PART ONE – THE INVENTION
AUGUST 14, 2034

The tropical depression had been growing in strength since forming just west of Africa over a week ago. When it became a tropical storm, it was named Felicity. Felicity was heading west and three days later it was upgraded to a hurricane. All of the predictions were that Felicity would make landfall on Montserrat on August 24th as a category 2 storm.

Charles and Catherine Simpson retired in January and had planned the vacation they were currently enjoying on Cat Island more than a year earlier. Charles had worked at NASA for more than thirty years as an engineer, and for the last five years was in charge of propulsion systems development. Catherine worked as a high school science teacher. They both loved the beach, and really enjoyed snorkeling and scuba diving. They were in the second week of their three-week vacation when they heard about Felicity. But Montserrat was hundreds of miles south of Cat Island and they weren't concerned.

On August 22nd Felicity made a surprising sharp turn to the northwest and was heading straight for Cat Island. The storm was upgraded to a category 3 level. It had sustained winds of one hundred fifteen miles per hour with gusts that exceeded one hundred fifty. The storm was enormous, with hurricane force winds extending more than ninety miles from the eye.

By the time Charles and Catherine were aware of the danger it was too late to get off the island. They were staying in a stone cabin that looked like it could withstand anything Mother Nature could throw at them. Early in the morning on August 25th they were sheltered inside their cabin and the hurricane shutters were tightly closed waiting for Felicity to strike.

Charles decided to call their son, Albert, and let him know about the situation while they waited for the storm. They talked for a few minutes and Charles assured Albert that they were in a safe place and would be okay. He promised to call again after the storm had passed.

As the storm approached, the sound of thunder was constant and almost deafening. It was impossible to speak so they just sat silently on the chairs in their room. Although it seemed impossible, the thunder got even louder right before the power to the cabin died.

Now they could hear the wind too, and it was almost as loud as the thunder. Suddenly they heard a loud cracking sound. They both looked up and saw the slate roof of their cabin beginning to crumble. Before either of them could react, the entire cabin collapsed, burying them under several tons of stone. Their bodies remained buried for days in the debris before they were found.

February 16, 2035

It was Saturday and Albert Simpson was alone in the lab at Simpson Metallurgical Laboratories. An impressive name for a company with only three employees. Albert was thirty-four years old, about six feet tall, and thin. He had brown eyes and matching dark brown hair that he kept perfectly groomed. Albert was very intelligent, and many of his acquaintances thought him handsome. But, despite his intelligence and good looks, he often felt uncomfortable around other people. As a result, he had few friends and hadn't been on a date in years.

The work he was doing was boring and his mind wandered back over the events of the previous six months. His life made an abrupt change when his parents were killed while on vacation. Before his parents' death, he had been a professional student. He graduated high school at the top of his class at sixteen. He received his first bachelor's degree in electrical engineering at nineteen. In the fifteen years that followed, he earned master's degrees in electrical engineering, mechanical engineering, chemical engineering, computer science, and metallurgy. He was working toward his first doctorate when the disaster struck. His parents had supported him both financially and in his quest to continue his education. Now he was on his own.

Albert inherited the house and their savings. It was obvious he was going to have to drop out of school and find a job. During the time his father worked at NASA, Albert had met several of his colleagues. He reached out to them in hopes of finding a job, but the openings available all required work experience. He certainly had the required education, but never having held a job disqualified him. Albert sent out dozens of resumes, but it was a wasted effort. He received only a few polite responses indicating they would retain his resume in case a position opened in the future that met his qualifications. Albert was growing depressed.

He had enough money to last a while and moved into his parents' home, so his living expenses were minimalized. He needed something to do and had thought about taking a job that he was over qualified for just to keep busy until something better came along. Before he took that plunge, one of his father's business associates contacted him. Albert had met Jeff Leonard several times and was both surprised and pleased to hear from him. Jeff said that NASA was in the process of developing a new propulsion system and suddenly realized they required an extremely strong magnetic field to make the system feasible. They wanted to subcontract the analysis of potential materials to a third party. Jeff, who was aware of Albert's situation, explained that if Albert set up a company that could do the work, he would help Albert get the contract.

Albert gratefully accepted the offer and immediately began the process of starting up the company. Realizing he knew nothing about starting a business, he turned to one of his few friends, Susan Woods, who had recently received an MBA. She agreed to help him and also expressed an interest in joining the company. Susan was not interested in working for a large corporation where it would take many years to even be noticed. Additionally, she liked Albert and found him interesting. The excitement in her voice was a clear indication that she thought it would be fun to work with him.

