

INSPIRING THE NEXT GENERATION OF SCIENTISTS

For many, the sciences can often be thought of as a niche subject. For Kromek, we we're thrilled to work on this programme to inspire and educate the younger generation on the opportunities Science and Innovation can afford them.

Summary

As part of the Irvine CubeSat Program, an initiative to get school children inspired by STEM in California, Kromek's GR1 gamma spectrometer was incorporated into the CubeSat built by the school children and launched into space. With its small size and low power requirements, the GR1 was the perfect fit for collecting spectral data from space for the schoolchildren to view and evaluate.

Using Kromek detectors in a CubeSat

The Irvine CubeSat Program, powered by Irvine Public Schools Foundation (IPSF), is a revolutionary STEM initiative based in Irvine, California, composed of six public high schools from the Tustin and Irvine School Districts. The program collectively strives to assemble, test, and launch a solar-powered CubeSat. It aims to inspire the next generation of innovative thinkers, creators, programmers, and explorers.

Kromek has been working with Irvine CubeSat to find the perfect gamma spectrometer to go into orbit, they will be using the Kromek GR1.

Irvine CubeSat represents an incredible opportunity for a diverse group of students to come together and gain advanced hands-on STEM experience with an emphasis on space. Students will not only assemble a CubeSat, but they will also participate in a professional team environment that challenges them to receive and process technical training in their team's area of emphasis, collaborate with manufacturers to acquire components, and even participate in professional panel reviews of their work from industry experts.

Once the CubeSat is successfully launched, schools will engage in a variety of orbital manoeuvres and experiments, including operating the CubeSat to position the antennae, solar panels and camera for optimal operation. The CubeSat will also collect data that students can practice evaluating and share for further study.



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Partner colleges and universities are supporting the program because they view it as a training ground for the next generation of great minds in space science. Beyond high school, participants will be uniquely positioned to pursue post-secondary education in a variety of science and space-related disciplines.

“The program trains our students in many crucial skills needed to thrive in the modern workplace but it also shows them the connection between what they are doing in school and careers that are available. They see from working with the team at Kromek that there are employment opportunities in science and technology.

The GR1 is the perfect solution for us. It takes the radiation measurements we need, it is within the power budget and the space constraints of the satellite.”

Dr Brent Freeze, Irvine CubeSat



Looking for Gamma Radiation

The GR1 will be mounted in a CubeSat and put into orbit into a low earth polar orbit: north-south crosses over you twice a day. It is looking outward from the Earth to the Crab Nebula (the Crab Nebula (catalogue designations M1, NGC 1952, Taurus A) is a supernova remnant and pulsar wind nebula in the constellation of Taurus. The students will study the spectra from the gamma-rays and x-rays being emitted by the nebula. The science mission is one year long but it could be in orbit for up to three years. This is the third in a series of twelve CubeSats. Launch dates can move but the first is scheduled for April 2018, the second in autumn/fall 2018 and the third one likely to be between late 2019 and early 2021.

What is a cubesat?

A CubeSat (U-class spacecraft) is a type of miniaturized satellite for space research that is made up of multiples of 10×10×11 cm cubic units. CubeSats have a mass of no more than 1.33 kilograms per unit, and often use commercial off-the-shelf components for their electronics and structure.