

This year, travel with The Planetary Society!

# DISCOVER HAWAII

From Lava Flows to Observing the Night Skies...

It is simply "Out of this World!"

October 2-9, 2010

Dear Friends:

We invite you to join us in 2010, as we explore the greatest place on Earth to view our solar system, the planets, and beyond—Hawaii!

In Hawaii, spectacular clear skies and high elevation observatories offer the best viewing in America! Thirteen telescopes focus on the wonders of the night sky, from star clusters to companion galaxies! Scientists can see literally "Out of this World!" into the vastness of space with amazing accuracy.

On this expedition, we will introduce the natural wonders of Hawaii—from lava flows to spectacular sea life! We will also show you some of the great astronomical observatories, which generate an enormous amount of information about our solar system, galaxies, black holes, and beyond!

In Hawaii, earth's forces create new land right before our eyes, as lava streams forth from volcanoes rising 33,000 feet from the ocean floor. The Pacific is home to a profusion of life—from whales to sea turtles, fish to rays, many of which we can see while snorkeling.

More than a thousand years ago, indigenous people followed the stars across the Pacific from Tahiti to settle Hawaii, and brought Polynesian culture with them. In recent centuries, European explorers followed the same stars across the Pacific and discovered Tahiti, Hawaii, and New Zealand!

Our journey will begin in Kailua-Kona—on the dry side of the Big Island of Hawaii—where old black ribbons of lava flow to the sea. Here we will see Galaxy Garden, inspired by planetary artist Jon Lomberg, with a botanic scale model of the Milky Way Galaxy.

We will cross the island between the two largest volcanoes on Hawaii, Mauna Loa and Mauna Kea. En route, we will



visit the W.M. Keck Observatory headquarters near the famous Parker Ranch to learn about their discoveries.

At 9,300 feet on the slope of Mauna Kea we will visit the Onizuka Visitor Center and then transfer to 4-wheel drive vehicles to go to the summit of Mauna Kea, at 13,796 feet, and see sunset from the mountain top near some of the world's largest observatories. We will then return to Onizuka to look through telescopes at the wonders of the universe as seen from 19°N latitude.

At Hawaii Volcanoes National Park, we will see ancient lava formations which built the island and hot molten lava that is flowing to the sea. We will drive as close as we can to the two latest eruptions, Halemaumau and Kilauea at the coast.

At the world class 'Imiloa Astronomy Center of Hawaii we will explore the Hawaiian cultural and navigational understanding of the stars with real-time information obtained from the 13 telescopes on the Big Island.

Throughout our journey, we will explore new discoveries and the continuing effort to unlock the mysteries of the universe and nature's paradise of lava and sea.

We invite travelers with an appetite for adventure and discovery to explore the day and night wonderland of our 50th state this year.

Sincerely,

Dr. Louis Friedman  
Executive Director



THE  
PLANETARY  
SOCIETY

# Hawaii Itinerary

## Day 1 Home to Kailua-Kona, Hawaii

Expedition members fly from their nearest gateway city to Kailua-Kona on the Big Island of Hawaii. Transfer on your own to the *Outrigger Keauhou Beach Resort (2 nights)*. Afternoon at leisure. Welcome dinner and trip orientation. (D)

## Day 2 Kealakekua Bay & The Galaxy Garden

Today we will explore Kona for an introduction to the marine world, people, and heritage of Hawaii. We will take a snorkeling boat off the coast to Kealakekua Bay Marine Reserve to enjoy the undersea wonders of Hawaii. Hawaii has over 1,200 species of fish and we will see some of the most colorful schooling varieties. Lunch on board. Afternoon visit to the Galaxy Garden, designed by Jon Lomberg, who is on The Planetary Society's Advisory Council. Walk in the model of the Milky Way Galaxy and see the center, black holes, and the position of the Earth to scale. Then walk through the adjoining Palealu Peace Gardens Sanctuary. Late afternoon visit to the City of Refuge, Pu'uhonua o Honaunau National Historical Park where ancient Hawaiians pardoned sinners who found sanctuary within its lava walls. (B,L)

## Day 3 Onizuka Visitor Center & Mauna Kea Observatories

This morning we will drive along the shoulder of Mauna Kea to the cowboy town of Waimea. Here we'll visit the administrative offices of the Keck Observatory, see the displays, and learn about

