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Ironwood Maine Students Launch Scientific Balloon

Maine Space Grant-funded Satellite Project Brings NASA Lessons to Ironwood Maine Teens

Morrill, Maine: Scientific investigation reached new heights when students from the [Ironwood Maine School](#) successfully launched a high-altitude balloon carrying a NASA-like payload that the students themselves designed and built over the past five months. The balloon, capable of entering the stratosphere, can reach as high as 120,000 feet - 99.5% above the Earth's atmosphere - at a fraction of the cost of a rocket or satellite.

Following the 8:00 am launch on September 22, 2010 at Ironwood Maine, the payload was tracked and monitored. Scientific balloon payloads, flying at the edge of space, can take pictures normally associated with space missions. From such a great height, student payloads are capable of seeing the curvature of the Earth and the blue haze of its atmosphere.

Ironwood Maine Project coordinator Mark Ford called the scientific initiative a real NASA-type aerospace program and highlighted the unique educational opportunities fostered by the project.

“Scientific ballooning is an incredibly valuable experience,” Ford concluded. “The process we used at Ironwood Maine for building and operating a scientific balloon payload is a junior version of the way NASA works with space satellites. This project offered an opportunity to take an abstract concept and make it a hands-on learning experience that excited the students’ imaginations.”

The project began in April when Ironwood Maine received a grant from the [Maine Space Grant Consortium](#), the state agent for NASA's educational and outreach initiatives. Teams of Ironwood Maine students began working on two scientific ballooning initiatives.

The first balloon initiative, named CricketSat, required Ironwood Maine students to design and build a small payload consisting of a temperature sensor, circuit board and battery capable of communicating with a ground-based command module using a ham radio frequency. The instrumentation was designed to track atmospheric temperatures as the balloon rises in altitude. Ironwood Maine students built remote sensor circuits using PC boards that convert temperature changes to a tone and broadcast it over a radio frequency.

The project required Ironwood Maine students to master a variety of skills. They learned how to solder and assemble circuits, assemble the payload modules, calibrate instrumental responses, launch the balloons, operate ham radios and track radio signals. In designing the payload, Ironwood Maine students took into consideration such factors as extreme temperature changes, which can affect power sources such as batteries, and learned to evaluate atmospheric conditions. Each phase of the project required testing protocols and meticulous record-keeping.

During CricketSat, Ironwood Maine students learned that obstacles, from equipment malfunctions to changing atmospheric conditions, can frustrate even the best-planned scientific experiment. At Ironwood Maine, the timing of the launch created a problem. Having informed the FAA of their launch plans, the Ironwood Maine project coordinator received a phone call from the Secret Service in Washington, D.C., notifying them that the upper air winds would put their scientific balloon into a no-fly zone through which President Obama's flight was scheduled to pass. So the launch had to be scrubbed.

Ironwood Maine's latest initiative, named IronSat, involved a much larger balloon capable of lifting a heavier load into near space. Again, Ironwood Maine students built the circuitry and designed the payload, which included a GPS location-finding module for tracking the balloon, a radio communications module and a digital camera remotely programmed to periodically take photographs. Retrieving the payload was part of the challenge and fun of the project.

"Ironwood Maine's balloon launch was not an iPod simulation or a classroom lecture, but a hands-on project that required real teamwork," Ford said. "Ironwood Maine kids put all the pieces together and sent it up. What will come back are real photos that look like something from the NASA Web site. Even more important than the technical skills they learn, every participant has a chance to experience the emotional side of building and completing a scientific project. Ironwood Maine students can say, 'that's my payload up there,' and 'my payload took that picture.' It brings their experience to a concrete point, and they can say, 'Here's something I care about.'"

About Ironwood Maine Therapeutic Boarding School

Ironwood Maine is a one-of-a-kind combination of a traditional boarding school and therapeutic treatment program that specializes in working with struggling, underachieving teens whose behavior is often out of control. Through an extensive and customized therapeutic program and academic curriculum, Ironwood Maine helps teens find greater success than they have ever experienced. Ironwood Maine's mission is to give hope to parents who are concerned about their children by helping their teen become healthy, happy and responsible. For more information on the Ironwood Maine program, call 1-877-496-2463 or go to www.ironwoodmaine.com.