SAGITTARIUS EYE

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EXPLORING IN Style

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SAGITTARIUS EYE
ISSUE 22

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SAGITTARIUS EYE

EDITORIAL

Who the hell are you?

Don't answer. We know who you are.

We know what makes you pick up these pages. We know the call. We hear it too.

From our flight seats, we salute you. The undaunted few; the lonely and the brave. Those who hear the siren song of the stars.

They hate and fear you, don't they? Those mudbooters and sceptics, locked in their spinning prisons and on their little worlds. We know. It's not their fault.

In ages past, they'd have called us gypsies, wanderers, vagrants, opportunists. Rootless wanderers of independent means, riding in with a whiff of adventure and dubious money. "You can't trust them." "Thieves and killers, the lot of them."

But they don't understand, do they? They can't. They have homes, jobs that pay them to stay and be safe. They haven't seen the laser fire streak past as they scream through silently-spinning rockfields at twice the speed of sound, hunted by alloyed predators. They haven't been spat out of hyperspace into the light of a never-seen star, streaming in through a pockmarked canopy. Visions of staggering beauty and loneliness.

But we know you, wanderer. We know how little there is between your fragile flightsuit and an unknowable void. We know what's on the line when you drift out into space, the sum of your material wealth precariously strapped into the cargo hold. We know the price you pay for your freedom and we know the terrible risks that come with a life etched among stars.

They can't understand — but we do. So we make this for you: the renegades, the lonely, those who risk everything, those who have nothing to lose. Pilots of the stars, this is your magazine. Know that, however distant a friendly face and how vast the black, we *are* with you. Because we are you.

By commanders, for commanders.

In the words of a friend: *fly to live. Live to fly.*

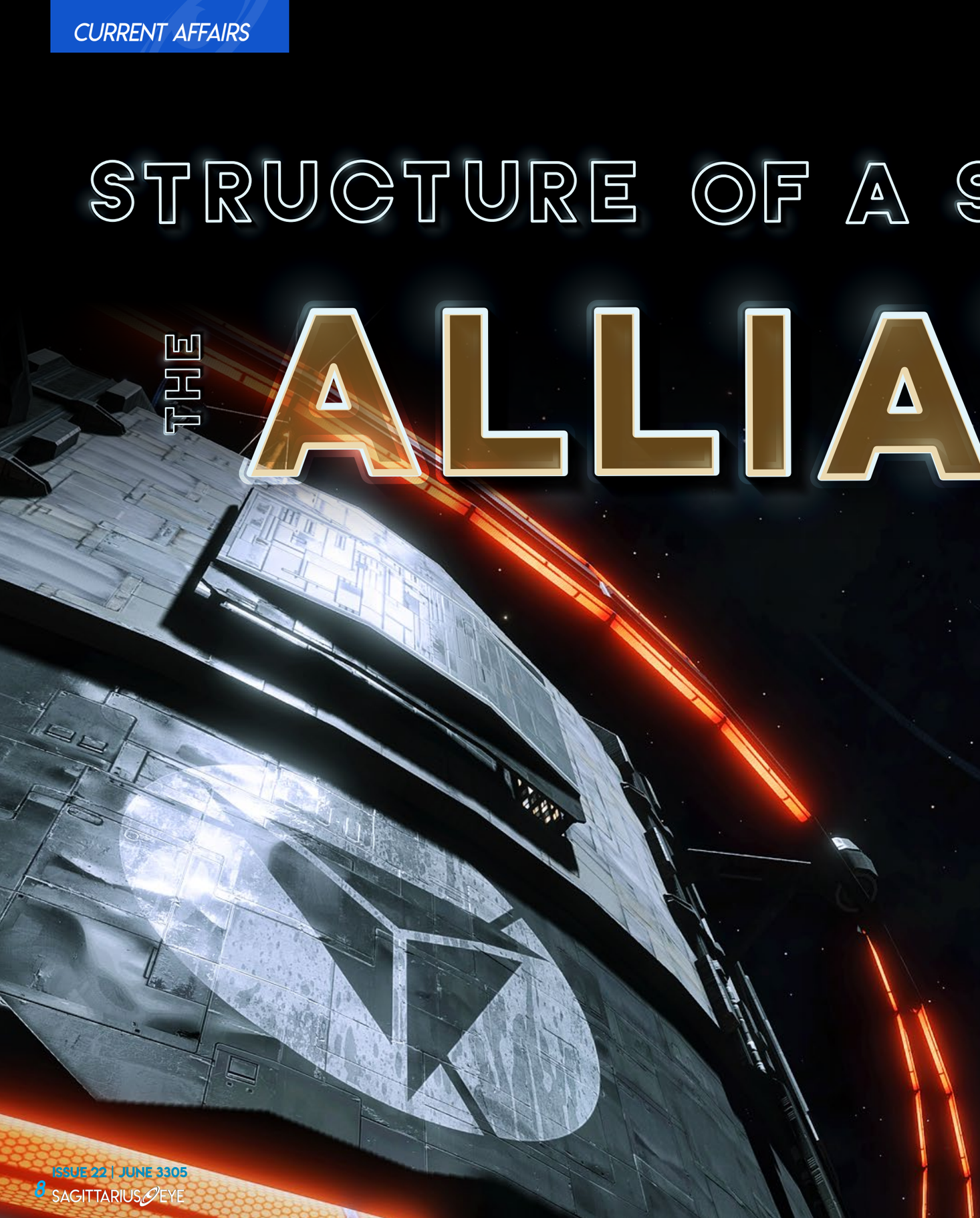
Souvarine

Photo: Erimus Kamzel

Photo: Chaukk Saotome

STRUCTURE OF A SUPERPOWER:

THE ALLIANCE



Concluding our series on what life is like on worlds controlled by the interstellar superpowers, in this issue, we turn our attention to the Alliance.

The foundation of the Alliance faction lies in the intertwined history of the Alioth rebellion, the rise of Argent Incorporated, and the desire amongst planetary populations to come together in a solid block against the dominant but distant influences of the Empire and Federation alike.

Human history is littered with instances where colonies rebelled and cast off the shackles of their distant rulers, and so it was with the revolution on Alioth. The decisive moment came in late 3229 when the Federation finally gave up on suppressing its colony. Suddenly, a powerful and well-resourced star system had the means and opportunity to stand apart from the two superpowers of the time. The shape of its new government became the blueprint for the third kind of superpower — an administrative model that drew strength from the independence of its members.

At the same time, Meredith Argent, a key member of the revolutionary forces, struck a deal with the fledgeling government to provide much-needed ships and weapons to secure Alioth and support other systems that wished to join them in casting off the yoke of the Federation or the Empire. AAAI, which later became Argent Incorporated, thrived and prospered on the demands of this new power, quickly rising to rival other giant interstellar corporations in human controlled space.

Alliance society is diverse. Each member world has different needs and priorities. There are regional power blocs which manifest as voting groups in the Assembly, but even then, the delegates recognise that the broad range of opinions, lives, and perspectives that are represented in chambers provide the strength of each faction. Decisions do not come quickly out of such a legislative body, and for internal matters, member systems act autonomously. Seeking agreement between the member systems is generally a tortuous process, usually ending up with a great deal of compromise.

The binding commitments made by Alliance members are to oppose slavery and champion the rights of the individual. Citizens from any other Alliance member system must be granted full rights of abode and citizenship in all other Alliance member territories. Alliance members must also commit to interstellar trade and military co-operation, and member systems must have an elected civilian government — although in some systems (mostly corporate), the definition of 'elected' is stretched somewhat.

Large corporations obey a common set of export regulations, which in many areas have been subsequently adopted by the Federation and the Empire, so from the perspective of an interstellar trader running a small ship freight business, the Alliance has been a very welcome positive influence. Its existence as a third presence has forced the other powers to abandon thoughts of conducting a trade war.

Some trade items are considered illegal in Alliance space, but the enforcement of the law varies between systems, as it is left up to the local authorities.

Alliance members must come to the aid of other members in times of distress, either as part of the Alliance Defence Force (ADF) or directly. The ADF fleets are made up of contributions from different member systems. Some of the more affluent signatories are capable of providing entire battlegroups, but others provide smaller task forces or single ships. These contributions to defence are made in rotation, although senior ranks in the fleet are usually permanent, to provide strategic consistency.

> **Lave, with its ancient reputation, would provide a check on Alioth's dominance of the Assembly.**

Lave and the Alliance

In recent times, one of the most controversial and notorious members of the Alliance was the Lave system. Lave joined the Alliance in 3265, in the immediate aftermath of a bloody revolution. In that conflict, an ADF fleet, predominantly from Alioth, had played a major part in overthrowing the independent dictatorship of cloning expert and resident eugenicist, Doctor Hans Walden.

However, Lave joining the Alliance angered both the Federation and the Empire. The former protested over the assassination of its ambassador, one John Graham, by the previous regime. The latter objected over the actions of its ambassador, Martha Godwina, who immediately recognised Alliance authority in the system. The crisis almost brought the Empire and the Federation together in opposition to their rival, but some swift diplomacy and political appeasement eased the immediate tensions. However, the alienation of Federation and Empire fatally wounded Argent Incorporated, whose rapid rise turned to gradual decline. Rival corporations in Federation and Empire space received substantial subsidies to design and sell new ships that would put the Alioth-based manufacturer out of business.

After joining the Alliance, Lave's new democratic government quickly began to recruit other systems from the region, known as the Old Worlds, into the Alliance and formed a voting bloc with these systems to rival the dominance of Alioth. Some saw this as a good thing, reasoning that Lave, with its ancient reputation, would provide a check on Alioth's dominance of the Assembly, but many others were not convinced.

In 3305, Lave's elections saw a new party take charge of the system. Immediately after being elected, Lave Radio Network (LRN) withdrew the system from the Alliance. The next few months saw a messy power struggle between LRN and its allies and an assortment of Alliance loyalists who wanted to retain Lave's membership in their organisation. The matter remains under dispute, but for now, Lave has returned to being an independent system, leaving behind a group of Old World representatives in the Assembly without its leadership.

Edmund Mahon

In many ways, the position of Edmund Mahon as Prime Minister of the Assembly is something of an anomaly. For an administrative body that has historically prided itself on being a forum for discussion rather than an executive and legislative entity, the rise of Mahon as a delegate, a minister and now Prime Minister has been something different. However, Mahon's role has also been seen as traditional, particularly in recent times. Mahon has repeatedly sided with the member systems against attempts by the executive to centralise power at the member systems' expense. This contrary policy strengthens the political validity of his post and endears him to a broad swathe of delegates.

In addition to this, Mahon has a polished understanding of Alliance bureaucracy. His knowledge and experience have allowed him to outmanoeuvre a number of rivals and continually 'manage upward', guiding the hand of a succession of Assembly presidents.

At the moment, Mahon is engaged in a dispute with President Gibson Kincaid over the redistribution of legislative powers to the executive branch, but few would bet against such a diligent Prime Minister, who has defeated all previous attempts to weaken his position.

> **Individuals welcome and embrace the diversity of life in the Alliance.**

Life in the Alliance

Individuals welcome and embrace the diversity of life in the Alliance. After joining, the spirit of each member system is largely preserved intact. Citizens are generally outspoken and often critical on political views, how their system is run, and how money is spent, but they relish that freedom to be critical. This is why meetings in the Alliance Assembly are generally long and often inconclusive, involving a great deal of negotiation and compromise; but it is also why there have been remarkably few disputes between Alliance members that have resulted in war.

Within the Alliance, there is a strong emphasis on culture. Entertainment of all sorts is celebrated, from food to drama, to comedy, to ancient literature. Holo-vid dramas from the Federation and the Empire are imported by many worlds, and their biases treated with good humour. The corporate influence and brand loyalty of the Federation is seen on some worlds, but this does not extend into interstellar politics.

The Alliance today

With the rising threat of the Thargoids and a resurgence in military design and construction, the Alliance is changing to suit the times. Despite the loss of Lave, in recent years membership of the Assembly has skyrocketed. Despite Mahon's opposition to Kincaid's proposals on the consolidation of power, if the superpower is going to be able to defend its members it needs to be able to make decisions collectively and react quickly to each new crisis that emerges.

Structure of a Superpower: The Alliance

Text: Allen Stoud

Design: McNicholl

Art: McNicholl

Images: Zer0axis, OrangePheonix

LOSING THE WAR

HUMANITY'S HOPE DIMINISHES DAILY

On 5th January 3303, Commander DP Sayre became the first commander to encounter a Thargoid vessel in centuries. Two and a half years later, human space is slowly being swallowed by the Thargoids' invasion. We are losing ground.

"There goes the last of the hearts!" shouts a member of the three-part wing. "Shoot it, kill it!"

"It's using lightning!" shouts another wing member. "Get outta there!"

"Almost got it... Th—" the third commander's transmission is cut off as his ship's hull loses integrity and splits open, spilling his Remlock-encased body out into space. At the same time, the shriek of the dying Thargoid Cyclops reaches the other wing members as it, too, dies in an explosion of caustic green gases. There's cheering and groaning over the comms in equal measure.

"He got it, he got it good," says one commander.

"He was stupid and got his ship blown up," says the other. "We can't keep taking these kinds of losses if we expect to beat back the incursion this week."

The harsh reality

A couple of years ago, when the Thargoids' return was new and exciting, commanders often joked that it was time to welcome humanity's alien overlords. Today, far fewer are laughing, with the exception of radical groups like the Far God cult. The Thargoid menace has proven to be savage, powerful, and overwhelming. Every week, new systems fall to their advance, and their attacks are growing more and more frequent. In the first three months of 3305, the Thargoids attacked more stations than in the whole of the previous year.

Independent commanders fight back, but their efforts are stunted by a number of factors. The superpowers, seeing that the Thargoids do not seem to be encroaching on their core systems, seem unwilling to engage too much beyond their support of the Aegis Initiative. Logistical support, which was once very useful in beating back infestations before they became full incursions, has become less-so thanks to Thargoid countermeasures. Finally, expeditions and other concerns have robbed the Bubble of many of its greatest defenders, at least temporarily. Needless to say, the Thargoids aren't waiting for humanity to get its act together.

