

THE OPERATING MANUAL OF TWO



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The Physics of Us

THE BINARY STAR

THE 15-MINUTE EDITION

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The Binary Star · the 15-minute edition

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The Operating Manual of Two. The complete concept: the barycentre, the four orbit types, the five forces, repair, release, and the full audit. Fifteen minutes, honestly spent.

Here is a question that ends arguments in physics departments and starts them in marriages.

When two stars form a binary system - and most of the bright stars you can see tonight have companions - what do they orbit?

Almost everyone answers: each other. Almost everyone is wrong. Two stars orbit a point between them called the barycentre - the centre of mass of the pair. Neither star is the centre. Neither circles the other. Both fall, forever, around a third thing that belongs to neither and exists only because both are there. When the stars are unequal - they always are - the barycentre sits closer to the heavier one, but it never sits inside either. Even mighty Jupiter pulls the barycentre of the solar system outside the body of the Sun.

Now the sentence this whole book hangs on. **You do not orbit each other, and you were never meant to. Two durable people orbit a third thing between them - the shared project, the household, the made thing - and every relationship that tries to make one person the centre decays.**

Every wedding speech says you two are each other's everything. The physics says that arrangement has a name. The name is a decaying orbit.

Part one: the barycentre

Watch any partnership that has lasted decades and stayed alive - not merely intact, alive - and you will find the third thing. Marie and Pierre Curie orbited a laboratory: shared work so real it earned them a Nobel Prize together, and the orbit was so stable that after Pierre's death Marie kept the work alive and won a second Nobel alone - the centre outlived the star. Daniel Kahneman and Amos Tversky, the great platonic binary of modern science, orbited a shared question about human judgement for years - two men, one problem between them - and the work changed economics forever. A farming couple orbit the farm. New parents orbit the child. Two old friends orbit thirty years of showing up.

The third thing does three jobs romance cannot do. It gives the pair somewhere to put energy besides each other's flaws. It gives daily negotiation a tiebreaker - not "who wins" but "what serves the centre". And it holds the pair together on the days the feelings do not, which is the part the love songs skip: feelings are weather, and orbits need mass.

Three clarifications the full book spends chapters on.

Mass and pull, without villainy. In every pair one body is heavier - earns more, decides more, needs less. Unequal gravity is not injustice; it is universal, and it only becomes injustice when the lighter body is treated as a satellite instead of a partner in the fall. The test is not equality of mass. It is whether both bodies genuinely move - whether the heavier one is visibly bent by the lighter one's pull. A partner who never moves is not a binary. He is a planet with a moon.

Choosing the centre. The third thing is not automatically the children. Children leave - they are supposed to - and pairs who orbited nothing but the kids meet each other as strangers at the empty nest. The durable centre is chosen and renewed: the household as a made thing, a shared work, a shared practice, a garden, a cause. Small is fine. A Sunday walk that never gets cancelled is a barycentre.

The empty centre. The couples in real trouble are rarely the ones who fight - fighting is at least energy. They are the pairs orbiting nothing: the third thing dismantled or never built, two bodies drifting on history and a lease. The diagnostic question is gentle and brutal: what, exactly, do the two of you build or tend together that is not each other? If the answer is silence, the repair is not a date night. It is choosing a centre.

Love is not the centre. Love is the gravity. The centre is the thing you build.

Part two: the four orbits

Every close pair you know - including yours - is running one of four orbit types.

The stable binary. Two unequal bodies falling around a centre both of them feed. It does not look dramatic; stability never does. Its test is not the absence of conflict but conflict's geometry: arguments happen in orbit, about the shared thing, instead of head-on, about each other's essence. Stable binaries argue about the renovation. Decaying ones argue about who each other is.

The decaying orbit. Energy is leaking: fewer shared projects, shorter conversations, the third thing quietly starved while both bodies blame the growing distance on each other. Decay rarely has a villain. It has deferred maintenance - and it compounds, which is why the repair section below is mostly about earliness.

Tidal lock. The Moon shows one face to the Earth, always. Locked partners do the same: agreeable, curated, managed - one face presented for years while the hidden hemisphere grows stranger in the dark. It looks like peace and photographs beautifully. It is performance, and its cost arrives late and large, when the hidden face finally rotates into view and the other partner says: I never knew you at all. The correction is not confession all at once; it is rotation by degrees - one previously hidden truth, shown at a time, to a partner who has agreed to receive it.

