



# VATICAN OBSERVATORY NEWSLETTER

*embracing, encouraging and promoting scientific study*

## Giovanni Cardinal Lajolo Visits Observatory in Arizona Signifies Holy See's Support

By Father José Funes, S.J. ✦ Director, Vatican Observatory



After a long flight from Rome that landed him in Tucson on 25 February, Cardinal Giovanni Lajolo spent three busy days with Vatican Observatory and University of Arizona astronomers, touring their campus offices and laboratories and hearing presentations on their latest research.

Cardinal Lajolo is the President of the Pontifical Commission for the Vatican City State. As the executive in charge of the day-to-day running of Vatican City, Cardinal Lajolo reports about the Vatican Observatory directly to Pope Benedict XVI. His visit signified the Holy See's interest and continued support of its scientific research institute.

Cardinal Lajolo visited the operations center for HiRISE, the High Resolution Imaging Science Experiment, where he viewed the spectacular images of Mars coming from the camera aboard the Mars Reconnaissance Orbiter.

Mirror Lab director Roger Angel gave Cardinal Lajolo a tour of the unique mirror-making facility beneath the football stadium, where giant mirrors for the next-generation Giant Magellan Telescope and Large Synoptic Survey Telescope are now being ground and polished. The Vatican Advanced Technology Telescope (VATT) on Mt. Graham in Arizona is the first telescope to employ one of these unique mirrors. Cardinal Lajolo toured the Mt. Graham International Observatory where the Large Binocular Telescope and the VATT are in full operation.

"I am truly grateful to be here," Cardinal Lajolo said at the Vatican Observatory Foundation's annual research seminar, and to "see the amazing world of the observer — those who seek the truth about our universe, about God and about humanity."

Cardinal Lajolo's visit coincides with the International Year of Astronomy 2009, celebrated by nations the world over to mark Galileo's first scientific use of the telescope 400 years ago. The special astronomy year "is of particular interest to the Vatican Observatory because (the observatory's) roots go back to Galileo Galilei," Cardinal Lajolo said.

**"I am grateful to be here (and to) see the amazing world of the observer—those who seek the truth about our universe, about God, and about humanity."**

—Giovanni Cardinal Lajolo



Founded in 1891, the Vatican Observatory demonstrates the Church's desire to embrace, encourage and promote scientific study, on the basis of her conviction that 'faith and reason are like two wings on which the human spirit rises to the contemplation of truth' (Fides et Ratio, Proemium). For more information, email ([info@vaticanobservatory.org](mailto:info@vaticanobservatory.org)) or call (+1 (520) 795-1694).

**Father José Funes, S.J.**  
Director, Vatican Observatory

**Father George Coyne, S.J.**  
President, Vatican Observatory Foundation



Archbishop Pietro Sambi (foreground, second from left), Apostolic Nuncio to the United States, welcomes friends of the VOF to the Vatican Embassy on March 2.

## VOF Welcomed at the Apostolic Nunciature

Friends and newcomers to the Vatican Observatory Foundation visited Archbishop Pietro Sambi at the Vatican embassy in Washington DC on March 2, 2009. With a generous welcome, Archbishop Sambi recognized all those who make the work of the Vatican Observatory possible and spoke briefly of the Observatory's importance to the Holy See because of its role at the nexus of science and faith.

## Coyne awarded Van Biesbroeck Prize

The American Astronomical Society recently awarded Father George Coyne, SJ, Vatican Observatory director emeritus, the George Van Biesbroeck Prize "in recognition of the diversity and scientific richness he has brought to the astronomical community through his visionary leadership of the Vatican Observatory Summer School and its long-term mentoring program, and for the unique role he has played at the juncture of science and religion." The Van Biesbroeck prize is normally awarded every two years and honors a living individual for long-term extraordinary or unselfish service to astronomy, often beyond the requirements of his or her paid position.

# VATICAN

## Stellar Spectral Classification

Princeton University Press has just released a book entitled "Stellar Spectral Classification" by Father Chris Corbally, SJ and his colleague Richard Gray, professor of astronomy at Appalachian State University. Written by these premier experts in the field, it is the only book to comprehensively discuss both the foundations and most up-to-date techniques of spectral classification systems. Definitive and encyclopedic, the book introduces the astrophysics of spectroscopy, reviews the entire field of stellar astronomy, and shows how the well-tested methods of spectral classification are a powerful discovery tool for graduate students and researchers working in astronomy and astrophysics.