Albert also reached out to Tim Martin, another friend and professional student, in hopes that he could convince him to join the company and help with the technical aspects of the operation. Like Susan, Tim expressed interest in working for a smaller company. He had already earned several degrees and he wanted to do something besides go to school, so he thought this would be a great opportunity.

Albert, Susan, and Tim were well matched. Each of them was very intelligent and somewhat introverted. Tim was a few inches shorter than Albert, but was built like a football player. He was very strong and agile. He had green eyes and black hair that showed definite signs

of receding. Susan, at thirty-one, was the youngest of the group. She had an obvious Nordic heritage, with blue eyes and long blond hair. Susan was thin and very attractive. She exercised for at least an hour every day to make sure she stayed that way.

In exchange for their efforts in helping Albert get the business running and because he was unsure at this point how much he would be able to pay them, it was decided they would form a partnership. Albert would have 70% of the business and Susan and Tim would each have 15%. Since Albert was putting up all the money, they agreed this was a fair arrangement.

Albert had about five hundred thousand dollars in the bank. Most of that was the result of the life insurance policies his parents had. The rest was money that had been left to him by his parents. Susan thought that would be more than sufficient to get the business going. They had forty-five days to get the business operational and submit the bid to NASA. Because of Jeff's involvement with the project and the short time frame, he was given the authority to award the contract. So, if they won the bid, and Jeff assured Albert they would, they would have to be ready to start work within thirty days after the contract was awarded.

Susan got busy with the legal requirements while Albert and Tim looked for a suitable place for the operation. It took only a few days to find the perfect location: a three thousand square foot building previously used as a meat storage facility. The refrigeration equipment had been removed but the "cold storage area" was perfect for the lab. It also had an area set up for offices that would easily house three desks, the computers, printers, and other necessary office equipment. An additional reason for selecting the building was that it had the needed electrical service and natural gas service available for the alloy manufacturing and testing equipment. (Please note that at that time, natural gas was the fuel of choice for many heating applications. It was often used for cooking and heating homes.)

By the time Albert and Tim found the location for the business, Susan had completed the paperwork and Simpson Metallurgical Laboratories was created. The building lease was signed and Albert and Tim began the process of ordering the equipment that was needed for the operation. The three of them spent the next several weeks setting up the business, so by the beginning of November 2034 they were ready. All they needed were some customers. Albert kept Jeff aware of their progress throughout the process of setting up the company, so when the business was ready, they could immediately submit their bid.

True to his promise, Jeff helped Albert with the bid, and three weeks after it was submitted, Albert was notified by NASA that his company had won the contract. They would have to begin the work on January 2, 2035.

The contract with NASA required Albert's company to create metal alloys and evaluate the magnetic properties of them. The alloys were created by melting all of the component metals and combining them. The goal was to find the alloy that would create a magnetic field strong enough to contain the plasma that was the heart of the new propulsion system while using a minimal amount of power.

The metal alloys were created in rods an inch in diameter and three inches long. The testing was simple. The alloy rod to be tested was placed in a hollow plastic cylinder tightly wound with very thin, enamel-coated wire. When an electric current was applied to the coil, the testing device would evaluate the magnetic field strength at several distances from the alloy rod. The testing apparatus was automatic. It applied twenty-four different voltages to the testing coil starting at .5 volts and increasing in .5 volt increments until twelve volts was applied. The test results were automatically transferred to a file on their computer system and displayed on a monitor so the operator would see the results.

The first group of alloys to be tested was made from iron, silver, and nickel. The differences between each alloy sample were very small. The amount of one of the component metals was increased or decreased by .5 gram. Each sample took about an hour to make, and only a few minutes to test. The work was easy and boring, but it paid well and Albert, Tim, and Susan enjoyed working together.

The testing apparatus beeped to indicate the test for the sample labeled 178 was over. The sound brought Albert's mind back to the testing. His face had a look of astonishment when he looked at the results of the test. Realizing the magnetic field created by the sample was about ten times stronger than any previously tested sample his heart began to race. The results were absolutely astonishing. With a new-found excitement and a smile you could not wipe off his face, he moved on to the next sample.

