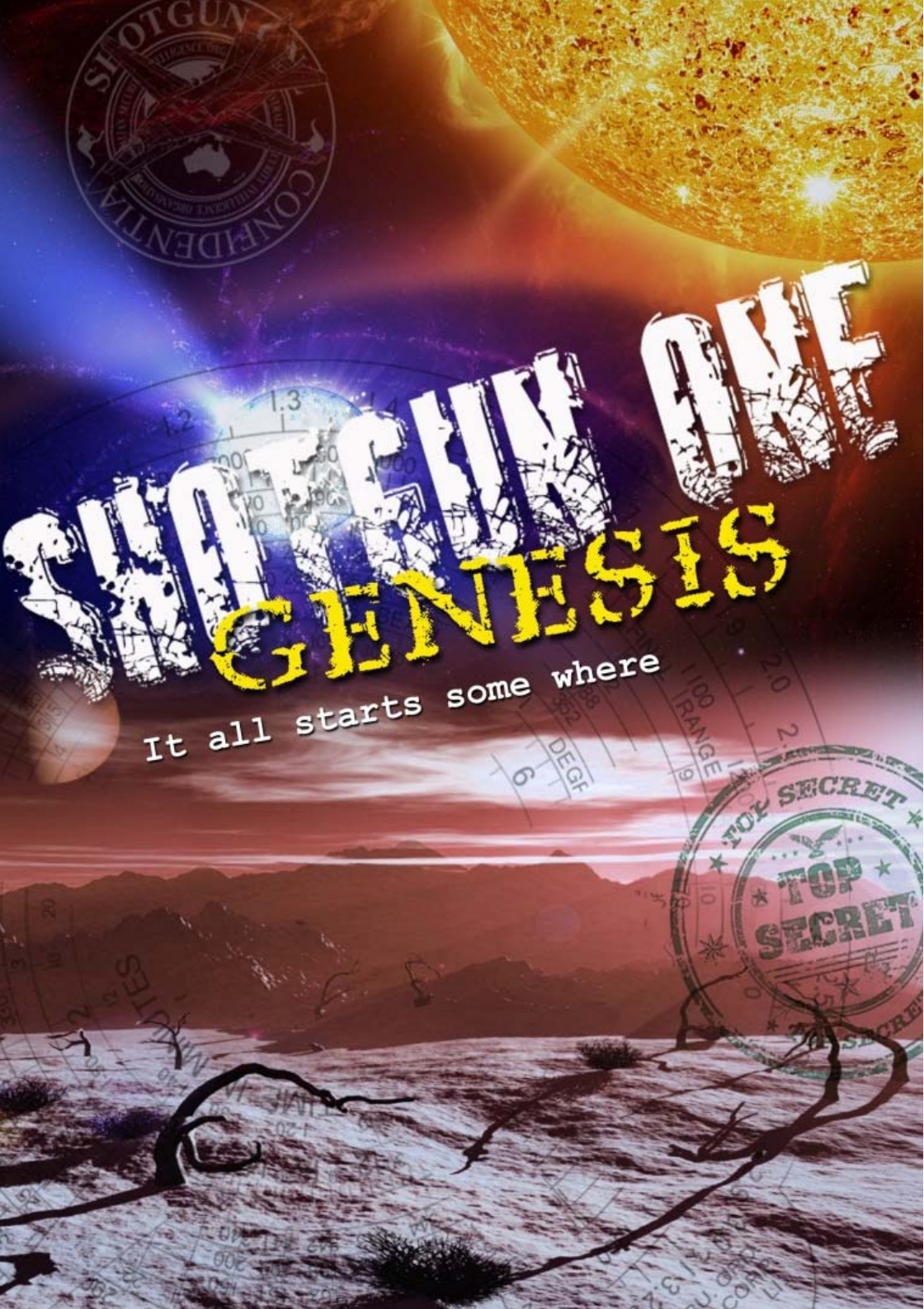
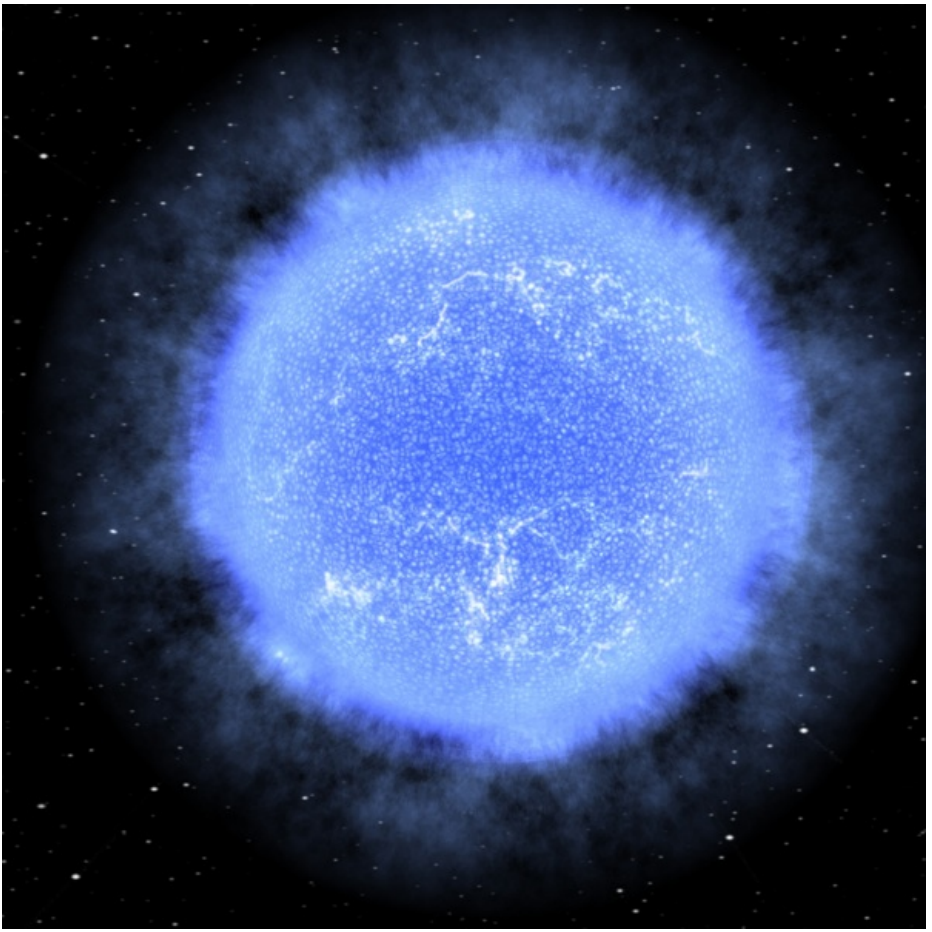

