

THE PERFECT WAVE
by Rudy Rucker & Marc Laidlaw

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It's a pleasant June evening in the funky California beach town of Surf City. Shadows lengthen across the state university campus, nestled amid redwoods and pastures above the town; on the bay, wetsuited surfers bob and slide on the tubes off Parker Point, their waves gilded by the setting sun.

The Boardwalk amusement park's chains of lights are coming on; squeals burst irregularly from the roller coaster. Low cars creep down the beachfront avenue, pumping beat-heavy music. Couples and families stroll about; kids play in the yards of the grimy pastel homes in the side streets off the Boardwalk; skaters grind and flip along railings, stoops and curbs. Borne upon the cool evening breeze, the smells of grease and oregano waft from a waterside warehouse restaurant.

The establishment's marquee displays a long-snouted grinning cartoon rat holding a surfboard and an oversized slice of pizza, the slice flopping down to drip a cheese-strand onto the rat's gnarly bare toes. The rat wears a top hat and a long red T-shirt labeled *C.R.* The marquee sign reads:

Cheezemore Ratt's Surf Shack

Pizza, Games, and Family Fun!

Yes, We Have "The Perfect Wave"(R)TM

A tall, skinny young man with a shock of straight platinum blond hair is spraypainting a mural onto a concrete block wall facing the mostly empty parking lot, the mural potentially visible to the cars trolling the beachfront avenue. The painter is Zep: avid surfer, amateur scientist, temporarily unhoused. His recently acquired companion Kaya sits on the ground, smoking cigarettes, drawing in an art-quality notebook, and admiring him. She wears a carved black coral tiki-goddess head on a Day-Glo red string around her neck.

Zep is handsome, in a street-worn, unshaven way. Kaya wears her hair in a blonde Bettie Page bob—or, no, that's not her hair, it's a wig. Her eyebrows are shaved off and replaced by fanciful drawn-on lines. Her face is young, her front teeth large and rabbit-like. She wears a flowing paisley pashmina-size scarf across her shoulders against the cooling evening air.

Resting beside Kaya are three cartons of spray-paint cans, and next to the cartons are the couple's freshly spraypainted bicycles, fat-tire beaters with stuffed saddle bags. Zep's bike is now green, Kaya's yellow. A garish science fiction novel and a computer science textbook peep from Zep's saddlebags, also a soldering iron and a voltmeter. Visible in the open tops of Kaya's bags are a Tarot deck, the brass stalk of a pocket bong, a plastic Ziploc bag of granola, a tea-kettle spout, the corner of a silky purple sleeping bag, also pliers and a screwdriver. Kaya's bicycle has a tiny motor jury-rigged to its rear wheel, with a little cylinder of gas connected to the motor.

Zep's bicycle has a rack welded to one side, and snuggled into the rack is his peculiar translucent gray surfboard, with an irregular dark shape embedded within its center. The board's surface is rough and sticky. It, too, has been recently decorated by the spray-can: the name "Chaos Attractor" rainbows across it in loose script.

Zep has already covered the concrete-block wall with a blue sky background dotted with red-tinged white clouds. And now, holding a dirty handkerchief over his mouth with one hand, he dances along the wall, swinging a can of green spray-paint up and down in great arcs—limning the requisite image of a perfect wave.

"Slower," said Kaya in a gentle tone. "Don't rush it, Zep."

"I want transparency," says Zep through his handkerchief. "So the sky

shows through. I'll build up the base of the wave one layer at a time." He jitters back and forth till the can is empty, selects a fresh can, begins shaking it, and hunkers down by Kaya's side.

Kaya shows her notebook to him. "Look, I figured out how to position Cheezemore Ratt on a board. You're lucky you met me yesterday, huh?"

Surprise: the pages of Kaya's notebook are completely covered with astounding da Vinci-like drawings: a flow diagram of the air currents inside a cloud, a schematic for a small motor of novel design, a sketch of a twin-peaked quantum wave function, an image of Zep as a skeleton, and a fetching sketch of Kaya riding down the face of an enormous wave.

"Whoa," says Zep. "I'm flabbergasted."

"You still don't remember me?"

"What."

"We were in the same physics class freshman year, before you dropped out."

"That makes you what, a junior now?"

"I never forgot you, Zep. Summer's here, and you're my summer project. Why do you think I pitched my tent by yours on the beach?" Kaya turns her face up at Zep, expecting a kiss, but he backs off, spooked, frantically shaking the spray-can.

"To be inside the radius of my awesome electronic sand flea disintegrator?" he says, not looking at her. "Maybe someday I can use the profits to buy a house."

"You're scared now? After last night?" says Kaya.

"You're stalking me?" says Zep.

"Chasing happiness," says Kaya, looking sweet in the fading light. "And I love talking physics with you. I'm writing a term paper about how the planetary wave function can change modalities and cohere into a fresh solution. About how the entire Earth can change."

"All these threads at once," says Zep, picking up a second spray-can and shaking the two cans at the same time. "What if I just put pieces of

pizza on the wave. Hella easier to draw than Cheezemore Ratt and his Slicers.”

“Triangles!” says Kaya. “The elemental form. Good idea, Zep.”

Zep looks at her for a minute and comes to a decision. “Paint this with me, Kaya. You’re a better artist than me. Frankly, I’m worried about that wave I just started. It’s not epic. It needs—oh, of course!”

Zep sets down his paint cans to fiddle with his surfboard Chaos Attractor. The surface lights up with pale green scrolls that form a realtime graphical model of a wavy water surface as seen from above, with the water-heights coded as shades of green. The tints of green flow like sun and shadows on a wind-tossed harbor, but there’s something odd about the flow, something nonlinear, and now odd square-spiral waves begin rotating within the stew, sending out shockwaves of altered behavior.

It’s Kaya’s turn to be surprised. “Your surfboard’s a computer? I heard rumors but—how does it work?”

“That dark shape in the core, where it looks like a shark skeleton? That’s a vintage CAM8 cellular automaton machine. My good stick Chaos Attractor can not only simulate the state of the nearby sea, it can also propagate realtime tweaks into the surfspace at large, which means that, when I’m jamming the tubes, my moods can influence them. And when we’re dry-docked like this, I can use my board to simulate imaginary oceans. That’s what we’re seeing now. A boiling cubic wave equation. See how it wobbles out those bulges that gobble up the square corners?”