"Right now we're struggling," admits Commander Ninj, an anti-xeno expert and leader of Operation Ida. "There was a promising start but odds have increased against us massively with the Thargoids stepping up their attacks at the same time that a lot of independent pilots went off on various expeditions. Sad to say it, Distant Worlds 2 took a lot of needed fighters away and their loss is really felt at the moment."

The invasion began with human settlements in the Pleiades sector, and has been slowly making its way into the Bubble. Commanders have been tracking the progress of the invasion with a variety of tools, including the Eagle Eye surveillance stations and the Pilots' Federation Galaxy Map. The numbers tell a grim tale: with each passing week, the number of kills necessary to repel incursions rises, while the number of participating Thargoid hunters plateaus. According to records kept by the Anti-Xeno Initiative (AXI), in the early weeks of the war, Thargoids would attack only two or three systems at a time, and those attacks were often repelled before they could develop into full-fledged incursions. Thargoid hostilities have steadily escalated.

In the meantime, even tracking commanders' progress has proven difficult, as intelligence on the state of the war can be challenging to sift through. The Pilots' Federation appeared to be better able to track Thargoid movements in the early days of the war, but their logistical support has become less reliable since then. More on this later.

Once we get more people back from the expeditions, then humanity can start tipping the scales in our favour once again.

Operation Ida

One aspect of the war that is turning in humanity's favour is that we've become better at recovering from our losses — though perhaps not for the reasons we'd like. For each week that a system remains in Thargoid incursion, a space station in that system is heavily damaged by Thargoid attacks. Commanders who haven't seen the results of this destruction should definitely do so. It is at once an entrancing and horrifying sight: the infrastructure of human society burning in space, threatening not just the populations of the stations, but the millions and sometimes billions who rely on trade to and from those stations.

Fortunately, commanders are getting better at facilitating repairs. Commander Ninj explains that "station repairs have stepped up, with lots of other groups helping out Operation Ida." Operation Ida is a group of assembled commanders which has, from the beginning of the war, been dedicated to repairing stations damaged in Thargoid incursions. Apart from being frequently mixed-up with the Independent Defence Agency (a very serious problem), Operation Ida's biggest challenge up until this point has been that the stations requiring repair, until recently, required long trips to reach. As a recently-colonised area of space, the Pleiades Nebula does not have many established supply lines.

We know from history and experience what the Thargoids are capable of.

"The whole job is easier now we're in the Bubble. The Pleiades was slow going but it helped us appreciate local supplies in the end," says Commander Ninj. It's true: stations have become easier to resupply, with many cargo transports able to make runs with only a single jump. Of course, from the dawn of war, supply lines have always become easier to maintain as the battlefront moves closer to home, so this is not exactly cause for celebration. Still, Operation Ida continues to do excellent work, and with greater and greater levels of assistance. Ninj explains some of the challenges with the work they do:

Repairing stations involves a fair amount of coordination, such as deciding which target to repair, communicating as a group on what is needed, and reporting when a task is completed so over-delivery doesn't occur. We also do our best to let people know that getting fined around a repairing station is bad news as the contact service is disabled — meaning they have to travel elsewhere to pay off a fine. We try and catalogue the nearest places to clear fines, to help those who get caught out. Managing resources is a lot easier since we left the Pleiades, as now there are usually many options to find various commodities. Back in the Pleiades, we had to deal with human-induced problems to ensure we weren't getting caught out by undesirable security situations. Lockdown could slow down or even cripple the repair of a station back then. We've also had to try and limit the influence we have on any particular faction, often by carrying out countering actions. Sending a faction into an expansion when they didn't want to do that is definitely considered impolite!

"I'm glad [the Thargoids] haven't hit Colonia," Ninj adds with a laugh, referring to a small colony of human-occupied systems twenty-two thousand light years from the Bubble. In previous years, cargo runs to help establish the Colonia settlements could take dedicated transports many, many hours to complete, especially before the advent of the so-called 'neutron highway'. While an attack on Colonia would be a particularly effective way for the Thargoids to split our forces, as many commanders have sentimental attachments to Colonia, a more pressing danger is that posed to our atmospheric worlds. At the time of this writing, Thargoids have chosen not to attack settlements on our earth-like planets, perhaps because of their preference for ammonia-based atmospheres. That may change, especially if they draw closer to major targets, such as the White House on Mars in the Sol system and the Imperial Palace on Capitol in the Achenar system. In the meantime, the war is confined to the vacuum of space.

War is a rich man's game

When it comes to fighting the Thargoids head-to-head, only the wealthiest commanders are able to contribute the most — not just those with the highest credit balances, but also those with the most free time. While Thargoid Scouts can be fought with conventional ships and ordinary weaponry with reasonable degrees of success, when it comes to the larger Interceptors, commanders need to perform quite a bit of legwork to survive in combat. Aegis' experimental weaponry is the minimum that is effective against these targets, and some experimental modules such as the AX xeno scanner are considered almost essential.

For those commanders that want to increase their odds even more, converted Guardian technology is currently the most effective way to destroy Thargoids, and acquiring these tools takes a lot of time and resources. For example, unlocking the purchase of just the Class 1 fixed Guardian shard cannon requires a commander to supply a technology broker with one Guardian weapon blueprint fragment, twelve Guardian power conduits, twelve Guardian technology components, and fifteen Guardian sentinel weapon parts. Many commanders don't have the kind of time necessary to do this work.

Additionally, engineering is essential for survival against the Thargoids. Experimental modules cannot be engineered, but a ship can only integrate four experimental modules at once, and for the rest, an engineer's touch is frequently the difference between life and death for an anti-xeno pilot. Any commander who's invested any time in the engineers knows just how drawn-out that process can be, even following the engineers' rework of their compensation structure.

Finally, after all this work has been done on a ship, it requires further fine-tuning on its most important component: the pilot. Thargoid Interceptors are bizarre and challenging combatants, entirely unlike any human opponents, and merely holding one's own against a Thargoid requires learning extensively about their capabilities and tactics (previous issues of this magazine have covered these lessons to some degree). That means time and attention, and (almost always) insurance rebuys. Many, many insurance rebuys. Members of *Sagittarius Eye*'s faithful photography partners, the SVPFA, will attest to how expensive engaging with the Thargoids can be.

Commander Ninj highlights the difficulty of entering the fight:

Beating back incursions is hard work which involves dedicated ship builds. It's not something that every person can pick up right away. There are a lot of really helpful, amazing anti-xeno groups out there that run wings, provide guides on how to fight as well as how to build an effective ship, and generally provide awesome assistance. At Operation Ida, we've had a bit of experience in fighting infestations a few times, but we really do rely on the goodwill of the AX combat groups to help out with the incursions. Without what they are doing we would have so many more targets to repair… Not to mention those systems which would be burning forever if the incursions never ended. These groups face some tough challenges when they can see a system is under threat in the Galaxy Map, but the right conflict zones aren't turning up.

This last part references another challenge to the war effort: logistics.

When it comes to the larger Interceptors, commanders need to perform quite a bit of legwork to survive in combat

Intelligence?

At the start of the war, humanity was ready — or at least, its commanders were. Pilots leapt into systems classified as 'Infested' by the Pilots' Federation, shooting down scout after scout to prevent full-fledged 'Incursions.' Eventually, records would show that the invasion had been successfully beaten back, whereupon pilots moved on to the next system.

Unfortunately, weeks later, Pilots' Federation officials reported that they were no longer able to determine when an infestation had been successfully beaten back. As a result, countering infestations has become a frustrating guessing game.

Ninj explains: "previously, we knew when to keep fighting and when to stop. [The Infestation monitoring system] got removed a few weeks later, which has made it so much harder. Seems a bit silly in my opinion. You can see when a system is in incursion via the Galaxy Map and GalNet. The Pilots' Federation should at least have some sort of report for infestation, too. We have to rely solely on Eagle Eye now, but it still doesn't let anyone know when a system is cleared."

This new reality in war intelligence makes it far easier to wait for a system to fall into an incursion state and beat the invasion back, rather than trying to preemptively stop it. With regards to this grim triage, Ninj says: "with the limited resources available, it's more sensible to fight the target you can actually see the progress on, even if the conflict zones are tougher." Pilots attempting to beat back attacks are understandably frustrated when their efforts are proven useless, and thanks to the lack of intelligence, they don't even know how many more scouts they would have needed to destroy.

In the first three months of 3305, the Thargoids attacked more stations than in the whole of the previous year.

The war outlook

Despite all these challenges, Commander Ninj has a somewhat optimistic perspective on the war. "As for the outcome, I'd like to think we can still win," he says. "Once we get more people back from the expeditions, then humanity can start tipping the scales in our favour once again. There might also be some impending strategy which slows down or kills the Thargoids, like the mycoid virus did previously. Even if the Thargoids keep up their rampage, we're not going to sit by and let stuff burn. Repairing will continue. We enjoy it and we're somewhat stubborn."

His optimism was soon validated. Shortly before this article went to our design team, the AXI reported that Thargoid invasion forces had been completely repelled — that is to say, all Thargoid incursions had been cleared, at least temporarily. It was a startling development, and the first time in many months that anti-xeno pilots had been so far ahead of the opposition. Commander Mackenheimer from the initiative said, "All incursions are cleared… We are hitting back hard. Former members have returned. We are up to 750 certified AX Pilots with a couple thousand recruits."

Still, humanity continues to face new challenges — and not just from Thargoids. Ninj comments: "we have corrupt station officials who seem to occasionally decide that self-profit is a better path than helping repair their station. As a consequence, some of the commodities delivered to a station go missing. It's unbelievable! Losses aren't huge but it is still frustrating. As a result we need to throw more weight at the problem and deliver extra commodities."

Thargoid Interceptors are bizarre and challenging combatants, entirely unlike any human opponents.

With regards to anti-Thargoid combat, Ninj adds: "if you've not fought a Hydra [Interceptor variant] before, you'll be having some challenges ahead if you participate in a conflict zone in an incursion. Hydras regularly turn up at the end of the fight after you've taken on multiple scouts, including some difficult variants that boost damage and on top of a couple of other interceptor variants that will drop into the fight. [Facing a Hydra] is not for the faint hearted, and as you can imagine, it really is not easy."

For commanders looking to join in the fight, Ninj can tell you where to start. "If you have any questions about station repairs, then Operation Ida is the group to come to. We have our central network as well as a dedicated communications channel. Commanders can come and join our big efforts or, if they have a group and want a challenge and their own station to work on, we can offer advice and guidance. For AX combat, there are several groups. The largest is the AXI. We also work with Hank's Alliance of Anti Xeno, the Hand and the Hive — all of which contribute to battling incursions and getting wings together to fight in style."

While Ninj and others may be optimistic, there is definitely cause for concern. We know from history and experience what the Thargoids are capable of. Thargoid attacks continue to escalate, and it seems unlikely that the Hydra Interceptor, which began appearing in human space a few months ago, will prove to be the Thargoids' most dangerous challenge for us. This conflict is just getting started, and independent commanders are humanity's best hope.

Losing the War: Humanity's Hope Diminishes Daily

Text: Adurnis

Design: Donald Duck

Thanks to: Ninj, punky-drummer01, Mackenheimer

Images: Sebastian Wehmeyer, OrangePheonix, NickWeb85, Sirruf

In early 3305, the largest event involving independent pilots that the Galaxy had ever seen began. The Distant Worlds 2 expedition saw nearly fourteen thousand people set off to cross the entire Galaxy, cumulatively travelling unimaginable distances and redefining what members of the Pilots' Federation could collectively achieve.

This month, we look back at the expedition now that it has come to an end, and catch up with its organisers.

An insight into how the early plans of the Distant Worlds 2 (DW2) Expedition were formed, what motivated them, and how they were eventually implemented — by Erimus Kamzel, Project Leader.

The first early ideas of a new Distant Worlds expedition began during a gathering of commanders at a Pilots' Federation event on Earth two years before the expedition launched. I remember meeting a lot of fellow explorers there, some of whom had been participants on the Distant Worlds 3302 expedition (DW1), and who still talked fondly of that event and were keen to know when the next DW event would take place.

At the gathering, a whole range of activities were discussed, and attendees were keen to try some interesting new activities as part of any second expedition. With a variety of ships and technology set to be released throughout 3304, commanders were keen to incorporate these innovations into our journey. Among other things, mining would be an important new feature for participants with some innovative and explosive mechanics. Fleet carriers were also discussed along with squadrons and ice worlds. Explorers would make use of new exploration technology as well, including planetary mapping, allowing commanders to discover a whole codex full of new things.

This was the kind of excitement we had been waiting for before announcing a follow up to DW1, and coupled with the lingering enthusiasm that the original DW event still had amongst those who experienced it, I felt the timing was right to start seriously thinking about its sequel.

For Distant Worlds 2 to be more than just a rerun of DW1, it was important to find ways in which to incorporate as much of the new technology as possible into the expedition. In addition, I felt that a new Distant Worlds event needed to appeal to a wider scope of pilots.

On DW1 we were creating the first Jumponium highway across the Galaxy, and the practical reason of why we were embarking on such a trek was to seek out Jumponium-rich systems from Pallaeni to Beagle Point for the Galactic Mapping Project. This provided reasons for 'prospectors' to take part on DW1, which ultimately lead to the birth of the Rock Rats group.

