SKYLARK OF SPACE: THRESHOLD

Episode 1 — "ANOMALY"

Written by

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COLD OPEN

FADE IN:

EXT. PORTLAND STATE UNIVERSITY — SCIENCE BUILDING — NIGHT

Rain. A brutalist concrete building, half its windows dark. One lab on the third floor glows fluorescent.

SUPER: PORTLAND, OREGON — PRESENT DAY

INT. MATERIALS SCIENCE LAB — CONTINUOUS

A cluttered academic lab. Oscilloscopes. A vacuum deposition chamber the size of a refrigerator. Coffee cups in various stages of abandonment. Printed papers pinned to corkboard. A dying spider plant.

DR. NATE SEATON (early 30s, lean, wire-frame glasses, flannel over a faded Oregon State tee) sits at a workstation staring at a deposition controller readout. His Moleskine notebook is open beside him, dense with handwritten calculations.

He's alone. It's 1:47 AM.

NATE checks a sample tray inside the vacuum chamber through a viewport. Copper-doped thin films on titanium substrates — six of them, each the size of a playing card. He's been running variations on copper isotope ratios for thermoelectric efficiency measurements. Routine work. Boring work. The kind that gets your DARPA grant renewed or doesn't.

He loads a substrate into the test fixture — a small platform wired to a high-current power supply. Clips on the sensor leads. Checks the vacuum gauge: 10^-6 torr. Good enough.

NATE
(muttering, to himself)
Sample fourteen. Batch C. The one from the wrong supplier.

He types a note into his laptop. Glances at the isotope analysis printout clipped to the chamber: Cu-63/Cu-65 ratio reads 72.6/27.4. Not what he ordered. Not what he wanted. But he's running everything — waste not.

He ramps the current. 10 amps. 20. 50.

The force sensor reads zero. Normal.

100 amps.

The sensor TWITCHES. A reading: 0.3 newtons. Nate frowns. Leans in.

200 amps.

The sensor reads 1.2 newtons. The substrate is PUSHING against the fixture. Directed force. No visible cause.

NATE
What the...

He checks the wiring. Checks the sensor calibration. Runs it again.

The reading holds. 1.2 newtons. Normal to the film surface. Steady.

He cranks to 500 amps.

The sensor PEGS. The substrate TEARS free of the fixture clips —

The copper film, still on its titanium plate, ROCKETS across the vacuum chamber, PUNCHES through the viewport glass, FLIES across the lab, CRASHES through the drywall of the far wall, and KEEPS GOING.

The sound is enormous. Glass. Drywall. Something structural behind the wall. Then a distant BANG from the corridor.

Silence.

Nate sits frozen, ears ringing, hand still on the current dial. The vacuum chamber hisses — viewport shattered, atmosphere rushing in.

He stands. Walks to the hole in the wall. Looks through. The corridor wall has a matching hole. Through that: the door to the parking structure, dented outward.

He walks to the parking structure. The titanium substrate is embedded in the concrete pillar of the parking garage, two inches deep. The copper film is mostly intact, fused to the substrate surface.

Nate stares at it. His hands are shaking.

He looks back at the lab. Looks at the substrate. Pulls out his phone. Puts it away. Pulls out his notebook instead.

He writes: "Sample 14. Batch C. Anomalous directed force. No visible exhaust. No detectable reaction mass. Repeatable?"

He underlines "Repeatable?" three times.

SMASH CUT TO:

MAIN TITLES

ACT ONE

INT. MATERIALS SCIENCE LAB — NIGHT — LATER

Nate has cleaned up the glass. Taped plastic over the viewport. He loads another sample from Batch C. A smaller piece this time. He bolts the test fixture to the chamber floor and wraps it with a cargo strap for good measure.

He runs the experiment again.

Same result. Directed, steady, proportional-to-current force. The cargo strap holds. He measures carefully: force scales linearly with current. Direction is normal to the

film surface. No radiation above background. No particulate exhaust. No acoustic emission.

He runs the energy budget. Electrical power in. Mechanical work out. The efficiency is absurd — not free energy, but the coupling between electricity and thrust is orders of magnitude better than any ion drive, any plasma thruster, anything.

He does the delta-V calculation in his head, then on paper, then on his laptop. Each time the number comes out the same.

He sits back. Stares at the ceiling.

Then he picks up his phone and dials.

NATE
Martin. It's Nate.

INTERCUT WITH:

INT. MARTIN CRANE'S HOME — LAKE OSWEGO — SAME TIME

MARTIN CRANE (late 30s, broad-shouldered, ex-rower's build, clean-cut) is in bed. His wife LAURA (late 30s, red hair, teacher's patience) shifts beside him. The clock reads 2:34 AM.