The slingshot. Some relationships were never meant to be permanent orbits. They were gravity assists: encounters that bent your trajectory and flung you toward a life you could not have reached alone - the mentor who launched you, the first love who changed your course, the intense friendship that quietly completed. Spacecraft do not resent the planets they borrowed speed from. Naming a slingshot is not a demotion; gratitude without permanence is still gratitude, and some of the most important bodies in your sky were only ever passing through.

Part three: the five forces

Tides. Any two bodies close enough reshape each other - daily, invisibly, without permission. Ten years beside someone and your vocabulary, habits, and moods carry their fingerprints. Tides are not optional; the only choice is whether the reshaping is mutual. The audit question: in what ways have I been changed by this person, and could I name ways they have been changed by me?

The Roche limit. In astronomy there is a minimum distance below which a moon is torn apart by the very gravity that holds it - closeness itself becomes shredding. People have a Roche limit too. Merged finances, merged friends, merged identities, no room that is only yours: past the limit, closeness stops deepening a bond and starts disintegrating a self, and the disintegrating self then has nothing left to bring to the orbit. The strongest pairs are

not fully merged. They are two intact bodies, close enough to warm each other, far enough to remain whole. Distance in a marriage is not a failure of love. Below the Roche limit, distance IS love.

Perturbation. Children, in-laws, careers, illness - visible third bodies that bend every orbit. Perturbation is not betrayal of the pair; it is physics, and it is budgeted for, not resented. The arrival of a child does not threaten a binary that expects the wobble and re-plans the orbit around the new mass. It shatters the ones who pretend nothing changed.

Dark companions. Astronomers detect invisible objects by watching a visible star wobble for no apparent reason. If your partner wobbles for no visible reason - moods with no trigger, flinches at nothing you can see - something unseen has mass: the unspoken history, the grief never mentioned, the ex, the secret. Unseen mass does not vanish by being ignored; it keeps bending the orbit from the dark. The protocol is gentle naming: I notice the wobble; I am not demanding the mass, but I am telling you I can feel it.

Energy loss. Orbits decay by radiating energy away - and pairs radiate through contempt, through chronic distraction, through the phone at the table. The physics is indifferent to intention: energy not fed to the centre is energy the orbit loses. Every shared ritual dropped is wattage gone.

Part four: repair and release

Small burns early. Spacecraft engineers correct a drifting orbit with tiny thrusts made early; the same correction attempted late needs a hundred times the fuel and often tears the craft apart. Nearly everyone runs relationships backwards: ignore the drift for three years, then attempt the grand gesture - the big holiday, the renewal, the dramatic reckoning - the massive late burn that arrives after the orbit is past saving. The evidence from long partnerships is dull and decisive: the ten-minute conversation this week beats the counselling in year nine. Small, early, boring, relentless. That is the whole art.

The long orbit. Over decades the barycentre moves - it is supposed to. Kids arrive and leave; careers rise and end; the centre that held you at thirty cannot hold you at sixty. Long pairs renegotiate the centre openly, every era: what are we orbiting now? The pairs who never re-ask the question wake at retirement orbiting a point that no longer exists.

Escape velocity. Some orbits end. Pretending otherwise helps no one, and physics offers a better model for ending than destruction: escape velocity - enough energy to leave cleanly, on a trajectory, without shattering either body. An ending done at escape velocity names the truth early, divides the mass fairly, refuses the temptation to strip the other body for parts, and honours what the orbit made. Lennon and McCartney built the most loved songbook of

the twentieth century around a shared centre, and their public, painful decay is the cautionary case - yet the work still stands, entire. What the orbit made outlives the orbit. That is not tragedy. That is what orbits are for.

The greatest binary in science, and how it decayed

The Kahneman-Tversky partnership deserves a closer look, because its whole arc - formation, glory, decay, and partial repair - is on the public record, and every force in this book shows up in it.

For years the two psychologists worked with their chairs pulled to one desk, talking for hours a day, laughing so much that colleagues assumed the work was play. The barycentre was as pure as centres get: a shared question about how human judgement actually works, and a rule that ideas belonged to the pair, not to either man. They alternated first authorship. The orbit was so stable it produced the research that would later win the Nobel Prize in economics.

Then the forces arrived. Distance, first - separate continents, separate universities: a perturbation they under-budgeted. Then unequal recognition: the world began crediting Tversky, the more dazzling presence, for work that had been genuinely joint - and the barycentre drifted toward one body. Energy stopped being fed to the

centre and started leaking into grievance, the classic radiative loss. The orbit decayed for years, two men who loved each other circling a centre that was being starved. What partially saved it was a small burn made just in time: when Tversky fell terminally ill, the two returned to shared work and shared conversation in his final months. The repair did not restore the old orbit - late burns never do - but it let the partnership end at escape velocity instead of in debris. Kahneman spent the rest of his career saying “we” about the ideas.