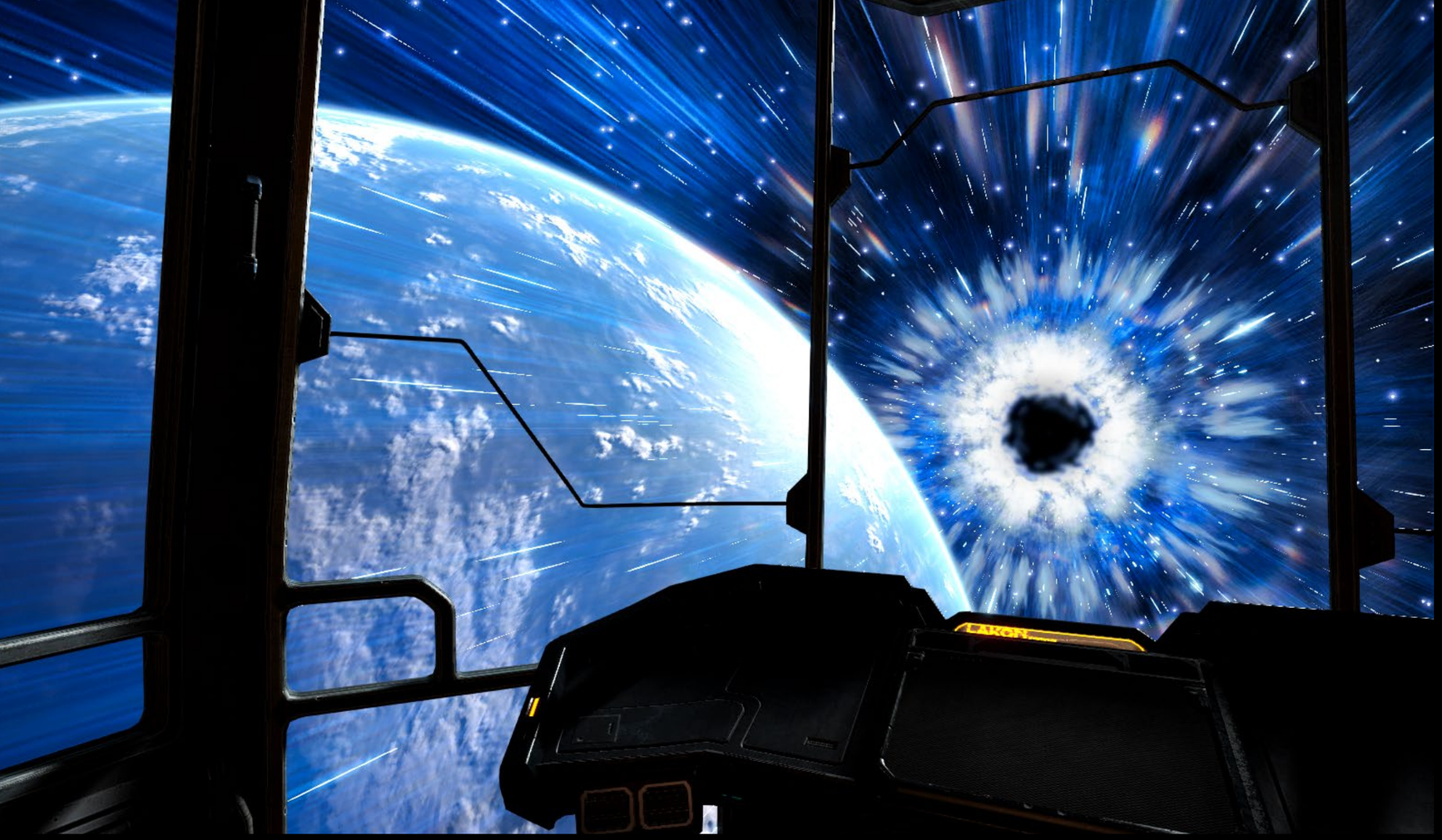
For DW2, another trek across the Galaxy needed to have a different reason for us to go again — and this time something with a lasting legacy along with a narrative for its many participants to look back on and feel a sense of achievement and pride for being part of this grand adventure.

So, a journey to seek out unique anomalies and content for the Codex, or the building of something out there in the depths, far from home, would give DW2 just that - both its narrative and its lasting galactic legacy.

In addition, one thing that I was extremely keen on integrating into Distant Worlds this time around were fleet roles beyond just the 'explorer' role. And not just roles in name only, but roles that actually had some tangible purpose behind them to warrant their inclusion on a deep space event. Roles offer participants a variety of activities to invest themselves into, they encourage teamwork. A variety of roles flesh out an event and open it up to being a multidimensional undertaking that caters for many different types of pilot. Those are core aspects of what Distant Worlds is all about — the diversity, the social interplay, teamwork, and community.

One such role that often cropped up in expedition discussions was that of the 'Miner'. And with the upcoming mining revamp, I was keen to incorporate this if at all possible as not only would this be an awesome revamped mechanic to utilize and experience far out in the depths of space at some of the Galaxy's most iconic locations, but mining itself would open the event up to incorpo-

This was the kind of excitement we had been waiting for.



rate all sorts of peripheral activity; such as prospecting, transport roles and logistics via limpet supply, and even the inclusion of hull mechanics (since deep core blasting had an element of danger to it).

After returning home from the meeting of pilots, I began writing the first draft of DW2 — exploring ways in which, given the current features and those scheduled for 3304, we could create practical reasons for miners to have some tangible roles to play on a journey across the Galaxy. I initially wrote two mining-based objectives for DW2 and shared the ideas with Dr. Kaii and members of the Rock Rats group for their input, before opening the proposals up for community discussion in early 3304.

The first objective was to build a science station at Sagittarius A* via mining, the second one was designed to round off the expedition by having the surviving fleet members help build an outpost on the surface of Beagle Point, planet 2, at journey's end. This latter objective had to be reworked as the logistics of building anything that far from human controlled space proved to be unfeasible and eventually that objective became the Omega mining base event held at Waypoint 2 instead. Its focus would be to extract the raw materials needed for construction of the Sag A* starport.

But with the objectives, we now had an event to pitch that not only catered to explorers but also incorporated industry and logistics-based activities. Projects based on these aspects were discussed and gradually over a period of a few months in early 3304 the roles associated with those projects were ironed out.

Expedition organisers are always looking for ways in which to link up community-created ideas, and I was keen to incorporate as many of them as possible into the expedition. In early 3304, I invited several content creators to become part of the DW2 organisation team. Qohen Leth implemented the fleet roster and helped set up the registration process. This became integral in promoting DW2, as alongside the roster sign-up, we presented the defined fleet roles that pilots could take on, with each role including a synopsis of what they entailed. Mad Raptor came on board to oversee the expedition geology project, the Rock Rats and Polish Dan of the IMU to oversee prospecting, the objectives, and mining. Satsuma was brought in to set up his Science project. Kolato was invited to create the Tour Guides, Wishblend to implement elements of the campaign, and Karanth to work on bringing aspects of the roleplay campaign into practical scenarios. Olivia Vespera set up the fleet logistics aspect of the expedition, and Alex Brentnall implemented the fleet mechanics role. These would be the early team leaders that brought their ideas and creativity to DW2, helping to flesh it out and compliment the objectives, Codex discovery events, and mapping projects that made up the core of the expedition.

DW2 would now include multiple aspects and roles based upon exploration, geology, industry, science, logistics, and even roleplay. As a result, we now had an ambitious event that incorporated many aspects of community-created content, and as such it appealed to a much wider spectrum of the community. But we had no idea that almost 14,000 people would eventually sign up to take part!

In the Autumn of 3304, Dr. Kaii and myself discussed the proposals at some length with the Pilots' Federation. Eventually, after a few amendments and compromises, we had an event that they could work with us on, and one that would give the expedition a chance to pack as much new content, new roles, new objectives and goals, into it as possible; all playing out against that background narrative of building a starport at the heart of the Milky Way — The Explorer's Anchorage — a lasting legacy of what the Distant Worlds Starfleet accomplished during its five-month journey of discovery across the Galaxy.

We hope that the popularity and success of Distant Worlds 2 has given some food for thought for everyone on how expeditionary events can capture the imagination of thousands of pilots interested in exploration, cooperation, and the social aspects that these large-scale events pride themselves on. The social aspects of DW2 worked well because they catered to a variety of career styles and encouraged pilots to take on some semi-specialised roles that complimented each other and fostered teamwork.

The new technologies and innovations of deep core blasting were a fantastic addition, and via DW2's construction and resource-gathering objectives we were able to give miners and prospectors a reason to embark on this deep space journey. Without these objectives, there would have been very little practical reason to include them at all, but as we discovered, industry, logistics, and the resource-gathering that was required to complete certain DW2 mission goals out in deep space, and all the peripheral roles associated with them, proved to be some of the most enjoyable and successful aspects of the entire DW2 experience.

Maybe this too will be one of DW2's lasting legacies, paving the way for future expeditionary events to become much more inclusive to a variety of specialist activities, and the roles that emerge from them.

MEMORIES FROM A FEW OF THE ORGANISATION TEAM

Ouberos

– DW2 Fleet Member

For some reason, I'm not sure why, but some folks decided to travel on DW2 with trading goods. Olivia Vespera headed the project to gather an example of every commodity and Rare good available — which on paper sounds easy enough. Only this was several months before DW2 began and these things were going to have to be stored until launch day.

This was where Cmdr Pollycough came in. A while back he had been heavily involved with the first trading depot business and had several Cutters and T9s which could be used to 'warehouse' goods. With his know-how and contacts, they began to collect the straightforward goods and the easily available 'rares'. They were stored in the warehouses — things were running smoothly. Suddenly this mad little project had become a substantial undertaking.

My involvement came later. I was known to both commanders from previous adventures. I'm a pirate by trade. I had worked with an organisation called Sacra Oculus in the past to try and liberate some of the 'lost' rares which are blocked by factions [which prohibit their sale].

The rares were safely stored on board a Cutter. All of them — every single one. Hey, did I tell you I'm a pirate?

So anyway, I've known Polycough a long time. He trusts me. I ask if I can make a delivery to the warehouse. He agrees — we've been working together for a few weeks. Nothing unusual about that.

Only I spoke to a few people about how to drop a Cutter's shields real fast. I had a Python and the general consensus was that three 3C overcharged Plasma [Accelerators] will do the job. Make a big dent and put the hijeebees up him. So I cruise in, make my drop of cargo from Kamitra and we [are] chatting away. Then I deploy hardpoints and tell him to stick 'em up.

He runs, I drop his shields, and he comes to a stop. It was almost too easy. I scan him. Can't wait to see every single rare, in one place. I'm going to take a bunch, I'm going to rob the DW2 warehouse. Only it turns out Polycough doesn't trust me after all, and the only things on board are my Cigars!

Dr.Nagi

– Distant Radio 3305 DJ

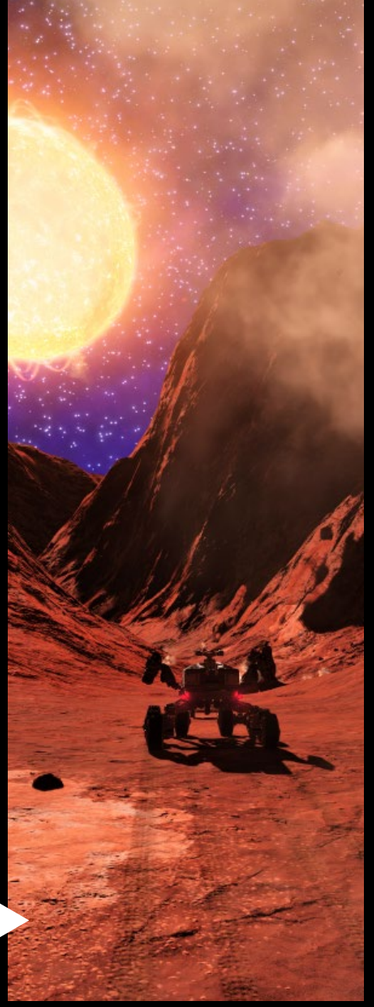
My first involvement came through Distant Radio 3305 which I helped build from the start, organising people and interviews, as well as collecting news for our DJs to broadcast. Through the interviews, we could establish connections with different parts of the community, including *Sagittarius Eye*, and provide interesting content not only for the Radio but for our video channels as well.

I was also involved as a 'DW2-Helper' on the fleetcomm server, giving information and guidance to expedition members and having a direct connection to the moderation and organisation team. Later on, I was promoted to Event Team Leader as I was put in charge of hosting and coordinating the Grand Formation flying and mass jump instances, the latter being initiated by Rebecca Lansing. It also included planning these events, and I even had the honour of announcing the last stage of the expedition live.

This involvement helped me stay sane out there, as I felt rather lost within the huge [number] of expedition members. It wasn't a big achievement to reach Beagle Point for me either, as I have been there before.

I did have some fun, though, circumnavigating the 'Quantum World' in my SRV, during which I got stuck in orbit and had to be rescued by Cmdr Huskeer42 because I had reached escape velocity. I also found two potential POI's during Stage 3: 'Mapping the Aphelion', and submitted them to the Galactic Mapping Project, and also became a member of the Hull Seals.

So far, so long, thanks for the fish!
Arf



Eisen

– Prospector & Mining Team Leader

As a Rock Rat and organiser during DW1, I was already involved in the planning of DW2 from the early stages. As soon as it was clear that the Pilots' Federation would give us two Community Goals, my task was the conception and fleshing out of the CG texts and the planning of how and where the CGs would be placed. I did this together with Michael Darkmoor.

I wrote and took care of the CG forum thread. Also, the Rock Rats as a group were asked to provide assistance to the fleet should there be the need for the prospection of Jumponium materials. In the case of WP8, I wrote a short prospection guide for the fleet.

Planning the CGs proved to be quite gruelling because communication with the Pilots' Federation was like Chinese whispers. All had to go through intermediaries, and the existence of an NDA those intermediaries had to sign blocked off a lot of information. I almost never knew in advance what would be feasible and what would not.

Ultimately the Pilots' Federation changed almost everything we had worked out, and even altered the CGs while they were running, buffed station outfitting, added a shipyard to Omega Mining, and so on.

Overall I'm glad that we managed to get the Explorer's Anchorage starport built but I can't deny a feeling of exasperation [due to] the involvement of the Pilots' Federation in the expedition.

Apart from that, I enjoyed the expedition very much — I had some great meetups at waypoints and the sights en route were certainly amazing.

We had no idea that almost 14,000 people would eventually sign up to take part!