All the samples were sequentially numbered. So, Albert picked up sample 179 and placed it into the testing apparatus. He decided to test this sample manually. He started at .5 volts and he could not believe the results. This sample registered almost twenty times the field strength of the previous sample. He slowly began increasing the voltage, carefully watching the results. As the voltage reached one volt, the magnetic field created by the sample exceeded the capacity of the system to measure it.

At first, Albert thought the testing system was giving false readings, but when he increased the power to two volts, the resulting magnetic field was so strong that a pair of needle nose pliers on a workbench four feet away flew toward the sample, narrowly missing him on the way. The pliers banged into the sample with a loud clang. Albert shut down the test as his mind began to race. He simply could not believe the results of the test. He picked up his phone and called Tim.

Tim answered after a few rings and Albert exclaimed, "Tim, you need to come to the office as soon as you can. I have something to show you that you may not believe! In fact, I'm not sure I believe it. I want you to run this test yourself."

"Okay, I can be there in fifteen minutes. Is this something good or something bad?" Tim asked curiously.

"If the testing results are correct, we may have made the scientific discovery of the century. Please hurry!" Albert replied. Tim said he would leave immediately. Albert returned to the testing apparatus and recorded his results while he waited for Tim to arrive.

The implications of the test results were astounding and Albert was certain this alloy would meet NASA's requirements, but he was thinking far beyond that. He was already imagining new, more practical applications. By the time Tim arrived at the office, Albert was fairly sure what that application would be.

Albert was deep in thought and didn't even notice when Tim walked into the lab. He was startled when Tim said, "Hi."

"Please test alloy 179. Do it manually, not automatically, and increase the voltage in .25-volt increments. If your results are the same as mine, and I'm certain they will be, I think you'll agree we've found something pretty spectacular. The sample is already in the coil."

"Okay, do I need protective gear or a Kevlar suit?" Tim joked. He sat down in front of the testing console, reset the system, and started the test. At .25 volts, the alloy created the strongest magnetic field they had ever measured. He raised the voltage to .5 volts and the field had increased in strength by almost ten times. At .75 volts the field exceeded the system's capacity.

"Oh my God! Is this for real? Are these the same results you got?" Tim inquired.

"Yeah." Albert picked up the pliers placed them back on the work bench, about five feet away and said, "Raise the voltage to two volts and watch the pliers."

Tim did as Albert suggested, and just as it happened before, the pliers flew off the work bench and banged into the end of the alloy sample with a loud clang.

"Pretty amazing stuff, wouldn't you agree? When I tested sample 178 it exceeded every previous sample by a factor of ten. Please continue the testing to verify the results. While you are doing that, I'm going to work on increasing the capacity of the testing apparatus. After you verify the test results, please make additional samples. The difference between 178 and 179 was the nickel content. So, increase the nickel by .1 grams in each sample. Sound good?" Albert asked excitedly.

"Sure. Let's get going," Tim replied.

For the next two days Tim worked on creating the samples and Albert modified the testing equipment to increase its measurement capacity. Albert's first modification increased the measurement capability by a factor of ten, but when he attempted to measure the magnetic field from sample 179 at one volt, he realized his design was inadequate. The system still could not measure the field strength, because it still exceeded the system capacity. Each test came with a newfound realization that they were on the cusp of something very special.

For the next modification, Albert decided to increase the measurement capability by one hundred, so now they could test the fields one thousand times stronger than his original design. Using his new design, he tested the field produced by sample 179 at one volt. At two volts, the field reached 70% of the system's capacity. He had to shake off the initial shock, and it took him a few seconds to realize what he had discovered. When the shock wore off, he yelled, "Tim, you have got to see this."

Tim ran over and looked at the computer screen. Like Albert, he could hardly believe what they had found. "Oh, my," he whispered.

By late Monday night the samples were ready. Albert and Tim decided to begin evaluating the new samples on Tuesday morning. They went to a nearby restaurant for dinner. Up to this point they had not really discussed what the potential application for their discovery would be. Now that they had some free time, this would be the ideal opportunity to talk about it.

They found a booth at the back of the restaurant and sat down. A waitress brought menus, took their orders, and left. Then Tim said, "I'm sure you've been thinking about how we could use this discovery. Did you figure out how this is going to make us rich?"

"Not only rich, but famous, too," Albert said with a big smile on his face. "What we have is basically an electromagnetic amplifier. We can take a small electric charge and from that create a very powerful magnetic field. We could then use that magnetic field to create a much larger electric charge. In fact, I think if we do this right, we could even make it self-sustaining."

