San Francisco welcomes the 2013 Circles of Giving Awards Dinner

The traditional Annual Circles of Giving Awards Dinner of the Vatican Observatory Foundation was held this year in the beautiful city of San Francisco, California. Father President, the Members of the Board and friends of the Foundation gathered to honor those individuals who during the past year attained a significant and admirable level in their giving. Each Circle of Giving is named in honor of one of the exceptional individuals connected with Astronomy, the Society of Jesus and the Vatican Observatory. This public recognition is but a small token of our profound gratitude and appreciation. Our many thanks and prayers go to all those honored in San Francisco.

During this evening the VOF also honored and gave special thanks to two couples who have supported the VOF with their time, expertise and generosity for decades. Jim and Diane McGee and Manny and Lupita Espinosa have been extremely influential in the continuing success of the foundation through their many years of service and loyal dedication as board members and benefactors. They have demonstrated for decades their appreciation of the work of the observatory by the insight, wisdom and time they have shared with us. Though neither Mr. and Mrs. Espinosa nor Mr. and Mrs. McGee were able to join us it is only right that their loyalty and generosity were recognized at this event.

2012 Circles of Giving Honorees

**Gregory XIII Circle - $250,000**
Jesuit Community of the Vatican Observatory

**Christoph Clavius Circle – $10,000**
Larry and Mary Ann McNamee
West Pharmaceuticals

**Georges LeMaitre Circle - $5,000**
Greg and Linda Maxon
Edward Oleen

**DID YOU KNOW?**

It was in the famous Tower of the Winds that Pope Gregory XIII was shown the need to reform the calendar and commissioned the Jesuit astronomers and mathematicians to gather the needed data in 1582. Thus began the tradition of Papal interest in astronomy leading to the modern day Vatican Observatory. The Vatican Observatory Foundation recognizes his contribution by welcoming benefactors of $250,000 to the *Gregory XIII Circle of Giving.*
Message from the President

by Fr. Albert DiUlio, S.J.

The Vatican Observatory Foundation (VOF) continues its work of supporting the Vatican Advanced Technology Telescope (VATT) and the Jesuit scientists who use it for astronomical observations. The past year has been an exciting one as the VOF is developing several new initiatives that will make the telescope a more useful and accessible instrument for many people. In this issue of the newsletter you will find information on ‘remote observing’ which allows observers to view from the VATT but remain in Tucson at the Steward Observatory. This exciting development will provide for many additional scientists to utilize the amazing capabilities of the VATT without having to make the eight hour round trip to the top of Mt. Graham.

The second major initiative will be to enter into a consortia arrangement with the University of Arizona as we fully robotize three of the telescopes that are currently in use: VATT and two of the University’s smaller telescopes. When ‘robotization’ is fully implemented in 2015 or earlier an observer will be able to indicate at what coordinates he wishes to view a star, galaxy, planet or space in the sky from anywhere on earth with an internet connection and the center for the telescopes here in Tucson will be able to enter the coordinates and VATT will automatically move to them. Savings in time, personnel, cost and energy will be tremendous and will expand the VATT’s usefulness to thousands of people. Such a program will cost approximately one million dollars for VATT but the additional usefulness of the telescope and its reach will be well worth the expenditure.

A third initiative that VOF is exploring concerns the Vatican Observatory Summer School for May, 2014 at the headquarters in Castel Gandolfo outside Rome. In one scenario the VOF would offer to raise money for scholarships of about $5000 for a student from either the US or from a developing county. These monies would help defray the costs of the summer school and would allow young astronomers from developing nations to attend and bring their skills and talents not only to the summer school but with them when they return to their home countries in late June. While this remains in the planning stages it is my hope we will be able to initiate a scholarship program late this year.

So, as you can see the VOF continues its efforts and your help and support remain vital to this mission of the Church. Without you and your generosity our work would not be possible and we thank you for your wonderful efforts. In no other area of the Church can you share in such a vital endeavor to understand and explore the fullness of God’s marvelous creation for it is truly where the Church “Reaches for the Heavens.”