SHOTGUN ONE
GENESIS
It all starts some where
TOP SECRET
TOP SECRET

Genesis

Star dust, we are all made of star dust, every atom in our body born violently within the bowels of not one, but two exploding stars. Most of the iron that flows in our veins, the cars, frying pans and rail lines were spat out from a type 1A supernova billions of years ago, in this case a white dwarf star called Maximum. This little star was about the size of the moon but much heavier. A matchbox worth of Maximum's material weighed about as much as an elephant. Maximum was the remnant of a small star that had completed its normal life cycle and had ceased nuclear fusion. Normally a white dwarf would grow gradually dimmer and eventually become a black dwarf - a frozen lump of carbon floating though space. But Maximum was part of a binary system – two stars circling each other. Instead of going quietly in the night and becoming a cold carbon rock, it began to suck in and feed on material from its sister star that had become a red giant. They became closer orbiting each other within hours.

The white dwarf was called Maximum for good reason. When consuming matter from companion stars, white dwarfs cannot exceed what is called the Chandrasekhar limit; about 1.38 solar masses of our star, after that they explode in a supernovae. It's a very precise process and they all explode once they reach that exact limit. When Maximum exploded it burned with a luminosity five billion times greater than our Sun. Carbon and oxygen fused into heavier elements within a period of only a few seconds and that is where most of our iron came from. But the rest of the stuff that makes up the planet and you and I, came from somewhere else.

We are therefore somewhat of a cosmic mongrel, mostly the progeny of two star bursts. The second supernovae to which we can attribute our existence was truly spectacular and something you could be proud of.



A long time ago in the part of our galaxy we call Orion; a remote cluster of star forming material coalesced to give birth to a stellar monster, a giant blue star. Called Genesis she weighed in at 335 times the mass of our sun with a surface temperature more than 42,000 degrees Celsius. Eleven million times brighter than the Sun it radiated more energy in less than a second than our Sun does in a year. But unlike our Sun whose life will exceed thirteen billion years, Genesis lived just five million. This star was special, without her we would not exist. She was called *Sidus Creatricis*; our star mother.

When it comes to stars, size does make a difference. After five billion years our Sun still burns hydrogen, while Genesis burned its hydrogen load within a little more than a million years fusing it to helium. Our Sun will never supernova, it is not big enough, but for Genesis its end was written in the first moments of fusion. For stars less than about 25 solar masses the end of their lives is to evolve to white dwarfs after substantial mass loss…a whimpering end to a stellar career. There was no such whimpering finish possible for Genesis, she was simply too big and wired from day one to entertain the entire universe with the most convulsive display of energy emission experienced since the big bang.

