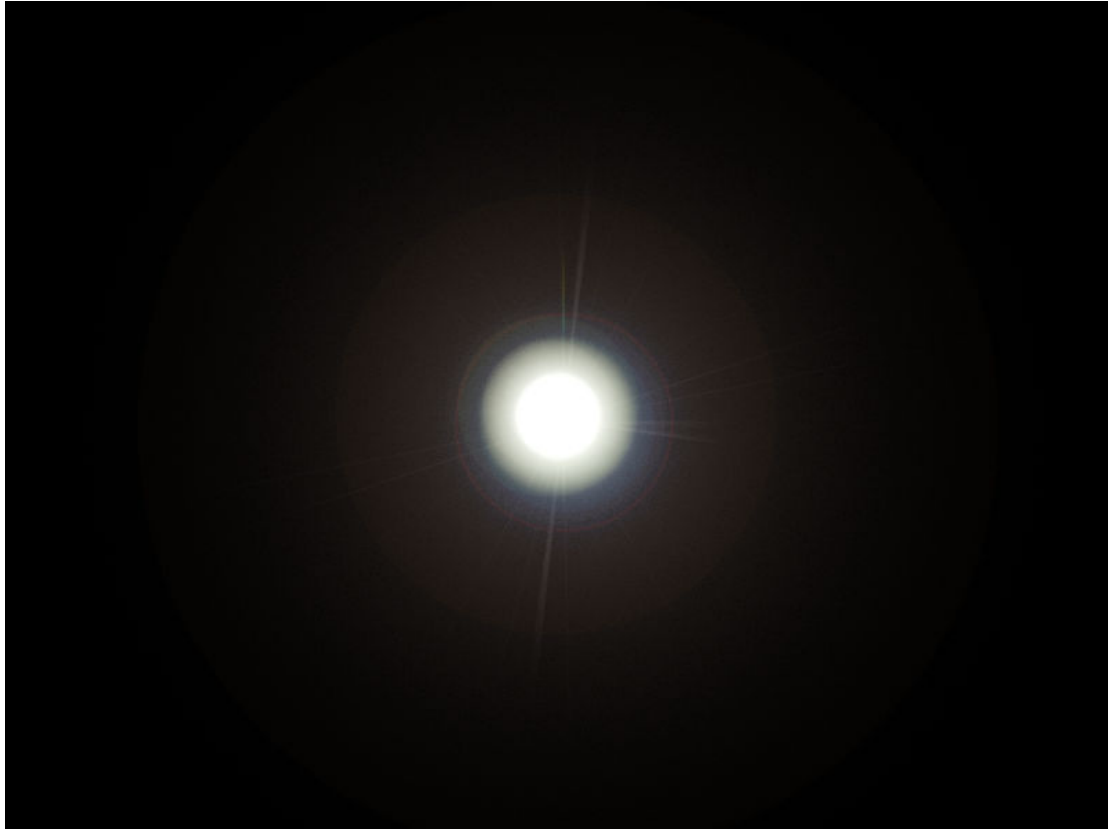


Van Maanen's Star and the Drexler Outpost



Where There is Nothing, There is God
-W.B. Yeats

Nature

The star was discovered 1917 by Adriaan van Maanen, who noticed its rapid motion in astronomical photo plates taken 1914-1917.

It was eventually found to be an isolated white dwarf, classified as DZ7 - a dim dwarf with an opaque atmosphere of calcium, magnesium and iron. It has 70% of the mass of the sun, but only 1% of its diameter (18,096 km). It is ten times denser than Sirius B - until the discovery of the Augerau black hole it was the densest object in explored space.

The surface temperature is 6000 degrees, comparable to the sun. However, this is just remnant heat from its life as a first generation star 10 billion years ago. In fact, it is one of the older white dwarves in the galaxy and well on the way of cooling into a black dwarf.

Being a first generation star there was very little metal in the nebula that formed it, and hence any planets would have had to be gas and ice rather than rocky; however, the subsequent red giant stage and collapse would likely have evaporated most of them.

Exploration

From a distance it is something; and nearby it is nothing.

-- Jean de LaFontaine

When the Manchurian Arm opened up for real in the 2180's van Maanen's star was a high priority among astrophysicists. While the public cared more for garden worlds and dramatic solar systems, this was a unique system.

The Manchurian Space Ministry automated probe Xu Xiake II did a first pass in 2182, returning several times over the next five years. It found that the star lacked any planets, but there existed a few asteroid chunks in remote orbits.