“That’s your mood?” says Kaya, tapping the surface of the board. “Oh, look, you feel me!” Oblong scrolls percolate out from her touches, blending with the jerky molten motions of the cubic waves. “I like you a lot, Zep.”

Zep freezes the simulation and walks to the wall with his cans of paint. “Grab a pair of cans and jam with me, Kaya. As soon as we’re done copying this image we can go into the Surf Shack to stuff our guts.”

“And talk about our future,” adds Kaya.

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Despite what one might expect for a kiddie pizza parlor, Cheezemore Ratt’s Surf Shack is a place of peace. It’s the audio ambience that makes

the difference. The great room is wired to play the natural sounds of breaking waves, sprinkled with seabird skirls. Also woven into the mix are faint, sweet strands of surf music, and not hackneyed old crap—no, it's offbeat procedural surf music that no one's ever heard, the music mixed down low enough so that it fades in and out like a party you're hearing from a quarter mile down the beach. The room's air is fresh, with high windows open to the breeze off the bay. Children race in circles around a central clump of booths where their parents enjoy pitchers of imported beer.

Yes, the floor is sticky with spilled sodas, shiny from discarded pizza scraps, and gritty with cast-off kernels from the bowls of free pretzels and popcorn. And every so often a child falls heavily and breaks into screams—but never for long. The Surf Shack is an oasis of calm, the vibe-equivalent of an actual beach.

Cheap, free-access videogames line the wall on the room's right side, their speakers turned way down so as not to clash with the pulse of the surf and the chiming of the surf music. Along the left side of the room are the pizza and drink counters. And at the far end of the room is the entrance door to The Perfect Wave, a high-end networked virtual reality cave with a few hydraulically jacked surfboards. Riding The Perfect Wave costs seventeen bucks for a five-minute pop, ten minutes for thirty bucks. It's popular enough that sometimes there's a line to get in. There's another Perfect Wave cave down on the Boardwalk, but that one's too heavily frequented, it's like a worn-out public restroom.

Del works behind the pizza counter; he's a short young fellow with a plain, honest face. He serves a man a slice of Cheezemore's Hawaiian pizza: roasted fresh pineapple, Serrano ham, and locally made mozzarella topped with roasted Kona coffee beans—then turns to smile at the girl beside him filling a pitcher with dark beer. Both of them are wearing top hats like Cheezemore Ratt, with little pins saying Slicer.

"Almost closing time, Jen," says Del. "You want to stick around? Mr. Prospero said I could play The Perfect Wave free all night if I'd mop the place. That's hundreds of dollars worth of play-time. I'm really moving up the tournament ladder. You could watch me play."

"How do you surf on a ladder?" says Jen absently. "Anyway, sorry, I need to get out of this box." She's cute with high blonde pigtails, though her face is drawn. Her bloom of youth is fading, with only work in sight.

"I think it's fun here," says Del. "Working next to you every day. When are you off this week?"

“Monday.”

“Damn, I’m only free on Tuesday. Maybe I can change to Monday and we can take a picnic out to Bitchin Kitchen beach where Zep’s camped out. Surf the day away.”

“I’m malling on Monday,” says Jen. “I have to find a dress for Zep and Kaya’s wedding.”

“Wedding!” said Del. “Zep only met her yesterday.”

“Oh, she’s known him a long time,” says Jen. “He has such a bad memory. She’s been, like, tracking him, and now she’s finally hooked up with him, and she’s using astrological birth control, and you know what that means.” Jen arches her back, grins and pats her stomach. “Wedding in July!”

“Good thing Zep got Mr. Prospero to hire him for the mural,” says Del, shaking his head. “He’s gonna need an apartment, or at least a room. Poor guy. He has this impossible dream of buying a beach cottage.”

“Kaya’s really rich,” says Jen. “Doesn’t he know that? She plans for Zep to finish college. Do you think Zep will thrash his mural? How did he even convince Mr. Prospero that he could paint?”

“Day before yesterday Zep showed Prospero some mural pictures in a book from the library and claimed he’d done them under a pseudonym,” says Del with a snicker. “You know Zep. He can fake anything. And it’s not like Prospero’s paying him very much. Prospero’s always so broke—for a guy who runs a business.”

There’s a sudden squawk outside on the sidewalk, the sound of voices raised. Kaya is cursing at someone, and that someone, a guy whose voice raises the hairs on Del’s neck, is cursing her back. Abruptly the man’s voice rises to a frantic bellow. Zep comes tear-assing in through the door with its tiny tinkling bell. Close on his heels is a big guy with an ill-favored, somewhat triangular form. Del knows the silhouette from high school corridors and adolescent nightmares.

“Lex Loach,” he mumbles, casting a sidelong glance at Jen. He’s shocked to see her straighten, pull back her pixie pigtails, and smooth down her Cheezemore Ratt-faced apron.

“Hi, Lex!” she chirps perkily.

Zep tosses Del the can of red spray-paint he’s carrying, then vaults the bar and reaches under the counter, pulling out the lead-filled billy club that Mr. Prospero keeps by the cash register. Zep taps the club against his palm, glaring at Loach, who’s holding a can of black spray-paint.

“Yo, Jen,” says Loach, dropping his pursuit of Zep and giving his spray-can a maraca shake. “You about ready?”

Kaya comes in the door now too. “Hey, crackwipe! What the quap did you just do? You think you can get away with that?” She’s carrying her paisley pashmina scarf by one corner; it’s all smeared with red paint.

A mother at a nearby table grabs her highly interested toddler and leaves. In any case, the place is nearly empty by now.

Loach slips into a stool at the bar, ignoring both Zep and Kaya. He sets his spray-can down and flashes Jen a sunny grin. “Maybe I’ll have a beer before we go.”

“I’m talking to you, butt-face,” says Kaya, right at his side.

“Chill, Kaya,” snaps Jen. “Lex is my friend.”

“Friend?” squeaks Del.