Wishblend

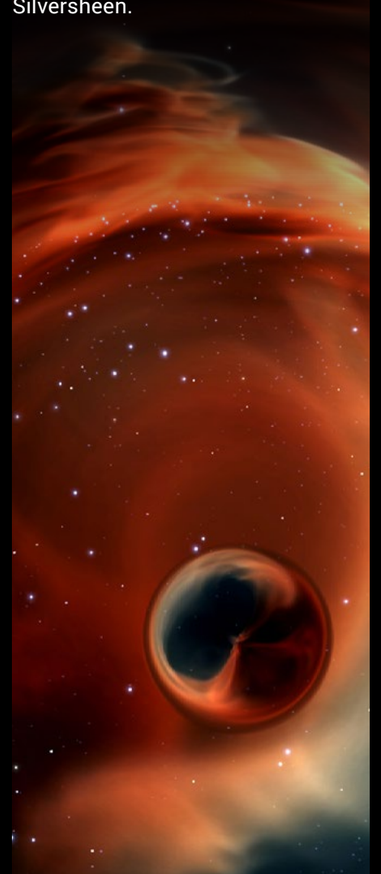
– DW2 ED:RPG Gamemaster

I am the roleplay coordinator and creator of the official DW2 roleplay story.

My job on the expedition was to coordinate stories other pilots created as well as certain roleplay events.

As the expedition set out, I took what was happening in the Galaxy (be it ships crashing into a planet a lot, or a pirate attack against the DW2 expedition fleet) and incorporated it into the official DW2 story.

The official story is made up of events in the [expedition], the ship-borne fighters of the fleet defence force and a group called 'Bandits' that are fighting over some damaged escape pods that have appeared in some strange gravitational anomalies. The rest of the story follows the adventures of Cmdrs Snorks [and] Silversheen.



Those are core aspects of what Distant Worlds is all about — the diversity, the social interplay, teamwork, and community.

Qohen Leth

– Fleet Roster Administrator

I was in from the beginning, back in early 3304. My main roles were the graphic elements (logos, banners, ship showcase, posters, sometime later the website) and the Roster, which had me working daily on it for well over a year.

Up to the actual launch I was also very active as a Mod and DW2 reference on the FleetComm server. I also made the embroidered patches available — they were a ton of work, I was surprised to receive so many orders!

I enjoyed preparing DW2 for over a year more than the trip itself, to be honest. On DW3302 I was a new [pilot], but even before DW2 started I was severely burnt out. I had a few great discoveries, but for the most part my enjoyment was out of the [cockpit].

I'm looking forward to meeting up with the rest of the organisation team at Beagle Point, before powering down the ship for good.

The most challenging and difficult aspect of my entire DW2 experience was working with the Pilots' Federation. It was extremely frustrating, in several aspects. I will not do this again.

CDR_WillTRiker

– DW2 Console Fleet Member

I am CDR_WillTRiker and part of All-CrowsAreBlack's organisation team.

My main objective within the DW2 expedition was to help people with the mining for the two Community Goals: assist in outfitting, finding teams to mine and logistical worries. But what most people might remember me for is that I organized the mapping of rings ahead of both CGs which brought us the indite and bauxite hotspots – as far as we know, the only ones found to date.

This wouldn't have been possible without the countless numbers of commanders that helped, and I am eternally grateful to them.

The best part about DW2 for me personally was meeting those dedicated pilots that had the same mindset and wanted to show our best with the community goals. [The Pilots' Federation] community is one of the best out there and I feel happy to be part of it for years to come.

Chankk Saotome

– Distant Radio 3305 DJ

I'm Chankk Saotome. I'm just a dude.

Before the launch of DW2 I contributed heavily to the Distant Worlds 2 Survival Guide with information on stars and their hazards, as well as most of the work on Modemus' Survival Supplement with detailed information on Neutron Boosting.

Most may know me from the radio which I helped found with Mykl, the boss of Distant Radio 3305; Dr.Nagi, who has been pushing me for a year at this point to always do more; and Henkka, one of the heads of DECE who brought me on as occasional interview cohost and got me interested in the idea of interviewing fellow commanders.

I began as one of the original talking heads broadcasting two live shows a week from my region but usually mid-day to early-morning for most other commanders. Still, I did gain a regular following and group of avid listeners of the weirdness I was pumping into the galactic void. I am also an occasional co-host for the interviews run on the Radio. Sometimes I kill it, sometimes I ruin everything. I still have no idea what I'm doing. On top of the DJ gig, I also manage the Radio's video channels with editing interviews and shenanigan streams down and creating thumbnails for them.

I also occasionally had the opportunity to stream or record various unplanned social events during DW2 such as Synaptik's Folly in the Conflux and The Pumpkin Cult meet at the singular BioSite of Newton's Necropolis, which really connected me to the community of FleetComm and the DW2 Expedition.

Mate, I ain't done nothin' important. Ain't nobody special. I'm just a dude, a dude who yells at magnets. I'm just glad the lot of it gave me the opportunity to meet so many amazing commanders out there.

Distant Worlds 2

Text:
Erimus Kamzel

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McNicholl

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SHIPS YOU DON'T FLY

COBRA MK IV

One of the most maligned ships to have come out of any shipbuilder's yard is the Cobra Mk IV, the 'big brother' to one of the most beloved ships in space, the Mk III. Continuing our revisionist series on lesser-flown models, this month we take another look at the Mk IV and ask: is there really nothing it's good for?

Commander Unrealization is an explorer. Apart from his own solo excursions, he has led convoys across the Galaxy and served as a civic leader in Colonia. He has probably flown the Cobra Mk IV as much as anyone. He first bought one just to see what it was like:

"I'm a huge fan of the Cobra Mk III. It's actually my main ship for hopping from A to B, and my exploration ship as well, as crazy as that may seem. Initially I was simply curious to see how the new model of the Cobra would differ from the old one," he told us.

The Mk IV follows a design pattern Faulcon deLacy have employed before: that of taking a popular chassis known for its speed and handling, and giving it greater survivability and module flexibility. The Viper Mk IV is the most well-known of these experiments. Broadly considered a success, the Viper Mk IV resembles a Mk III in appearance but is a very different beast. It is broader, larger, more capacious, and better-armoured than its sibling. It finds use among a small but enthusiastic cohort of Pilots' Federation commanders, who praise its flexibility.

The design of the Cobra Mk IV follows this logic. It takes the Cobra Mk III frame — universally popular for its unusual combination of speed and cargo capacity — and beefs it up, adding more module space, armour and increasing its arsenal.

"I like to call the Mk III the little brother of the Mk IV, even though it's not completely accurate," Unrealization says.

So why does nobody fly it?

To answer this question, it's worth revisiting the Mk III to explore why that ship is so loved.

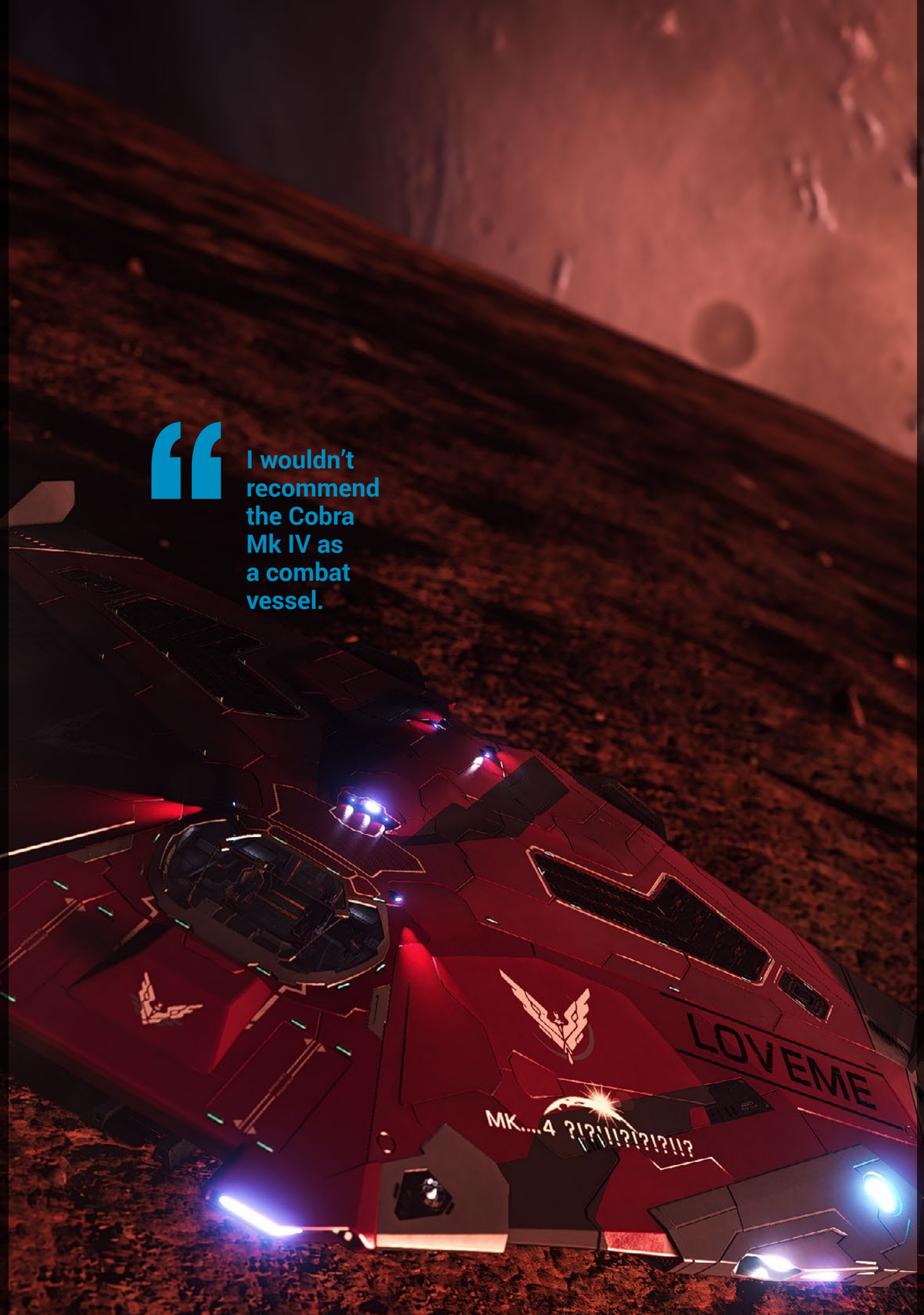
Reviewed extensively in this magazine in Issue 5, the Cobra Mk III is a classic. It is consistently one of the most commonly-bought ships among Pilots' Federation members and is an essential step along the common ship progression that marks a pilot's career.

"I simply fell in love with [the Mk III] as soon as I could afford it," Unrealization says. "I enjoy its speed and handling, especially in supercruise, and the fact that it can do five to six jumps on a single fuel tank is something that I found very convenient in places where scoopable stars are rare. It also makes an extremely good jump ramp for SRVs when gathering materials planetside with friends!

"I also think the compartment sizes are perfect for the ship. A size 4 fuel scoop allows me to refuel while I align for my next jump, and usually come out full each time. That means I can keep jumping indefinitely."

It is a true multi-role ship that can turn its hand to any task a career pilot might throw at it, with three outstanding features: blistering speed (properly outfitted, the ship cruises at close to the speed of sound, boost aside), impressive cargo capacity, and low price. It's fast, competitively armed and armoured, and can carry over double the cargo of a Hauler — for less than half the price of the next dedicated cargo ship, the Lakon Type-6.

> **I wouldn't recommend the Cobra Mk IV as a combat vessel.**



The Mk IV is very different.

In designing the Mk IV, the Faulcon deLacy engineers took the radical step of removing the most striking of these three advantages: speed. The Cobra Mk IV is slow.

"In normal space, or planetside, you can feel the weight difference," Unrealization explains. "[The Mk IV] turns a bit slower. For stock configurations, the Mk IV actually boosts only slightly faster than the Mk III can go without boosting."

With an unmodified cruise speed of 200 metres per second (m/s), the Mk IV's speed is equal to that of Saud Kruger's Beluga Liner, which is less a ship than a mobile holiday resort. The sensation of raw speed is one of the facets of space flight that most draws pilots to the flight seat, and its removal from a classic so known for precisely that characteristic was a bold bet on the part of Faulcon deLacy.

What could make up for such a drastic reduction in speed?

"The Mk IV has one additional size 4 and size 3 module compartment each, and it upgraded one of the size 2 compartments to a size 3. It also comes with an additional small hardpoint," Unrealization explains. "These changes are reflected in its weight, and therefore its jump range and speed, which are reduced compared to the Mk III. It also features a few slight changes to the exterior, with small winglets on its back and two small protrusions on its front."

The Mk IV's extra hardpoint is rarely cited as a redeeming feature: the original, though capable of defending itself, isn't a natural combateer, and the addition of an extra hardpoint while depriving the ship of its speed advantage is generally thought to leave the whole, on balance, less suited to combat.

"Due to its lack of turning speed, I wouldn't recommend the Cobra Mk IV as a combat vessel," Unrealization says frankly. "For someone who just recently made enough money to afford a Cobra and wants to do combat, I'd suggest using an Eagle or a Viper, as agility is an important part of combat."

However, he admits he has not pushed the combat potential of his Mk IV that far.

"The weapons on my Cobra Mk IV are mostly there as a deterrent, and I haven't made any modifications in regards to its combat abilities, like enhancing the power distributor. Given that nowadays everyone has their ships modified to the brim, I wouldn't consider my Mk IV all that suited for combat. Still, I have killed a few small ships, like Eagles, in self-defence," he recalls with a grin.

However, as any spacefaring grease monkey will tell you, the showroom specifications for any ship are only part of the story.

"After the emergence of the engineers, which conveniently happened around the time Faulcon deLacy introduced the Cobra Mk IV, we weren't limited to just using stock modules anymore. That helped a lot both with the speed and jump range issue," says Unrealization. "I am sure with proper modifications it can be a pretty decent fighter."

However, the size of the ship's power distributor is a real limiting factor in its combat potential.

"Personally I disagree most with the decision to add an additional hardpoint but not upgrade the ship's power distributor," explains Unrealization. "Especially if a laser is used in that extra hardpoint, you run out of weapon power noticeably quicker than with the Mk III."

So why does Unrealization fly the Mk IV?

Those extra, larger module slots translate to flexibility. “In the Cobra Mk III I have to choose between bringing a single [surface recon vehicle, or SRV] or cargo racks. With the Mk IV, I can [carry] two SRVs and cargo racks, assuming an otherwise identical setup,” he explains. “It provides more flexibility on how to outfit it.”