## Traditional Hawaiian Astronomy & Navigation

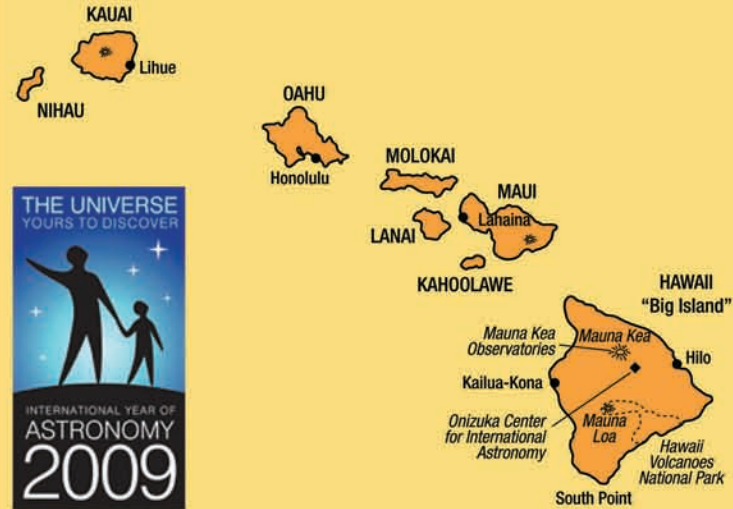
*Early Polynesians were highly skilled navigators who populated thousands of square miles of the South Pacific. From their Tahiti base they explored and settled the Polynesian Triangle from New Zealand to Easter Island and north to Hawaii. Navigation was primarily through a knowledge of the stars, the rising and setting points along the horizon and their passage angle as a function of latitude. These early navigators also studied seasonality of the weather, cloud formation, ocean swells, and the daily flights of seabirds.*

*Many of their gods and demi-gods were derived from early Polynesians study of the night sky and many of their adventures were depicted in groupings of stars. The demi-god Maui tried to snare the Sun to slow its progression across the sky. It is depicted in the constellation Scorpius. The stinger, as we know it, was known to Hawaiians as the hook that snared the Sun to allow the tapa cloth to dry.*

*Early Hawaiians had names for hundreds of stars, groups of stars and practical stories to link them together. The stories kept their traditions alive and gave youngsters knowledge about the past and the ways of the society.*

*In the last 40 years there has been a rebirth of interest in Polynesian navigation and astronomy. A successful voyage to Tahiti in 1976 retraced the ocean voyage of ancient Polynesians in a traditional canoe. Since that time they have sailed back and forth from Tahiti, the Marquesas, and New Zealand without any modern navigational instruments.*

# HAWAIIAN ISLANDS



their research with the world's largest optical and infrared telescopes sitting atop Mauna Kea. We will then drive up the Saddle Road to the Onizuka Visitor Center at 9,300 feet on the south slope of Mauna Kea. With 4-wheel drive vehicles we will visit the summit of Mauna Kea at 13,796 feet to view the many observatory domes. See the sun set into the Pacific Ocean and then return to the Onizuka Visitor Center for an evening to view southern constellations and deep sky wonders. Late night drive to Hawaii Volcanoes National Park. *Hilo Hawaiian Hotel (5 nights)*. (B,D)

## Day 4 Hawaii Volcanoes National Park

We'll start the day with a visit to the Jaggar Museum surrounded by an *ohia* and tree fern forest for an introduction to the natural history of the park. We'll have a late morning visit to Halemaumau Crater, which has been active since 2007. Depending on the activity level we will view the rising steam and the red molten lava from the rim of the massive crater. In the afternoon we will drive the Chain of Craters Road to see the immense black lava fields extending to the sea. Explore the many flows, cinder cones,

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and shiny lava as we proceed to the end of the road. Depending on activity level and weather conditions, we can walk to see the lava flowing into the sea with billowing steam shooting upward and lava exploding as it cools rapidly. (B)