“Jen!” says Kaya. “This turd sprayed black paint all over Zep’s mural!”

Loach shrugs. “Just wanted to save myself having to clean an even bigger mess off that parking lot wall in a week or two when the sale of this place goes through. No point putting any more work into it, Zeppo.”

Zep smacks the billy club evenly into his palm.

“No point flipping out either,” continues Loach. “You see me gettin’ mad? I could get mad. You sprayed a friggin’ pig face on the hood of my SPC. But thanks to a little turpentine and your stoner girlfriend’s do-rag, I’m willing to let it go. Just don’t come out from behind that counter, batboy.”

“I’ve heard enough,” says Kaya and stalks outside.

The smell of burning pizza crust registers upon Del. He reaches for the big wooden paddle. “What sale?” he quickly gets in.

“Prospero didn’t tell you, huh?” gloats Lex. “He’s in denial. Fact is, he’s selling this place to my Dad, yo. Gonna install a Snack-Fac right here. Give the Boardwalk tourists something they can relate to. Not like this space-case Cheezemore Rattshit scene you got here now.” He glances over at the Perfect Wave cave and snickers. “You play that big bad surf game, Del? You a heavy dude in the virtual world?”

“Don’t make fun of Cheezemore Ratt,” says Del with simple dignity. “He’s vibby. Just like Mr. Prospero. And, yes, I have the number two Perfect Wave ranking in Surf City. My Perfect Wave handle is El Surfiao.”

“You just tell that to everyone?” says Loach, shaking his head as if pitying Del’s naiveté. And then he reverts to his usual warty demeanor. “It’s not fair you get all that free time on the Perfect Wave machine here. Maybe I’ll have my Dad move that rig to our house while we’re steam-cleaning the stink outta this hole.”

“Let’s have our beer at the Boardwalk,” says Jen to Loach, hanging up her apron. She flashes Del a smile that lifts him for a second. “Del, since you’re staying late, will you close out for me?”

Stiff-faced, he says, “Uh—sure.” And turns to slide out the darkened extra pizzas with the paddle. The special after-hours snack he’d planned to share with Jen. The Surf Shack’s lights flicker twice. Closing time.

Still holding that billy club, Zep follows Loach and Jen outside. Knowing that Zep is weaponized, Loach chooses to ignore him. Kaya is standing in the lot looking happy again. It’s night now, with a low full moon’s light dancing on the ocean waves. A few blocks away, the Boardwalk amusement park roars.

Kaya watches Lex let himself into his dad’s Suburban Personnel Carrier, leaving Jen to haul on the massive slab of passenger door as if she’s opening a bank vault. The behemoth rolls away.

“I can work that slash-mark into my composition,” remarks Zep, calmly studying his defaced mural. “I can have the picture be showing a quantum transition where one version of reality shifts into another. On the left side I’ll have pizza slices on a normal-type wave, and on the right side I’ll have, um, Easter Island moai gods on a boiling cubic wave. Like that tiki god you wear on your neck. Tikis are easy to draw. No arms and legs.”

“She’s a goddess, not a god,” says Kaya, fingering her amulet.

“But—if Loach says his father is buying this place, why bother finishing the mural?”

“I’ll get paid just the same,” says Zep. “No effort’s ever in vain. And who knows, maybe my mural can jujitsu the deal into falling through. Anyway, half the time Loach is talking out of his ass.”

A muffled thud sounds a couple of blocks away, followed by a crowd’s burst of applause and laughter.

“Could be the Loach family is in for a run of bad luck,” says Kaya, dimpling. “Could be they’re losing their wave.”

“You spiked that pig’s gas tank?” says Zep.

“His carb and spark-plug,” says Kaya. “I set it up to explode like a bomb. I’ve forgotten more about motors than most men will ever know. What do you say we move all our stuff inside the Surf Shack and lie low?”

“I’m down with that,” says Zep.

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Delbert’s desultory mopping is done, along with the counting out. Zep, Del, and Kaya have the whole Shack to themselves, the lights dim, the doors and windows shuttered and locked, infinite beer on tap and the two burned eggplant-and-anchovy pizzas that Del made.

They’re sitting at a table, smoking Kaya’s bong, with plangent surf music playing on low. Kaya extends her tongue; it’s smarting from molten mozzarella.

“You actually blew up Loach’s dad’s car’s engine, Kaya?” says Del, finishing his beer. “You’re too cool. Maybe you really should marry Zep.”

“Dude!” exclaims Zep, shocked. “Where’s that at? Next topic, man. Tell us about that Perfect Wave game you’ve been talking about.”

“I’m farming waves,” says Del. “What it is, all the Perfect Wave game installations are networked. There’s five standard courses, and once you’ve mastered them, you get to design new breaks of your own. The way to really improve your ranking is to build a break that you can totally slyve, but which sends all the other guys over the falls.”

“Guys?” puts in Kaya, exhaling a plume of smoke. “No women?”

“He was using ‘guys’ in the gender-neutral sense, Kaya,” puts in Zep.

“Were you, Del?” probes Kaya, her eyes bright under her blonde wig and weirdly curved hand-drawn eyebrows.

“Oh what-frikkin-ever,” says Zep. “You are so—”

“Guys and *women*,” says Kaya. To lighten this she passes Del the bong.

“I’d love to see you marry Zep,” Del tells Kaya, gratefully accepting the pipe. “Whip his skanky ass into line. Anyway, I was talking about my progress up the Perfect Wave tournament ladder. I’ve got this awesome new point break I designed, Zep, and the only one who can handle it without wiping out is Lova Moore. She’s in slot numero uno on the Surf City Perfect Wave rankings.”

“Lova Moore?” says Zep, liking the stripper-type name. “Do I know her?”

“I’ve never seen her face to face,” says Del. “But her personal profile says she’s a twenty-year-old woman, just moved to Surf City from Minnesota. Her body icon is hot, but she’s really rude. She claims she’s a farmer’s daughter and that she learned to play Perfect Wave in the cave installed in, like, the Mall of America. You know—way inland.” They all shudder simultaneously at the thought of being a thousand miles from the nearest ocean shore.