Just over one million years old and depleted of hydrogen, the massive gravity, pressure and heat of our star mother allowed it to continue the fusion process rendering helium into carbon. Once everything had been burned to carbon, the mass and extreme gravity allowed fusion to continue, but the clock was running out. There are only so many elements a star can eventually fuse down to. The carbon was exhausted and in just one hundred years it produced oxygen then magnesium and neon. The neon and oxygen took less than a month to burn through (very fast on astronomical timescales). At three billion degrees the core then began to fuse silicon nuclei into iron with the entire core supply used up in one day, the same element that nailed Maximum in its last moments.

Up until this point where iron was produced, the energy and its outward pressure had prevented the star from collapsing under its own weight. But when it finally fused neon into that stuff we fry eggs on, the end came very quickly – within seconds. To a large star, iron is like Superman's kryptonite. Once iron is formed, instead of fusing into heavier material and producing more energy and keeping the star inflated, it instead "reverses" the previous fusion draining energy (in the form of high-energy photons) out of the system. Once the silicon burning phase has produced an iron core the fate of the star is sealed. Since iron will not fuse to produce more energy, energy is lost by the

production of neutrinos. Neutrinos, which interact very weakly with matter, immediately leave the core taking energy with them.

Within a heartbeat, Genesis formed a new iron core measuring 6000km across. In the next heart beat the iron core shrunk to just 50km. The following heart beat was its last. The sudden stoppage of energy generation caused the core to collapse and the outer layers of the star to fall into inwards. As the core shrank, it increased in density. Electrons were forced to combine with protons producing neutrons and neutrinos, a process called neutronization. The core cooled and became extremely rigid. This entire process took less than a quarter of a second. The entire star collapsed in on itself at almost the speed of light. At this point, the strong nuclear force came into play, the collapse came to a screeching halt, overshooting and springing back. The outer layers that were collapsing in collided head on with this bounce back.

The rebound caused the star to explode as a supernova. In the blink of an eye, Genesis became brighter than all the stars of the galaxy combined. And in that miniscule moment, all the heavy metals, the atoms and molecules that make us today were formed. This was the moment you were really born along with a little help from Maximum.

It would take a long time and some lucky ducking and weaving in a wild cosmic shooting gallery for humankind to arrive, but luck was on our side. Luck after all is just another word for a probability and we had lots of rolls at the dice. Fortunately for us there are up to 200 billion stars in our Galaxy and up to three trillion times one hundred billion stars in the universe, that's a big number. Boffins call that 300 Sextillion – probably because they find it so exciting. But let's not get away from the incredible size of this number, essentially beyond our comprehension; with numbers that big, the chances of almost anything happening become pretty good. Let us proceed.

The ionized nebulae of the star Genesis glowed for thousands of years after the explosion. The little particles that race around in you at this very moment were floating around in this spectacular nebula. The supernova event ploughed up the surrounding interstellar

gas creating a spectacular star cluster that moved along with other sheets of dust pulled in by the gravitational pool of the Milky Way's central black hole. The compression of this matter surrounding this cluster clumped the material together to form our star, the Sun. With enough gravity to cause hydrogen to fuse, our star ignited, blowing out incoming material. Fortunately some of this material (you and I) was expelled into that lovely place we call the goldilocks zone. After a few stops and starts, bangs and scrapes our solar system formed a few planets, including Earth.

Our own star burst into life some 4.5 billion years ago – give or take a few million years. Within just a few million years of the earth's coalescence a Mars sized object called Theia smacked into us. Lucky for us again the ejected material quickly coalesced into our tidal forming satellite within less than a month.

While orbiting closely around our solar system, the solar system itself lives on the outer edge of the galaxy. A mere 180 and 210,000 light-years away exist two irregular dwarf galaxies, their magellanic clouds being slowly syphoned by our own Milky Way. The Milky Way has already ingested other smaller galaxies such as the Canis Major Dwarf Galaxy. Flying through space we are constantly running into dust and all sorts of age old shit from places once far away and a long time ago. This is where our story begins, because drifting amongst that stellar debris was something very unusual.

ShotgunOne Chapters:

1. http://www.vostokstation.com.au/chapters/Genesis.pdf
2. http://www.vostokstation.com.au/chapters/Weapons Free.pdf
3. http://www.vostokstation.com.au/chapters/Hammer_FOB_Jackson.pdf
4. http://www.vostokstation.com.au/chapters/Feathers_and_Flaps.pdf
5. http://www.vostokstation.com.au/chapters/From God to Guns.pdf
6. http://www.vostokstation.com.au/chapters/Walla- Warr.pdf
7. http://www.vostokstation.com.au/chapters/Tethys Beach.pdf
8. http://www.vostokstation.com.au/chapters/Sitti Hawa.pdf