#### Day 5 Thurston Lava Tube & Gemini Headquarters

Morning walk through Thurston Lava Tube, the remains of a colossal lava flow now surrounded by a Tree Fern Forest. Continue walking among tree ferns with the sounds of birds singing above and wildflowers at trail's edge. Lunch in Hilo and then depart for the University Park of Science and Technology. Gemini has two observatories, one in northern Chile and one on Mauna Kea. They have developed the Angular Differential Imaging technique which gives them the opportunity to image exoplanets. (B)

#### Day 6 'Imiloa Astronomy Center & Richardson Ocean Center

The 'Imiloa Astronomy Center is surrounded by most of the headquarters of the different observatories and is the focus of astronomy education in Hawaii. We will visit the center, attend a planetarium presentation, and see the many interactive displays on astronomy, Hawaiian voyaging, and other fields of science. Learn how today's astronomers use different wavelengths of the spectrum to explore our vast universe and the beginnings of life. (B)

#### Day 7 Caltech Submillimeter Headquarters & Pacific Tsunami Museum

This morning we will visit the headquarters of the Caltech Submillimeter Observatory where they have a collection of eight radio telescopes directed to protostars and the envelope of cosmic dust surrounding their formation. Learn about their research on local galaxies that adds new understanding to the development of the universe. Afternoon visit to the Pacific Tsunami Museum which brings to life the destructive force of tsunamis. See the computer simulation and documentaries, but it is the first person histories of survivors that you will long remember. The historic walking tour of Hilo starts on the next corner for all who are interested. Farewell dinner in celebration of our journey. (B,D)

#### Day 8 Hilo to Home

After breakfast, transfer to the Hilo Airport. Connect with a flight to Honolulu and then a return flight to Los Angeles or other cities on the mainland. (B)



## Reservations

#1151

**Yes!** I/We want to join the **Hawaii Expedition, October 2-9, 2010**, offered by **The Planetary Society & Betchart Expeditions Inc.** Please reserve \_\_\_\_ space(s) on the expedition. As a deposit, I/we have enclosed a check for \$\_\_\_\_\_ (\$500 per person), payable to Betchart Expeditions Inc. Trust Account.

Name(s): \_\_\_\_\_ Age \_\_\_\_ Sex \_\_\_\_

\_\_\_\_\_ Age \_\_\_\_ Sex \_\_\_\_

Address: \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_ Zip \_\_\_\_\_

Phone: Home (\_\_\_\_) \_\_\_\_\_

Work (\_\_\_\_) \_\_\_\_\_

Email: \_\_\_\_\_

Citizenship: \_\_ USA \_\_ Canada Other: \_\_\_\_\_

Member of the Planetary Society: \_\_ Yes \_\_ No

Accommodations Preference:

\_\_ Twin \_\_ Single Twin Share \_\_ with a friend *or*

\_\_ Nonsmoker \_\_ Smoker \_\_ assign a roommate

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Please Mail To:**

**Hawaii Expedition, Betchart Expeditions Inc.  
17050 Montebello Road, Cupertino, CA 95014-5435**

**Coming July 4-12, 2010!**

## Tahiti Total Eclipse!

Just a few spaces are available.

email: info@betchartexpeditions.com

phone: (408) 252-4910 (Int'l.)

or (800) 252-4910 (USA)

fax: (408) 252-1444



## Costs & Conditions

**Expedition Fee:** \$2,795 per person twin share for 8 days (plus air fare from the mainland to Kailua-Kona, Hawaii, with return from Hilo).

**Singles:** We encourage singles to register on a "twin share" basis. Should you desire single accommodations, the single supplement is \$695. If you do not have a roommate and we cannot assign one, you must pay the single supplement.

**What to Expect:** This expedition is for the travel enthusiast who would enjoy exploring the natural wonders in Hawaii. We will learn about superb observatories and telescopes in Hawaii which discover sights literally "Out of This World!" Also explore the Big Island of Hawaii including the Kona coast, with important historic locations and great snorkeling. We will travel by 15-passenger van or bus and 4-wheel drive to the summit of Mauna Kea at 13,796 feet, then observe the night skies from the Onizuka Visitor Center.

