

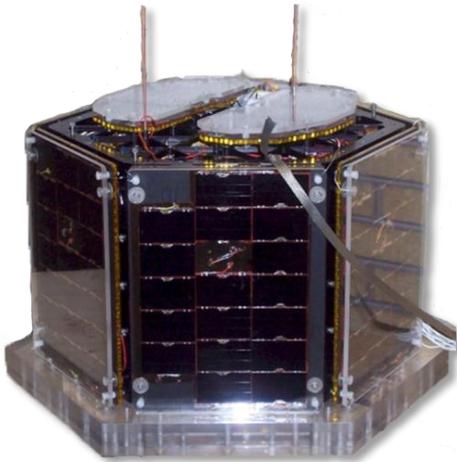


## Development of Personal Spacecraft

*Stephen Horan, PhD*

The cost of going to space is extremely high. In fact, a number of experiments never make it to launch because of the price. Reducing the price of a launch typically means reducing the size and weight of the payload, which isn't easily accomplished.

Many of NASA's space experiments are conducted using large satellites. However, with the advancement of communication and sensor systems, small satellites are emerging as a viable option for testing technologies and conducting scientific experiments.

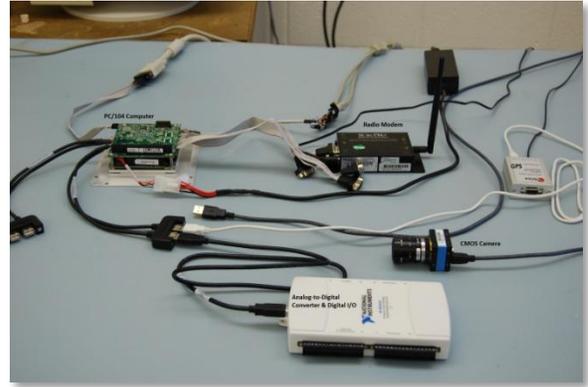


**A representative "personal spacecraft"**

At NASA Langley Research Center, electronic engineer Stephen Horan has created a laboratory to develop and test software and hardware for use in small satellites. He calls the satellites he's developing "personal spacecraft" because they are 18" x 12" and 10 to 50 kg in mass, making them small and light enough for a single person to pick up.

Horan is focused on building satellites in this size range because they can accommodate adequate power supplies and high speed communication systems. The size also allows for multiple sensors and technologies to be tested against each other in a single mission.

Small satellites could allow researchers to try new science sensors, techniques such as wireless avionics, and deployable antennas and power arrays.



**Small satellite test environment configuration**

"What these satellites are really good for is taking a process that you're still learning how to do, like make a certain kind of measurement, and iterate on how you make that measurement and make it better and design your instrument better" said Horan.

In the lab, Horan is building a test environment for the satellites. He is also investigating some unique interface standards for them, including a plug and play capability.

"Like in your regular computer where you just plug something in a USB port and it works. . . . I'm interested in applying that philosophy in the satellite. You would just take an instrument, plug it in, have it reconfigure and come up and running right away."

The next step is to find some candidate science instruments to test in the environment. If successfully demonstrated, personal spacecraft may become a low cost option for testing technology and conducting scientific experiments in space.