Name	Orbit (AU)	Diameter (km)	
Wuzhou	3.3114	18	
Zhaoqing A/B (now called Haldane/Bernal)	5.8598	87 93	A double asteroid, with two bodies orbiting just 68 km from each other.
Gaoyao	7.0684	163	
Gaoming	8.6210	362	
Jiangmen	9.9130	294	

The discovery of the asteroids raised great interest: they were either remains of some of the earliest planets formed in the galaxy, or had coalesced from the planetary nebula after the star imploded. In 2188 the first human expedition arrived, and Lt. Ya Liao set her foot on Gaoyao. The exploration was fruitful, with tantalizing hints that the outer asteroids were indeed remnants of the original solar system.

Over the next decades several astronomical expeditions visited the system. They placed sensors in orbit around the star, performed geological surveys on the asteroids and sampled the interplanetary dust disk. Astroseismological studies found that a sizeable fraction of the star's core has crystalized into a rigid lattice. Probes were dropped into tight orbits around the star.

The high velocity of the star and lack of planets made the system a "threshold system" that most expeditions preferred to avoid if they could – removing the residual velocity from another system is extremely cumbersome, requiring much clever astrogation. Worse, discharging requires going within 0.06 AU of the star. The star has a strong magnetic field that can easily disrupt starship equipment, and passing through it at high velocity is a recipe for unexpected electrical discharges. One effect was to delay the exploration of the DM+1 4774 system, which in turn delayed contact with the Sung and the discovery of the Canadian arm by decades.

Ya Liao Station



In the 2240's the Manchurian Academy of Sciences hatched a plan (the Sanxingdui Project) to send mini-probes into the uppermost layers of the star atmosphere to study ultra-dense physics and extreme magnetic fields. This was enabled by advances in nanotechnology but mainly motivated by the hope for breakthroughs in materials science and stutterwarp physics. The cost of repeated visits annoyed the Manchurian Space Ministry, so in 2245 it was decided to set up an outpost in the system, on the double asteroid Zhaoquing.

Named Ya Liao Station it was a state-of-the-art space habitat with space for over 400 researchers and roomy labs and workshops. One of the unusual design decisions (largely motivated by the need for delicate microgravity engineering of the probes) was not to build a spin habitat but to rely on the gravity of the asteroid. Rather than dock directly or try to land, visiting ships parked at the Lagrange points of Zhaoquing A and B. Small tugships were used to transport equipment and people.

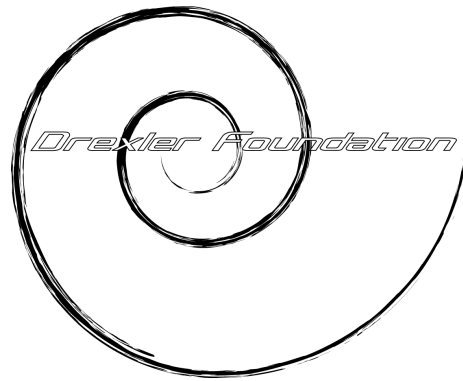
The Sanxingdui Project got off to a good start, learning unexpected new things about the behavior of dense metal gases in strong magnetic fields (some of these insights would eventually lead to plasma weapons). But in 2248 the Sung were contacted. At first this did not affect the project, but the contact, war and opening of Sung research information changed the political balance in the Academy away from the fraction that had promoted the Project towards the pragmatists who wanted to focus on applied colonization and focusing on the Sung. Funding began to dry up, supply expeditions were diverted to other projects and development of the second generation probes stalled.

In 2258, as part of the great academic reorganisation, Ya Liao Station became an unmanned station. Since the system could act as a reserve path to Sung space (in the case of problems at DM-15 6209) or an extra route to keep rebels on Kwantung in check the station was

refurbished to act as a starship repair facility. It was used very intermittently over the next 52 years, mostly by scientists or as training grounds for the Manchurian navy. An accident in 2279 depressurized a sizeable section of the station, leaving only a quarter habitable.

The Transhumanists

Laughing in vacuum
I will be free under the iron sky
A stone sunrise
-- Dr Daisuke Miyaguchi



In 2310 the Manchurian government were approached by the Stichting Catharine Vromans, a foundation closely allied with the Transhumanist League. The Foundation offered to buy the old station for a decent price. After much haggling both parts agreed and the Foundation took over the station, renaming it Drexler Station after the nanotechnology visionary.

