might narrow an asteroid's predicted position to within a few thousand kilometers. A month gets you something you can actually rely on.

2007 FT3 gave us one-point-two days. Fourteen observations across twenty-nine hours before it faded below the detection threshold and disappeared. That was enough to establish a rough orbit — a long, elliptical path swinging from inside Venus's orbit out past Mars, completing one trip around the sun every three-point-one years. But the uncertainties were massive. When astronomers projected that orbit forward, the cone of possibility was wide enough to intersect Earth eighty-nine different times over the coming decades.

This is the counterintuitive part: we know when it might hit, but not if it will hit. The potential impact dates aren't predictions — they're windows where Earth will be passing through that cone of uncertainty. If the asteroid happens to be in that same spot at that same moment, we have a problem. If it's anywhere else in its uncertainty range, it sails harmlessly by. Probably.

And we can't just point a telescope at it and check, because we don't know exactly where "it" is anymore. The object is too small and too dark to spot at a distance. We'd essentially have to wait for it to come close enough to Earth to reflect enough sunlight to see — which rather defeats the purpose of early warning.

Now, 2007 FT3 isn't unique. The catalog of near-Earth objects contains thousands of asteroids with incomplete orbital data — objects spotted once or twice and then lost in the darkness. Most of them are small enough to be harmless. But some of them aren't. And the only way to know for certain is to find them again.

The challenge is that space is, to use the technical term, extremely big.

Consider 2019 OK — the football-field-sized asteroid that passed within forty-five thousand miles of Earth with less than a day's notice. This wasn't a failure of technology. The object had actually been photographed multiple times in the weeks before its close approach. Pan-STARRS, one of NASA's premier asteroid-hunting telescopes, captured it on June 28th and again on July 7th.

But 2019 OK was approaching almost head-on, moving directly toward Earth. From our perspective, it barely seemed to move against the background stars — drifting at a rate of just zero-point-zero-one degrees per day. The automated detection software, trained to look for obvious motion, didn't flag it. It sat in the archive, unrecognized, until the asteroid was practically on our doorstep.

The same quirk of geometry that made it dangerous — a direct approach trajectory — was exactly what made it invisible.

Then there’s the problem of the sun. Ground-based telescopes can only observe at night, which means anything approaching from the sunward side of Earth is essentially invisible until it crosses into the night sky. Asteroids in certain orbital configurations can lurk in that blind spot for weeks or months, visible only in the brief windows of twilight when telescopes can point near the horizon without being overwhelmed by daylight.

And even when conditions are perfect, there’s the sheer volume of sky to cover. The celestial sphere contains about forty-one thousand square degrees. A typical telescope might image a few square degrees per exposure. Covering the entire sky, multiple times per night, with enough sensitivity to spot faint moving objects, requires a coordinated global effort — one that, until recently, we simply didn’t have.

This brings us to the uncomfortable category of “lost” asteroids. Objects like 2007 FT3 aren’t missing in the traditional sense. We know they exist. We have approximate orbits. We have lists of dates when they might pose a threat. But we cannot currently see them, we cannot refine their trajectories, and we won’t know for certain whether they’re a danger until they either impact Earth or sail safely past.

It’s a bit like knowing a delivery truck is somewhere on the highway, heading vaguely in your direction, scheduled to arrive sometime in the next decade, and possibly carrying fifty-four million tons of explosive cargo. You’d probably want a better tracking system.

The good news is that we’ve built one. Several, in fact.

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Second Section: “How We Got Better at Watching the Sky”

The story of asteroid detection is, surprisingly, a story of very recent progress.

In 1998, NASA could track perhaps ten percent of the large near-Earth asteroids — the kilometer-scale objects capable of global catastrophe. The technology existed to find them, but the coordinated effort didn’t. Telescopes were scattered, data sharing was inconsistent, and the whole enterprise operated on what could charitably be called a shoestring budget.

Then Congress got involved.

In 2005, the United States legislature directed NASA to find ninety percent of all near-Earth objects larger than one hundred forty meters — roughly the size threshold where an impact transitions from “local disaster” to “regional catastrophe.” The deadline was 2020.

They missed it. By a lot.

As of today, we’ve catalogued approximately ninety-seven percent of the kilometer-plus objects — the true planet-killers. None of them pose any threat for at least the next century. That’s the genuinely good news. The extinction-level asteroid is, for the moment, off the table.

But the hundred-forty-meter objects? We’ve found maybe forty percent. The city-killers, the ones that could flatten everything within fifty miles of the impact site, remain mostly uncatalogued. At our current detection rate, finishing that survey would take another thirty years.

The problem isn’t motivation — it’s physics. Smaller asteroids are fainter. Fainter objects are harder to spot. And the difficulty doesn’t scale linearly; it gets exponentially worse as size decreases. A hundred-forty-meter asteroid might only be visible when it’s relatively close to Earth, which doesn’t leave much time for observation before it either passes by or, well, doesn’t.

So how have we improved?

The first major leap was NEOWISE. Originally launched in 2009 as the Wide-field Infrared Survey Explorer — an astrophysics mission designed to study distant galaxies — the spacecraft was repurposed in 2013 for asteroid hunting. The key insight was that infrared detection doesn’t rely on reflected sunlight. Instead, it picks up the heat that asteroids radiate after being warmed by the sun. Dark asteroids that would be nearly invisible to optical telescopes glow brightly in the infrared.