## Vatican Observatory at the Pontifical Evolution Conference

Members of the Vatican Observatory figured prominently in the recent III STOQ International Conference "Biological Evolution – Facts and Theories: A Critical Appraisal 150 Years After *The Origin of Species*." The conference was held March 3-7, 2009 at the Pontifical Gregorian University in Rome, with the collaboration of the University of Notre Dame (Indiana) and under the Patronage of the Vatican's Pontifical Council for Culture. Father José Funes, SJ, Director of the Vatican Observatory, was on the Committee of Honor, along with Father Michael Heller, last year's Templeton Prize Winner and an adjunct member of the Observatory. Father William Stoeger, SJ gave an invited talk on "Emergence, Directionality and Finality in an Evolutionary Universe." The overall framework of the Conference was provided by the multi-year Science, Theology, and the Ontological Quest (STOQ) Project, in which a number of the Pontifical Roman Universities, including the Gregorian University, participate. The aim of STOQ is to support and foster study, research, dialogue, and education on key issues relating the natural sciences, philosophy and theology. Father Stoeger's presentation outlined how cosmic evolution set the stage for the emergence of life, and for biological evolution, principally by generating the chemical building blocks and the venues suitable for life.



# OBSERVATORY NEWS

## Vatican Observatory in Worldwide Astronomy Marathon - ONLINE!

The Vatican Advanced Technology Telescope was among leading ground-based and space-based telescopes featured in a first-ever, 24-hour live video Webcast on Friday, April 3. The Webcast, called “Around the World in 80 Telescopes,” was sponsored by the International Astronomical Union as part of the 100 Hours of Astronomy project that celebrates the International Year of Astronomy 2009. The Webcast was hosted at the European Southern Observatory’s headquarters in Munich, Germany, with live streaming by Ustream.tv. “The VATT has been operating efficiently now for 16 years at one of the darkest astronomical sites, the Mount Graham site,” said Vatican Observatory astronomer Father Richard Boyle, SJ. Boyle with his colleagues, A.G. Davis Philip and Father Richard De Souza, SJ guided the live Webcast tour at the VATT. To view the recorded webcast, visit [www.astronomy2009.va](http://www.astronomy2009.va).

## International Year of Astronomy (IYA 2009)

Vatican Observatory initiatives for IYA2009 include an expanded, special session of the international summer school that has been taught at the Vatican Observatory at Castel Gandolfo every two years since 1986. The Vatican Observatory is also planning an exhibit that will open at the Vatican Museums in October and a weeklong study session on astrobiology organized together with the Pontifical Academy of Sciences. The Philatelic and Numismatic Office of the Vatican has produced two stamps to celebrate the IYA (pictured at right).

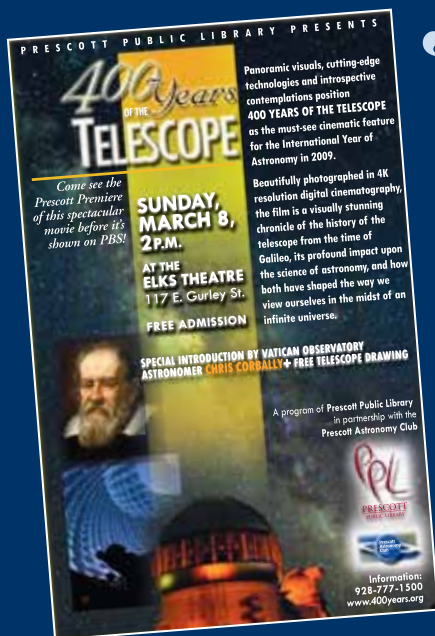


# Noteworthy

March 8, **Father Christopher Corbally, SJ** introduced the premiere of “400 Years of the Telescope” to a capacity and very appreciative audience at the Elks Theatre in Prescott, Arizona. This spectacular movie, for which Corbally had advised and helped, chronicled the history of the telescope since Galileo’s first observations. It was shown on PBS on April 10. Check your local listings for additional showings.

**Father George Coyne, SJ** was appointed to the international selection committee for the Bower cosmology prize of the Franklin Institute in Philadelphia.

**Google Calendar!** The staff of the Vatican Observatory often travel around the world giving presentations, lectures, and participating in fascinating discussions. To keep up with their travels—and to find out if they’ll be in your area—be sure to check out the new Events Calendar link from the Vatican Observatory web page. And keep your eyes peeled for the launch of a **new web site this summer!**



## Foundation Travels

The Vatican Observatory Foundation recently visited friends in Phoenix, Los Angeles, Pasadena, Houston, Washington DC and more. If you would like to host an event in your area on behalf of the Vatican Observatory Foundation, please contact Brother John Hollywood, SJ at (520) 795-1694.