“Amerikkka with three K’s,” says Kaya, refilling the bong. “I hate consumerism. That’s why I sleep on the beach.”

“My goal is to get *off* the beach,” says Zep. “Some of us don’t have a choice.”

“I thought you were on the beach because you’re stalking Zep,” Del says to Kaya. He’s getting a little sick of her interruptions. “That’s what Jen told me.”

“Can we please just talk about surf algorithms,” says Zep unhappily. “No more social dynamics. The Perfect Wave, Del. How many fake boards are in that little room?”

“Three,” says Del, standing up. “You ready?”

“Me too,” says Kaya, snugging down her wig.

The Perfect Wave cave is a dome-like enclosure with a cushioned floor and three surfboards mounted upon swiveling hydraulic jacks augmented by squiddy sprawls of secondary and tertiary pistons fastened lamprey-like to their undersides and skegs. Wave sounds fill the dome, whose inner surface is seamlessly covered with projected images of a surfy sea. The boards are parallel just now, with Del in the middle, Zep on the left, and Kaya on the right. Del leans rhythmically back and forth, leading the others through a series of low waves and out to a rocky point with barking seals. Thanks to the exquisite aquahaptics of the boards, Del feels the currents, chop and eddies within the computations.

“I built this break,” he says. “I call it Monster Mash. Look out!”

An improbably big wave spins off the tip of the point, growing larger at an accelerating rate. Working on instinct, Zep hunches and leans, spinning his board to the left to slide off down the long part of the onrushing breaker.

“Don’t go that way!” yells Delbert. “It’s a trap!”

But Zep ignores him and drags the virtual reality his way. Seemingly the display is slaved to follow the moves of whichever surfer manages to get out in front of the others. Working hard to catch up, Del slides down the virtual wave in Zep’s wake. As for Kaya—her board bucks and dumps her laughing onto the floor.

And now the reason for Del’s warning becomes clear. They’re racing down the tube toward, oh god, a gnarly barnacle-encrusted pier with barbed wire strung between the pilings. Moving with surprising grace, Del gets ahead of Zep and snaps his board around to lead them back toward the initial rocky point.

“Tubeleader Aspect!” Del shouts, and Zep finds his board sliding gracefully around to fall in behind Zep; it’s as if he’s acquiring Del’s procedural exit from the trap. Del knows a special gamer hole in the wave, a hollow tunnel of surf. He flashes in there, wearing a beatific goofy smile, all worries about Jen and Lex temporarily gone. Zep slides along in Del’s wake, glad to see his friend happy.

They end up on a sandy shingle beside a mother seal nursing a pup.

Zep plops down on the floor beside Kaya. “So, Del,” he says. “Nobody from Surf City can ride Monster Mash but you and—what was her name?”

“Lova Moore from Minnesota,” says Del. “Nobody but her and me and, well, now you.”

“Good going, Zep,” says Kaya. “You rule.”

“Aw, Del showed me the way. I was about to get us all hung up on barbed wire.”

“Actually, you can get a quad bonus for making it through the wire safely,” says Del. “But I didn’t think we’d want to try that on your first run. Maybe later. I’ll show you something else now.”

There’s an alphanum toepad at the nose of each board. Del taps out a code with the big toe of his left foot.

“Get ready to ride—*people!*”

“That’s better,” says Kaya, and mounts her board.

Around them, the ocean shore shimmers and warps. They’re a few hundred yards off a new coastline, facing out to the sea. The ocean seems to curve up forever, a bowl of blue mounting into the mists around a gleaming little sun directly overhead.

“Where’s the horizon?” says Kaya.

“This is the Pellucidar break,” says Del, as if that’s an explanation. “I love this place. It feels so safe and cozy to be living on the inside.”

“The Hollow Earth!” exclaims Zep, who’s read the same low-brow books as Delbert. “How bitchin’ is that? Look at the whales!”

In the distance, four huge whales have breached from the sea and are beating their great tails against the air, sweeping a path through the mists, their mouths agape, seining insects and floating orchids from the teeming inner sky of the Hollow Earth. With a final fillip of their flukes, they arc hugely toward a sky-high spot in the Hollow Earth’s concave sea.

Looking toward shore, Zep smiles at how the shorebreak rises on both sides. “This is like the ultimate tube,” he says. “Imagine being in here

all the time.”

“The Hollow Earth is the best break of all,” enthuses Delbert. “I wish it were real. All the high-ranking players hang here.”

Bobbing all across the great blue dome are dots that resolve if you stare at them for more than a second. Each is a person on a board—an idealized representation of that person’s surfer persona—dark sunbronzed figures, many of them covered with lurid tattoos and the occasional corporate logo. Most don’t bother modeling wetsuits, since the water in the sim is always perfect. But more than a few have given themselves the features of sea creatures: seal-like snouts, shark fins, whiskery lionfish spines. Their names and other identifying marks circle their heads like translucent halos. Del’s game name EL SURFIAO floats over him, while Zep and Kaya are labeled N00B1 and N00B2. Zep tries to tap out the first obvious commands on his toepad, but whatever he’s done merely makes the world spin until it feels like they’re hanging upside down.

“Stop ... it ... before ... I ... hurl!” says Kaya.

Del stabilizes the scene. “What’re you trying to do, Zep?”

“Zoom on one of those surfers. Or enter a name search.”

“You know someone in here?”

“Only by repute. Your girlfriend Lova Moore.”

“*Not* a girlfriend,” says Del. “Not even a friend. She’s very aggro. But, yeah, I’ve got her on my foe-list. Sec.” One toe-tap, and suddenly they’re in deep water. No shoreline in sight, jus the boundless bowl of blue, with the immobile Inner Sun still shining down.

Nearby is a surfer woman with the mandatory shock of sunbleached hair. She has pouty red lips, brilliant blue eyes, wide hips, and enormous naked boobs. And, surfer goddess that she’s supposed to be, she sports a deep tan and a sand-scrape on her right cheek. Her name-halo says, “LOVA MOORE.” The name is accompanied by a constellation of award logos and content rankings. Spotting Del, she pulls up a flashing mermaid tail and coils it around herself, sitting poised on her board to watch him glide closer.