The main motivation was twofold: to set up a major sociological experiment in the viability of a transhuman society, and to provide a refuge for transhumanist ideas in the case the situation in the Core became too repressive (or the Kafers invaded). The alien environment and isolation was regarded as a plus.

The Foundation did not plan to run the station themselves, but instead set it up as a non-profit foundation. The Drexler Foundation set up the ground rules: Drexler was to be a model society, where the inhabitants would work together to explore and innovate transhumanist technology and culture. The Foundation was to have an executive board responsible for, and elected by, the inhabitants who had signed the station charter. Membership is by application to the Drexler Recruitment Committee on Earth.

Setting up the station required much repair and refurbishing. The blowout was repaired and the station re-pressurized. Underground chambers were built to provide extra space and extensive hydroponics facilities. A modern fission reactor was installed. To do this the foundation hired belters and had them train the first batches of colonists in zero-gravity life, space survival and engineering. The goal was to make the station and its society as self-sufficient as possible.

Although endowed with money from Stichting Catharine Vromans the Drexler Foundation needed income: transporting new recruits all the way to the station was costly, let alone buying the implants and technology needed for a transhuman lifestyle. A long-term goal is to make the station able to construct even the most advanced technology, but realistically this is many years away (if it can even be done). The foundation decided to contract out services: the Drexlerians are quite willing guinea pigs and beta testers for new implants, they have a high concentration of skilled people and the station and system remains a good place for out-of-the-way research and development.

Among the companies involved with the station are Dorsale Biologique, PsiTechCorp and Newton Cognomics, all developing and testing new forms of neural implants as well as zero gravity enhancements. One of the biggest research areas is "mind networking", the use of implants to enable fast and high-bandwidth communications. The nanotechnology labs were taken over by Golden Flower Nanosystems. The station also has a contract with Hyde Dynamics Corp to do plasma research on the star.

Drexler Foundation

Headquarters: Drexler, van Maanen's Star

Motto: "We try to learn the lessons of the future before it arrives".

Products/services: Transhumanist research, development and testing.

Languages: English, Manchurian

Culture: Wildly futuristic, assumes everybody is a potential transhumanist.

Staff levels: 10 person executive committee on Drexler, 10 people in the Amsterdam offices, 5 people on Chengdu.

Scope of operations: van Maanen's Star, Earth

The foundation keeps a toehold on Earth through a set of offices in Amsterdam, in the same building as Stichting Catharine Vromans. This is where the Recruitment, Public Relations and Business Committees are located. There is also a small office on Chengdu near the university for technology transfer.

The local political system is a variant of demarchy, with strong elements of agorism and computer-aided decisionmaking. Whenever a policy issue comes up people debate and vote on it using their implants, supported by a whole infrastructure of decision markets and simulations. Given that there are relatively few real-world issues every day this is obvious overkill. Hence the inhabitants have given themselves two large virtual worlds to manage, both as entertainment and as a way to properly test their political theories.

The current chairman of Drexler Foundation is Daisuke Miyaguchi, a charismatic Japanese astronomer. Energetic, infectiously optimistic and generous, he is the most popular person on the station. He is ruthless about the pursuit of truth and reality, and often launches into highly entertaining rants against religion, superstition and outmoded views like nationalism that holds mankind back. He doesn't mind if people get offended as long as they *think*. Of course being surrounded by people who roughly agree with him makes this much easier.

Drexler Station

The station is located at the "subcompanion point", the part of Haldane directly "underneath" Bernal. It spreads out like a star from the central dome, with hangars and sensor complexes scattered across the asteroid surface.

The Iron Rooster is the main communal meeting volume. It is named after a quite skillful caricature on a wall that was found when the station was refurbished. It depicts the head of the once president of the Manchurian Academy of Sciences attached to the body of a rooster (being an "iron rooster" is a Chinese expression for being mean). The Iron Rooster has been turned into a 3D meeting hall, with padded railings and perches on all sides, interspersed with display screens. The perch underneath the caricature is usually reserved for whoever chairs the meeting, *especially* if it is about economy.

Underneath the old base large hydroponics spaces have been built, lit by long lightstrips. Recently more and more people have started to move into the hydroponics bays, building "tent apartments" along the walls with a splendid view of the plants growing in their transparent plastic tubing. The local biosphere is unique in that it is practically all genetically modified organisms: the Drexlerians have a stated preference for modified nature. Several species from Chengdu and Syuhlam are cultured as potted plants/pets and subjected to amateur genetic tinkering.

