



VICTORIA USOVA

QUANTUM CHITIN

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**Quantum hitin**

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He's a talented engineer with a full personal life. She's a lab technician dreaming of the stars. Together, they study the biomorphic structures of beetles, unaware that their work holds the key to unlocking ancient technologies from Saturn and Titan. Will Fedor's "family business" be able to withstand the hyperspace overload and reach an agreement with the beetle creators? Science has never been so personal.

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# Victoria Usova

## Quantum hitin

### Introduction

The corridors of the BioTechProm Research Institute smelled of boiled pearl barley from the cafeteria. Engineer Fedor sat with his head in his hands. A jewel beetle crawled on the lab table in front of him, shimmering in every shade of emerald and gold.

"Fedor, did you forget to pick up the youngest from kindergarten again?" Berta entered the lab as silently as a cat. She held a tablet with the spectral analysis results.

Berta was the ideal lab assistant. Always neat, unmarried, with a perpetually cool gaze and astonishing patience. Everything in her life was laid out in its proper place, while Fedor's resembled a quantum superposition.



"It's worse, Berta," Fedor groaned. "All three of them are coming to see me today."

"Who are the 'three'?" Berta raised an eyebrow.

"Wives. Ex-wives and current one. And five children. We need to discuss vacation schedules and..." He waved his hand at the beetle. "And why doesn't this beetle want to absorb infrared radiation, as the calculations said?"

## **The essence of the experiment**

They were working on the Chitin-M project. Scientists discovered that the emerald beetle's shell possesses a unique nanostructure capable of not just reflecting light, but refracting it to create invisibility in a certain spectrum.

"If we understand how the beetle controls its pigmentation at the molecular level, we'll create radiation-resistant casings for interplanetary probes," the research institute director liked to say.

"Maybe he's just stressed?" Berta suggested, carefully touching the iridescent elytra with tweezers. "Just like you. Too many external stimuli."

## Breakthrough in chaos

At that moment, the lab door swung open.

"Dad! Gleb took my car!" A toddler of about five flew into the room, followed by a determined woman in a formal suit.

Fedor jumped up, tripping over the oscilloscope wire. The sensors howled. The jewel beetle, startled by the noise and sudden movement, suddenly flared with a blinding white light.

Berta quickly glanced at the monitor and froze.

"Fedor Petrovich... Look at the graph. The light pressure has jumped! It's not just reflecting, it's accumulating stress energy and converting it into kinetic momentum!"

Fedor looked at his ex-wife, his bawling son, the calm Berta, and the glowing beetle.

"So, to get the engine going, we just need to create the conditions for a total family scandal?" he whispered.

"Most likely," Berta nodded, smiling for the first time that day. "Congratulations, engineer. It seems your turbulent personal life has just paved the way for humanity to reach the stars."

The atmosphere in the lab was heating up. Fedor's second wife, Bunya, was already standing in the doorway with the twins, and the determined click of his third wife, Mira's, heels echoed down the hallway.

Fedor Petrovich felt the temperature in the room physically rising, but the sensors on his desk were showing something even stranger.

## **Thermal self-portrait**

"Fedor, why was the child support payment three months late?" Bunya began, but stopped short. In the center of the room, the jewel beetle stopped glowing white. Its shell turned matte black, as if absorbing all the light in the room.

"Bertha, look at the thermal imager!" Fedor shouted, forgetting his family troubles.

An incredible image appeared on the monitor screen. The jewel beetle, usually a cool insect, was now glowing bright purple on the heat map. But that wasn't the most astonishing thing. The beetle didn't just "see" heat; it projected it.

## Infrared diffraction

Berta quickly flicked the switches, switching between the ranges.

"Fedor Petrovich, it uses the microstructure of its elytra as a living diffraction grating for infrared radiation. Look, it's focusing the heat waves from your guests into a narrow, focused beam!"



The physical principle was elegant. The jewel beetle's chitinous layers had a variable density, a multiple of the infrared wavelength. This allowed the insect to literally "orchestrate" heat flows.

## **Family resonance**

"Dad, why did the beetle look like a coal?" one of the twins asked, reaching for the device.

