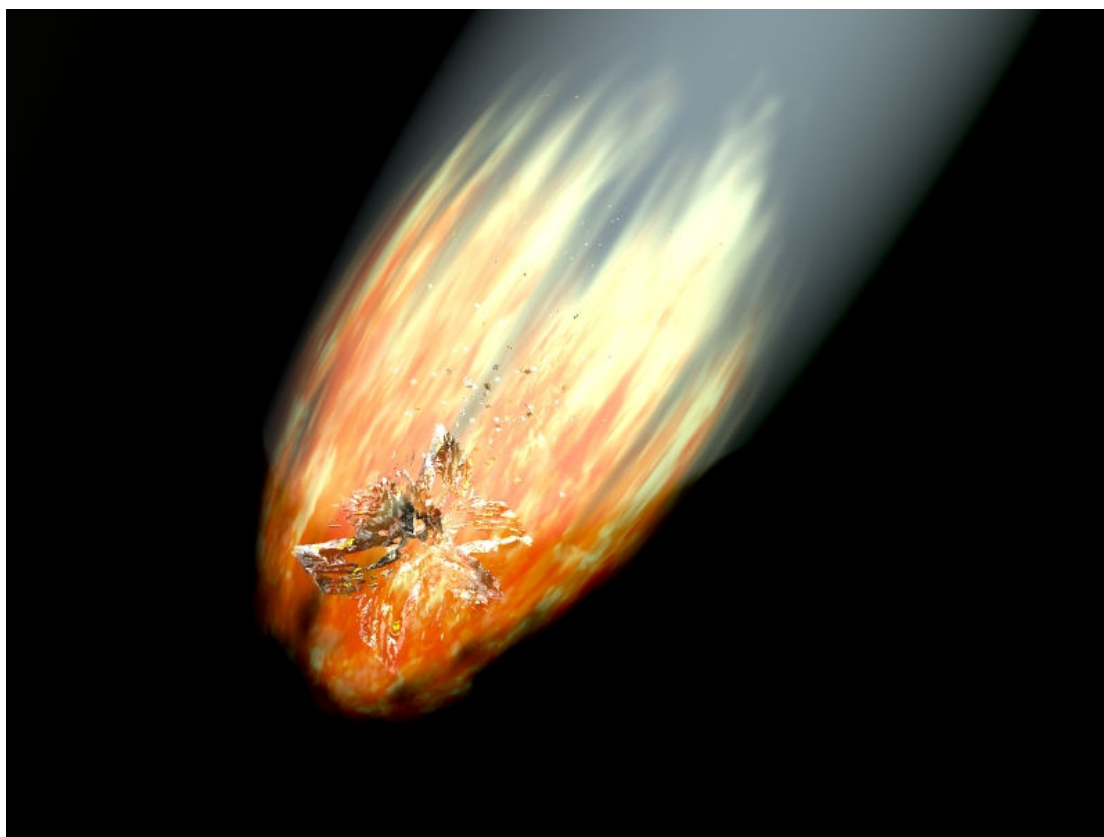


Unconventional Starship Attacks



Starship ramming

Using starships to ram a target is mostly holoivid entertainment. In practice they are too expensive and quite unable to do much damage.

Although the pseudo-momentum of a FTL starship can be enormous, it just vanishes when striking a massive body. Inside the 0.1G limit the ship slows down. Even when it hits a smaller object like an asteroid the pseudo-momentum only causes a bit of local quantum tunnelling. The effect is destructive but rather minor. When the American ship *WildMan II* crashed into the asteroid *Hilda* at full speed in 2275 it merged with the asteroid surface. About half of its mass and the rock inside the ship tunnelled a meter extra, and then the whole compound exploded with a few kilotons of power. While destructive to the nearby asteroid habitat and killing everybody onboard the ship, it was still just a minor disaster.

Starships tend to pick up large velocities due to stars and gravity assists, and these can be dangerous. A large cruiser massing a few thousand tons can easily pick up the kinetic energy enough to do massive damage. If, for example, a Kennedy class cruiser (10,927 tons) were to hit a planet at 140 km/s the total kinetic energy would be 10^{17} J, about 25 megaton. The lack of streamlining would likely break up parts of the ship before hitting if it passed through a terrestrial atmosphere, but the heavily armoured core parts would still hit the ground. On an airless world the damage would be worse.

Using starships as terror weapons or military kamikaze attacks is in principle possible, but they are usually far too expensive to be worth wasting on this kind of attacks. Most colony planets have defences intended at least for meteors that can prevent out-of control ships from

hitting. Shipboard security also tends to be tight with various cut-off commands and hard to circumvent safeguards; in fact, it is more common that accidents occur because ship computers refuse apparently dangerous orders than they comply with them.

Another reason hijackings so not end in megadeath crashes is that nuclear weapons are more enticing. Since they are components of missiles they are widespread and not always as guarded as they should. It is a growing worry that the chaos of the Kafer war has put so many missiles in so many hands that they might leak out to the terrorist market – Provolution is known to have possessed nukes even on Earth.

Asteroid Missiles

A small but growing worry is asteroid missiles. While none has ever been used outside a few classified military tests, the idea is known. A starship is affixed onto an asteroid, the drive field keyed to encompass it and then used to move the entire asteroid into a collision trajectory – even though the ship plus asteroid is very slow as a ship, a delivery near a target world could wreak much damage. This is especially a concern outside the stellar FTL shelf, where it would be nearly impossible to protect against asteroid bombardments. Since most colonies are safely inside the concerns are not enormous, but some outposts are potentially vulnerable. Even a minor asteroid a hundred meters across could easily wipe out an outpost and be quite resistant to normal anti-meteorite defences.

As an example, affixing a 25MW new commercial drive to the 250 m diameter asteroid 99942 Aphopis (mass of 2×10^7 tons) gives a drive efficiency of 0.17. While exceedingly slow compared to normal ships, it is enough to bring the asteroid close to a planet in a few days. Assuming a very low density (a “rubble pile”) of one ton per cubic meter and an armour multiplier of 8 still gives a 2.5 million point hull hit value; if the ship doing the pushing is buried safely inside the asteroid it is practically invulnerable. Landing a nuclear device on the asteroid is not possible while it is jumping. Moving at about 10 km/s it would descend from the 0.1 limit in just 23 minutes, the only window where deflection attempts could be made (and it is relatively easy to find faster moving asteroids or comets, or to affix automated point defences). Once released the asteroid would impact an Earth-like world with a force between 880-1480 megatons, enough to trigger a short-lived impact winter.

So far nobody has attempted anything like this. Practical considerations of how to get the pusher spaceship safely away from the asteroid when it nears the 0.1 G limit (and will presumably be under constant attack) are tricky but likely solvable. The fears left behind by the Twilight war have inhibited humans from attempting planetary mass-destruction. However, the atrocities of the Kafer war have made asteroid strikes more thinkable. Worse, asteroids appear to be ideal weapons for low-tech colonial resistance movements with some civilian starships to strike at key outposts. Various military forces are quietly trying to figure out the best way of stopping an asteroid missile.