Mining is another activity that requires a lot of module slots — and doesn’t require a fast ship. “Due to its slower speed, the Mk IV also allows for some more precision [than faster ships] when getting close to things,” says Unrealization. “While I personally haven’t tried it for mining, I am pretty sure that it would make a better miner than the Mk III. Both because of the module compartments, and the aforementioned precision, which can be very useful when manoeuvring around rocks in planetary rings.”

Extra module slots also mean extra cargo capacity.

The Mk III can carry an absolute maximum of 64 tonnes of cargo; the Mk IV can carry 92 tonnes. That’s an increase of nearly 40%. The Mk IV has no fewer than four Class 4 module slots, two Class 3s, two Class 2s and two Class 1s. That makes the Cobra Mk IV comfortably the most capacious small ship and puts it alongside much larger ships like the Keelback in raw cargo capacity.

However, the plaudit of ‘most cargo capacity on a small ship’ isn’t a particularly compelling pitch, especially when considering that there are no stations or outposts restricted to small landing pads. Buyers are not constrained by a ship’s size, they are constrained by its cost: the Lakon Type-6 carries 22 tonnes more cargo, and is only 300,000 credits dearer — and is 10% faster out of the showroom, to boot.

Unrealization explains how he uses the Mk IV.

> **The Mk IV’s speed is equal to that of Saud Kruger’s Beluga Liner, which is less a ship than a mobile holiday resort.**

“I use the Cobra Mk IV mostly for exploration near the Bubble. Its main role, in my fleet, is as an alien research vessel. Being able to slowly approach and scoop up a Thargoid probe, and keep it safe in corrosion resistant cargo racks, is the main reason for me to keep it.”

Most Thargoid research (and Guardian research, for that matter) does not need to take place very far from the Bubble — the Pleiades are only a few jumps away, and Guardian ruins can be found within a few hundred light years of Sol. The Mk IV’s stock 24.9 light year jump range is more than adequate for distances like these.

Unrealization has, however, taken the Mk IV further afield.

“I used the Mk IV during the August Exodus expedition. Due to a co-operation between the expedition and the Twin Candles initiative, many commanders brought along slaves for the expedition, with the intention to free them on arrival at Jaques Station to be the first settlers in what is now known as Colonia. Because of the Mk IV’s ability to have SRVs and room to safely transport [cargo], I chose it over the Mk III. Its flexibility to set it up made the difference.”

He concedes, however, that this was a very specific use case.

“I wouldn’t use it for my regular exploration trips, because I simply enjoy the speed of the Mk III too much, and boosting through a canyon somewhere far from home is something I like to do to mix things up. But whenever I need to travel and transport something at the same time, the Cobra Mk IV is my ship of choice, despite doing a few light years fewer per jump.”

Unrealization has clearly experienced some wonderful things in his Mk IV — associations which, we suspect, form part of the ship’s enduring appeal for him.

“One of the fondest memories of my time as an explorer overall is connected to the Cobra Mk IV: the August Exodus expedition. I consider it a tremendous honour to have been part of the organisation team of the expedition that ultimately led to the creation of Colonia. And I made many friends during that time.”

The August Exodus: Jaunt to Jaques expedition of 3302 was the largest and most organised supply convoy to the stricken starport, helping to seed the nascent colony.

“There’s a little anecdote about my way back to the Bubble after the expedition. I stumbled across a downed fighter, a couple of thousand light years into the return trip. Thanks to having cargo racks, I was able to save [the occupants]. I carried them all the way to just a few thousand light years outside the Bubble, where I passed them to Cmdr Satsuma, who carried them back all the way to Colonia; where, as far as I am aware, they are now leading a happy life.”

> **Whenever I need to travel and transport something at the same time, the Cobra Mk IV is my ship of choice.**

Coming to the point

One of the most common arguments against the viability of the ship is that not everyone can buy it. The fruit of an unusual marketing plan by Faulcon deLacy and the Pilots' Federation, its sale is limited to pilots and corporate customers who gained their pilot's licence before certain dates in 3302.

"It's a shame they don't allow everyone to have it. In my opinion, it's been exclusive for long enough. And it's certainly no game-changer," admits Unrealization.

"Without modifications, it can feel a bit sluggish. It does turn slower than the Mk III, and it has a lower jump range."

But it still has a place and a specialism.

"I do disagree with many of the commanders I have talked to who say that it's useless: just a heavier Cobra. The additional compartments provide more flexibility and, in my opinion, justify the continued production of the Mk IV," he says.

Unrealization is perhaps more forgiving of the ship than some potential owners.

"In addition to being able to make improvements, I am also very tolerant when it comes to its drawbacks. I can accept that the added flexibility comes at a cost. I don't always need to be fast, either in normal space or while traversing the Galaxy."

We suspect that part of his enduring fondness for the Mk IV might be attributable to the remarkable memories he gained while in its flight seat. However, his final assessment of its capabilities is clear-eyed.

"The Cobra Mk IV isn't a ship I wouldn't recommend at all, but I think it is a bit of a niche product. For an inexperienced commander looking to do a little bit of everything, it can be a viable alternative to the Mk III."

It has one other feature worthy of note, too...

"The flat nose of the Cobra makes it very easy to put it on the ground to allow SRV drivers to drive onto the ship. Depending on the ship's angle and the SRV's speed that can lead to quite a nice jump," Unrealization smiles.

"In that regard, it's kind of like a portable hill."

Ships You Don't Fly: Cobra Mk IV

Text: Souvarine

Design: McNicholl

Thanks to: G-Dubya, Unrealization

Images: Zer0axis, StarFox

EXPLORING IN Style

THE SAUD KRUGER RENAISSANCE

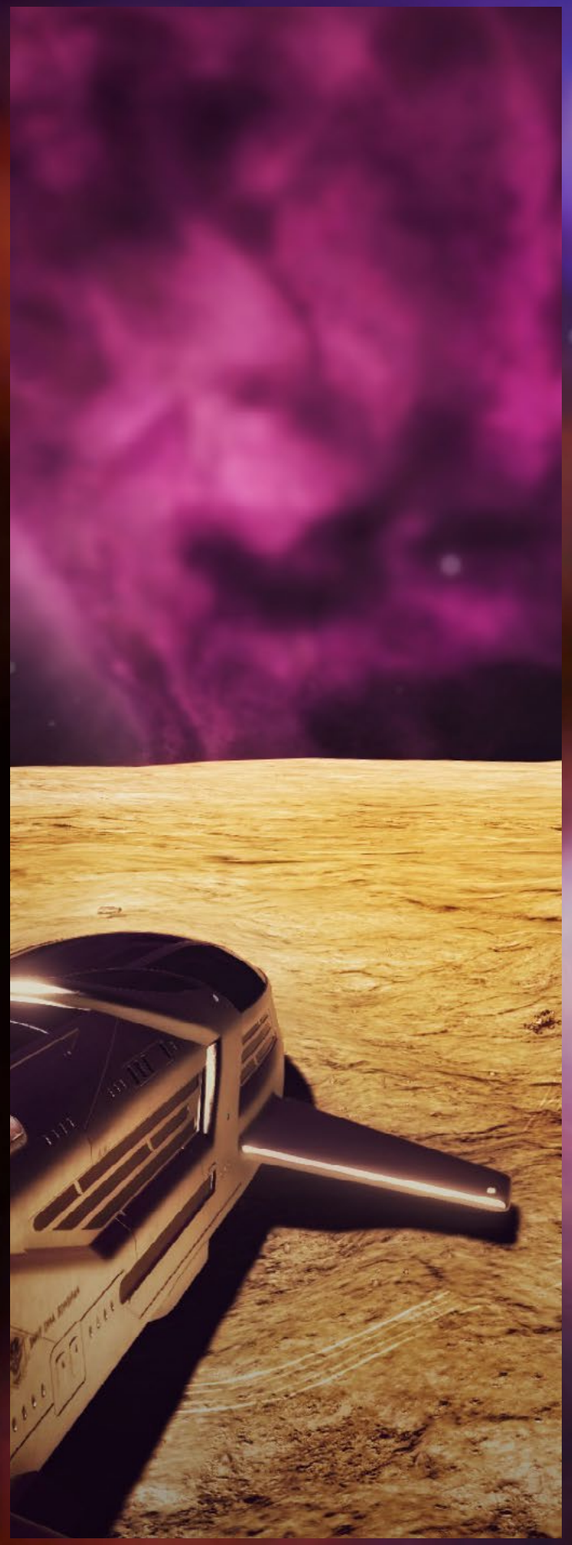
Until recently, there was something of an orthodoxy among independent explorers: Anaconda and Asp, good; everything else, bad. However, something unusual has been happening amongst the Pilots' Federation exploration community of late...

Last month, this correspondent witnessed an interesting conversation at the Millerson, a notorious space bar in the Alrai sector. A seasoned pilot pointed out to the other two at his table that, in deep space exploration, range was everything. Range, he said, lets an explorer be there first, "tag the stuff," and move on. The second fellow at the table countered that flexibility is paramount. An explorer needs to be able to handle any and all challenges on their own, because civilisation is thousands of light years away. Both nodded in agreement.

Finally, the third pilot smiled and pointed out that whatever you do, you should do it in style. In this day and age, he quipped, civilisation does not have to be left far behind when going on a 'survey cruise'.

He opened his hand and a hologram sprang out: a spinning Saud Kruger Beluga Liner in red and gold. The other two looked puzzled; first at the man, and then at the ship.

This conversation — and the apparent clash of pilot cultures — summarises what a portion of the exploration community has debated over the last few months, if not years: because of a number of industry and management decisions, Saud Kruger ships are becoming more and more attractive for survey trips into the black.



The days in which Dolphins only showed up for such hilarious events as the Silly Ships Expedition of 3303 seem to be over. There is a real fight going on between those pilots wanting to sit in a 'real' cockpit and those wanting to sit at a bar, while still in the 'exploration business'. While the Dolphin only made up 0.7% of the Distant Worlds 2 fleet (95 ships), the fleet also contained 154 Orcas (1.14% of the total) and a stunning 275 Beluga Liners (2.03%).

Some explorers express disbelief at this new trend, but others point out: why can't explorers have nice things in a serious, lonely, and often dangerous business?

Saud Kruger introduced leisure and style to exploration.

The source of this division is deeply rooted in psychology and a great deal of nostalgia: Until recently, explorers — and, by extension, the ships they used — leaned into the philosophy that 'being out there' meant being cut off from supplies, a shower and the general amenities of civilisation. Traditionally, explorers are a no-frills people able to survive indefinitely on 3D cartridge meals made of soylent (instead of grain-based cereal) and dried kelp. They recycle their ship's coolants into alcohol, and vice versa. Their ships are ugly, angular beasts held together by spittle, duct tape and the sheer willpower of their owners.

Now compare this to a Saud Kruger Dolphin. Originally advertised as a small passenger vessel, it has quickly and undeniably gained a reputation as a reliable ship for ferrying tourists to their famous resorts and vistas, as well as a flashy personal yacht for the style-conscious commander. The ship is sleek and elegant, and — with a price tag of under two million credits — it's relatively inexpensive to fly. Saud Kruger has poured billions of credits into marketing campaigns that portray their line of ships as the ultimate means to go on tourism cruises with style.

It's a job well done, and that is where the 'cruise' attitude comes from: Saud Kruger introduced leisure and style to exploration and the company hit a nerve in the minds of the camera limpet aficionados, eager for footage of their silvery, mirrored hulls drifting elegantly in a gas giant's icy rings.

Commander TwoSpoons77 commented:

There comes an age to us all, this commander included, when the thought of being strapped into a rickety [Diamondback Explorer], an Asp Miner (sorry, Explorer) or an Anaconda sounds like hell. Who wants to fly ships stripped so light that the only life support comes from a blanket and an old wood burner stuffed with Galactic Travel Guides?

The Dolphin is the smallest of Saud Kruger's lineup. It boasts basic entertainment facilities that hardcore explorers would most likely label as superfluous luxuries.

The Dolphin's main strength, however, is its astonishing modular capability for a ship of its size and purpose. It surpasses that of the famous Cobra Mk III or even the Diamondback Explorer (DBX). In contrast to a DBX — one of the most successful exploration ships — a Dolphin boasts a Class 5 internal module slot. Taking into consideration its Class 4 frame shift drive (FSD), this means that pilots can fly on what they call 'FSD +1': a fuel scoop one size class bigger than the FSD, which means faster fuel scooping and thus fewer heat issues.

At this point it must be said that Saud Kruger ships in general have a higher heat signature than their dedicated exploration counterparts. Some may call this a disadvantage, some a mere nuisance, and some may not care at all, but heat signature comparisons are an important factor when judging the reliability of a spaceship as an explorer. The Dolphin passes the baseline test, but heat dissipation will never be a feature in which the Saud Kruger ships excel.

Commander Kai Calimatinus explains:

While all three [Saud Kruger ships] have thermal capacity statistics similar to their contemporary exploration options (excluding the famously cold-running Diamondback series), all three run larger core internals, from thrusters to FSD to life support. This leads to a higher idle heat than one might look for in an explorer; and even engineered, close shaves with stellar bodies will still risk overheating the vessel.

The Dolphin has gained an additional significant boost from the Pilots' Federation module management firmware patch in April 3305, which redistributed modular access protocols. This freed valuable internal capacity for bigger modules and resulted in two additional Class 1 module slots for the Dolphin, which is a useful addition. For explorers, this meant they could move items like the detailed surface scanner (DSS) or the research limpet controller accordingly, thus vacating two Class 2 module slots. Again, for a ship of that size, that's significant.

This was not the only benefit for the Dolphin, however. There was also Saud Kruger's decision in late November 3304 to remove the ship's restriction on some internal module spaces that were designated 'cabin-only.'

With these two important changes in recent months, not only the Dolphin but all three Saud Kruger ships have become extremely versatile in terms of exploration. Geared with an SRV hangar and a cargo full of research limpets, for example, an unengineered Dolphin with a Guardian FSD booster can still reach a jump range of close to forty light years, a range that long has been the exclusive

domain of Asps, Anacondas and DBXs. additionally, the Dolphin can do this without sacrificing too much of its higher-than-average interior comfort standards, which is very useful on extended survey trips. Why not have a drink at the bar while the DSS does its thing?