A small “workshack” space station called Stapledon has been placed at the centroid point between Bernal and Haldane. It is little more than an empty cargo cannister with added sensors, position-keeping thrusters and life support. This is used for some microgravity experiments, launching probes and experiments judged somewhat risky.

The asteroids were prospected in detail by the belters when the station was repaired, and a few minor mineral finds noted. These are all too small to be commercially viable, but could provide extra material for the station if needed. A loose committee of the remaining belters and Drexlerian engineers are running a metal extraction project.

One of the greatest problems is the lack of water in the system. Human outposts need water for not just drinking and hydroponics but for oxygen and fuel, thruster reaction mass, cooling and many forms of chemistry. Tiny amounts of ice have been harvested from Jiangmen, but beyond that everything is dry rock. Importing water from nearby outposts is necessary but quite expensive

Life on Drexler

As my eyes adapted to the low light I could make out Bernal hanging overhead. Some old part of my mind screamed danger: there was an *enormous* rock hanging suspended above me! I breathed slowly, letting the feeling pass. That Bernal and Haldane had been falling towards each other for longer than the Solar System had existed did not matter. There is no way an intellectual understanding of celestial mechanics can crowd out a survival instinct honed by millions of years – yet. The next perceptual shift came right on schedule as I began to see my surroundings not as ground with a suspended mountain above, but as two rocky walls and no floor. I let that sense of fall pass too. While I waited for my midbrain to remember what century it was in, I looked for Sol. I found it on my own, a star among others between Spica and gamma virginis. At that point a third part of my midbrain decided to protest – I was *turning*, the whole world was slowly toppling to the side. I would never be much of a spacer.

I decided I had enough communing with my origins and set out to do my job. I turned on the external link and rebooted my system. As each implant turned on the environment changed. First everything became outlined and distance-marked, with helpful labels attached. Sol became obvious from the cluster of icons hanging around it. Then the normal murmur of the habitat appeared, with my comrades and co-workers standing out. They had waited, respecting my moment of privacy as I oriented myself outside the airlock, but now several of them crowded in: Li could not wait to see if his plan worked, Heinz had a new scheme for the dipole on Tree 5 and POS just wanted to make sure I did my EVA perfect. My equipment also became smart again. The stick grumbled about an unexpected disconnection, something in my toolpack politely asked if I was a printer and the payload quietly let me know it was still intact. I let POS and KOC download a flight path into the stick and set off along the virtual hallway centroid-wise towards Stapledon Station. My midbrain was drowned out by the solidity of the virtual: I couldn't be falling if I was moving inside a wireframe structure. Some agent with a rudimentary sense of humour began to pipe Strauss music.

All inhabitants are required to have the zero-G DNAM and at least some basic communications implants. They are recruited from transhumanists wanting to live their

dream among the stars (a sizeable group), but only people with solid skills and minds are selected. The inhabitants are practically all scientists, engineers or otherwise involved in research. This has produced an extremely intellectual (some would say scientific) society. It is not necessarily a smarter society than at any other research outpost, but it embraces its cultural oddities in a way no other outpost does.

Although the habitat has been improved immensely, visitors (especially people not used to normal outposts or expecting a shining utopia) find the place rather cramped and dreary. If they also happen to dislike transhumanism it is even worse: in this place it is, if not the state religion, then at least the assumption behind everything. Drexlerians love debating, but everybody accepts the idea as obvious that humans can and should modify themselves. After a while they simply forget that this is not what the majority of humans elsewhere think.

On the station there is a shared economy based on reputations. The more a person contributes to the welfare of the station, the more resources they can request (of course, requesting more than your fair share will reduce your reputation).

Locally there are very few restrictions on enhancement (or nearly anything else) except safety: any activity that threatens the safety of the station has to be monitored by at least ten randomly selected people. Doing anything that risks station safety like firing a weapon is a serious crime and can lead to expulsion. At the very least, behaving recklessly causes ostracism and loss of reputation. While there are a few people acting as part-time security the ubiquitous sensors and networked surveillance of the society makes it hard to commit a crime in the normal sense. It is also hard to get any kind of privacy (there is a vigorous and ongoing debate about whether privacy has any future at all).

The two virtual worlds (or, "levels") most of the inhabitants are engaged in are Qabila and Enitharmon.