“Nice butt-fin,” says Zep. “Must make it hard to work your keypad.”

“You’re bringing newbies in here, Surfiao?” Lova asks Del. “That’s a hella cheap way to get points.” Despite her beauty, she has an unpleasant, callow voice, made a bit shrill and distorted by sound processing.

“N00B1 and N00B2 are pals of mine, Lova,” says Del. “I’m showing them the breaks.”

“I’ve unlocked everything in your cheesy Monster Mash, El Surfiao,” says Lova with a flip of her tail. “Got anything that’s not totally stale?”

“For sure my brah El Surfiao is twisting up a fresh joint,” volunteers Zep. “A gnarly break that’ll blow you right outta the Surf City tournament tree, dip-twit.”

Del casts Zep a surprised look. “I—I—

“As if,” says Lova, hefting her boobs like six-shooters. “Surfiao’s my puppy dog.”

“Ah, but I’m gonna help Del program his new break,” brags Zep, tapping his skull. “Got math? I’m hatching the gnarliest wave ever seen. Let’s close out this chitchat and actualize my vision, Del.”

But Lova doesn’t want to let them go. “Oh, his name is Del now?” she says mockingly. “Not El Surfiao? Hard to say which handle is groovier. I’ve heard of a Del who—” She breaks into a chirping guffaw. And now her attention turns to Zep. “How about you, N00B1? I don’t see that you’ve been in a single Perfect Wave competition.”

“He’s an indigenous Surf City local!” says Kaya, coming to Zep’s defense. “Not an invasive toxic slime Great Lake geoduck.”

“Gooley duck?” Lova narrows her eyes and glides close to Kaya. “You’re trying to be N00B1’s bitch, *hmmm*? I think you’re a slumming yuppie larva.”

“Don’t trip on me,” says Kaya. “You got no idea how rough I am.”

“Oooo,” says Lova. “Some surf-rats, they’d wreck a guy’s car engine if he even looked at them wrong. But you’d never get *that* real, would you, N00B2?”

“Oh yeah?” cries Kaya. “That’s exactly what I did a half hour ago! I pulled loose a spark plug in some crackwipe’s SPC and rigged his carb to

spray an explosive mist of fuel! *Thud, clank, meow-boom-boom!* Game over.”

“Maybe I’ll share that info,” says Lova. “Skeevy slushed stoners.” She speeds off, churning the water with her ample tail.

The sim closes down and they’re standing in the musty, carpeted dome of the Perfect Wave cave.

“Man, Zep,” complains Del. “Why did you have to be so rude to her?”

“Rude? Dude, you gotta learn to fight back.”

“But Lova is so—so stacked. I always lose my head.”

“She’s a computer graphic run by a horrible person,” says Kaya. “Jen’s the one you should be thinking about. An actual no-implants woman that you physically know. I’m gonna go by the Food Bin and get some betel-nut energy tea from my friend Becka. She’s on the night shift. See you in a little while, kay, Zep?”

“KZEP: the call letters of the gods.”

Kaya puts her bong in her pocket and sashays out of the cave and through the empty restaurant. Zep follows her as far as the front door, harkening to the teeming summer beach night outside: the hiss of the cars with their headlights raking by, the music and laughter from down the block, the rattle and thrum of the Boardwalk rides, and always the calm oceanic pulse of the surf.

“Come on back, Zep,” nags Del, peering out of the Perfect Wave dome. “I’ll show you the programming interface now. All we have to do is get on our boards and say, ‘Design Mode.’”

“Kind of sucks to be in a room inside a room, doesn’t it?” says Zep, sullenly returning to his place on the fake surfboard. “How’d you get into something so dinky, man?”

“*Design Mode,*” says Del insistently.

The surfscape gives way to a virtual laboratory. The dome is tessellated with maybe a thousand holographic surf-break animations. A fanciful virtual console encircles the lower part of the wall, all brass and mahogany, with heavy-duty Victorian dials, levers, and knobs.

“To start with, you can point out some of the breaks that you like, and the design wizard spawns off variants,” says Del. “Blends and crossovers. Or you can just tweak the individual surf-breaks with your bare hands—” He reaches right into a point break and bends the rocky spit of land a bit further to the right. “*And* down by the floor we have the lab-type controls.” Del moves a slider, making the crests of the waves in the active breaks grow about 30 percent higher.

“Can I input an equation?” asks Zep. “Is there, like, a programming language?”

“There’s, uh, some kind of display over there,” said Del, pointing out a round glassy screen filled with glowing green symbols. “I think there’s a keyboard. I’ve never used it.”

Zep crouches over the round screen, watching its reactions to the twitches of his fingers on the virtual keyboard, a fanciful construct of copper and ivory.

“No prob!” Zep soon exclaims. “The system uses this easy reverse Polish language called Whuffo. I’ll just change your water’s physics to use the boiling cubic wave equation—there. And now we pimp our ride. Lova Moore’s gonna be sucking sea urchins.”

Sooner said than done. Two hours roll by before the boys get a crude first approximation working, a crufy break with staircase-shaped waves. Unlike in the Hollow Earth break, there’s no sun in their design-mode world; the air simply glows. The waves hump out of the acid-green virtual water like wobbly escalator treads. The square blocks swell as they rise, ballooning into prickly-pear-cactus lop-lop shapes, and if one of those lop-lops bursts near your head, you’re off your board for true.

“We’ll call this break Wobble Gobble,” exults Zep. “It’s almost as gnarly as I dreamed.” He shows Del a virtual control that he’s fashioned: a numerical read-out with a thumb-wheel. “To keep it interesting, I can dial up the gain as high as I like. I’ve got it set on eleven right now. But it can go way higher. I’m using a logarithmic scale.”

“Eleven is enough,” says Del. His board keeps pitching him onto the floor.

“Here’s the trick,” advises Zep. “After each wobble, there’s a flat spot that you can slide across before that big cactus bulge grows out to gobble

you.” He’s wildly twitching his board, like a salmon climbing a fish-ladder. His face is sweaty and his damp hair lank. “Come on, Del, don’t lie there like a noob. You gotta master this so you can shut down Lova Moore.”

