



**'IMILOA**

Astronomy Center of Hawai'i

## Educational Highlights January-February, 2009

<b>K-12 Student Field Trips</b>				
<b>Date</b>	<b>School / Youth Group</b>	<b>Location</b>	<b>Grades</b>	<b>Student #</b>
1-7-09	YWCA Development Preschool	Hilo	K-4	23
1-8-09	Moore Grant/Hawaii Preparatory Academy	Waimea	1 + 2	40
1-13-09	Moore Grant/Mountain View Elementary School	Mt. View	1	105
1-13-09	Moore Grant/Waters of Life Public Charter School	Mt. View	1+2	27
1-15-09	Moore Grant/Pahoa Elementary School	Pahoa	1 + 2	112
1-16-09	Montessori Country School	Pahoa	Pre	43
1-20-09	Moore Grant/Malamalama Waldorf School	Pahoa	1 + 2	15
1-20-09	Moore Grant/Kua O ka La Public Charter School	Pahoa	1	7
1-20-09	Moore Grant/Christian Liberty Elementary School	Keaau	1 + 2	47
1-20-09	Moore Grant/HAAS (Hawaii Academy of Arts & Science PCS)	Pahoa	1	2
1-21-09	Moore Grant/Laupahoehoe Elementary School	Laupahoehoe	3 + 4	30
1-22-09	Moore Grant/Kula Kaiapuni O Waimea	Waimea	1 + 2	14
1-22-09	Moore Grant/Ka `Umeke Ka `eo School	Hilo	1 + 2	107
1-23-09	Waiakea Elementary School	Hilo	5	13
1-23-09	Hualalai Academy	Kona	3	14
1-23-09	YWCA Development Preschool	Hilo	K-4	74
1-27-09	Moore Grant/Waiakeawaena Elementary School	Hilo	1	142
1-28-09	Maryknoll School	Honolulu	6	60
1-29-09	Moore Grant/Waiakeawaena Elementary School	Hilo	2	113
1-29-09	Moore Grant/Keaukaha Elementary School	Hilo	1 + 2	96
<b>January Total</b>				<b>1084</b>
2-3-09	Moore Grant/Kapioloani Elementary School	Hilo	1	49
2-5-09	Moore Grant/Mt. View Elementary School	Mt. View	2	80
2-10-09	Moore Grant/Na`alehu Elementary School	Na`alehu	5	92
2-10-09	Moore Grant/Pahala Elementary School	Pahala	5 + 6	45
2-10-09	Moore Grant/Volcano School of Arts & Sciences PCS	Volcano	5 + 6	32
2-12-09	Moore Grant/Pa`auilo Elementary School	Pa`auilo	5 + 6	26
2-13-09	Moore Grant/Waiakea Elementary School	Hilo	2	154
2-13-09	Kula Kamali`i Preschool	Hilo	Pre-K	20
2-13-09	Moore Grant/Honoka`a Elementary School	Honoka`a	5	40
2-13-09	Moore Grant/Mt. View Elementary School	Mt. View	2	80
2-14-09	Girl Scout Troup 2096	Hilo	1-6	8
2-14-09	Grace Christian Academy	Saipan	K-12	18
2-17-09	Science Fair/Kua O Ka La PCS	Pahoa	9-12	27
2-18-09	Maryknoll School	Oahu	6	53
2-18-09	Science Fair/Maunaloa School	Hilo	K-9	19
2-20-09	Science Fair/Ha`aheo Elementary School	Hilo	5 + 6	44
2-20-09	Science Fair/Hawaii Preparatory Academy	Waimea	4	20
2-20-09	Tutu & Me Preschool	Waimea	Pre	12
2-24-09	Science Fair/Kona Christian Academy	Kona	5	15
2-25-09	Science Fair/Ke Kula O Nawahiokalani`opu`u School	Keaau	7 + 8	26
2-25-09	Science Fair/Keaau Elementary School	Keaau	3-5	31
2-25-09	Science Fair/Hawaii Academy of Arts & Science	Pahoa	K-12	11

2-26-09	Science Fair/Hawaii Academy of Arts & Science	Pahoa	1	26
2-26-09	Science Fair/St. Joseph High School	Hilo	9 + 10	61
2-26-09	Science Fair/St. Joseph Elementary School	Hilo	4-6	67
2-27-09	Science Fair/E.B. DeSilva Elementary School	Hilo	4	55
2-27-09	Science Fair/Keaukaha Elementary School	Hilo	6	25
2-27-09	Science Fair/St. Joseph Elementary School	Hilo	7 + 8	43
<b>February Total</b>				<b>1179</b>

## K-12 Student Programs

### Gordon & Betty Moore Grant Field Trips:

During the month of February, the grade 1 + 2 Moore field trips came to a close and the grade 5 + 6 field trips began in earnest. These will continue through the end of May, completing our first year of the grant which was focused on grades 1-6 from all Big Island schools. The grade 5/6 experience, Kinesthetic Astronomy, focuses on the relationship between time, seasons, and astronomical motions of the Earth around the Sun. A major goal of the field trip is to dispel the common myth held by many people that the reason for seasons on Earth is because the Earth is closer to the Sun during Summer, and farther away from the Sun in Winter. Through a guided movement activity, and a special planetarium show, students learn that the “*real*” reason for the seasons on Earth is the tilt of the Earth as it orbits the Sun!