As part of the special events surrounding Cardinal Lajolo's visit to Arizona, friends and benefactors of the VOF made a day trip to Kitt Peak and the International Observatories there.



1 Cardinal Lajolo and HiRISE project leader Alfred McEwen of the Lunar and Planetary Lab discuss the camera aboard the Mars Reconnaissance Orbiter. 2 VOF Board Member Rich Friedrich and Fr. Funes show the VATT computer during a tour of the telescope. 3 Fr. Corbally points out parts of the telescope to the cardinal.



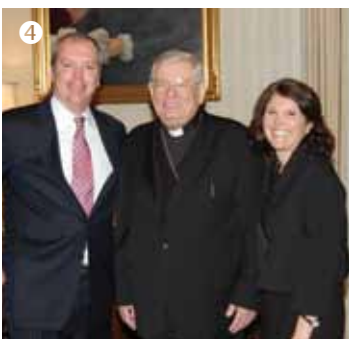
4 Fr. Mark Haydu, LC; Cardinal Lajolo and Fr. Funes gather outside the VATT on Mt. Graham. 5 Fr. Funes watches as a mirror similar to the VATT's is polished at the Steward Observatory Mirror Lab. 6 Cardinal Lajolo joins VO staff and University of Arizona scientists for lunch. 7 Fr. George Coyne makes a presentation during the VOF's annual Board meeting in Tucson.



(Above) Cardinal Lajolo joins VOF friends during cocktail hour; VOF Board members Ken Kilroy, Ben Dalby, Brendan Thomson, Fr. Charles Currie, SJ and Karen Dalby celebrate after the annual board meeting. (Left) Fr. David Brown, SJ dines with Jim and Sally Considine at the annual Awards Dinner



Archbishop Sambani and Fr. George Coyne (right) greet Cardinal William Keeler, Archbishop Emeritus of Baltimore.



1 Michael Szpak and Gene Sigilitto raise a glass; The Szpaks were inducted in the Circles of Giving at the Awards Dinner 2 Jacquie McNulty and Bro. Guy Consolmagno, SJ 3 Ann Coughlin and Mollie Ingram have a good laugh with Archbishop Sambani 4 Brian and Kara Walsh join Archbishop Sambani at the Nunciature

## Get to Know: Miguel Chavez, VOSS Class of 1990

### What was the most important thing you experienced at the 1990 Summer School?

It is difficult to summarize the number of unforgettable experiences during the school. The trip to Castel Gandolfo was the first overseas trip in which I had *international exposure*. I was really worried about not being smart enough to follow the lectures, or not being able to communicate in English with the faculty and fellow students. Another important aspect was the access to a fresh panorama on two contemporary fields in astrophysics—stellar spectral classification and structure of galaxies. At the end, my participation was a personal success thanks to the patience of the staff and faculty, and the clarity of the lectures. There was one experience that more deeply impacted me in a manner I cannot explain. This was the privilege of having an audience and a short individual interview (we even shook hands!) with the Holy Father, John Paul II.

### Did the Summer School help you in your career as an astronomer?

The school was extremely helpful in several aspects! Perhaps the most cardinal one was that the faculty clearly depicted the flavor of conducting cutting edge research. The school provided an environment characterized by a wide diversity of levels among fellow students. And I learned that a successful career in astronomy (and in any other field) needs humility, perseverance and strength; requires keeping your chin up in difficult times; and that the spirit of collaboration must emerge naturally. Afterward, I had the chance to visit numerous research institutions in Europe. About a year later I successfully applied to the International School for Advanced Studies in Trieste, Italy. Then, in 2002 I spent a sabbatical year at the University of Arizona – a stay that was possible and successful thanks to the support of the Vatican Observatory.

### What are you doing now?

I am a full-time researcher at the Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE), in Puebla, Mexico. My main area of research is the study of stellar atmospheres from the far-UV to optical wavelengths and their applications to the study of stellar populations. I have directed 11 theses, taught 14 graduate courses on stellar physics and led 6 undergraduate courses on Linear Algebra, Electromagnetic Theory and General Astrophysics. I am co-author



of nearly 80 publications and have edited two proceedings books.