MARTIN
(groggy)
Nate. It's two-thirty in the—

NATE
I know what time it is. I need you in the lab.

MARTIN
Can it wait until—

NATE
No. It can't.

Beat. Martin hears something in Nate's voice he's never heard before.

MARTIN
I'll be there in forty minutes.

He hangs up. Laura rolls over.

LAURA
Who was that?

MARTIN
Nate Seaton.

LAURA
The guy who forgets to eat?

MARTIN
Yeah.

LAURA
At two-thirty AM?

MARTIN
Yeah.

He's already getting dressed.

INT. MATERIALS SCIENCE LAB — LATER — PRE-DAWN

Martin stands in front of the hole in the wall. Then he looks at the vacuum chamber. Then at Nate's data on the laptop screen. He's been here ninety minutes. Nate has run the experiment four more times.

MARTIN
Show me the isotope analysis again.

Nate hands him the printout.

MARTIN
And the force only occurs with this ratio?

NATE
I've been running seven different batches for three months. Six of them do nothing. This one — the one from the wrong supplier, the one with the wrong isotope ratio — punched through

two walls and into a parking garage.

MARTIN
So the "wrong" ratio is the right ratio.

NATE
Apparently.

Long beat. Martin stares at the data.

MARTIN
Nate. If this is real—

NATE
It's real.

MARTIN
If this is real, then the delta-V numbers you're showing me—

NATE
I know what they mean.

MARTIN
Say it.

NATE
(quiet)
It means you could go anywhere. Not in theory. In practice. If you could build a vehicle that manages the thermal load and carries enough film material — you could accelerate continuously. No propellant mass. The scaling is linear. More film, more thrust, same efficiency.

MARTIN
And the energy source?

NATE
Electrical. You need a lot of it. A LOT. But it's not exotic — it's just power.

MARTIN

What kind of power?

NATE
For anything useful? Megawatts. Continuously.

Beat.

MARTIN
A reactor.

NATE
A reactor.

They look at each other. The fluorescent light hums.

MARTIN
I'll fund whatever you need. But we need to understand the failure modes before we understand the applications.

Martin crosses to the whiteboard. Picks up a marker.

MARTIN
First: replicate under controlled conditions. Vacuum chamber, calibrated force sensors, thermal imaging, Faraday cage. I want triple-confirmed measurements before I let myself believe this.

NATE
I already believe it.

MARTIN
That's because you're a scientist. I'm an engineer. I need to see it break before I trust it.

EXT. PORTLAND STATE UNIVERSITY — PARKING STRUCTURE — DAWN

Nate walks Martin to his truck (a Rivian R1T). The rain has stopped. The city is waking up.

MARTIN
Who else knows?

NATE
Nobody. My postdoc, Vanessa, will figure it out when she sees the lab.

MARTIN
(firm)
Nobody else. Not yet.

NATE
Martin, the physics is—

MARTIN
I know what the physics is. That's why nobody else. Not until we know what we have and what it costs.

Martin gets in the truck. Pauses.

MARTIN
The isotope ratio. Where is it documented?

NATE
In my notebook.

He holds up the Moleskine.

MARTIN
Not in any digital file?

NATE
No. My experimental logs have the batch number, but the isotope analysis was a separate printout from the supplier. It's clipped to the chamber.

MARTIN
Take that printout home. Put it in a safe. And Nate—

He looks at him hard.

MARTIN
Lock your lab.

He drives away. Nate stands in the parking garage, beside the concrete pillar with a titanium substrate embedded two

inches deep in it.

He touches the pillar. Looks up at the strip of sky visible between the garage levels.

ACT TWO

SUPER: 72 HOURS LATER

INT. MARTIN CRANE'S WORKSHOP — LAKE OSWEGO — DAY

Martin has converted his detached workshop into a secondary lab. Professional-grade equipment is arriving: a calibrated force-balance rig, a new vacuum chamber (smaller, portable), thermal imaging cameras.

Nate and Martin work in focused silence. They replicate the experiment under rigorous conditions:

— Vacuum chamber, 10^-7 torr

— Calibrated piezoelectric force sensors (0.01 mN resolution)

— Thermal imaging on the film surface

— Faraday cage around the entire setup

— Two independent accelerometer packages

CLOSE ON: the force sensor readout. Clean, linear, repeatable. 0.3 newtons per square centimeter at moderate current. Direction: normal to film surface. No radiation. No exhaust. No electromagnetic artifacts.

CLOSE ON: the thermal camera. The film glows warm under load. At high current: 280°C... 320°C... 360°C...