Qabila is an interstellar setting based on the real world but set in the year 2400. It is largely an extrapolation of current trends, given a transhumanist slant. Mankind has colonies within a 100 light-year radius, forming a loose kind of partnership with several other alien races. Drexlerians run a number of local governments and try to make them prosper in the face of threats from hostile aliens like the Kafers, self-reproducing machines, nationalistic expansion, economic fluctuations and "social waves", an emergent phenomenon predicted to occur in a sufficiently large interstellar society.

Enitharmon is a luxurious fantasy world, the antithesis of the often rather bare Drexler. It is an alchemical free market society inhabited by tiger-human AI personas, transhumanism through magic and complex political intrigue. Where Qabila is serious and realistic, Enitharmon is fun and dramatic. The main goal is to gain influence, wealth and power individually and in teams, but it is important to collectively keep the Red Emperor from lashing out and destroying sizeable chunks of the world.

Drexlerians are used to live in several online worlds to the extent that even Core people may find it extreme. Everything is virtually annotated, decorated with augmented reality and referring to the jargon of the shared culture and the virtual game worlds. In addition they tend to have eccentric interests. One team is seriously thinking about whether the crystalline matter inside the star could be used for information storage. Another is composing artificial languages intended to mesh with the genetics and behavior of genemod pets. Several people are pursuing bizarre neurohacking in order to experience new and previously

unexperiencable mental states. Some people are married to different people on different virtual levels. A large group is working hard (so far fruitlessly) on forming a true group mind.

Beside the Drexlerians there are a few outsiders on the station.

Dr Talib al-Qarraghul is the Stichting Catharine Vromans representative, a sociologist studying the station and its society. He is documenting and participating in many activities. Secretly he is a bit disappointed: he had expected the station to develop into a completely different direction.

There are a few corporate researchers. The degree they participate in the transhumanist society varies; Solanida Yeskey from Newton Cognomics is a high-reputation person everybody wants to interact with and discuss enhancement technology with, while the nanotechnologist Dr Liu Hsien can hardly wait to get away from the decadent madhouse.

Of the belters who helped start the station 15 remain and are new citizens: they may not be card-carrying transhumanists, but they like the system and the respect they get through the reputation economy for their "outdoors skills".

Adventure possibilities

An isolated habitat crammed with people trying to build utopia: what could possibly go wrong? The history of utopian communes is filled with real stories that could be applied, everything from spectacular infighting over doctrinal questions or leadership disputes to millennialistic visions ("If we only build the Nexus computer network we will get the AI to transcend!"). The PCs may arrive just in time to see conflicts reach a boiling point, a situation where you are either for or against the sides. Isolation, the feeling that we know the truth and the rest of the world is deluded, radical experimental enhancement and a harsh environment – Drexler is in many ways terribly vulnerable.

The Reefs of Space: The PCs have no plans whatsoever to visit Drexler, but since they need to rapidly get from one system to another their ship has to pass by van Maanen's star. During stutterwarp discharge something goes wrong: an electromagnetic interaction damages the ship and forces it to limp to Drexler for repair. This might both be a way of stranding them among the transhumanists for further adventure or a humorous/stressful situation where they need to get the ship repaired *quickly* but have to rely on the eccentric locals. Another version is to have the PCs already on Drexler, but another ship in distress – the drive malfunctioned in the strong magnetic field, and it is now trapped close to the white dwarf. Can they save the crew or even the ship?

The Good, the Bad and the Provolutionist. A dangerous provolutionist criminal is on the loose on the Arm, and there is reason to think he might be hiding on Drexler. The PCs are pursuing him, and now must find him on the station. It ought to be trivial to find a person in a place with ubiquitous sensors, people wired into a network and limited space. But the inhabitants might be more sympathetic with the criminal than the investigators. Worse, the criminal knows many high-tech tricks and can use the transhuman environment much better than the mere human PCs. But the criminal may also outstay his welcome, leading to a three-way standoff. Another take on this scenario is that Manchuria is claiming the station is harboring the provolutionist or even a provolutionist cell in order to get a pretext to shut it down. Can the PCs prove the innocence of the transhumanists, or will they have to face down the Imperial Police?

Virus! A virus is loose on the station, threatening everything. It might be a software virus infecting the computers and robots, a brain interface virus infecting brains, a biological virus or even a meme – an emergent social phenomenon turning people into propagators for itself – or even a combination of all of them. Can the PCs discover its nature and stop it before it is too late, or do they have to devise an escape plan? Worse, if they or anybody else is to escape, how do they guarantee that the virus does not spread with them? And did it appear naturally, by accident or by design?

