

NO SPACESUIT IS PERFECT

“If you’re lonely when you’re alone, you’re in bad company.”

— Jean-Paul FARTre

In case you were wondering, there is one problem that the new Antares-SM6 ‘Super-Magnificent’ spacesuit has not solved. Rather than comment, let me simply tell you an actual true and recent story adopted from one Mr. Hermene Grenier’s time log.

By all accounts Mr. Grenier was a very capable explorer, with multiple routes taken on

seven different bodies in the solar system, not including Earth. Close associates all describe him as very overconfident, admittedly alcoholic, but despite that a very capable and experienced trekker. It should not be a surprise that such a person would have rushed to buy the revolutionary new Antares-SM6 as soon as it appeared on the market. The most notable features of the suit, in case you don't know are:

- 1) A self-contained mini-fusion reactor, which produces both a magnetic field and a sheath of plasma around the spacesuit, thus protecting from cosmic and solar radiation. 2)

In addition, this excess of power allows the suit to produce its own oxygen from rocks or

water ice, by placing small bits of the stuff in a side compartment. As long as you're on a solid body, you will never run out of oxygen. This is one of the "elements of invincibility" the suit has, as Antares calls them in their advertisement. The second main element is a carry-over of earlier Antares suits, a strong graphene body which is so strong that no animal that has ever lived on Earth could bite through the armor of the thing. If a killer whale tried to bite the spacesuit, it would break off its own teeth instead. "No more Captain Kirk battling monsters in his T-shirt," proclaims the ad. "No bare-knuckle fist fights with Terminator robots from sequel XXXIV." At any rate, what actually happened to Mr. Grenier? That is what

has been pieced together by his log and other data available, since he is now unable to give an explanation himself.

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It was the beginning of his weekend 48 hour block, and of course Hermene was not telling anyone that he was going out, or where he was going. Someone could call him back for some emergency. And no one is supposed to leave the base alone, anyway. So, he would take the time to put his new suit—his new baby—to a test.

He had already exited Ganymede station-Beta from the back cargo exit, at a time when almost everyone was sleeping. The lights were dimmer during this designated sleeping period, and

Ganymede was currently in the Sun's shadow. He was anxious to get out of view of the lights, so that no one would see him leave. He kept close to the structure, out of sight of the few windows it had. Jupiter was some way over the horizon, and so gave no light. Most bases were still over the horizon from the Jupiter-facing side of the moon, a throw-back to the days when that added some protection. As he slunk away, into the darkness, the base fell away. He took a route that deliberately kept him out of line of the base's crude lidar security system. He had left his personal transponder, with its radio link behind, in case anyone tried to locate him, and he had not yet activated the complicated

communication system for his new suit. This was to be a lone, quiet trek, with no disturbances.

About fifty meters from the back of the base a tiny ridge, about 5 meters tall, cut off the light like a knife. Looking back, there was no trace of human habitation except a few items of machinery and one parked vehicle. Another 20 or 30 meters further and nothing was visible that suggested anyone had ever set foot on this desolate body, except a glow on a distant mountain, reflecting back the light from the base. "Hmmm!" he said aloud approvingly. He realized that the distant glow, which made everything visible around him, was only visible because of the built-in night vision of the suit. Without that, he would be totally blind.

He did not want to use his built-in light for fear of being spotted.

As he walked, the suit conveyed some of the vibration of the crunch of his boots on solid ground, back into his suit, so he could actually hear his own footsteps. Despite the harsh cold near-vacuum and harsh radiation environment outside his suit, he knew he was totally safe, and took large bounding jumps over the landscape. He was already looking forward to the idea of bragging about this adventure, once he got back.

It is amazing how fast you can travel by foot in a low gravity environment, if you are not worried about springing an oxygen leak, or hitting the ground too hard. Each step was more

like a jump, with the built-in exoskeleton of the suit designed to cushion any hard landing. "They thought of everything!" he exclaimed. Sometime after, he asked, "Distance?" and the suit replied: "you have travelled 6.3 kilometers." It seemed like he had just left the base a few minutes ago.