Fifth and Sixth grade students from West Hawaii Explorations Academy (WHEA) participate in the Kinesthetic Astronomy activity during a recent Moore Grant field trip. Each student becomes an Earth revolving around the Sun (Lā). During this part of the activity they are simulating looking from Earth at the Sun, low in the western horizon, (sunset).

## Science Rocks! After School Program:

During January and February the after school program focused on Astronomy, Heat & Thermodynamics, Properties of Matter, Weather and Geometric Bubbles.



Observing the concept of buoyancy, demonstrated by dunking weights suspended by a spring scale into water



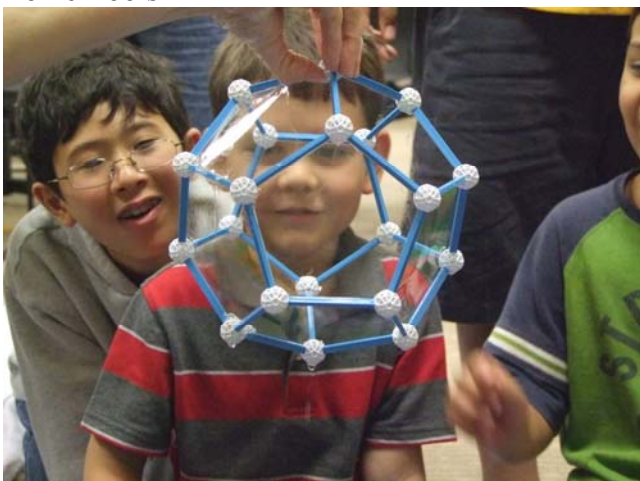
Students invent their own bubble makers



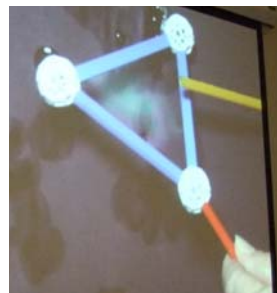
Students build basic polygon shapes using Zome Tools



A basic pincushion shape can be expanded into different polyhedra



A dodecahedron immersed in bubble solution amazes students



Interference patterns in soap film shows the concept of wave interference



Minimal surfaces in a cube: A cube within a cube. WOW!

## Hawai`i District Science & Engineering Fair:

On February 14<sup>th</sup>, the 2009 District Science and Engineering Fair judging took place at `Imiloa Astronomy Center. Middle and high school students from the island of Hawaii compete at the school level to be selected to attend the district fair. From the district fair approximately 50 outstanding projects are selected based on scientific merit to attend the State Science Fair (April 6-8, 2009) in Honolulu. Additionally, the top senior research projects at the State Fair will be chosen to represent Hawai`i at the 2009 Intel International Science and Engineering Fair (ISEF) to be held this year in Reno, Nevada, May 10-16, 2009. Exhibits at the fair are of two types:

- *Display*: explains or demonstrates a scientific principle, apparatus, technique, design or application
- *Research*: an investigation in which a hypothesis or question is stated, experiments are designed and conducted; data collected and recorded; and conclusions drawn.

The educational value for middle and high school students who participate in a science fair comes from completing science or engineering project work and developing exhibits for public viewing. A project involves the use of the library, the internet, designing and executing a scientific investigation if research is involved, and reporting the results. Preparing an exhibit involves graphic communication skills and creativity. This year 121 projects were submitted and judged at the district level. 45 judges were solicited from the University and scientific community. Students from 15 different Big Island schools submitted projects. 12 community members served as mentors to various student projects. 51 awards were presented to science fair participants from organizations as diverse as the U.S. Navy and Marine Corps, the Yale Science and Engineering Association, the Sierra Club, and Hawai`i Electric Light Company.