In another half hour Del has the hang of it. “Wobble Gobble!” he says. “Nice work, Zep. I’ll spiff up the break now.” He adds dolphin-shaped non-player-characters, steep-sided stone islands, tree ferns onshore and, just for the hell of it, a dinosaur-sized kiwi bird that wades around trying to eat stuff. And then Del flips back to play mode and messages Lova.

“I’ve decided to call the cops on N00B2,” shrills Lova Moore, appearing almost right away. “Malicious automotive mischief. I know her true name, too.”

“Man, what kind of surfer are *you*?” cries Zep. “Goody-goody snitch. Back to the Heartland with you!”

“Never been there,” says Lova, sitting next to them on her board, her giant boobs jiggling as she studies the kinky Wobble Gobble waves. “In reality, I’m a Surf City local.”

Even now the breast-besotted Del fails to reach the obvious conclusion. Mainly he’s focused on showing off his break. And Zep is too busy grooving on the cubic waves to realize that Lova Moore has blown her cover.

“Stairway to heaven!” shouts Del as he fish-twitches his board across a mound of ziggurat-like cubic waves, then slides down them with thuddy, smacking sounds, ducking the flying water-balloons overhead.

Lova tries to follow him, but she’s not doing well. Over and over she wipes out and then, how sweet, the monster kiwi eats her virtual surfboard and she’s left paddling in the chop with ripple rings radiating out from her neck. The schools of dolphins flip their tails and leap for joy. Lova’s ranking has dropped by about 10 percent, enough to put her well below Del’s level.

And then Lova notices the gain controller in Zep’s hand.

“Cheaters!” she screeches. “You’ll pay for this!” She disappears.

“The standard gain of eleven is pretty easy,” Zep tells Del, a smile playing across his lips. “That’s why every time that it looked like Lova was settling in on a wave, I goosed the gain up to a hundred.”

“Zep, that’s not—”

“Hell, if she deserved to have the top ranking, she could have handled the higher-gain waves. I bet you can even surf a gain of a *thousand*, Del. Check it out.” Zep twiddles his control.

Fat goutts of hyperactive water fly across the walls. The mounted surfboards are like bucking dragons. But the boys learn these rhythms too, and Zep keeps on inching the gain higher. It’s fun.

And now here comes Kaya, hurrying in from the intricate night, her flip-flops slapping the floor, her cheeks flushed. Somewhere during the evening’s changes she’s set aside her blonde wig, revealing cropped mousey brown hair with a tiny braided pigtail in back. “Wuxtry, wuxtry!” she cries, newsboy style. “Lova Moore is Lex Loach!”

“*Ga-hoink!*” ape-screams Del, slapping his forehead and falling off his board.

“I wasn’t attracted to Lova Moore for one second,” Zep is quick to put in.

“Blinded by boobs,” says Kaya, shaking her head. “Moronized by mammaries. Titillated by—grow up, boys. They’re just glands. What it is, I was hanging with Becka at the Food Bin for a couple of hours, catching a betel buzz, and then Jen comes wandering in, bored out of her skull. She says Lex is pissing away the evening at that trashed Perfect Wave cave, the one on the Boardwalk. So I’m like, *hmmm*, and we jam over there and find Lex lying on the floor, he’s just wiped out on your Wobble Gobble break. So of course I’m harshing on him about playing Lova Moore—but then he says if I don’t stop, he’ll call the cops on me for his shitbox car! So I act nice for about ten seconds, but then he puts his hands on me, so I say why try to be butch when you’re such a queen, and he calls his dad and gets permission to take immediate possession of Cheezemore Ratt’s and cut the power! What it is, he’s gonna shut you down.”

Zep has a workaround. “If I crank up the gain to an insane level, I think the Wobble Gobble break can draw power from the ambient wireless radiation,” he says. “Thanks to the entropy gradient. That way Loach can’t shut us down. Macho Lex with his triple-K cups.” Zep is pumping his thumb to move his virtual controller’s wheel. “I’m setting it to ten thousand, Del.”

“Are you freaking nuts?” cries Del, as the virtual water begins rearing into frantic spouts.

“Ten thousand degrees of weirdness is just where it starts gettin’ good,” says Zep, taking an unsteady stance on his rapidly twitching board. Del has no choice but to join in.

They can hear Loach bellowing outside. He’s unlocking the electrical cabinet, turning off the Cheezemore Ratt circuit-breakers one by one. The lights wink out across the room. But the Perfect Wave cave stays alive. Yes! The high-entropy simulation is drawing energy from the global funk of wireless info waves. If anything, the sim images are brighter than before.

Loach pounds into the restaurant and snatches up the billy-club from behind the bar.

“Oooo, Wova wikes to wub the wood,” whoops Kaya, standing by the Perfect Wave dome. With a shriek of laughter she nips inside.

“And now get on your board,” Zep tells her. “We gotta jam!”

“I’m too high to surf those humpty water eggs,” says Kaya. The bright shapes are coming loose from the walls, the air itself is dancing with globs. “I’ll just sit on the back of your board, Zep. Oooo, here comes Wova Woach!”

Hoarsely roaring, Loach is beating the club over and over against the dome of the Perfect Wave cave, breaking down the walls.

“We’re going all the way to a million now,” says Zep, sweating and bending over his virtual controller. “We’ll be drawing in even more stuff from the outside world.”

“The perfect wave,” raves Kaya. “You’re gonna crank up the uncertainty of the planetary wave so high that we’ll end up somewhere totally—” She breaks off, suddenly concerned, holding her hand to her throat. “My tiki string just snapped! I heard my little goddess bounce off your board.” Kaya lies on her stomach across Zep’s chintzy wave cave board, peering at the floor.

A piece of the dome breaks loose and—melts. The cubic wave simulation is absorbing material reality. The dome, the nearby tables and chairs and even the walls of the restaurant merge into the growing blue wave.

Loach throws himself through the warped, glowing air, grabbing for

the third board. And misses—just. But he’s made it into the pudding intact; he’s power-paddling like a merman.

Del, Zep, and Kaya slide away, Del in the lead. The world is hanging sideways, like a wall whose floor is a million miles below. They’re surfing across a washboard of shelf-like ripples on the face of the vertical wave—and they keep getting higher, climbing the wave like stripes on a barber pole.