Board of Directors

While in San Francisco the members of the Foundation Board gathered for an all day session to discuss the state of the foundation and its future.
News from Castel Gandolfo

The 64 page report contains information on the current research projects, instrumentation renovations on the telescope and staff activities and publications from the past year. Copies are available by contacting katie@vaticanobservatory.org.

New Meteorite Lab
The Vatican Observatory meteorite collection is one of the major meteorite collections in the world, with over 110 samples representing 150 kg. of extraterrestrial material. A new laboratory has been installed in record time with impervious surfaces and improved climate control and security that will carry the important work done here well into the 21st century.

Dome Restoration and Visitor Center
To showcase the Church’s commitment in contributing to the progress of scientific knowledge and the Observatory’s scientific heritage two domes located in the Pontifical Gardens in Castel Gandolfo are being restored as part of a visitor center museum. The domes house two telescopes, the Carte du Ciel (1891) and the Schmidt (1957), which were advanced technology telescopes in their day.

UPCOMING EVENTS

Tour of Rome & Castelgandolfo November 3 to 9, 2013
This tour has only a few openings at press time. The full brochure is available at www.MyBrochureOnline.com/Steinke

Tour the VATT
Join us to celebrate the 20th Anniversary of the Dedication of the Vatican Advanced Technology Telescope. A limited number of spaces are available to visit Mt. Graham on Saturday, October 12, 2014.

Tour of Astronomy in Chile, Fall 2014
With the assistance of Spanish astronomer, Dr. Fernando Comeron, the VOF is organizing a trip to Chile in the fall of 2014. Dr. Comeron was a student of the Vatican Observatory Summer School in 1990 and returned in 2007 as a faculty member. He has recently become the European Southern Observatory (ESO) Representative in Chile. Look for more information in our next newsletter.

For more information about any of these events contact Katie Steinke at (805) 901-6591 or Katie@vaticanobservatory.org

Visitors to Castel Gandolfo: The Diplomatic Corps accredited to the Holy See was the largest group of the many visitors to the Vatican Observatory headquarters last year.

Appointments: Fr. Christopher Corbally, S.J., who served as Vice Director for the Vatican Observatory Research Group since 1993, was succeeded by Fr. Paul Gabor, S.J.. During his many years in this position Fr. Corbally played a crucial role in building and running the VATT.


Brother Guy Consolmagno crisscrossed the US several times speaking to many groups including The University Series in Thousand Oaks, CA and at the Ignatius Loyola Lecture at Loyola University Chicago. While on his trek he met some interesting space “colleagues” in Hollywood.

At his presentation, “Star Wars: When Astronomy & Religion Meet” at the University of Charleston, Fr. Christopher Corbally said, “You look to the Bible to find out how to go to heaven -- not to know how the heavens go. If you’re trying to find out how things go, look to science and textbooks. If you want to know what the relationship is between the creator and creation, look to the Bible. Science will tell us how, but it will never tell us why.”
The question of whether we are alone in the universe – however you care to frame that – is one of the most profound questions science can ask, and, I think, will answer in our lifetimes,” University of Arizona astronomy professor Chris Impey told a Vatican Observatory seminar on astrobiology Feb. 23 in San Francisco.

Human beings have imagined other civilizations inhabiting the night skies nearly from the beginning of time, but, with rapid advances in the ability to remotely probe space 10,000 light years away, that imagining is now fodder for mainstream scientific theorizing. The National Space and Aeronautics Administration launched the Kepler Mission March 9, 2009, a solar-powered space telescope that trails Earth’s orbit around the sun. It is the first space mission to search for Earth-size and smaller planets in the habitable zone of other stars, as part of its mission to explore the structure and diversity of planetary systems in the galaxy. Already, the Kepler space telescope has found about 3,000 planets in other solar systems, over 300 of which are Earth-sized or smaller. Impey estimates that this number projects to several hundred million sites in the Milky Way where some form of life is likely.

Water, commonly believed necessary to life, has been found on Jupiter’s moon Europa, and is likely present on many planets and moons, including others in our solar system, he said. Discovery of microbial life is the most likely scenario, Impey said. If conscious life is discovered, Impey said, “The disconnect is likely to be so profound that communication is an extraordinarily unlikely premise. That’s less comfortable.”