Teachers can bring students to view Science Fair projects. The hope is that they will be inspired to participate in Science Fair in the future



A teacher discusses the scientific principles involved in different projects

## Family Programs

### Journey through the Universe: Family Science Day & Night:

This is the third year `Imiloa has collaborated with Gemini Observatory and the extended observatory `ohana to host the Journey through the Universe Program. This is a national science education initiative designed to engage entire communities: students, teachers, families, astronomy educators, and the public. The context is astronomy, highlighting science concepts, math, and technology while seeking to inspire the next generation of scientists and engineers. The program provides a window on the true nature of science, and the lives of modern-day explorers. The emphasis is not only on *what* is known about our world and the universe but *how* it has come to be known. It is an approach that reveals the very personal means by which researchers ask questions of the world and empower themselves to create pathways to an answer. Teachers (grades K-12) are also trained with curriculum and support from scientists and astronomy educators to facilitate their delivery of powerful pre and post lessons in their classrooms. During the week of Journey, astronomy educators visited ~8000 different classrooms to share their expertise and enthusiasm for “doing science.” The astronomers prepared for their visits by attending a workshop held at `Imiloa. Teachers, whose classrooms were visited, attended workshops at the center to learn about curriculum provided by the Journey Program. Each year of the Journey program highlights a different curricular focus.

A highlight for everyone is the family event which provides a venue for parents and their children to learn and have fun with science, together! This year a second family event was added to the lineup and hosted at `Imiloa. Sunday, February 8<sup>th</sup> was an entire day for families to visit the center at no cost, where 1000 people enjoyed planetarium shows, exhibits, and special displays and activities provided by the observatory community. During the week, on February 11<sup>th</sup>, `Imiloa hosted another 700 family members for a second free event, thus increasing the number of people reached this year by 1000 over last year’s count.



Demonstrating planetarium freeware for home computers during Journey Family Science Day



Waiakea Elementary School students show their “Happy Planets” during JTU classroom visit

## **Onizuka Day:**

On January 24, 2009 `Imiloa Astronomy Center hosted a table and presented two workshops for families attending the annual Onizuka Day celebration at UH-Hilo. The workshops entitled: Big, Little, & In-Between: Observations in Scale took participants through exercises in observing objects that were very small, using Jeweler's Loupes, to the everyday, using rulers and yardsticks, to the world of very large scale, using models to help understand large distances in the Solar System and beyond. Students and their parents were amazed at how size changed their perspective which sparked many imaginative metaphors for the things they saw through the jeweler's loupes!

## **Galileo's Birthday: Two Small Pieces of Glass:**

On February 15<sup>th</sup> `Imiloa opened the new planetarium show: Two Small Pieces of Glass. The new show opened on Galileo's birthday. It explores 400 years of the telescope and its discoveries as seen by two students and their mentor as they attend a star party. Learn how Galileo, Newton and many others developed these instruments and how they have allowed humans to learn about the universe. Visitors can experience the view from the largest observatories in the world such as Maunakea, Cerra Telolo, and numerous other ones around the globe. This program also celebrated the International Year of Astronomy (2009). To complement the new show, `Imiloa's education team hosted a hands-on activity in the atrium, also called: Two Small Pieces of Glass. Visitors were able to hold two different bi-convex lenses in their hands, one in front of the other, to discover how a refracting telescope like the one Galileo used to view the moons of Jupiter and craters on Earth's Moon, works. This deconstruction of the refracting telescope takes the mystery out of "what's inside" and lets children and adults "see for themselves" how these telescopes work. This is in keeping with the spirit of discovery exemplified by Galileo's work 400 years ago.



A young visitor uses "two small pieces of glass" to view objects at a distance

## Teacher Training/Professional Development

### NASA Educator: Tony Leavitt:

On January 23, 2009 Imiloa staff and volunteers attended a training session offered by visiting science educator from NASA, Tony Leavitt. Tony shared two fun activities with volunteers and staff that we can use with the public and school groups. The first activity simulated the way craters were created on Earth's Moon. Participants dropped various objects into a simulated Moonscape (a pan of flour dusted with cocoa) from various heights. They proceeded to collect data on the depth of the crater and the length of debris around the crater. In the second activity, paper rockets were crafted and launched via a Stomp Rocket Launcher constructed with PVC pipe and a 2 liter soda bottle. A good time was had by all! We hope to bring Tony back later this year for a teacher training session.



Imiloa staff member Gail Loeffler uses the stomp rocket launcher to successfully launch a paper rocket...

## Collaborations

### Princess Ke`elikolani's Birthday:

At this first time ever event, `Imiloa Astronomy Center hosted students, faculty, and staff of Ka Haka `Ulu o Ke`elikolani (UHH College of Hawaiian language Studies), along with consortium partners, `Aha Punana Leo, and Nawahiokalani`opu`u at a celebration of February 9, 2009, of the birthday of Princess Ke`elikolani, for whom the UHH college is named.

Born in 1826, Princess Ke`elikolani was the granddaughter of King Kamehameha I. She overcame a life of many personal tragedies to become a beloved leader whose strength and vision proved inspiration. Although fluent in English, she spoke only in Hawaiian as a way to encourage others to speak the native language, and many believe that her actions so appeased Pele that the 1881 lava flow spared the town of Hilo.

