'IMILOA
Astronomy Center of Hawai'i

Educational Highlights
November - December, 2007

K-12 Student Field Trips

Date	School / Youth Group	Location	Grades	Student #
Nov 6	YWCA Developmental Preschool	Hilo	Pre-K	65
Nov 8	Kea`au High School	Kea`au	11-12	12
Nov 9	St. Anthony's Junior High School	Maui	7	44
Nov 13	Ke`ana La`ahana Charter School	Hilo	12	9
Nov 16	Stars Homeschool Network	Kona	6-10	15
Nov 18	Kaneohe Pop Warner Football	O`ahu	K-8	15
Nov 28	Pāhoa High School	Pāhoa	9-12	9
Dec 2	Orchid Isle Ford Keiki	Hilo	K-12	40
Dec 5	Mauna Loa School	Hilo	K-9	24
Dec 7	Waimea Elementary School	Kamuela	2	23
Dec 11	Radford High School	O`ahu	9-12	17
Dec 12	Waiākea High School	Hilo	11-12	11
Dec 13	Christian Liberty School	Hilo	7-8	36
Dec 14	Kea`au High School	Kea`au	10	72
Dec 14	Christian Liberty School	Hilo	3	20
Dec 14	Hale Aloha Nazarene School	Hilo	K	9
Dec 14	Keaukaha Elementary School	Hilo	1	37
Dec 18	Ha`aheo Elementary School	Hilo	3-4	42
Dec 19	Waiākea High School	Hilo	9-12	11
Dec 21	Salvation Army Family Intervention Services	Kona	K-12	9
Dec 22	LDS Church	Kea`au	6-12	22
			Total	**542**

K-12 Teachers

"Cosmic Questions" Orientations

Hawai`i Island teachers were invited to attend one of two free orientation sessions held on November 28 and December 1 to learn about `Imiloa's newly installed exhibit, *Cosmic Questions: Our Place in Space and Time*. Teachers who participated in the orientation were provided a map of the exhibit hall, which included a brief description for each of the new interactive displays, and then allowed time to explore the exhibit on their own. These sessions were conducted to help teachers plan and prepare for future student field trips to `Imiloa.

Hands-On Optics Teacher Training

Eleven Hawai`i Island teachers participated in a two-day Hands-On Optics (HOO) training workshop on November 11 and 12. HOO is an inquiry-based science education program consisting of six learning modules of fun hands-on activities. This workshop focused on Modules 4, 5, and 6, and was taught by Rob Sparks, Science Education Specialist from the National Optical Astronomy Observatory (NOAO) in Tucson, Arizona. Astronomers and science education specialists from the Joint Astronomy Centre and Subaru Telescope also participated in the workshop and will serve as resource volunteers to the teachers.

In Module 4, Peculiar Polarizations, teachers explored the properties and applications of polarized light. The activities began with a demonstration using cookie racks and a telephone cord *(photo at left)* to show how light waves pass through polarizing filters. The teachers also discovered how polarization can be used as an engineering tool. In the photo at right, Michelle Medeiros and Bianca Weismueller- Hastings, both from Earl's Garage, used polarized filters to analyze the stress and strain in plastic wrap.

In Module 5, Ultraviolet and Infrared Light, the teachers investigated light beyond the range of human vision. Using a long spring, they observed the relationships between amplitude, length, and frequency of light waves *(photo at right)*. The teachers also constructed a scale model of the electromagnetic spectrum to compare visible light waves to infrared, microwave, and radio waves. At left, Sara Medeiros, Kealakehe Elementary School, and Richard Crowe, `Imiloa Astronomer-in-Residence, calculate wavelength ratios for their model.

Module 6, Communicating on a Beam of Light, began with a kinesthetic activity in which teachers modeled wavelengths to learn about laser light *(left photo)*. Following a demonstration on how diode lasers can carry sound, the teachers designed their own laser communication systems in a "challenge" to transmit sound over a long distance. In the photo at right, Nancy Snedecor, Hale Aloha Nazarene School, and Julie Matsushima, Waiākeawaena Elementary School, test their system. The final activity in this module dealt with total internal reflection and how it relates to communication via fiber optic cables.

HOO was developed by NOAO in collaboration with the Optical Society of America, the International Society of Optical Engineering, and the National Science Foundation.

