

Enabling Satlet Technologies Provided by *Stellar Exploration, Inc.*

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Many observers have noted the recent rapid resurgence of mini-, micro-, nano- and pico-satellites, with rapidly growing capabilities. Dramatic improvements in computing capabilities, onboard intelligence, smart pointing and stabilization algorithms, have been noted and demonstrated.

However, this rapid growth in capabilities has not been uniform. In some areas, we are still faced with the same limitations as has been experienced over the past twenty years. Specifically, apertures has continuously been a weakness of this class of affordable satellites -- regardless it's an aperture for solar power generation, communications antenna or observed signal collection. Partly, it is a natural limitation of a physically small platform but uneven and slow progress in capabilities has been painful.

That is one exciting promise of the DARPA Phoenix project that can mitigate these limitations by expropriating existing but surplusd aperture assets, like deployable reflector antennas.

In our poster, we will present several specific ideas of exploiting technologies that have been developed by Stellar or are under development at Stellar, and enable such aperture repurposing and redeployment.

Our (Cubesat-inspired) satellite focus has been on sophisticated devices and subsystems that are not currently duplicated elsewhere. Two primary company R&D area of focus are:

- a) chemical monopropellant integrated propulsion module and
- b) large deployable structures, like antenna feeds and booms.

These efforts are based around applying the COTS technology to address these tough requirements. The key skill is synergy between rigorous systems engineering and hands-on multidisciplinary engineering skills. The essential steps to our successful projects are:

- Ask the right questions
- Translate customer needs into product requirements
- Realistic project planning
- Focused on practical near-term solutions
- Quick test-beds of high-risk functions
- Emphasis on rapid and affordable design-test-validate product cycle