Del looks back past Zep and Kaya, wondering if his procedural kiwi bird is still in place. The kiwi is nowhere in sight—it’s been replaced by a tiki goddess—armless, legless, with a blunt chiseled head that’s been gazing out over this sea for a trillion years. The tiki is riding that empty third board, which has morphed into a kahuna’s mahogany longboard. Far in the rear, Loach is doggedly paddling in the tiki’s wake.

For his part, Zep flashes that the Polynesian goddess is, yes, the very amulet that had once hung from Kaya’s neck. Putting it another way, the amulet has been pulled into this more expansive version of reality, along with everything else. This perfect wave is drawing in the entire material substance of planet Earth.

Zep, Kaya, and Del look down, watching the world melt into their mighty simulation. Rivers and lakes, pastures and mountains, baseball stadiums, ocean liners and suspension bridges—all are stretching, turning liquid, and surrendering to the pull of the perfect wave, dribbling into the flow like fresh wet paintings on a spinning platter, feeding their colorful blotches into the omnivorous mound of blue.

Reveling in its plenitude, the wave lofts higher and higher—and Del shoots up toward the supernal crest.

“We’re a planetary wave in probability space!” murmurs Kaya. “But what happens when it breaks?”

“Maybe it doesn’t have to break,” says Zep, working his double-loaded board up the face of the watery slope. “It’s the perfect wave, right? We can ride it forever.”

“That tiki is so beautiful,” says Kaya, turning her attention to the craggy face just behind them. “She looks green, now, doesn’t she? Maybe she stands for Gaia. The planetary eigenvector.”

The tiki hears her; she makes just the slightest of funky moves,

tottering a few inches further forward on her oversized longboard. The beetle-browed goddess's motions are sheer understated elegance, drawn from the racial memories of Mother Earth.

“Dig it,” says Kaya, sketching invisible energy lines with her fingers. “The tiki's still entangled with me—like by an astral cord around my neck. Everything's gonna work out for the best.”

Surfing well above them, Del is happy, knowing he's at the top of the tournament ladder. Indeed, he's somewhere above the topmost rung of any conceivable ladder. The seas and mountains of planet Earth are folding into the perfect wave like rich loam opening up before a plowshare. The planet's mantle and its fragrant, sizzling core flow into the wave; vast whirlwinds suck the planet's atmosphere into the ever-mounting peak of ultramarine blue. So awesome. Only now it occurs to Del that—if this is as real as it seems—they're annihilating everyone on Earth.

A shadow falls over him. The highest edge of the wave has begun to curl over, occluding its face from the full glow of the atmosphere's light. In the nearly transparent sheet of water, shapes are moving, darting, dancing, chirping. They flip into the air, twist, and dive into the wave again, laughing. Dolphins by the thousands, millions, more.

One of them cuts in close to Del, chattering, and as Del speeds up his brain, the sounds congeal into human speech. It's still a simulated dolphin, yes, but it's also a storage module, holding one of the billions of human minds now folded into the flowing mountain, minds waiting for the planetary wave equation to settle into its new configuration so they can don their reborn forms.

“Your fuddy foe has tagged the tiki,” says the dolphin with utterly grave hilarity.

Sure enough, Loach has caught hold of the third board's skeg—the fin that projects down into the water from the base of this board, a board so big that it might have been shaped from a single ancient mahogany tree. Climbing onto the tiki's longboard, Loach doesn't look the least bit intimidated.

His physical form is a churning mixture of Lova Moore and Lex Loach. Huge breasts emerge and wobble away, detached Dali blobs that surround him for a moment, try reattaching to his chest, find it unyielding and merge with the water instead. His lips puff up like botox worms, then shrivel away to show zombie skull fangs.

Loach crawls forward along the board, unable to find his balance. In order to drag himself to his feet, he wraps his arms around the goddess from behind, blinding her lidless eyes. The stonefaced tiki's expression shifts; her tightly pursed lips part in a warrior-woman's grimace. The tiki is enraged by Loach's sacrilege—but armless and legless as she is, she has no way of shaking him free. The great board wobbles.

The loss of poise spreads through the entire planetary wave. A period-doubling quiver of chaos percolates down through the quantum fluid. And now it seems the once-perfect wave is scraping across a subdimensional version of a reef, a crystalline ur-reality that was previously hidden beneath the cozy warmth of the natural world. The dark underlayment sends up the sinister tendrils of degenerate fixed-point computations, threatening to crystallize the entire wave-mountain into something dead and dull.

Del watches helplessly from above. The subdimensional reef is eating into the living water; it's killing the information flow.

Down in the crisis zone, Zep hears a horrible humming sound coming off the water, like brake drum linings peeling metal. It's a harsh scream that no board should make. Sparks are coming off the tail. The instability-fueled spikes of reef matter may snag him soon. And all around, the dolphins are screaming in fear. As he imagines the whole wonderful womanly wave crystallizing into the dead fixed-point computations of the senile subdimensions, Zep feels deep grief. He should have loved Kaya while there was time. Marrying her wouldn't have been so bad. Their eyes lock.

"We can't let it set up like this," says Zep. "We can't let the boring crud win."

"I can help," says Kaya, solemn beneath her hand-drawn eyebrows. "Me and my tiki."

Standing erect on the rear of Zep's board, Kaya stretches her arms along the curve of an invisible circle whose far perimeter rings the tiki goddess. Kaya undulates her arms with a snaky wriggle and then—she's teleported herself to the longboard, replacing the tiki in the embrace of Lex Loach, with the tiki herself once again an amulet hanging from a bright red thread around Kaya's neck.

With a quick, efficient motion, Kaya elbows Loach in the solar plexus. His hold weakens and just then one of the boob-blobs, hovering like a

satellite around its former owner, flattens and goes hard. It catches Loach in the face, rocking him back on his heels. Kaya reaches out and gives Loach a graceful one-finger shove. He slides off the board and hangs in mid-air like cartoon shock personified: a fixed expression of gaping eyes, open mouth, raised eyebrows. And then he begins to fall, not quite touching the face of the nearly vertical wave.