NATE
Watch the force reading when it passes three-eighty.

The thermal reading climbs: 380... 390... 400...

The force reading drops. Sharply. The coupling efficiency falls off a cliff.

NATE
There. That's the ceiling. Above four hundred Celsius, the copper dopant atoms start migrating through the lattice. The geometry that makes the effect work — it melts.

MARTIN
Irreversible?

NATE
Irreversible.

Beat.

MARTIN
So thermal management is the game.

NATE
Thermal management is the entire game.

Martin runs the numbers on his tablet. Thrust-to-weight. Power consumption. Radiator sizing. He shows the screen to Nate.

MARTIN
This is the performance envelope for a crewed vehicle.

ON THE TABLET: graphs, calculations. Nate studies them.

NATE
That's... that's a spacecraft, Martin.

MARTIN
(quiet)
Yeah. It is.

INT. NATE'S LAB — PORTLAND STATE — MORNING

VANESSA ALMEIDA (late 20s, short, dark curly hair, sharp eyes) arrives at the lab. She sees the patched wall. The taped viewport. The cargo straps on the test fixture.

She stands in the doorway for a long moment.

VANESSA
Nate.

NATE
(at his desk, not looking up)
Morning.

VANESSA
There's a hole in the wall.

NATE
Yeah.

VANESSA
And the backup wall.

NATE
Yeah.

VANESSA
And your vacuum chamber has a trash bag for a viewport.

NATE
(finally looking up)
Yeah. So. We need to talk.

INT. NATE'S LAB — LATER

Nate explains. Vanessa watches the experiment run. She's skeptical, methodical, demanding. She makes him run it six more times with different sensor configurations.

Then she sits down heavily.

VANESSA
You're telling me this has been sitting in our lab for three months as a supplier error.

NATE
I'm telling you physics has a loophole nobody ever tested. And I fell into it because a copper supplier in Arizona

can't read a purchase order.

VANESSA
The isotope ratio — have you checked it against the theoretical—

NATE
I called someone at MIT. Hypothetically. Anya Patel, quantum vacuum dynamics. She thinks the lattice geometry at this specific ratio creates a phonon mode that couples to virtual photon pairs.

VANESSA
Couples how?

NATE
Coherent quantum tunneling across the film boundary. The momentum transfer is real. The vacuum is the reaction mass. Distributed across spacetime instead of concentrated in an exhaust plume.

VANESSA
(staring at the data)
So it's not reactionless.

NATE
No. It's just... very efficient at hiding where the reaction goes.

Long pause.

VANESSA
Who else knows?

NATE
You, me, Martin. And whoever hacked our network three days before I made batch C.

VANESSA
(sharp)
What?

ACT THREE

INT. PORTLAND STATE — IT DEPARTMENT — DAY

Nate sits with a CAMPUS IT TECHNICIAN who is showing him logs on a monitor.

IT TECH
We flagged it last week. Unusual outbound traffic from your lab subnet. Started six days ago, ran for about seventy-two hours. Whoever it was had root access to your file server. They exfiltrated everything — experimental logs, equipment configs, your entire LabArchives database.

NATE
Everything digital.

IT TECH
Everything on the network. Your email too. We've patched the vulnerability and reset credentials, but...

NATE
(to himself)
Three days before the accident.

IT TECH
Sorry?

NATE
Nothing. Thanks.

He leaves. In the corridor, he leans against the wall. His face says it all: someone has his data. Not the isotope ratio — that's in the Moleskine. But everything else.

INT. VANGUARD STRATEGIC — TYSONS CORNER, VIRGINIA — DAY

ESTABLISHING: A glass-and-steel campus indistinguishable from any Beltway defense contractor. Badge access. Security desk. Good cafeteria visible through lobby windows.

INT. DUQUESNE'S OFFICE — CONTINUOUS

DR. MARC DUQUESNE (late 30s, tall, sharp-featured, pressed shirt, deliberate movements) sits at a clean desk reading a tablet. On the screen: Nate Seaton's experimental logs. Raw data. Equipment configurations. Batch numbers.

DuQuesne scrolls slowly. His expression shifts from professional interest to something deeper — recognition. Wonder, even, quickly controlled.

He picks up a desk phone.

DUQUESNE
Brookings. I need fifteen minutes.

INT. VANGUARD — BROOKINGS' OFFICE — MOMENTS LATER

BROOKINGS (mid-50s, silver hair, tailored suit, forgettable face by design) sits behind a large desk. American flag in the corner. Photos with senators on the wall.

DuQuesne stands, presenting from the tablet connected to a wall display.