Educational Outreach

Hands-On Optics – Family Science Night

Sara Medeiros, a Kealakehe Elementary School teacher, conducted a Family Science Night featuring Hands-On Optics (HOO) activities at her school on December 13. Sara *(at right)* completed training in all six HOO modules at `Imiloa workshops this fall. About 70 people (25 families) attended the evening event and were engaged in HOO activities at stations staffed by her 5th grade students. According to Sara, the "big hits" of the event were working with lenses to build a simple telescope, participating in a laser challenge, and using mirrors to create a kaleidoscope.

Science Saturday

On November 10, `Imiloa participated in "Science Saturday," an event held in conjunction with Mauna Loa Observatory's 50th Anniversary exhibit at Wailoa Center in Hilo. Sponsored by NOAA, the event included interactive displays and activities for families. Pomai Kajiyama *(left in photo)*, `Imiloa Student Assistant, and Matt McBride, NOAA Outreach Specialist, presented data sets of global information, such as atmospheric carbon levels, on the "Magic Planet," a digital video globe. The Magic Planet is on loan to `Imiloa from the NOAA Pacific Services Center in Honolulu.

Kū ki`o Family Day

On December 21, Nico Schnitzler, Membership and Development Associate, and Gail Loeffler, Science Coordinator, traveled to Kona to participate in the Kūki`o Homeowners Association's Family Day. During the event, they provided an opportunity for children to engage in hands-on activities about the Sun and shared general information about `Imiloa with attendees.

Special Events and Activities

Huaka`i i Na Hōkū - Travel to the Stars

On November 3, `Imiloa hosted its second Star Trek event, which featured Michael and Denise Okuda, a husband/wife visual effects and producer team for the popular television series. The Okudas *(left)* presented lectures about re-mastering the original Star Trek series and using astronomical images in Star Trek graphics, and also signed copied of books about the show. Dr. Richard Crowe, `Imiloa Astronomer-in-Residence, conducted a planetarium program about the stars and science of Star Trek, and Inge Heyer, Joint Astronomy Centre Science Outreach Specialist, talked about Star Trek "fandom." A collection of Star Trek memorabilia was also on display for the 81 attendees. To set the mood for the event, many `Imiloa staff donned Star Trek costumes *(right photo)*.

"Exploration Stations"

To engage visitors and enhance their experience at `Imiloa, "explorations" (hands-on activities and demonstrations) are being presented by volunteers and staff at various locations in the Center. Four interactive stations focusing on the expanding universe (balloons), visible and UV light (rainbow bracelets), infrared light, and using filters to view celestial objects began on December 21, and will be conducted through the end of January as a pilot program. If this endeavor is deemed successful—and feedback thus far has been positive—a menu of activities and demonstrations will be developed to make "Exploration Stations" available on a continuing basis.

Staff and Volunteer Training

Maunakea Excursion

On December 17, nine `Imiloa volunteers, accompanied by Clayton Young, `Imiloa Visitor Services Supervisor, participated in an excursion to Maunakea led by Richard Crowe, `Imiloa Astronomer-in-Residence, and Saeko Hayashi and Ryuji Suzuki, Subaru Telescope Astronomers. After an orientation at Hale Pōhaku, the group ascended the mountain to Subaru Telescope, where Saeko and Ryuji provided a tour of the observatory. They returned to Hale Pōhaku for dinner, and after dark, Richard led five volunteers back up the mountain to tour the NASA Infrared Telescope Facility (IRTF), where they were able to look at the night sky through an infrared viewer. The rest of the group opted to remain at the Maunakea Visitor Center, where they viewed celestial objects in the night sky through a 16-inch telescope.

"Canoe-Do-It"

Tom Cummings, Culture Education Manager at Bishop Museum, traveled to Hilo on December 13 to train `Imiloa staff and volunteers on a program he created to teach students in grades 4-6 about building wa`a (canoes) and voyaging. To demonstrate how he presents the program, Tom conducted the training session with a live audience of Christian Liberty School students who were visiting `Imiloa that day. The program accompanies a Bishop Museum traveling exhibit that compares Hawaiian and Alaskan canoes, which is currently on display at `Imiloa.

Updates

The Office of Hawaiian Affairs recently announced an award of $66,334 to `Imiloa to fund the proposal titled "Expansion of the `Imiloa Astronomy Center Pocket Theater Program" (noted in May-June report). The grant will be used to hire student interns who will research, develop, and perform pocket theater programs at `Imiloa.