Me, myself and me: PsiTechCorp is very interested in copying brains into computers, a technology that has been "just around the corner" for ages but never really seem to work as it should. Besides, the public in the Core is not too keen on this kind of research. This makes Drexler the perfect place to work on the problem. What happens if they succeed at least partially? Suddenly there could be several (possibly slightly erratic) copies of some of the test subjects. While the transhumanists may not be too bothered by that, the economic implications of copyable human expertise are staggering. Suddenly what is known on the station is more worth than tantalum, and people will be willing to kill for it. To complicate things, many transhumanists may think it would be a great idea to expand the station by multiplying virtually – or that human-based AI is just what the Core needs to shape up.

Pushing ice: if the PCs are traders and hear about Drexler's water problem, they might want to make easy money by selling them water at a premium. But Feng Dao has a bold plan: why not take a hefty chunk of ice from an outer system moon, anchor it to a starship and take the whole load to van Maanen's star? Drexler Foundation would no doubt want to pay very well for the ice. Most people doubt it could be done: how do you adjust for the velocity difference between the systems? Either you would need to pass close to the star, or to perform some serious gravity assists in the neighbouring system. Sure, the tidal forces near the star ought to be small enough that a well secured ice load shouldn't misbehave, but who knows what electrical nastiness that occurs when a big chunk of ice, spaceship and looped nanotube cables careens through a strong magnetic field? Doing the gravity assists in nearby systems might have the same problem near gas giants, as well as the risk of colliding with something small during the looping. Of course, some local traders and outpost personell dislike the possibility of losing the easy money (a fallback if other trading isn't profitable) and would like to see the whole mission fail...

The seven samurai: Drexler is vulnerable to space piracy – it is isolated, unarmed and crammed with imported high-tech goodies. Drexler Foundation has reason to believe they are going to be attacked (how they got the information may be another interesting story), and now they need outside security experts. Of course, working together with the inhabitants may prove the greatest problem: some are mistrustful and fear the PCs might want to rob them instead, others think it is better to try to keep the entire system demilitarized – and the PCs might find the Drexlerians rather bizarre to start with. Setting up defenses and training some locals to help may pose plenty of challenges, but the real problems of course starts when the pirates arrive. Unless some hotspur convinces the defenders that a sneaky pre-emptive attack is the best strategy, which could allow another pirate ship easy access: someone in the habitat may be a pirate infiltrator. Of course, given the sheer density of out-of-the-box thinking people, nanodevices and old equipment for probe launching it might be possible to improvise strange and dangerous weapons.

Stichting Catharine Vromans

Headquarters: Amsterdam, Netherlands

Mission statement: "To overcome outmoded limits of the human condition"

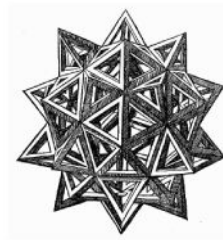
Products/services: Economic support to transhumanist research

Languages: English, French, Dutch

Culture: Ambitious, yet focused on manageable near term goals.

Staff levels: 75 people in the Amsterdam offices, mainly lawyers and researchers. It has 20 representatives inspecting various projects internationally/interstellarly.

Scope of operations: Interstellar



STICHTING
CATHARINE
VROMANS

Catharine Vromans was the reclusive founder of Plee, a major international furniture chain. It is known that she had invested heavily in life extension research, and when she died at 103 in 2308 she bequeathed most of her fortune (and stock in life extension companies) to a foundation to "overcome the outmoded limits of the human condition".

The foundation sponsors many research projects, from genetics research to computer-aided linguistics to radical life extension treatments. Most are located in the Core and are very applied: they seek to solve problems of human enhancement that are unlikely to get traditional academic or industrial funding.

The main exception is Drexler Station. The whole project was controversial from the start, but first director Geert Appel was insistent on the need for at least one "visionary" project, both to make the goals of the foundation visible to mankind and to provide a challenge internally as well as externally that would make the foundation evolve.

The current director, Sabrina Washington, is very restrained and unwilling to risk resources on projects with uncertain outcome. This has led her into a very quiet and polite struggle with some of the other board members who want the foundation to press the boundaries harder. As long as she is around it is unlikely Drexler Foundation will get any more money, and this forces it to seek alternative income.