It's up to the three surfers to find a new home for the human race. With a supreme effort of will, Zep morphs his dinky Perfect Wave cave board into his good stick Chaos Attractor. The board's oddly adhesive surface seethes with sharp-cornered cubic waves. With a grim smile, Zep ups the simulation chaoticity yet again.

Feeling the fresh burst of energy, Kaya swings her massive longboard about, sending a square-humped wake toward Del, passing him that last extra bit of force that he needs. And now Del flies up the glassy cliff toward the very peak of the wave, streaking like a shooting star, sliding across the still-living liquid crest.

"Lead the wave, Del!" calls Zep.

Looking down from his vantage point, Del sees Zep and Kaya stuck at the edges of a boring opaque stain that's turning to obsidian, to coal, to black ice. And below that is—something worse. Del hears the crystals forming far below, the dull sound of degenerate matter clanking into place. But he knows better than to dwell on that.

"Tubeleader Aspect!" he cries, his personal war-whoop.

There's still just room for him to ride, a thin, curling edge of dancing water. He crouches, feeling the outlines of the subdimensional reef viscerally through his feet, lowering his center of gravity to shift the moving mass of the wave.

The tipmost wave tube constricts and closes him in. But in a sense, he and his friends have designed this break. He knows what awaits them on the other side, for they've designed that too. Del's creating it even now, sculpting it into being as he carves the planetary wave toward a new solution.

"Surf into the light," he tells himself, and laughs. And then he's through the final tube.

* * * *

Lex Loach wakes as he always does, with an abrupt twitch that startles him out of sleep with a gasp. It's always the same, the dream of an endless fall that ends the moment he hits the sand. His eyes gape and he chokes back a groan at once again finding himself curled up with a ratty old beach towel for a blanket, groggy under the boardwalk. Same old, same old—the scuffing footsteps of morning joggers overhead, the sand in his eyes and mouth and hair and all the creases of his skin. He drags himself out on hands and knees, squinting at the Inner Sun burning through the glary fog. Sandpipers patrol the wet strip just above the tide.

A cold shower in the public restrooms removes most of the sand. He blots himself with his sandy, sodden towel, then hits the hot air blower three times to dry his pubes, and a fourth time just because it is one of the day's few pleasures.

As he trudges back down the beach toward his job, he glares at Zep's mural—considers hawking phlegm on it, but he's been caught at this before by the Surf Shack's proprietor, with heavy consequences. The boss is a beast.

Lex rounds the corner of the restaurant, pushes open the back door, takes up the broom propped there and goes out again to sweep the parking lot. The trash bin reeks. Later he'll be cleaning it out. Something to look forward to. As he's brushing sullenly at spilled cornmeal and soda straw wrappers, he hears a commotion down on the beach, and pokes his head around the corner.

There's a platform under construction on a paved stretch near the playground, just above the sand. Giant speakers, a mike stand, and huge banners going up:

“SURF CITY WELCOMES TUBELEADER DELBERT!”

Frikkin' Delbert, Loach thinks. Frikkin' hometown homecoming for the hero, back from his epic journey across the interior of the earth, sweeping every tourney. Every night the TV in the Cheezemore Ratt Surf Shack is tuned to Delbert accepting some giant golden cup, or some enormous golden check for a million bucks, with golden babes hanging off his shoulders. While Lex is slaving here, living off discarded crusts and soda dregs, sleeping in the sand.

“Hey, Lex, whatcha doin?” Here she is, bugging him again.

“Hey, Jen,” says Lex with a shrug. Jen makes him nervous. He can’t figure out why she’s nice to a loser like him. Obviously there’s something wrong with her. “I got work to do,” he says. “He’ll be all over me if I stop.”

“Oh ... okay, well ... you know Delbert’s coming by in the afternoon? He’s in town for Zep and Kaya’s wedding anniversary? There’s gonna be a party at their beach cottage on the North End, and I was thinking, maybe, if you wanted to, you know, come with me, I could get you in?”

Lex stops moving, grabs onto the broom handle as if it’s a lifeline, a crutch, putting his whole weight into it. What the fuck is going on with him? Are those tears? His belly is spasming. He’s a crybaby now, on top of everything else?

“Sorry, Lex, if you don’t want to....”

“I don’t know, Jen, all right? Let me think about it, okay? Jeez!”

She steps back and if she says anything else, it’s drowned out by the sound of the screen door slamming. The boss is coming after him. As usual.

“You done sweeping, Loach? Then get out the bleach and go after the dumpster.”

The voice is so harsh it cuts through Lex’s general despair and makes his baseline resentments seem like dreams of paradise. But what can he say? The old bastard has legally indentured Lex via some unsavory deal that Loach Senior could never bring himself to speak of—and then Loach Senior died. Lex has no choice but to live with the unbreakable contract. Under the boardwalk.

“Almost, yeah,” he mumbles.

“What’s that?” says the Surf Shack’s owner, coming in closer, leaning over him, the smell of melted cheese on his breath making Lex wilt away as if from one of the pizza ovens.

“Almost done, sir,” says Lex a bit louder.

“Squeak up, boy!”

Lex draws himself upright, to his full six foot two, from which height he still has to look up another foot or so to meet the black beady eyes of his

employer.

“I said yes, sir, Mr. Ratt, sir, I’m almost done with the work,” barks Lex.

“That’s the right attitude,” says the shopkeeper, adjusting his tall silk hat. “That’s how it’s gotta be. Maybe someday, when you’ve paid off your debt, say five or ten years from now, I’ll let you call me Cheezemore. Like my friends do. Till then you’re mine, boy. I own you.”

The screen door slaps shut. Lex waits a moment, till Ratt is gone for sure, then sags against the broomstick he clutches. Jen comes to him again, gently rubbing his aching back.

Lex looks out at the waves, wishing they could carry him away, but it’s hopeless. The ocean curves and up into mist, offering no chance of escape. As far as he might sail, the great seas of the Hollow Earth would wrap around and bring him right back here.

It’s Del, Zep, and Kaya’s world—at least for now. But perhaps there’s hope.

Maybe someday the perfect wave will break.