“Most people think there is life out there,” said Margaret Race, a SETI (Search for Extraterrestrial Intelligence) Institute ecologist with NASA in Mountain View. But, because other solar systems are light years away, contact with extraterrestrial life is unlikely in our lifetimes, she said. Race was one of several speakers at a seminar in San Francisco Feb. 23, sponsored by the Vatican Observatory with the generous support of the Jesuit Community of the Vatican Observatory.

Christopher Impey, Ph.D. University Distinguished Professor and Deputy Head of the Department of Astronomy at the University of Arizona, Tucson
“Present and Future of Research in Astrobiology”

Margaret Race, Ph.D. Ecologist at the SETI Institute, Mountain View, California
“Social and Cultural Impact of Life in the Cosmos”

William Stoeger, S.J., Ph.D. Vatican Observatory Research Group
“Philosophical and Theological Implications of Extraterrestrial Life”

Moderator: Guy J. Consolmagno, S.J., Ph.D.
Curator of Meteorites at the Vatican Observatory

(Excerpt from an article about the Seminar by Valerie Schmalz for the March 15th online issue of the Catholic San Francisco.)
Our thanks go to the members and staff of The Olympic Club in San Francisco for making our events a great success. A special note of gratitude goes to Club President, Dennis Murphy and his wife, Mahgie, for allowing us to be their guests.

The VOF is grateful to have had as guest speaker for the evening Dr. Alex Filippenko, Professor of Astronomy at University of California, Berkeley. Well known for his many television documentary appearances he is also the recipient of numerous prizes for his scientific research and teaching ability. Dr. Filippenko’s talk on “Dark Energy and the Runaway Universe”, was a fascinating subject made even more fascinating by such a wonderful presentation.

Vatican Observatory, “Astrobiology: Why is the Vatican interested in the search for life in the universe?”

“One key question for philosophy is, what is life?” said Jesuit Father William R. Stoeger, staff scientist at the Vatican Observatory Research Group at the University of Arizona. “If we do find intelligent life, even if we can’t really connect with it, that’s going to be extremely significant in a different way,” said Father Stoeger. “Another intelligent civilization in our galaxy indicates that there are two civilizations in a very small region in our galaxy. That statistically means a lot more.” Then, Father Stoeger asked, would they be “capable of prayer? Then it would be just like evangelizing another culture.”

“Revelation applies to whoever we meet in space,” said Jesuit Father Jose Gabriel Funes, “From our faith, we know we are children of God,” said Father Funes, who is an ex-officio member of the Pontifical Academy of Sciences. If we find spiritual beings in outer space, “These people would also be beings created by God,” Father Funes said, and they may “help us understand God better.”
On Friday, February 15, 2013 at 03:20:26 GMT (9:20:26 am local time), a meteor exploded over the sky of Chelyabinsk in Russia, outshining the morning sun. The Chelyabinsk Meteor continues to be studied by the scientific community around the world, but the early estimates available just a few hours after the event suggest that the meteor was 17 meters in diameter and liberated the energy equivalent to 500 kilotons of TNT (30 to 40 times more powerful than the atomic bomb dropped on the Japanese city of Hiroshima during World War II). Its mass was estimated at 10,000 metric tons and it entered the Earth’s atmosphere at more than 18 km/s (around 40,000 mph).

When a meteor of that size penetrates the Earth’s atmosphere, an exchange of energy occurs between its molecules and the molecules in the atmosphere. After they are excited, the atmosphere’s molecules then return to equilibrium, releasing that energy, which is seen as light in the sky; for several seconds it can outshine the sun.

A big meteor like this also creates a shockwave when it hits the atmosphere, capable of blowing down anything in its path. This shockwave will bounce back and forth between the ground and layers of the atmosphere, traveling thousands of miles; it can be detected by infrasound detectors around the world. The Chelyabinsk Meteor was recorded by a global network of infrasound sensors operated by the Comprehensive Test Ban Treaty Organization (CTBTO), such as one stationed in Alaska, 6500 kilometers away. The first estimations of the Chelyabinsk Meteor’s size and energy were made by analyzing this infrasound data.

A meteor of this size is likely to produce meteorites. Some fragments of Chelyabinsk have been recovered, and first reports suggest it is a sample of the well-known “ordinary chondrite” type of stony meteorite. However, the fragment responsible of the seven-meter-wide crater made in the icy surface of a nearby lake is believed to be still sitting at the bottom the lake, waiting to be recovered.