With an astonished look on his face Tim asked, "You think we can make the first perpetual motion machine?"

"Except there's no movement. I'm thinking in terms of the first perpetual battery," Albert responded excitedly. "All we need is an oscillator to drive the electromagnet and a transformer to pick up the resulting field. We would need some simple circuitry to clean up the output to make true sine waves and we could siphon off some of the resulting power to keep the oscillator running. If it all works, and I don't see any reason why it wouldn't, we would have a self-sustaining power source!"

"It sounds crazy. It would appear to violate several known laws of physics. But perhaps we're discovering new laws. In any case, if it works, we're going to change the world!" Tim said.

Albert couldn't sleep that night, so he got up at 4:30, showered, dressed, and left for the office by 5:15. When he arrived, he found Tim was already there. He had apparently been there

for some time, because he was putting the finishing touches on a big box made from what looked like steel plates.

"What is that?" Albert asked.

"I was concerned about the strength of the magnetic fields. This building has a steel support structure and a strong magnetic field. It could possibly damage the structural integrity of the building. I thought we should have something to contain the magnetic field, so I built this protective box." Tim replied.

"I thought about that too, but I think all we need to do is test the samples manually. You saw what happened at two volts, so I think if we start the testing at .5 volts and increase by .25 volt increments, we'll minimize the risk and still get the results we need. However, since you went to the trouble of building the box, I see no reason not to use it."

It took an hour to mount the testing apparatus inside the box. Albert started the test with sample 178 and there was no change from the previous test. The rest of the 178 samples also showed no change until Albert tested 178.9. The results really changed. At two volts sample 178.9 registered 13%. Obviously, a significant increase, but not even close to test results from the original 179 sample.

Albert was nervous as he inserted the new sample 179 into the testing coil. If the results were not the same as the original 179, they would have to spend days or weeks trying to figure out what had happened. As he started the test, his concern vanished. The results were identical to the first sample.

Next on the list was sample 179.1. Albert began the test at .5 volts, and the results were almost identical to sample 178.9. He continued the testing for the rest of the samples, and with each sample the resulting magnetic field dropped by about 10%.

"Do you realize how lucky we were to stumble onto this alloy? We could have easily missed it," Albert said.

"Do you think we should try it again with slight variations in the silver and iron content?" Tim asked.

"Yes, I think we have to do that, but I have a feeling the field strength will probably be less than with 179. Please make samples using the formula for 179 as a base and vary the iron and silver content by one-tenth of a gram in both directions. While you're doing that, I'm going to start working on our power source. Sound like a plan?" All were in agreement and they proceeded accordingly.

For the next few days, Tim concentrated on making the new alloy samples and Albert worked on what he called the "Simpson Power Module." He started by designing the electronic circuits that would supply the power to the coil wrapped around the alloy rod. He designed it so the voltage being supplied to the coil could vary from one volt up to six volts. For the output, he used an iron rod six inches long and a half inch in diameter. He wound insulated copper wire around the rod one hundred times and mounted it a half inch from the alloy rod. He attached measuring devices to the input and output of the device to check the results.

Albert turned on the device and verified the input was one volt. Then he checked the output: it was fifty-six volts. He needed the output to be one hundred twenty volts so he made modifications to the device until it matched the output he wanted. It took over an hour, but Albert was very pleased with the initial test results.

Then he modified the modified the design so it could use a battery to start the device. Albert also designed the circuit that would convert the device's output to match normal household power. That way it could supply electrical power to any household device. It took two days to design and

build the required components. He assembled the prototype device and called Tim over to watch the test. The output of the device was now going to a standard electrical outlet and a probe was plugged in to verify the output. On the input side was a spot for a standard 1.5 volt, D-size battery. Albert inserted a battery, turned on the device, and the output was a perfect sine wave that measured normal household power, one hundred twenty volts.

Next, he plugged in a one-half horsepower motor and turned it on. The startup current for the motor was ten amps and he expected to see a drop in the output voltage when the motor was turned on, but that didn't happen. The voltage stayed constant, and the motor ran perfectly. He had calculated the current drain on the battery powering the system and he expected it to run for an hour. It actually ran for almost an hour and a half before the system shut down.

Albert and Tim watched the test for the entire time, barely speaking, both of them were waiting for something to go wrong. When the test was over, Albert and Tim looked at each other with extreme surprise and approval obvious on their faces. They did not need words to acknowledge that it was possible to make the system self-sustaining.