If the Dolphin is already good at stylish exploration, the Orca and Beluga push the bar even higher.

A combination exploration and mining Beluga is not unheard of and speaks of the versatility the ship brings into the field.

The Orca has already been a popular exploration ship for some time now. It is cherished because of its high jump range and the number of modular configurations possible in a very stylish hull. The ship is also viewed as being adequately nimble in supercruise for its size. For this reason, the Orca is a premiere choice for 'planet hoppers': explorers keen on visiting planetary bodies in newly-discovered star systems in hopes of making discoveries on the surface while enjoying a fresh deli menu, along with genuine orange juice.

It should be noted, though, that the Orca's broad landing profile and fragile hull — coupled with weak thrusters — can make planetary landings somewhat hazardous for inexperienced pilots. As easy as it is to spend the money on an Orca, it is also easy to lose it. "Landing their broad frames can sometimes be more difficult than landing vessels with smaller footprints," admits Kai Calimatinus.

Like the Dolphin, the Orca can be flown and scooped on 'FSD +1' and can have an unengineered jump range as high as some forty light years with all the necessities of deep space exploration, like an SRV hangar, an auto field-maintenance unit (AFMU) and a stockpile of research limpets, along with the appropriate controller.

Overall, the Orca is roomy enough for any modular configuration one can think of when having a mixture of exploration and Lavian Brandy in mind. If some engineering genius had managed to squeeze the Keelback's fighter bay into the Orca, the Orca might well have been one of the most popular exploration ships of all time.

The main downside of the Orca is the price tag. For all its style and the Class 5 or 6 modular compartments, outfitting the ship with A or B-grade quality equipment will quickly stick an explorer with a bill of a hundred million credits. For the very rich, this won't be a deterrent - but for the novices and casual deep space jockeys it may well be the dealbreaker, and lead them to more inexpensive — but equally effective — exploration ships like the Asp or the DBX.

If the Dolphin is already good at stylish exploration, the Orca and Beluga push the bar even higher.

This once more illustrates that flying a Saud Kruger in exploration territory is mostly a statement of style — all the more so if one manages to get hold of a golden livery.

Speaking of gold, the Orca's big brother, the Beluga Liner, plays in the golden league, both in style and in price. Again, for the very rich it may not be an issue to fly an exploration cruiser worth some two hundred million credits, but the vast majority of explorers will never do so. In fact, though the ship's use as an exploration vessel is increasing, it is telling that they still only made up slightly more than 2% of the Distant Worlds 2 fleet.

An unengineered Beluga with a Class 5 Guardian FSD booster can reach a jump range close to thirty-eight light years, even with an SRV hangar and the ship's 'modular jewel', a fully equipped fighter bay. On the downside, where the Dolphin and the Orca can be flown on 'FSD +1', the Beluga is down to 'FSD -1' — its maximum fuel scoop size is one smaller than the FSD. Since the ship also suffers from heat issues due to its overall bigger module classes, the longer scooping times and prolonged exposure in a star's corona can be seen as a disadvantage.

On the other hand, with the aforementioned abolition of the passenger module limitations, the Beluga boasts the ultimate modular flexibility and is rivaled only by the Anaconda and, possibly, the Imperial Cutter, although a comprehensive comparison with those two ships would warrant another article. Suffice to say that a combination exploration and mining Beluga is not unheard of and speaks of the versatility the ship brings into the field while still offering zero-G cricket to its crew.

Its handling is competitive, too. Kai Calimatinus comments:

Although the Beluga is not the most agile ship (of the Saud Kruger line), for its size it is nonetheless impressive and not dissimilar to the Federal Corvette, flying marginally better than the Anaconda.

However, in this correspondent's view the greatest advantage of the Beluga is its large telepresence projector in combination with its fighter bay capacity, making deep sky exploration trips even more enjoyable with a number of like-minded survey specialists. The feeling of group accomplishment has done much to counter deep space dissociation syndrome (or 'space madness') over the last few years.

If nothing else, this ongoing debate shows that the exploration business is not static, and that with only a few cleverly-made decisions, commanders can adjust or even redefine what was formerly thought as orthodoxy.

Exploring in Style: the Saud Kruger Renaissance

Text: Andrew Gaspurr

Design: Balthazarn Noxx

Images: TwoSpoons77

TAMING THE STARS: Fusion Energy

Communication over long distances, flying a spaceship, or just staying alive in space: they all need energy. Or, to be more precise, electrical energy. It powers our ships, space stations and planetary bases. But where do we get that energy from? The answer is, quite literally, in the stars.

In this article, we recount the history of nuclear fusion energy and the remarkable effects it has had on the way we live.

For much of human history, humans burned fossil fuels to generate heat which, in turn, powered generators that produced electricity — augmented rarely with renewable power sources, like undersea tidal turbines or solar panels to capture sunlight. For a brief span of centuries after splitting the atom, we added nuclear fission to this arsenal, despite its drawbacks — but by then we had the goal of fusion in sight, keenly aware of its benefits.

Fusion was the most complex and technologically-challenging energy source to harness, but one with fantastic benefits. One free of the risks of meltdowns and lethal waste, able to produce enough energy to render it virtually without cost.

To understand fusion energy we have to go back to the stars themselves: the unimaginable amount of energy that they produce stems exclusively from the fusion of light elements within their cores. How does it work?

Atoms are made up of two parts: the shell and nucleus. The nucleus is positively charged and consists of protons (with a positive charge) and neutrons (with no charge). The chemical element of the atom depends solely on the number of protons in the nucleus — an atomic nucleus with one proton is always hydrogen. Additional neutrons change the mass of the atom but not its chemical element. Atomic nuclei like these with the same number of protons but different numbers of neutrons are called 'isotopes'.

The other part of the atom, the shell, has a negative charge and is made up of electrons. A neutral atom always has as many electrons in its shell as it has protons in its nucleus. It can gain or lose one or more electrons, but then it is called an ion, not an atom.

The nucleus carries over 99.9% of the mass of the atom, but takes up a minuscule proportion of its volume. Imagine the whole atom as big as a football stadium: the nucleus would be a grain of rice on the centre spot.

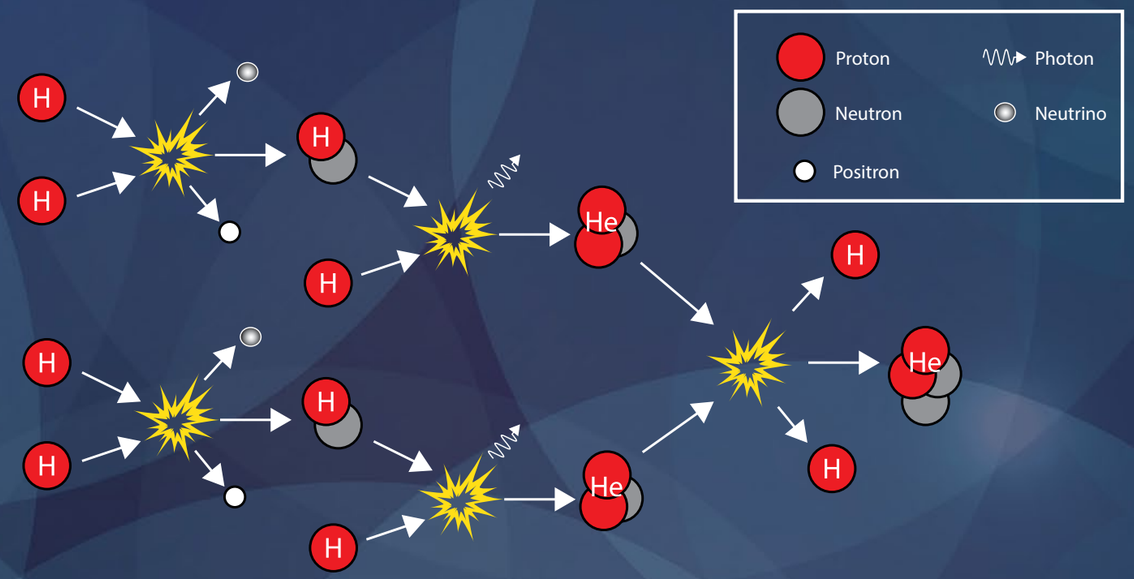
Like charges repel each other, while opposite charges attract each other. This is called the Coulomb force. The nuclei of more complex atoms contain more than one proton. The Coulomb force means that they repel each other and try to move apart, but there are stronger forces than the Coulomb force. The force responsible for keeping the atomic nucleus together against the Coulomb force is called the 'strong nuclear force' — it only comes into effect at extremely small distances. Both protons and neutrons are subject to the strong force, and this is the reason that nuclei with larger numbers of protons require the presence of a similar number of neutrons for stability.

So, to add protons to atomic nuclei to change the atom from a lighter element to a heavier element, you need to overcome the Coulomb force. This doesn't happen easily, even under the extreme conditions that exist inside a star's core. So how does it occur?

While classical mechanics cannot explain this, quantum mechanics offers us an explanation of how it works, through an effect called quantum tunnelling. Quantum mechanics describes how subatomic particles combine the characteristics of classical waves and particles. While a particle might be unable to overcome an energy barrier (in this case, the Coulomb force), a wave can do so — meaning that there is a very small probability that an individual proton can overcome the Coulomb force and join another nucleus. The probability that this happens is low, but the number of protons in a stellar core is very, very large.

"Energy can be released by fusing smaller nuclei together to form a bigger one.

A starport's fusion reactor, exposed due to damage



Fusion in stars

A popular misconception about stars is that they are huge balls of fire. They aren't: stars are extremely hot, but that has nothing to do with fire. Fire is a chemical reaction in which the shells of atoms (i.e. the electrons) interact with each other to form new molecules, made up of more than one atom.

Stars are so hot that they are made up of plasma, another name for ionised gas. And because a hydrogen atom is made up of only one proton in its nucleus and one electron in its shell, once it loses this electron there is only a proton. And no molecules can form without an atomic shell — so there is no fire in stars.

Every star is born from a cloud of gas and dust, mostly hydrogen, that starts collapsing or falling towards its core under its own gravity. When enough material is gathered, density, pressure and temperature rise to incredible values (respectively 150 g/cm³ or 150 times the density of liquid water, 265 billion bar, and 15 million Kelvin). And as soon as a critical point is reached, nuclear fusion starts.

Normally, the pressure and temperature inside a star are not high enough to allow the nuclear fusion of protons by normal means. But these tiny atomic nuclei are brought so close together that the quantum tunnelling effect can occur. The chances of this happening are small, but there are trillions of these nuclei close together inside a star, meaning that it does indeed happen.

The merging of two protons produces energy in the form of a photon, and a positron. This is an antimatter particle, the opposite of an electron, having almost no mass and a positive charge. This is important, because one of the two protons becomes a neutron and so deuterium, a heavy hydrogen isotope, is formed. This merges with another proton to form helium-3, a light isotope of helium, and more energy. The last step then is two nuclei of helium-3 merging, forming helium-4, the normal helium isotope, and splitting off two protons.

How much energy is produced through this process?

The most analysed and examined star in the Galaxy is Earth's star, Sol.

G-type stars like Sol fuse 600 million metric tons of hydrogen every second to produce 594 million metric tons of helium. The produced helium has less mass than the used hydrogen. The difference is the mass of the energy produced in nuclear fusion and can be calculated with Albert Einstein's famous equation $E=mc^2$.

The energy produced by Sol every second is 384.6 yottawatts, which is enough to provide energy for the whole of humanity in the early 21st century for 67 million years (one yottawatt is equal to 10^{24}, or one million billion billion, watts).

> Stars like Sol fuse 600 million metric tons of hydrogen every second

Fusion technology

Humans began exploring the use of nuclear fusion power in the early 20th century. The physicist Francis William Aston discovered that four hydrogen atoms have slightly less mass than one helium atom. This is now understood as the binding energy, and implies that energy can be released by fusing smaller nuclei together to form a bigger one as described above. With this revelation, the theoretical basis for all that would follow was laid out.

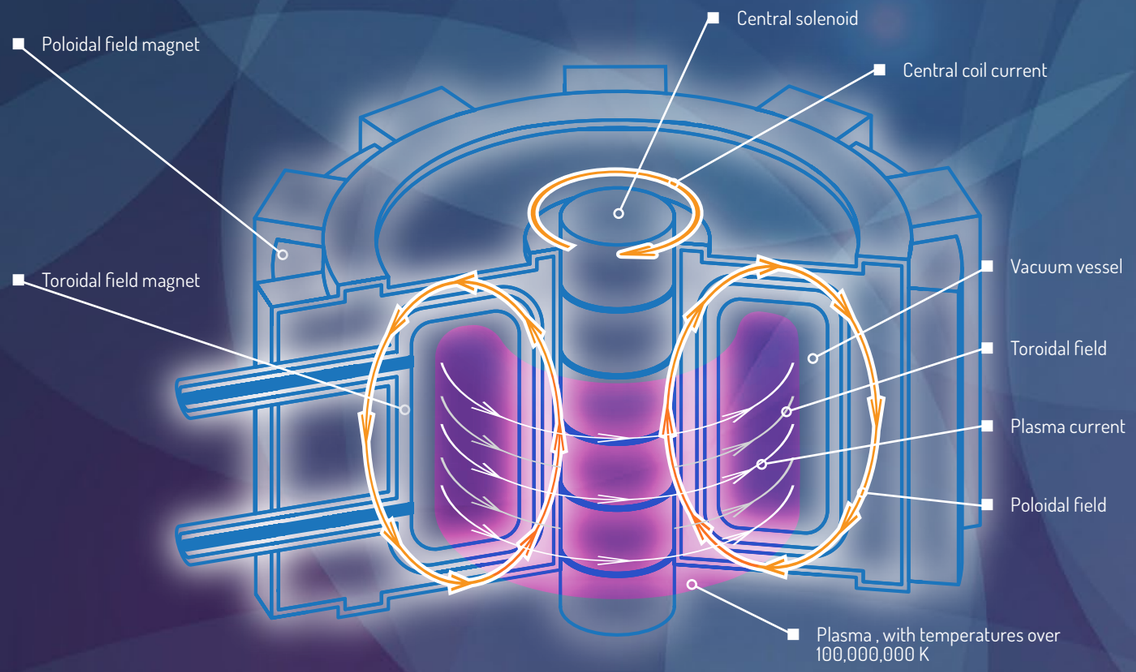
The first practical use of nuclear fusion was, sadly, not a peaceful one. Nuclear fusion bombs, or thermonuclear weapons, were built during the Cold War in the 20th century. They relied on atomic fission bombs to ignite an uncontrolled fusion reaction and released devastating amounts of energy.