The Russian meteor is believed to have been broken from one of the Apollo family of asteroids, asteroids which cross Earth’s orbit but whose elliptical orbits also take them out beyond planet Mars. The same day that the Russian meteor struck, another asteroid (designated 2012 DA14), discovered last year, also made a close flyby of the Earth. It passed by at a distance of 17,200 miles (27,000 km), between the Earth and the Moon. These two space rocks, even though they are clearly not related to each other (their orbital paths show they came to us from very different directions), have served to increase more than ever our awareness of the threat that such bodies may be to our planet, our civilization, and even to human life itself.

The Vatican Observatory is deeply involved in the study of NEOs (Near Earth Objects) to understand their dynamics, their physical and chemical properties, in close collaboration with the international community of scientists.

Fr. Jean-Baptiste Kikwaya measures the brightness and speed of meteors large and small as they are observed hitting the Earth, and he has developed a technique to estimate the size and origin of the materials that produced the meteoric flashes of light.
Using VATT Remotely: First Step toward Full Automation!

So astronomers can have fun while they wait for the asteroid to hit...

Recently Brother Guy Consolmagno, S.J. and Dr. Bill Romanishin, a retired Professor at the University of Oklahoma, observed with the VATT at Mt. Graham International Observatory remotely from Steward Observatory at the University of Arizona in Tucson. As Brother Guy so aptly put it, “We were measuring how the brightness of a couple of “centaurs” changes as they spin. Centaurs are proto-comets - no tails yet - faint and distant, orbiting in from the Kuiper Belt. These observations will let us work out their shapes. With three such light curves taken at three different places in their orbits we can work out a 3D shape but this requires data taken over the course of years. Some of our work will be combined with curves measured as long as 20 years ago. Such long term projects are ideal for our telescope.”

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A Cultural and Spiritual Journey to the Jesuit Reductions of Argentina and Paraguay
February 17th – March 1st, 2014

Sponsored by the California Province of the Society of Jesus. To know more contact: david@villasandvines.com

NEOs continued

Br. Guy Consolmagno measures the physical properties of the meteorites recovered from such falls, including those properties such as density and thermal diffusivity that are needed to understand the way these meteorites explode in the sky.

And with the VATT, these scientists and their colleagues at the University of Arizona and the Planetary Science Institute are planning a systematic study of NEO brightness and colors in order to learn the size, shape, and composition of such objects that may well make another near pass to the Earth.

We may some day visit such nearby asteroids, to learn what they can tell us about the origin of planets or even to exploit their mineral wealth. Or such visits may have a more urgent rationale, if it is determined that they are on a path to make an all-too close approach to our home planet!
Reaching Out to Others, Going to the Outskirts

José G. Funes, S.J.

It was about 11:10 am in Tucson when the white smoke from the chimney of the Sistine Chapel announced to Saint Peter’s Square and the world that a new Pope had been elected. I was following the events on the Internet like many of you. It was a kind of surprise that the Cardinals had resolved the election so quickly but for me the surprise did not end there. I was surprised and shocked when I heard the name of the elected Cardinal. Father Jorge Mario Bergoglio was one of the Jesuits who examined my vocation when I asked to join the Jesuit order. I have to confess that I am still in shock. The Jesuits are not used to leading positions in the hierarchical Church, we are used to serve where there is more need. Our role models are not bishops nor cardinals but Jesuits living at the geographical and existential frontiers. Therefore I need some time to accept that one of us is now the Pope.

In the first weeks of his Pontificate, Pope Francis has insisted on this through his words and by his gestures that are worthy of an encyclical. I would like to highlight one idea that I consider very important for our mission at the Vatican Observatory. Francis in the first general audience said that following Jesus means learning how to come out of ourselves to reach out to others, to go to the outskirts of our existence. These words encourage us to go out to the outskirts of the Universe, to explore the Universe, its origins and its future. It also means to come out of ourselves to ask the deepest human questions about science and faith. This is a journey for all people of good will not only for the Vatican astronomers. I hope you will join us. We would be delighted.