He was heading towards the Jupiter facing side of Ganymede, which was about 40 kilometers from the base, over a series of grooved ridges. He had already planned his route through a pass that made the trip easier. It was a partly recognizable terrain that he had traversed twice before with a pressurized vehicle. But still, as he passed up to the top of the first groove, and looked down into the deep valley below, for a

second his heart swooned, just as it had the other times he had seen the view. The valley floor was about 1000 feet below and the pathway down looked very narrow and dangerously steep from this distance. He calmly reminded himself of two things: first the gravity was a seventh of Earth's, even less than the Moon's, so 1000 feet was really only the same as 143 feet.

Secondly, if he were to fall, the spacesuit's own emergency boost would use his own oxygen supply to slow his fall to a safe speed. The suit had its own mini-plasma thrusters. In such a case, he would simply replenish his oxygen by putting some ice in his converter, once he hit the bottom. He thought of jumping out over the cliff and putting it to the test, but his heart

swooned again at the thought. He started passing down the winding passageway to the bottom. He was determined to make good time.

Near the bottom, at about 50 feet, he did jump, knowing he could take the fall even without a boost. Nonetheless, the suit calculated the fall as slightly too hard, and kicked in slightly. When he hit the ground, it asked, "Are you all right?"

"Yes," he answered. It occurred to him that somehow the voice of the computer gave the illusion that he was not alone. It had taken him a bit over an hour to pass over the ridge. He strode rapidly across the valley floor, and more slowly up the next groove, to the next fall. This time, he had more confidence looking down.

As always on Ganymede, the view was spectacular for kilometers around. The suit's night-vision allowed him to see from horizon to horizon in what looked similar to clear moonlight. And in the near-vacuum, every detail remained sharp and clear as far as the eye could see. He had seen such surreal views on many atmosphere-less worlds, but this seemed particularly weirdly beautiful. Mountains of ice seem different than mountains of rock, and since the light was not coming from any single source, there were no shadows, making it even stranger. At the top of the third ridge, he again thought about jumping, and again fell back. "You're a chicken, after all" he told himself. Many hours later, at the pinnacle of the final ridge, a tiny corner of

Jupiter's sunlit crescent was visible rising over the horizon of the vast ice plain below. Now a brighter light cast over the landscape, defining soft shadows.

It was here when he became conscious of a strong but mysterious anxiety whose source he could not explain. He put the feeling aside, and climbed down the final slope. At the bottom, he calmly told himself that nothing was wrong. He went over in his mind all the things that could go wrong, and negated them one by one. Sitting down on the ground, he recharged his oxygen supply, then extracted his right arm into the interior torso section of the suit, and slowly ate a venison packet. Soon after, he lay down

and dosed off. It had been seven hours since he left the base.

Whatever had begun to nag him had obviously not gone away. As he slept, it struck with a vengeance from some hidden corner of his mind, in the form of a terrifying dream: He was walking alone across a barren landscape, in total darkness. But strange lights were dancing across the sky, like conscious auroras. For some reason, these lights were terrifying because they were alive and conscious. And they were judging him, that he had done something terrible or evil. The feeling of terror seemed to be moving toward some unknown but frightening climax. He was being drawn to some doom. And then, he beheld it, a terrible angry eye looking

down on him, so that he could not escape its view. There was nowhere he could run. Anywhere he went, it would still see him. He let out a hopeless gasp—and instantly awoke. His heart was pounding and he was in a cold sweat. All of this was strange for him, since he didn't usually dream. He sat up, for a second not remembering where he was, which itself was frightening. Then, he remembered, and looked across the frozen plain he was to cross, trying to figure out what was bothering him so much.

"Antares?" he asked.

"Yes?"

"Do you detect anything abnormal about the external situation?"

"No, it is normal."

"Anything abnormal about me?"

"Yes. Your heart rate is high, and your brain waves are very unusual. Are you all right?"

"I must be all right." He tried slow breathing for several minutes, then got up.

