

## Crowdfunding

## Kickstarter for Space Projects

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## KICKSTARTER



Above: Covers of the recent issues of Horizons. Each cover image is linked to a PDF file for the corresponding issue. Image credits: Horizons.

Thousands of individuals contribute information to Wikipedia, an example of crowdsourcing. Take this one step further and have individuals contribute money instead. This is crowdfunding. This method of funding circumvents traditional sources and gatekeepers, allowing a grassroots method of wealth distribution to interesting projects. The largest crowdfunding site is Kickstarter. As of March 2012, web users had pledged more than \$165 million to millions of projects.

Kickstarter is simple. As a project starter, you set a target date (two months or less) to fund a goal, a target monetary amount. You then set various donor rewards depending on the level of donation which can range from \$1 to any amount. If by the target date, the goal has been reached, you take about 90% of the donations, while 5% goes to Kickstarter and 3 to 5% goes to Amazon Payments for processing donations. If the goal is not reached by that date, you get nothing. Typically, a project either makes the goal or finds little support. A good idea, demonstrated credentials and a good pitch are essential for generating enough support.

Though the initial set of projects which used Kickstarter were mostly in the arts, other fields successively followed suit. Over the last year, there has been an upsurge in popularity in using Kickstarter to successfully fund space projects. Let's go over a few projects that have been successfully funded and then bring up the use of Kickstarter for funding a print version of Horizons, the newsletter of AIAA Houston Section.

## 1. LiftPort

<http://www.kickstarter.com/projects/michaellaine/space-elevator-science-climb-to-the-sky-a-tethered>

<http://www.liftport.com/>

Goal: \$8,000

Funded: \$110,353

LiftPort, an idea started by engineer Michael Laine of Seattle, is a company started in 2003 to investigate building a space elevator on Earth. They researched carbon nanotubes but concluded they would not help. However, LiftPort worked on building robots that can climb a tether. At one point, they had 60 university research partners and between 800 and 1,000 volunteers working on the project. But the economy crashed in 2007 and LiftPort went downhill.

Their revolutionary idea is to build a space elevator on the Moon. With current technology, it is feasible to build it in eight years. LiftPort will build a tethered tower as a precursor to the lunar elevator. A robot will climb 2 kilometers to the platform of high-altitude balloons tethered to the ground. This will build upon the climbing robot experience acquired by LiftPort in the past.

## 2. ArduSat

<http://www.kickstarter.com/projects/575960623/ardusat-your-arduino-experiment-in-space>

[http://www.nanosatisfi.com/?page\\_id=16](http://www.nanosatisfi.com/?page_id=16)

Goal: \$35,000

Funded: \$106,330

ArduSat's mission is to provide affordable space exploration for everyone by building an inexpensive satellite, Arduino. This miniature cube satellite, measuring 10 cm along each edge and weighing 1 kg, will have more than 25 sensors including three cameras, a Geiger counter, a spectrometer and magnetometer. These sensors are connected to a bank of programmable Arduino processors which can run the pledgers' applications or experiments. The pledger will be the user.

Through a web interface, the user can upload code to an exact replica of the satellite on the ground to ensure that it works. After some tests and any needed modifications, the code will be uploaded into ArduSat where the application can run and gather data. Once the time the user has booked with ArduSat expires, the data will be sent to the user via the Internet.

## 3. KickSat

<http://www.kickstarter.com/projects/zacinaction/kicksat-your-personal-spacecraft-in-space>

[http://www.spacecraftresearch.com/MII/MII\\_overview.html](http://www.spacecraftresearch.com/MII/MII_overview.html)  
<https://github.com/zacinaction/kicksat>  
<http://www.kickstarter.com/projects/251588730/kicksat-your-personal-spacecraft-in-space/posts>

Goal: \$30,000

Funded: \$74,586

Zac Manchester, an aerospace engineering student from Cor-

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nell University, designed, built and tested a very tiny and inexpensive spacecraft called Sprite. It is about the size of a few postage stamps but contains solar cells, a radio transceiver, and a micro-controller with memory and sensors. Each Sprite will cost \$300 to launch.

KickSat will be a CubeSat that will be designed to carry hundreds or thousands of Sprites into low earth orbit. Initially housed in spring-loaded stacks and held in place by a lid, a transmitted radio signal will open the lid, releasing the Sprites as free-flying spacecraft. These Sprites will then be tracked and recorded by an international network of amateur ground stations. The Sprites will last a few days or weeks before entering the Earth's atmosphere leaving no traces of space debris.

#### 4. Final Frontier Design's 3G Space Suit

<http://www.kickstarter.com/projects/872281861/final-frontier-designs-3g-space-suit>

<http://finalfrontierdesign.com/>

Goal: \$20,000

Funded: \$27,632

Final Frontier Design (FFD) is a company designing and building a lightweight, inexpensive, and highly functional space suit for the new space industry. The FFD Third Generation (3G) Suit will follow NASA flight certification standards and will be an upgrade over the 2G Suit, including such features as a higher operating pressure, a carbon fiber waist ring, a retractable helmet and improved gloves and glove disconnects.

The 3G Suit is intended for Intra Vehicular Activity (IVA) which will be used in case of an emergency loss of cabin pressure. The up and coming space industry including SpaceX, Boeing, Sierra Nevada, Virgin Galactic, Armadillo, Blue Origin, STAR Systems, XCOR and any other suborbital or orbital spacecraft company will need these suits for the basic safety of crewed flights and they will need a cheaper alternative than current NASA suits which cost well into the millions of dollars.

#### 5. Hermes Spacecraft

<http://www.kickstarter.com/projects/hermesspace/hermesspacecraft>

<http://www.hermesspace.com/>

Goal: \$20,000

Funded: \$20,843

Space Transport and Recovery Systems, LLC (STAR Systems) is a startup aerospace company working on the Hermes spacecraft, a reusable suborbital spacecraft. Hermes is a vertical takeoff, horizontal landing vehicle that can carry four passengers to an altitude of 62 mi (100 km) with a maximum velocity of 2,300 miles per hour (3,700 kilometers per hour). An encrypted remote cockpit system will allow the spacecraft to be controlled remotely for low altitude test landings.

STAR Systems already has a full scale prototype of the Hermes structure. They only need help to create a full size prototype of the rocket motors. For propulsion, Hermes will use a hybrid rocket motor 10 inches in diameter capable of 5000 pounds of thrust. The donated funds will be used for buying sensors, data acquisition hardware, materials, tier awards

and fees for both Kickstarter and Amazon.

AIAA Houston Section's Horizons newsletter will use Kickstarter as a means of generating at least \$2000 for 200 printed copies of one issue (a special version reduced to 36 pages in length) for marketing and publicity. These magazines will be offered at events and online for tax-free donations of \$7. Once we sell all 200 copies, we can print 200 copies of the next issue, so the continuing operation pays for itself after a successful crowdfunding. We prepared the [video](#) (already on YouTube), arranged for pledger gifts (NASA medallions and more), and now we are ready to put it all on our own Kickstarter web page and start our crowdfunding. Please look for us on Kickstarter and pledge your support.

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The American Institute of Aeronautics and Astronautics

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www.aiaahouston.org

**The UP Experience - Houston 2012**  
Featuring Burt Rutan & his Interview with Horizons

Also, Continuing in this Issue!  
Part 3 of 8:  
**Man Will Conquer Space Soon!**  
(Collier's 1952-54)