At the same time, the first attempts at harnessing fusion power for energy production were made. These early machines were unstable due to problems containing the plasma. Nevertheless, at the 1964 World's Fair, the first public demonstration of nuclear fusion for power generation was unveiled to an audience.

Later in the same decade, the Tokamak-type reactor with its torus shape gained acceptance as a working concept. Although the first Tokamak was built in 1958, it was the serious improvements to it in the 1960s that led scientists across the world to believe that fusion power could actually work. From there it became the archetype of many fusion reactors to come.

The energy crisis of the 1970s triggered a need for the wealthier nations of Earth to search for a cheap and reliable source of safe energy. Although funding had been reduced, this was a period of great advancement for fusion power. The worsening environmental conditions on earth in the late 20th century laid the foundation for what would happen later.

A Tokamak reactor



An experimental research facility studying fusion reactor technology

In the early 21st century environmental conditions worsened further, showing once more that a new and clean way of producing energy was needed. This was later underscored by one of the biggest energy crises in human history during the 2030s, which forced governments to impose huge fossil fuel restrictions on their citizens.

In 2044, World War III broke out. Whole civilisations were wiped out as humanity unleashed its worst weapons, causing terrible damage to Earth's environment. However, war brought with it great technological advancements. Some of these helped in the development of fusion energy.

In the 2050s, the people of Earth started rebelling against their governments — they wanted peace. In 2055, the war ended.

Humanity began to rebuild. The new society was aided by new developments in fusion technology and power generation. Many of the advancements of the following millennium would not have been possible without this. A determined effort to colonise the solar system and to reach out to the stars was powered by fusion reactors as generation ships were launched into the void.

While the first commercial fusion reactors were still as big as a house, they were gradually reduced in size to fit inside smaller spacecraft like the Sidewinder. Interstellar travel, with the enormous amounts of energy it requires, would be impossible without these innovations. Fusion power is what makes undertakings like terraforming possible.

Every time you skim a star for fuel, it's hydrogen that you're scooping — to be fed into the fusion reactor aboard your ship.

Today, power has become extremely cheap. Hydrogen fuel is produced in every system inhabited by humans and purchased for credits on every space station. The economies of 3305 are no longer restricted by the amount of energy they can produce — in fact, fusion has made energy so abundant that its price is nearly zero.

This has had profound effects on our society, and as a development is arguably as fundamental as the frame shift drive in propelling us hundreds of light years from the planet of our evolution.

Taming the Stars: Fusion Energy

Text: LordTyvin
Design: McNicholl
Art: McNicholl
Images: OrangePheonix, Sirruf

The Long View:

Apollo 11 Expedition

> The president of the United States announced their goal of landing a man on Earth's moon by the end of the 1960s.

On 13th July 3305, an expedition consisting of over 200 explorers and travellers will launch from the Witch Head Science Centre in HIP 23759.

This, in itself, may not sound remarkable. Since the wide availability of the modern frame shift drive (FSD), there has been a veritable explosion in exploration, with expeditions of all sizes and of varying durations, some with a total distance of over a hundred thousand light years.

However, this expedition is different. Its purpose is to commemorate a now-largely-forgotten expedition that was one of humanity's first steps into space, and its first step onto another celestial body. The soon-to-be-launched Apollo 11 Expedition takes its name from these first and somewhat faltering steps into the Galaxy.

Many of the expeditions that take place today were unthinkable just ten years ago. The pace of change has been so rapid it feels like we, collectively, have a case of whiplash, catapulted forward by the breakneck developments in FSD technology. The arrival of specialist modules such as the Guardian FSD booster, and the engineers' mods and tweaks (most famously, those of Farseer Inc.) almost defy imagination. Commanders across the Galaxy speculate on where our technology could go from here. While no frameshift drive manufacturer has hinted of it, there's already scuttlebutt amongst pilots about a technology that could take a ship far enough to reach the globular clusters orbiting the Milky Way, or perhaps still further — to another galaxy.

It's not the first time in history that breathless optimism about space exploration has overtaken humanity. The imminent Apollo 11 Expedition celebrates such a period from our spacefaring past. It commemorates a time that popular culture has forgotten altogether. In its day it was deemed the Space Age, although looking back, historians are entirely justified in disputing this designation.

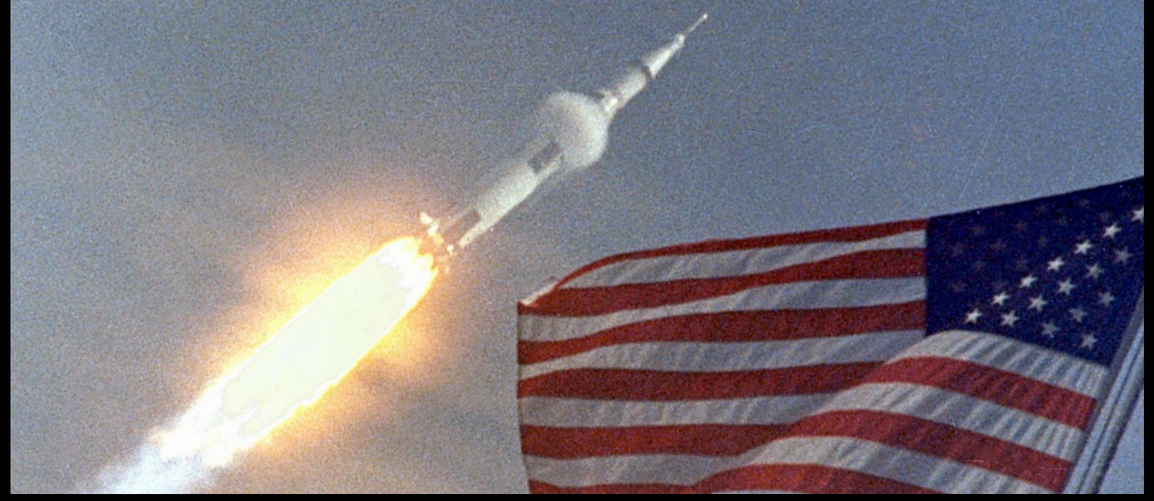
From Stone Age to Space Age

For about a millennium, we as a species have been able to take for granted easy and — at least in systems with reliable authorities — safe space travel. Even with the older hyperdrives before the advent of the modern FSD, a journey from star system to star system was a perfectly normal (albeit a very time consuming) event. While the development of the modern FSD and its rapid adoption is disorienting to many, the era in history that surrounded Apollo 11 had a similar effect on those alive at the time.

It was not until the turn of the 20th century — the year 1903 to be exact — that humans could so much as fly through the skies of Earth in powered and controllable aircraft. At that time, even self-propelled land vehicles were uncommon, with most people relying on their own legs for transport. The better-off had a horse, and the truly rich had a vehicle powered by a weak internal combustion engine. There were forms of mass transportation, such as trains pulled by steam locomotives belching flame and smoke like a dragon straight out of ancient mythology, but until 1903, there was no kind of aircraft that had any potential for travel.

This first aircraft was named the Wright Flyer, after its inventors, the Wright brothers. Its first short flight at Kill Devil Hills on the eastern coast of North America covered a distance shorter than the length of an Asp Explorer. Less than ten years later, aircraft were already being used for what seems to be humanity's favorite pastime: fighting wars.

Less than thirty years after the invention of the aeroplane, much of the planet became engulfed in war on a scale that had never been seen before, and mechanised to a level unimaginable only a couple of decades earlier. The two wars of the twentieth century produced a horrifying loss of life. The belligerents in



these wars were highly motivated to outpace each other in aerospace development, with each side desperate to make their aircraft travel at ever higher speeds and altitudes. New technologies such as the gas turbine jet and rocket engines were developed for the war. It's easy to see parallels with our current technological arms race in the current Thargoid conflict; our best research scientists and groups are urgently putting newly-discovered technologies, including those from alien races, into equipment for our ships so that we may counter this threat — just as the scientists of the twentieth century did. The end of the second war in 1945 marked the start of what was to be known as the 'jet age', as turbine engines replaced piston engines and aircraft began flying at the speed of sound.

After these wars, a new rivalry was born. Two superpowers emerged as implacable enemies — the United States of America (USA) and the Union of Soviet Socialist Republics (USSR), or Soviet Union. While these rivals were never officially at war, both sides became obsessed with proving that they were the best side, with the best engineers and scientists. The rocket motors that had been developed for the war were now turned to the more peaceful task of sending first machines, then humans into space.

Only 54 years after the very first powered and controllable flight, in 1957, the Soviet Union launched Sputnik 1 (Satellite-1) into orbit around the Earth. It was a primitive machine, carrying a few very simple instruments and a radio transmitter. The Soviet Union added to their success by sending the first human into space, a man named Yuri Gagarin on the spacecraft Vostok 1.

The early and sustained lead by the Soviet Union over the United States stirred the pot. Only four years after the launch of Sputnik, the president of the United States announced their goal of landing a man on Earth's moon by the end of the 1960s. This was to be the Apollo programme. The nation's ambitious goal was reached within the decade: on the 20th of July 1969, only eight years after the first crewed space flight, Apollo 11's lunar module *Eagle* landed on the moon. A few hours later, the commander of this tiny spacecraft, Neil Armstrong, made history as the first human to step on another celestial body.

Later expeditions even included a primitive wheeled vehicle, with a design not unlike that of our modern SRV. The last Apollo expedition was Apollo 17 in December 1972.

It would be the last time for many decades that a human being would leave low Earth orbit — to the surprise of most — as human space exploration came to an abrupt halt. Apollo 18 was cancelled, even though the spacecraft was fully constructed and ready to fly (and still exists in a museum on Earth today). Fiction writers had been writing books such as *2001: A Space Odyssey* that expected crewed missions to Jupiter and Saturn by the early 21st century, as well as space stations that resembled today's Orbis and Ocellus designs. Scholars and scientists also had grand predictions. A serious educational book published in 1978 named "The Universe and the Earth" predicted a permanent moon base and astronomical station by the year 2000, but it was not to be.

While the robotic expeditions that took place in the Sol system and the space stations Skylab, Mir and ISS, that orbited the Earth for many years aren't to be discounted — they were remarkable feats of engineering given the expertise and equipment available at the time — it was as if humanity had given up on space exploration. The feeling of 'technological whiplash' that space enthusiasts felt during the 1950s and 60s was suddenly replaced by silence and dust. Historians are agreed on the causes: the high cost, the end of the rivalry between the two main spacefaring powers, and an increasingly risk-averse society that simply didn't see the benefit of spending the money or taking the risks.

None of this, of course, suggests that history will repeat itself and that we will experience the same fate. However, it does suggest that innovations in space travel have arrived in fits and starts from the very beginning, often with long periods with nothing in between. It highlights that today's excited talk of visiting globular clusters around the Milky Way could be premature, and humanity may yet decide to draw back, just as it did in the late 20th century.

Celebrating Apollo 11

Commander Yanick is no stranger to the early history of human space travel. His first major expedition was the Mercury 7 Expedition which commemorated the 'Mercury Seven' - the original crew members of the Mercury expeditions, some of the first early crewed space flights into low Earth orbit. Yanick's commemorative expedition was a fleet of forty-four ships launching from the then newly-founded Colonia settlement to explore the Orio-Persean Conflux. Yanick was also one of the prime organisers of the Minerva Centaurus Expedition, a 104,000 light year trip around the relatively-unexplored eastern region of the Scutum-Centaurus arm; and the Lightning Strike Expedition, a shorter joint Colonia Citizens Network / Children of Raxxla journey to investigate systems of interest near Colonia.

With regards to Apollo 11, it seems about time to celebrate the most important expedition of the 20th century. Yanick explained his reasons for remembering this event, so long ago:

Apollo 11 is a seminal moment in the history of human space exploration. The first time that a person had walked upon the surface of another world. So it seemed only right to salute this early space flight. Something that in its time captured the imagination of the whole of our species. Looking back, it seems amazing, and even alarming that a crew of two people made this landing in such a small and fragile craft! This is all the more reason to pay tribute to this amazing journey.

The Apollo 11 expedition (A11X) launches with, at the time of writing, a fleet of 232 ships from the Witch Head Science Centre in HIP 23759. For security reasons, the final destination has not yet been announced, but the timing of the landing at the end of the expedition will be determined so that the fleet touches down on July 20th, 3305 at 20:17 UTC — the same date and time as the Apollo 11's Eagle lander touched down. One thing is clear, though: the touchdown will not be on Earth's moon, as the Sol authorities are still refusing permission for all landings.

Yanick told *SAGi*:

It's a shame really. This is something that would have made the expedition a bit more special, to have followed the path of these ancient spacefarers. To have been where they'd been. To have closely recreated their journey in the place that it all happened, over 1,200 years ago. Now that would have been a fantastic way to finish!

Finally, Yanick made an open invitation to all commanders:

The expedition is open to anyone who'd like to take part in space exploration. All people of goodwill who'd like to have their own adventure, all while paying tribute to those hardy pioneers of space. It doesn't matter whether you're new to this, or have millions of light years under your belt. You all have a place on the Apollo 11 Expedition.

Spacecraft comparison: Apollo and the Sidewinder

To get an idea of how small and fragile the spacecraft used by the Apollo expeditions were, here is a brief comparison with the most frail modern ship; the Faulcon deLacy Sidewinder, in its most basic E-rated configuration.