"Okay, let's go, Antares." How strange, he thought to himself, that he was talking to his spacesuit to calm his fears. As he strode across the plain in leaping jumps, he began going faster, then faster. He realized why: he was already thinking of going home. He wanted to get this done as fast as he could, and turn back. Concentrating on moving faster took his mind off the ever increasing anxiety. After a couple

hours, he looked up from concentrating on the ground, and saw the crescent of Jupiter rising above the horizon. Why had he not noticed it before, he wondered. He had been concentrating on the ground, and had noticed the light increasing, and the beginning of soft shadows. Why had he not looked up from the ground earlier to see Jupiter rising? Despite his strange mental state, he could not help but notice the beauty of the sight. For one thing, Jupiter from Ganymede is 30 times the apparent size of the Moon from Earth, so even a part of Jupiter is impressive. A monstrous planet, rising above a frozen landscape of icy plains and mountains: a sight which has existed for billions of years, but which almost no eyes had ever seen.

And then the answer suddenly hit him. "Yes, it is very clear," he said to himself. He had been wondering for hours what it was that had been increasingly nagging him. Now the whole thing was suddenly falling into place. It was not just that he could now see Jupiter, but that now Jupiter could see him. "Yes, that is why I first noticed it when I saw Jupiter from the top of the ridge," he muttered.

"I don't understand your request," said the spacesuit.

"I understand why my biological functions are unusual."

"Why is that?"

"Because Jupiter can see me now."

"There is no one else here to see you."

"No, Jupiter the planet,"

"Planet Jupiter is not a person."

He looked back at the ground. In about 90 minutes he would have been out for 12 hours. He had decided earlier to trek out for 12 hours, and then trek back. With the realization that he was now being watched by Jupiter, he moved out in the direction of it, but keeping his eyes to the ground, frightened of what he would see it he looked up, but determined to go forward with his plan. As he grew nearer to the 12 hour mark, Jupiter rose a bit more in the sky, and the crescent phase steadily increased. Ganymede's period is about a fourth that of the Earth's

Moon, and the waxing and waning period of Jupiter from its standpoint is perceptible every few hours. At around the 11:30 hour since the trek began, the situation began to suddenly and very dramatically worsen. First, he felt strong vibrations of some creature approaching him. Each footstep hit the ground with a powerful thud, and vibrated through the ground at the same speed that he was walking. Something was following him, and matching his own footsteps exactly. He struggled to remain calm, as he tried to quicken his pace toward Jupiter. He swerved around to see what was following him, but saw nothing. From the thud of the steps, he knew it had to be a large creature. He reminded himself that no living creature could harm him

in his spacesuit. And, if all else failed, he had weapons built-in, which he had paid a lot of extra money for.

"Antares, activate my weapons."

"Done."

"What is the procedure?"

"Focus eyes on point of target, and say
'fire.'"

He lurched on. As the time grew closer and closer to the 12-hour mark, time seemed to be slowing down. He was in full adrenaline mode now, and his perception of the environment around him was sharply warping. Not only was the creature still pursuing him, matching his footsteps, but soon he noticed another large

creature which was matching his own heartbeat. Both creatures were working together, which meant they were sentient, he realized. "They knew I could not stop until the 12th hour," he told himself. "They had this all planned." But what could he do? He could not call for help, because he had deliberately not brought any means of communication. And how could he be sure that the people at the base were not part of the situation anyway? They possibly had only pretended to not know he was leaving early in the morning. They must have known these monsters would be waiting for him. Now he realized that they had possibly been part of the set-up all along.

As the hour approached the final minute, he paused. Did he really have to go the whole 12 hours? His whole being was screaming at him to turn around and run back. Would it matter if he skipped the last minute? But now he was convinced that part of the conspiracy was to force him not to complete his mission. Each footstep now seemed to last forever. He had to force every one, and yet could not turn back. If he didn't reach the 12:00 hour mark, the solar system could come to an end, he told himself. He didn't notice that the spacesuit was calling out warnings to him, that his biological functions were all going haywire. His heart had been beating for some time at a dangerously fast rate, and so on. How in the universe could one

minute take so long, he wondered? He timed his jumps to be one second each, and counted down: eight-seven-six; the whole universe was sinking into a black hole, and it was his fault. He took three more steps, but didn't any longer know if his feet were hitting the ground. Was he flying or swimming, or something else? He took another step, then stared at his timer, which was blurry, but read 11:59:25, so half a minute to go. He stared at it, but it didn't move. How could that be? Had time frozen? After what seemed another minute, the timer climbed another five seconds to 11:59:30. He carefully thought through his situation. The two monsters had stopped pursuing him. Was this because they were waiting to pounce on him, or because they had