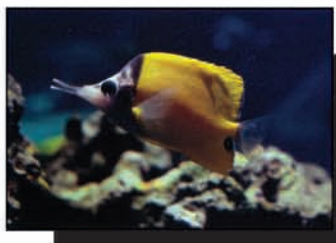
See lava flows in Hawaii Volcanoes National Park, and visit some of the world class observatory administration centers in Hilo. Typically, it will be in the 80's along the coast to the 30's to 50's at the summit of Mauna Kea. If you have any questions, please consult your physician before you register. This expedition will be a tremendous experience for travelers with an appetite for adventure and discovery who would like to explore the day and night wonderland of our 50th state. (No smoking in vehicles, during lectures, or meals, please.)

**Expedition Fee Includes:** Land transport by coach, boat, or vans; 7 nights accommodations in first-class hotels, twin share with bath; 7 breakfasts, 1 lunch, and 3 dinners; Hilo group out transfer; group entrance fees; baggage handling; leadership, administration.

**Expedition Fee Does Not Include:** Air fare to Kona with return from Hilo; five lunches, four dinners; independent airport transfers; optional activities; personal items such as alcoholic beverages, laundry, phone calls, bottled water, soda, snacks, or personal insurance.

**Airfares & Airline Ticketing:** Please make flight arrangements directly with the airlines to arrive in Kona by 4:00 pm October 2, and to depart from Hilo after breakfast October 9.

**Cancellations & Refunds:** The initial deposit for this expedition is refundable up to 60 days before departure less a handling fee of \$100 per person. There will be no refund for any cancellation after the 60-day period unless your place can be resold, then only the handling fee of \$100 is withheld. There are no refunds for unused meals, accommodations, or other expedition features. Trip cancellation insurance will be offered; it will cover preexisting medical conditions if purchased within 15 days of the date on your confirmation letter and full trip payment.



Courtesy of 'Imiloa Astronomy Center

## World Class Astronomy in Hawaii

*The Big Island of Hawaii is the world center for international scientific investigation into astronomy. The 13,796 foot summit of Mauna Kea provides the clearest and best viewing conditions on Earth. The skies are dry, the air is stable, pollution free, with no lights, and Mauna Kea rises above 40% of the Earth's atmosphere. The summit is home to the world's largest collection of astronomical observatories, with telescopes operated by scientists from 11 countries.*

*The W.H. Keck twin 10-meter optical and infrared telescopes are producing discoveries that were unimaginable a few years ago. They are researching new planets, gases on Mars, and star formation in the early universe, and have discovered the coldest brown dwarf. The Gemini Observatory is operated by seven countries with two optical and infrared telescopes, one in northern Chile and one on the summit of Mauna Kea. The 8.1 meter telescopes are studying galaxy formation, dark matter, dark energy, and massive black holes.*

*The Smithsonian Observatory has an 8 element radio interferometer, the Submillimeter Array. Their research focuses on star formation and development, early evolution and how stars shed their matter as they die.*

*Caltech Submillimeter Observatory houses a 10.4 meter diameter radio dish. Some of the research is directed to protostars and the envelope of cosmic dust surrounding their formation. Most of the local galaxies are being surveyed and adding new understanding to universe formation.*

**Responsibility:** Betchart Expeditions Inc. and The Planetary Society act only as agents for the passenger with respect to transportation and hotels and exercise every care possible. We can assume no liability for injury, damage, delay, loss, accident, or irregularity in connection with the services of any airplane, ship, motorcoach, or any other conveyance used in carrying out the arrangements of the tour. We cannot accept any responsibility for losses or additional expenses due to delay or changes in air or other services, sickness, weather, strike, war, quarantine, acts of God, terrorism, or other causes beyond our control. All such losses or expenses will have to be borne by the passenger, as tour rates provide for arrangements only for the time stated. We reserve the right to substitute another leader of similar expertise or to cancel any tour prior to departure in which case the entire payment will be refunded with no further obligation on our part. The right is also reserved to decline to accept or retain any person as a member of the tour. No refund will be made for the unused portion of any tour unless arrangements are made in sufficient time to avoid penalties. The price of the program is based on current tariffs and rates, and is subject to change. Any tariff, exchange rate, or fuel increases will be passed on to participants. Baggage is carried at the owner's risk entirely. It is understood that the air ticket when issued shall constitute the sole contract between the passenger and the airline concerned. The airlines concerned are not to be held responsible for any act, omission, or event during the time passengers are not on board their plane or conveyance.

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Map by April Milne. Photos on cover courtesy of David Morrison

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