Over its eleven-year asteroid-hunting career, NEOWISE observed more than forty-four thousand solar system objects, including over fifteen hundred near-Earth asteroids and nearly three hundred comets. Seventy of those are now classified as potentially hazardous. The mission ended in 2024 when the spacecraft’s orbit decayed too much to continue useful observations — but by then, it had fundamentally changed our understanding of the near-Earth population.

The second leap was ATLAS — the Asteroid Terrestrial-impact Last Alert System.

Developed by the University of Hawaii and funded by NASA, ATLAS took a different approach. Instead of looking deep into space for distant objects, it focused on scanning the entire sky, repeatedly, every single night.

The system consists of four telescopes — two in Hawaii, one in Chile, one in South Africa — positioned to cover both hemispheres. Together, they can image the entire dark sky every twenty-four hours, looking for anything that moves. ATLAS won't spot an asteroid years in advance, but it will catch objects on final approach. A twenty-meter asteroid — Chelyabinsk-scale — might be detected several days out. A hundred-meter object, several weeks.

That's not enough time to deflect anything, but it's enough time to evacuate.

ATLAS became the first system capable of full-sky nightly coverage in early 2022, and the results have been immediate. Remember those asteroids discovered hours before impact — 2022 EB5 over Iceland, 2023 CX1 over France, 2022 WJ1 over Toronto? Those were ATLAS and its partner systems working exactly as designed. Small objects, detected on final approach, trajectories calculated in near-real-time, impact locations predicted with remarkable accuracy.

We've gone from "asteroids occasionally surprise us" to "we can tell you which city to watch for the fireball."

But the real game-changer hasn't launched yet.

NEO Surveyor is NASA's first space telescope designed specifically for asteroid detection. Scheduled for launch in 2027, it will operate from the L1 Lagrange point — a gravitationally stable position about a million miles sunward of Earth. From there, it can do something ground-based telescopes cannot: look back toward Earth's orbit from the inside, scanning the regions of space that are perpetually hidden in the sun's glare.

This matters enormously. Many near-Earth asteroids spend significant portions of their orbits sunward of Earth, invisible to ground-based observers. 2019 OK, the football-field asteroid that arrived with same-day notice, could potentially have been spotted months earlier by a space-based infrared telescope looking in the right direction.

NEO Surveyor's mission goal is to find two-thirds of all asteroids larger than one hundred forty meters within its first five years of operation. Combined with ground-based surveys, that should finally push us past the ninety-percent threshold that Congress mandated back in 2005 — only about thirty-five years late.

And then there's the question of what we do when we find something actually heading our way.

In September 2022, NASA's DART spacecraft deliberately slammed into Dimorphos, a small moon orbiting the asteroid Didymos. The impact changed Dimorphos's orbital period by thirty-three minutes — far more than predicted, and definitive proof that kinetic deflection works. If we find a threatening asteroid years or decades in advance, we now know we can nudge it onto a safer path.

Detection, tracking, deflection. For the first time in four-point-six billion years of Earth history, a species exists that can see the cosmic bullet coming and, potentially, step out of the way.

The catch, of course, is that we have to see it first.

Which brings us back to **2007 FT3**, still out there somewhere, diligently following its long, elliptical orbit and showing no particular interest in being found. One of its more talked-about *possible* impact dates was **October 2024**, which arrived, passed, and concluded without the asteroid bothering to attend. Another opportunity was pencilled in for **March 2025**, a date we are now comfortably beyond, having survived it largely by not noticing. Further ahead sits **October 2030**, waiting patiently in the diary like a meeting that exists solely because no one has yet worked out how to cancel it.

If and when we do rediscover the asteroid, we'll finally be able to determine whether any of its **eighty-nine projected impact dates** were ever genuine concerns or simply statistical artefacts produced by a shortage of data and an excess of mathematics. Until then, 2007 FT3 remains what it has been for nearly two decades: an unknown quantity in an equation we can describe in exquisite detail, while the universe quietly declines to supply the missing variable.

The universe, it turns out, doesn't grade on a curve. But at least we've started doing our homework.

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Well, my cosmically vigilant colleagues, we've reached the end of another quantum near-miss. Today we've learned that in the multiverse of planetary defense, every asteroid exists in a superposition of "catalogued and harmless" and "unpleasant surprise" until someone points a telescope at it long enough to collapse the waveform.

We’ve discovered that humanity has gone from losing football-field-sized objects in our celestial blind spots to building global detection networks that can spot a two-meter rock hours before it becomes a fireball over France — though I suspect somewhere in the quantum foam of reality, there’s a universe where we fund planetary defense before the near-miss headlines instead of after, and a corporation like Quantum Improbability Solutions actually reads Darren’s incident reports.

Want to explore more quantum corporate chaos? Visit us at multiverseemployeehandbook.com where you’ll find fascinating science news, deep dives into existential risk management, and our latest blog series: “Cosmic FOMO: Things We Almost Didn’t See Coming.”

And if you’ve enjoyed today’s orbital anxiety adventure, why not share it with a fellow probability-weighted observer? Perhaps you know someone who thinks they have everything under control — they might benefit from learning that we’ve only found forty percent of the city-killers. Spread our signal like ejecta from a kinetic impactor test!

This is your quantum-coherent correspondent, reminding you that in the multiverse of asteroid detection, we’re all just trying to keep track of the inventory before the next surprise audit.

And somewhere out there, 2007 FT3 continues its silent orbit — not missing, not found, just patiently waiting for its next calendar invite to Earth.

Meeting status: tentative.