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been swallowed into the black hole like him? As for the timer, he now had to consider the possibility that the spacesuit was also part of the conspiracy, he thought. Why else would the time be moving so slowly?

He glanced back at the timer, which had moved to 11:59:58 while he had been thinking. The numbers were shimmering and warping out of shape so that he could barely read them. At 12:59:59, he bared what little courage he had left, and looked straight up into Jupiter's face.

"You are mine, now, Hermene," said Jupiter, in a deep and terrifying voice.

He let out a cry and then the most primitive animal instincts took him over. He panicked, and

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ran. Which way he ran he didn't know; he just ran as fast as he could, not knowing what he was doing. Soon, he dashed up a ridge and, at the top, saw a several thousand foot drop. Without thinking, he jumped into the void to escape.

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Several hours later, he awoke to Antares calling his name.

"Mr. Grenier, are you all right?"

"Who is that?"

"Your spacesuit. You jumped into the bottom of a ravine. I stopped your fall as much as I could, but you may have broken some bones."

"Did you inject me with a narcotic?"

"Yes, your heart rate was dangerously high, and you did not respond to repeated calls."

"How long before it wears off?"

"Another hour, but I cannot inject you again for several hours after that."

With the spinning thoughts and emotions wheeling about him, he grabbed onto what little modicum of rational thought that still remained. He thought through the events of the last hours. The narcotic had numbed his wild thoughts so that he was able to think at least partially clearly. None of these events could have happened, he told himself. No life-forms in the oceans below were advanced enough to tunnel through kilometers of ice to the surface and,

even if they could, they would die from the harsh environment. And Jupiter could not have talked to him like a person. Although he knew this all logically, the emotions remained very high, and he knew he could very easily revert to the same state once the narcotic wore off. Even a person who knows rationally that ghosts cannot exist, is often still terrified by them. Thus, he had to take action before this fragile state of sanity was lost. Why did this happen, and why never on any other trek he had ever taken on other bodies? What was different about Ganymede? He remembered having heard stories about the strong magnetic field of Jupiter's having induced instant insanity in people, but he had a spacesuit that was meant to protect from that,

and Ganymede itself was the only Moon in the solar system with its own magnetosphere. It could only be something about the fine structure of the suit's magnetic field, in modulation with the magnetic environment, he thought. Jupiter's field was constantly shifting and modulating, which in turn shifted and modulated the field of Ganymede—and that in turn, must be shifting the field of his suit in some unhealthy way. It had been known for years that magnetic fields were not homogenous structures, but highly detailed down to the minute level of space and time. So this would be like three bells, the larger touching the medium bell, and the medium bell touching the smallest bell. Even though they

don't cross into each other, they do affect each other.

"Antares, I am going to give you an over-ride directive."

"Okay."

"First, I need you to recharge the oxygen, whenever it reaches critical level, without my order."

"I already do that automatically, if I don't hear from you."

"Good. Two: I need you to stabilize my legs and arms, in case I broke or sprained any of them."

"Okay." He immediately felt the pressure of an internal structure tightening around his limbs."

"Now, are you ready for the over-ride directive?"

"Yes. Once you give the directive, you must state your password to activate the order."

"Okay. Now, I need you to take command of the spacesuit, and walk us back to the base. I need you to ignore all commands coming from me, unless your sensors detect a life-threatening situation that may need my opinion. When you get back to the base and safely through the airlock, I need you to call for emergency medical help, and specify 'mental condition five.'"

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"Okay," said Antares. "Now please state your password to activate this order. Once you state the password, the order will go into effect."

"Okay, password: "JupiterEye12hours."

His body made it back, but not his full mind.

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