Every pair should study this one, because it removes the comfortable excuse. If an orbit built on that much love and that much shared brilliance can decay through ordinary deferred maintenance, yours can too. And if theirs could still be partially repaired by one honest burn, so can yours.

A worked example

The audit is six questions on paper. Watching one couple run it makes the questions land.

A composite pair: Tom and Leah, together fourteen years, two kids, both working. Nothing is wrong, exactly. Everything is flat. They run the audit on a Sunday night.

The third thing stumps them for five full minutes - and the silence is the diagnosis. The kids, they finally write, then admit the kids are ten and twelve and increasingly a departure lounge, not a centre. Orbit type: decaying, they

agree, surprised by their own relief at naming it - the drift was real, and neither had been imagining it. Tides: Leah lists two ways Tom reshaped her (steadier under crisis, funnier); Tom lists what he absorbed from her (ambition, the habit of actually phoning friends). Both lists exist - good sign, the pull is mutual. Roche check: Leah has her Thursday netball; Tom, honestly, has nothing that is only his - a merged man, slowly disintegrating into the household, with less and less self to bring to it. The wobble: Tom goes quiet every Sunday evening, and neither has ever asked why aloud.

Three burns get scheduled, all small. A shared centre gets chosen - the garden rebuild they have discussed for three years becomes a real project with a budget and a Saturday hour. Tom claims a Tuesday for the bike he has not ridden since the second child. And Leah asks, that night, about Sunday evenings - and the dark companion turns out to be dread of the working week doing its dilation, which shrinks the moment it is named and approached.

No counselling, no drama, no grand gesture. Twenty minutes of paper and three two-second thrusts. Run it again in a year and the orbit is different. That is how orbits are actually saved - not in the crisis, but in the Sunday audit that made the crisis unnecessary.

The steelman

The serious objection: *this is cold. Reducing love to mechanics strips it of the very thing that makes it love - and people are not billiard balls; we have choice, growth, forgiveness.*

Two answers. First, the frame is not a replacement for love; it is a maintenance manual for it. Nobody accuses a gardener of reducing roses to soil chemistry - the chemistry is how you keep the roses alive. The mechanics here are in service of the mystery, not instead of it. Second, the physics actually dignifies choice: orbits are corrected by deliberate burns, centres are chosen and renegotiated, locks are opened by voluntary rotation. Every protocol in this book is an act of agency. What the frame removes is not love. It is the fatalism that says failing relationships are simply doomed and thriving ones simply lucky. Orbits are neither doomed nor lucky. They are maintained - or not.

The fifteen-minute exercise: the Binary Audit

Take the most important pair-bond in your life - partner, closest friend, adult parent or child - and a sheet of paper. Six questions.

One: what is the third thing? Write what the two of you actually orbit - built or tended together, not each other. If

you cannot name it, you have found the work, and the work is choosing a centre this month. Small is fine.

Two: which orbit type, honestly? Stable, decaying, locked, or slingshot. No type is an accusation; each has a different correction - feed the centre, make the small burn, rotate one hidden degree, or write the grateful goodbye.

Three: where are the tides taking you? Name two ways you have been reshaped by this person, and two ways they have been reshaped by you. If the second list is empty, read the mass-and-pull section again.

Four: check the Roche limit. Name one space - time, room, friendship, practice - that is yours alone, and one that is theirs. If either list is empty, the repair is distance, and the distance is love.

Five: name the wobble. One place energy is leaking or the orbit bends for no visible reason - the conversation postponed, the ritual dropped, the unexplained flinch. That is the site of the burn.

Six: make the burn this week. Not the grand gesture. The two-second thrust: the ten-minute conversation, the restored ritual, the gentle naming of the dark companion. Small. Early. This week.

The last word

You were told to search for your other half, as though you were incomplete and another person could be a destination. The sky disagrees. It is full of pairs, billions of years old, and not one of them orbits the other. They fall together around something between them, each body whole the entire time.

Stop trying to be someone's centre. Stop asking anyone to be yours. Choose the third thing, feed it daily, correct early, stay outside the Roche limit, name the dark companions gently - and when an orbit truly ends, leave at escape velocity with your gratitude intact.

The love is the gravity. The centre is what you make. Fall well.

Book Three of the Protocol Library. The full volume runs all sixteen chapters - the forces, the case files, and the complete audit - at full depth.