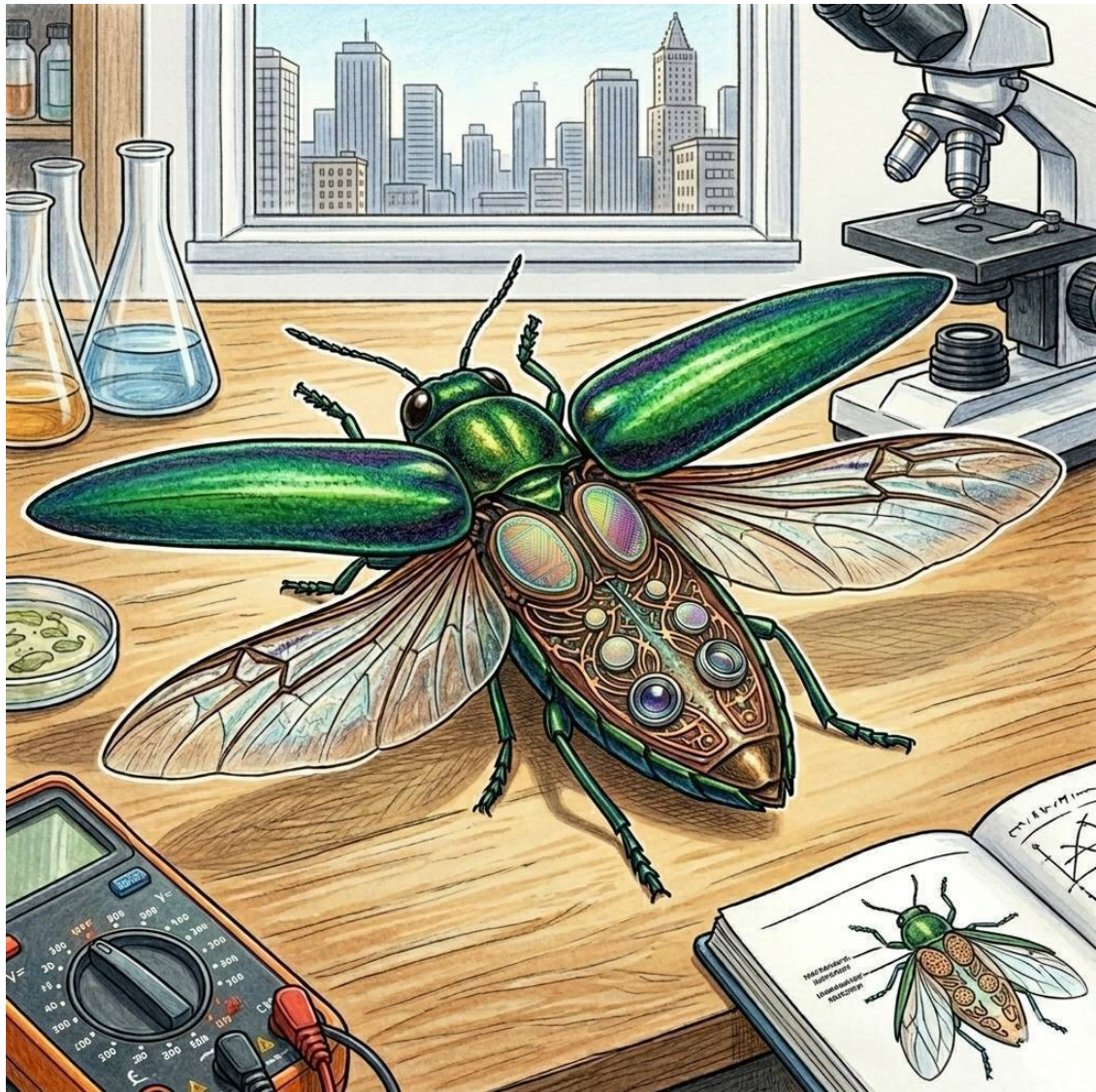
"Don't touch it, Gleb! There's a high flux density there now!" Fedor grabbed his son's hand.

At that moment, Mira entered. The air in the lab seemed to vibrate. Three women, five children, and one cornered engineer created such a powerful background of emotional and thermal radiation that the instruments went off-scale.

"Quiet! Everyone, be quiet!" Berta suddenly commanded. Her voice, usually quiet and warm, cut through the noise. "Don't you understand? It reacts to the temperature gradient. Your argument is the perfect fuel!"

## Discovery of the "Fedor Effect"

The beetle on the table suddenly spread its wings, revealing unique sensors underneath—pyroreceivers.



"It's searching for the source of the most intense infrared radiation to calibrate its navigation," Fedor whispered. "Bertha, if we replace chitin with our K-300 composite, we'll get a sensor that can detect a satellite's heat signature from ten thousand kilometers away!"

The gold beetle circled above the heads of the stunned wives, unerringly pinpointing the hottest point of the argument, and suddenly landed right on Bertha's shoulder. At that moment, the beetle turned a soft golden color, calming in her icy calm.

"It seems," Mira lowered her tone, looking at Bertha and the now-quiet insect, "our presence here is truly advancing science."

"More than that," Fedor wiped sweat from his brow. "We just figured out how to make a cooling system for the reactor. We just need to surround it with a structure that mimics the gold beetle's

abdomen." It will release excess heat into space through the atmosphere's infrared transparency windows.

The research institute's director, Professor Stern, drummed his fingers on the polished Karelian birch tabletop. A frozen infrared radiation graph appeared on his monitor, looking more like a cardiogram than a scientific report.



"Fedor Petrovich, are you out of your mind?" Stern pushed his glasses up onto his forehead. "'The dependence of the refractive index of chitin on the decibel level of a woman's scream'? Do you want us to lose the grant? So the ministry will decide we're doing everyday psychoanalysis here instead of bioengineering?"

"But Professor, the data doesn't lie!" Fedor stood at attention, adjusting his tie. "In nature, the goldfish flies to forest fires tens of kilometers away, navigating by infrared radiation. We've proven that its receptors can be modulated by external emotional background. It's the perfect biosensor!"

"Get out!" Stern pointed to the door. "And get your... relatives out of the hallway. They nearly gave my security guard a hypertensive crisis. No patents. The matter is closed."

## **New tram plan**

Berta was waiting for Fedor at the entrance to the institute. She looked unusually determined. Instead of a white coat, she wore a sleek raincoat, and she clutched a thick folder of blueprints under her arm.

"He didn't sign?" she asked curtly.

"He called us crooks," Fedor sighed. "And ordered us to disperse the 'camp.'"

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