In 1969, two spacecraft travelled together from the Earth to the Moon. These made up Apollo 11. They were the Command and Service Module (CSM) named *Columbia*, and a lander (LM, pronounced "lem") named *Eagle*. On arrival in lunar orbit, the CSM and LM separated, with the LM making the trip to the surface and back. Two crewmembers used the LM to land on the surface, while one crewmember remained in the CSM.

It's difficult to draw an exact modern parallel to the cost of the CSM and LM, as today's economy is so radically different to that of the late 20th century, so our estimate has been calculated by comparing a variety of basic goods available today that were also commonplace in that era to give a rough comparison.

The result: at the time, the CSM and LM each cost roughly as much as a fully equipped Imperial Cutter.

	CSM – *Columbia*	LM – *Eagle*	Sidewinder
Crew	3	2	1
Length	11m	7m	14.9m
Width	3.9m	9.4m	21.3m
Mass	28.8 tonnes	16.4 tonnes	43 tonnes
Payload	1 tonne	< 1 tonne	10 tonnes
Power	6.9kW fuel cell	Batteries only	6.4MW nuclear
Design life	14 days	75 hours	decades
Earth-Moon transit time	~3.5 days	-	Less than 5 minutes
Cost	840 million Cr	1.1 billion Cr	34,000 Cr

The Long View: Apollo 11 Expedition

Text: Mack Winston
Design: McNicholl
Thanks to: Yanick
Images: NASA

Mckinnon's Heart & Soul

Over the years, our exploration and colonisation of the Galaxy have afforded humanity a boundless opportunity to expand. The populations of single worlds have grown from tiny colonies to thriving and diverse societies. Yet in each new city, each town, each station, people remember where they came from and remember the courage and drive of the ancestors that brought them there.

Amongst the transient population of interstellar traders and pilots; there are examples of the same reverence, although acts that commemorate the passing of veterans tend to be more solitary, personal and fleeting as the commanders of the Galaxy are scattered all across space.

So, when those commanders take time out of their work to travel to a location and

mark the passing of one of their own, such an effort is unusual and often not noted as they gather in a remote spot and pay their respects.

Commander Alexander Mckinnon passed away on 19th November 3304. He had flown as a privateer for thirty-four years, after receiving his pilot license in 3270, from the Pilots' Federation academy in Ashoria on Lave. Mckinnon had lung cancer and, after a short battle with the disease, died peacefully in his sleep.

During his time in space, journeying between stars and stations, Mckinnon would often take his young son with him and by doing so kindled the same wanderlust in the next generation. Now, Commander OrangePheonix is also a licensed interstellar pilot and takes up the story:

When I was a child he would take me on the odd trade mission showing me the Galaxy and telling me tall tales of strange worlds and strange aliens such as humanoid felines and Thargoids. I would sit in the co-pilot's seat watching in awe as he flew through the letterbox out into the great beyond delivering goods to the stars.

This instilled the desire to fly in me and I'm proud to follow in his footsteps as a member of the Pilots' Federation.

Our Galaxy is home to many wonders and those who have the means also have the privilege to glimpse some of nature's finest creations. One of these wonders is the Heart and Soul nebulae. The intense red output emitting from the 'Heart' comes from radiation emanating from a small group of stars near its centre.

I contacted the Pilots' Federation to ask if there was a possibility to have a memorial placed in the Heart and Soul Nebula, as I felt — being one of my favourite areas to visit and fittingly named — it would be a poignant resting place.

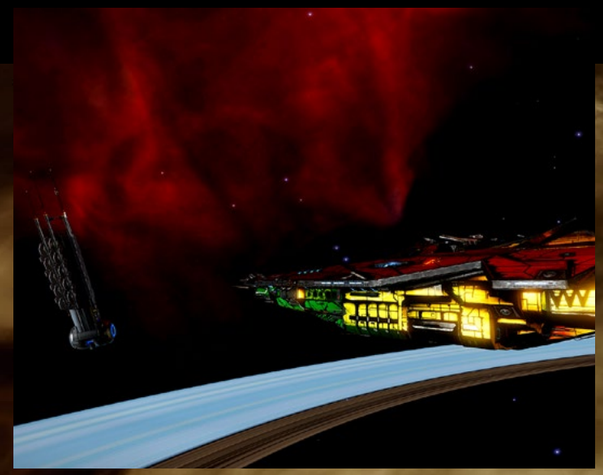
After hearing his story, the Pilots' Federation wholeheartedly agreed, approved funding, and began construction of his tribute. On the 26th April 3305, after the construction was completed, the listening post was put in place orbiting the 7th planet, a gas giant in the system Heart Sector EB-X C1-12.

Monuments are our way of building to commemorate individuals that are important to who we are. They celebrate lives, honour sacrifice and pass on an impression of those who are gone. Such creations are made out of materials that are solid and built to last. On old Earth,
stone lasts over
time, allowing generation
after generation to visit their ancestors
and think about what made them — but eventually,
even stone can crumble and fade.

In space, a monument is permanent and our past endures in the darkness, to be discovered, honoured, celebrated and remembered all over again.

Commander OrangePheonix had that opportunity when the listening post was finished.

As soon as I heard of its completion I immediately took my explorer Anaconda, Orphan Annie, *out to see it with my own eyes and have some personal reflection time at his memorial.*



On my return, I posted my appreciation on social media and the commanders' reactions were so vast and supportive with many expressing their condolences and desire to visit.

Lives shared in space form a special bond. Many of these pilots had never met Commander Alexander Mckinnon or Commander OrangePheonix, but all of them shared the same experiences of living in a vast expanse, beyond the comfort of a sedentary life. They recognised the bond: the bond of the explorer, the adventurer, who 'longed to sail forbidden seas'.

Having received a number of messages, OrangePheonix decided to arrange an event — a voyage to the listening post as a group, affording everyone who had contacted him the opportunity to travel there and share something of their lives whilst also learning something about his father.

I decided to share my intention to fly my father's Cobra Mk III, Infinity & Beyond, *out to the memorial as its final resting place, as my father never got the opportunity to visit the Heart and Soul.*

I posted an open invitation to any commanders who wished to come out and pay their respects in conjunction with the Cobra's final flight and decommissioning at the memorial site.

Once my intentions were shared I began the long fight to Heart and Soul in the Cobra. With as little refit as possible, I adjusted the Cobra to allow the flight by adding an extra fuel tank, size 4A fuel scoop and AMFU. After plotting the route I discovered that the un-engineered Cobra and its 21ly jump range would take over 400 jumps to reach the memorial to cover the 7,500ly distance.

During the journey, I took the Cobra through many experiences that my father had intended but never managed, such as taking it through its first neutron star supercharge, landing on new worlds outside populated space, and finally landing at its first asteroid base.

Once docked at 'Base Camp' asteroid base (Soul Sector EL-Y d7), a few days early, I awaited the selected date for the meet and while waiting, I took an express ship back to the Bubble to then fly my own ship, named after my father and grandfather, to make the meet.

The word went out and spread across the Galaxy. Commanders came from all over, making their way to the agreed location at the agreed time. Some even arrived with gifts.

In my open invite I listed suggested tribute items such as Arouca Conventual Sweets as my father had a rather sweet tooth, Fujin tea or Ceremonial Heike Tea and Jaradharre puzzle boxes, as he loved the challenge of intricate difficult puzzles.

When the day came, OrangePheonix unpacked *Infinity & Beyond* from station storage one last time.

I refuelled the Cobra for its last flight and opened comms to discover who was present in the station, as I had no idea on how many if any commanders were able to make it.

It was then that it hit me when the roll call began that a good number of comamnders had taken the time and effort to accompany me on this emotional event.

"I took the Cobra through many experiences that my father had intended but never managed.

As it turned out, ten had made the journey and we all made our way to the memorial site.

We all arrived safely and gathered around the memorial listening post while the pilots read the memorial message. We were then treated to a translated version of Im Abendrot, *read by Commander Vex:*

How lovely is your world,
Father, in its golden radiance
when your glory descends
and paints the dust with glitter;

when the red light that shines from the clouds
falls silently upon my window.
Could I complain? Could I be apprehensive?
Could I lose faith in you and in myself?

No, I already bear your heaven
here within my heart.
And this heart, before it breaks,
still drinks in the fire and savours the light.

- Translations by Richard Wigmore, first published by Gollancz and reprinted in the Hyperion Schubert Song Edition.

Afterwards, we took to a moment to compose ourselves. Then, while listening to an ancient piece of music from the 20th century — Monty Python's Galaxy Song, *chosen by my father and played at his funeral, we all began jettisoning our tribute cargo. This included Fugin Tea, Hutton Mugs, Arouca Conventual Sweets, Eranin Pearl Whisky, Ceremonial Heike Tea, Chateau De Aegaeon, Jaradharre Puzzle Box and Saxon Wine.*

In the end we had hundreds of canisters floating around the memorial and Commander ZerOaxis jettisoned an ancient Guardian artefact to represent my father's soul which I found very touching. To top it off, other commanders released a heat sink candle in respect for my dad's passing.

In all the event was very touching yet enjoyable. To see all these people make the journey to show their respects and pay tribute was truly humbling and I know my father would be very touched.

Mckinnon would often take his young son with him and, by doing so, kindled the same wanderlust in the next generation.

My family would like to thank all who chose to participate in my father's send-off and the decommissioning of his Cobra, as well as the large number of commanders who have voiced their intentions to make the journey in the future.

Now my father can enjoy the truly beautiful view he deserves for eternity.

Part of the memorial event was recorded by one of the participants, and this has been posted up for other commanders to view and pay their respects. The listening post monument to Commander Alexander Mckinnon remains out there for any ships that wish to visit it.

Contact the *Sagittarius Eye* offices or the Pilots' Federation directly for its location and details.

Mckinnon's Heart and Soul

Text:
Allen Stroud

Design:
Donald Duck

Thanks to:
OrangePheonix

Images:
OrangePheonix, NickWeb85, Vexigon Matraxis

Rare Commodities Spotlight

Ethgreze Tea Buds

One of the strangest delicacies of galactic trade, the tea of Ethgreze has an unmistakable bouquet, and trade in this rare commodity leads many natives to risk their lives.

'He who controls the spice…' – a phrase made famous in a long forgotten 20th century series of novels. He who controls the tea buds, however, has become a much more important factor in the politics of the Ethgreze system.

On Ethgreze 1, in the rural villages of the outlands, bud pickers are trained from a very young age in a 'pluck whip' motion with their off hand — usually the left. This action involves a high degree of hand-eye co-ordination, whipping the arm forward, extending and pinching the fingers and thumb around the target and then withdrawing the arm to a rest position. This action is practised against a mechanical dummy, and later as the bud picker becomes more adept (and potentially more valuable), against a faster, powered machine.

When the bud picker has consistently achieved the required action/reaction time to evade the bite of Ethgreze Carnivorous Camellia Sinensis, they are sent into the sub-tropical plantations to begin their life's work.

The Camellia Sinensis was a part of the original colonial DNA database from Earth. It is a species of evergreen shrub or small tree whose leaves and leaf buds are used to produce tea. It is believed that there was some genetic tinkering or that the plants reacted with some of the later terraforming residue. The resultant 'Ethgreze' variant is somewhat larger than the original species, with a deadly flower-like 'head' and formed calluses that look like teeth. These, combined with a corded muscle-like structure in the plant's stem, and a highly sensitive reaction to light changes, mean that the plant is more than capable of defending itself against an untrained picker or an ignorant tourist who decides to take a short cut through a field instead of sticking to the path.

Ethgreze Carnivorous Camellia Sinensis is not actually carnivorous, in that it derives no sustenance from anything it 'bites'. The new plant has been carefully screened and is not harmful to eat, but it is also not particularly appetising. However, the buds are wondrous when used in tea, hence the incredible demand for them.

Bloch Station is the only source for Ethgreze tea buds. It is currently controlled by the Perez Ring Brewery, but the majority of tea production is done by a set of trade houses which make up the Labour of Ethgreze faction. In the past, the Labour has dealt with Ethgreze Inc, a merchant conglomerate who managed transport and delivery of the tea to the station, but these circumstances have changed and now the tea makers find themselves talking to brewers, who are skilled practitioners but unfamiliar with this specific art.

Drinking Ethgreze tea is a subtle experience. The aroma of the tea's infusion into hot water is captivating and reminiscent of the smell on the plantations themselves. However, once you get close, the smell fades, allowing the tongue and mouth to taste the brew without distraction. The infusion retains its heat and some scientists claim there is a minor chemical reaction occurring as the drink makes contact with human saliva, that cleanses the mouth in a way no other beverage is known to match.

Rare Commodities Spotlight: Ethgreze Tea Buds

Text: Allen Stoud

Design: McNicholl

Art: McNicholl

Co-Pawlots

Commander name: **Bier00t**

Co-Pawlot name: **Celina**

Celina accompanies Cmdr Bier00t on expeditions, exploring the black in their Anaconda.

She is really good at route planning by paw... Long jumps are her speciality.

She is three years old and has spent more than 2,000 hours with me flying around the universe. She once ate a clod of Onionhead but has since recovered – and doesn't want me involved in the smuggling business any more!

Do you have a co-pawlot you'd like to show to the Galaxy? If so, hop onto our submissions page and send in a couple of pictures of them. Be sure to include their name, their role aboard your ship and any story about them you'd like to share.

Text:
Bier00t

Design:
McNicholl

PATREON | SAGITTARIUS EYE

Sagittarius Eye is the Galaxy's leading new network – created by commanders, for commanders, and supported by commanders.

We would like to thank those who have supported us over the past month:

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Special thanks to:

Stephen Rubin, Judith Walker

Interstellar Tachyon Fleet is a faction of like-minded commanders driven from their homes by Thargoid attacks. They are dedicated to the peacekeeping of populated space from pirates, outlaws and the xeno threat. Forged from the fire of the Pleiades, this faction holds pilots from all beginnings and political backgrounds; traders, explorers, bounty hunters and mercenaries - from Federation ranks and Imperial enlistments alike, all united against common enemies.

There's so much to do in the galaxy but you don't have to do it alone.

Join the Instellar Tachyon Fleet

ITF is a squadron based in the heart of the bubble, present in 9 systems and controlling 8 stations.

I.T.F
INTERSTELLAR TACHYON FLEET

ITF