DUQUESNE
Dr. Nathan Seaton. Materials science, Portland State. DARPA-funded, studying transition metal dichalcogenide films. Standard work — or it was, until six days ago.

ON THE DISPLAY: Nate's force sensor data. The graphs.

DUQUESNE
These are his raw measurements. A copper-doped thin film producing directed thrust from electrical input alone. No propellant. No exhaust. Force proportional to current, direction normal to the film plane.

BROOKINGS
And this is verified?

DUQUESNE
By him, yes. Multiple runs, multiple sensor configurations. The data is internally consistent. I've been checking the physics for three hours. It doesn't violate conservation laws — it exploits a coupling between the film's crystalline structure and quantum vacuum fluctuations.

BROOKINGS
In English.

DUQUESNE
He found a way to push against empty space.

Long beat. Brookings' expression doesn't change.

BROOKINGS
Applications.

DUQUESNE
Propulsion without propellant. Aircraft, spacecraft, submarines — anything that moves. No exhaust signature. No fuel logistics. The power requirement is enormous, but the physics scales. This is not incremental. This is...

He stops himself.

DUQUESNE
This makes every propulsion system on Earth obsolete.

BROOKINGS
Every weapons delivery system too.

DUQUESNE
(carefully)
Yes.

BROOKINGS
Can you replicate it?

DUQUESNE
With the data we have — partially. His logs show the film composition and deposition parameters. But the specific copper isotope ratio isn't in the digital files. It's referenced by batch number only. Without that ratio, I can produce the films, but the coupling will be incoherent. Noise instead of thrust.

BROOKINGS
So you need the ratio.

DUQUESNE
I need the ratio.

Beat.

BROOKINGS
What's your timeline if you had it?

DUQUESNE
Six months for reliable films. Twelve for a demonstrator vehicle.

BROOKINGS
(leaning back)
And what's Seaton going to do with this?

DUQUESNE
If he's smart? Publish and patent.

BROOKINGS
And if he does?

DUQUESNE
Then the physics is public and we're in a race with every state actor on the planet.

Brookings picks up a phone. Dials.

BROOKINGS
(into phone)

I need a collection team tasked to Portland. Physical and digital. Priority one.

He hangs up. Looks at DuQuesne.

BROOKINGS
Get me a clean room and a budget. You have six months.

DUQUESNE
Give me six months and a clean room. I'll give you something that makes hypersonics obsolete.

He means it. That's what makes him dangerous.

ACT FOUR

INT. NATE'S APARTMENT — NIGHT

Small apartment. Books everywhere. A safe in the closet (the Moleskine is inside). Nate is on the phone with Martin.

NATE
Someone exfiltrated my entire lab database three days before the accident. They have the experimental logs, the deposition parameters, everything digital.

MARTIN (V.O.)
The isotope ratio?

NATE
Referenced by batch number, not by value. The actual ratio is in my notebook and on one printout, both in my possession.

MARTIN (V.O.)
So they can make films, but they can't make them work.

NATE
Not without the ratio. They'll get close — the batch number might lead back to the supplier, and from there—

MARTIN (V.O.)
How long?

NATE
Weeks. Maybe months if the supplier's records are messy.

Long pause.

MARTIN (V.O.)
Nate. We need to move faster than I thought.

NATE
What are you thinking?

MARTIN (V.O.)
I'm thinking I know a mission architect at JPL who's on sabbatical and bored out of her mind. I'm thinking I have a hangar at Hillsboro Airport that's sitting empty. And I'm thinking that whatever we're going to do with this, we need to do it before whoever stole your data figures out what they're missing.

NATE
Martin—

MARTIN (V.O.)
I'm also thinking I need to call a space-law attorney. Tonight.

INT. VANGUARD — DUQUESNE'S LAB — NIGHT

DuQuesne alone in a clean room. He's already running his first deposition. The vacuum chamber hums. On his screen: Nate's parameters, adapted, modified by his own calculations.

He watches the force sensor.

Nothing.

He adjusts the current. Runs it again.

A twitch. Maybe 0.02 newtons. Maybe noise.

He stares at the readout for a long time.

DUQUESNE
(to himself)
There's a parameter I don't have.

He picks up a secure phone.

EXT. PORTLAND — AERIAL SHOT — NIGHT

The city lights. Rain on the river. Two separate pools of light — Nate's apartment, the lab across town — and somewhere far to the east, the glass towers of Tysons Corner.

Three people who know the world just changed. And they're already racing.

FADE TO BLACK.

END OF EPISODE 1

Runtime estimate: 52 minutes

VFX shots: 3 (crucible impact sequence, data visualization inserts, aerial establishing)

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