### Do you keep contact with your fellow students, the faculty and the Observatory staff?

There is an interesting and outstanding product of the Vatican Summer Schools that makes them quite distinct from other schools. Their length and well-balanced academic and social activities result in everlasting friendships, even with those that one has never met. Let me give you an example. Early in April, I had the chance to attend a meeting in Boulder, Colorado, to honor Dimitri Mihalas and, at some point, I chatted with two participants who happened to be ex-alumni of the summer schools—Rodney Medupe (VOSS 1995) and Javier Garcia (VOSS 2001). It was enough to mention that we are members of the same family for a spontaneous sensation of fraternity to appear. We are now actually thinking about collaborating in a couple of research projects. I also visit Tucson and take the opportunity to visit my VO friends there, in particular Father Coyne—or “Tio Jorge” as my wife and kids call him!

**Every two years, the Vatican Observatory Summer School (VOSS) gathers 25 students and scholars from across the globe to Castel Gandolfo to pursue their passion for astronomy under a renowned faculty of senior scholars. For more information on the program or to provide scholarships for students in need, visit:**

**[www.vaticanobservatory.org](http://www.vaticanobservatory.org).**



## Benefactor Notes Phyllis & George Mucciante



Phyllis and George Mucciante (bottom left) join Pope John Paul II, Fr. Coyne, friends and VOSS students during a trip to Rome with the VOF.

"My husband and I are fascinated by the work of the Vatican Observatory," Phyllis Mucciante recently expressed. "They are always looking for an answer to a great question, like 'What are the origins of the universe? Where did we get our start?'"

Phyllis and George Mucciante were introduced to the Vatican Observatory Foundation about five years ago through VOF Board member and fellow Chicagoan Paula D'Angelo. The Mucciante family is eager to help the VOF become better known and hope their support as Guardians of the Vatican Observatory Foundation will foster greater dialogue in the realm of faith and science.

"There's quite a bit of confusion about faith and science, the role of each and how they interact," Mucciante expressed. "Father Coyne visited us once and gave a talk to a small group. All my neighbors thought he and his work were really interesting. He did a great job explaining things that are difficult to understand."

The Mucciante family joined other supporters of the VOF on a trip to Rome several years ago and found it to be an enlightening and special experience. "I had Galileo's book in my hand!" remembered Phyllis. "We saw and did things you aren't able to do travelling on your own."

The Mucciante family is hoping to join the VOF in Rome again in October 2009. A special insider's trip, the Guardians Trip to Rome will coincide with the opening of an exhibition of astronomical instruments in the Vatican Museums as part of the International Year of Astronomy.

"I think it's important that we continue to understand what's around us, and how that complements our faith," Mucciante stated. "It's not just a matter of Creation way back when. We're also looking to find out what is out there **now**. And who knows what the future holds."



## RESEARCH HIGHLIGHTS

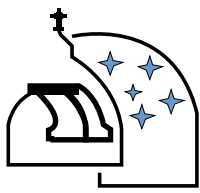
### Scientific Research at the Vatican Observatory ✦ By Brother Guy Consolmagno, S.J.

With support from the Vatican government, the scientists at the Vatican Observatory have a freedom to choose research topics not constrained by three-year proposal cycles or passing scientific fashions. As a result, our research topics, reflecting the wide range of interests in our staff, can focus on long-term survey programs and sometimes risky cutting-edge topics.

Among the surveys currently underway are participation in the Local Volume Legacy project which is a census of the local Galactic neighborhood in many different colors, including even the faintest galaxies; the validation and application of the seven-filter Stromvil system for classifying stars in clusters in the Milky Way; the identification and cataloguing of spectrally peculiar stars; and the measurement of meteorite physical properties such as density, porosity, magnetic and thermal characteristics. Each of these surveys has been underway for more than ten years, and have provided invaluable data to other astronomers and planetary scientists.

Among the cutting edge work being done at the Vatican include models for the stellar evolution of tidally stripped stars in binary systems; the characterization of meteor mass, density, and thermal properties from a statistical analysis of meteor light curves; and the development of a framework for observationally testing cosmological models that do not presume large-scale homogeneity, and thus go beyond the standard Freeman-Lemaître-Robertson-Walker interpretation of cosmological data.

Even beyond those subjects, research topics at the Vatican range from string theory and observing galactic clusters to the search for extrasolar planets. The Vatican astronomers come from nearly every continent (no Australians at the moment, but our members have done research in Antarctica!) and touch nearly every field of modern astronomy.



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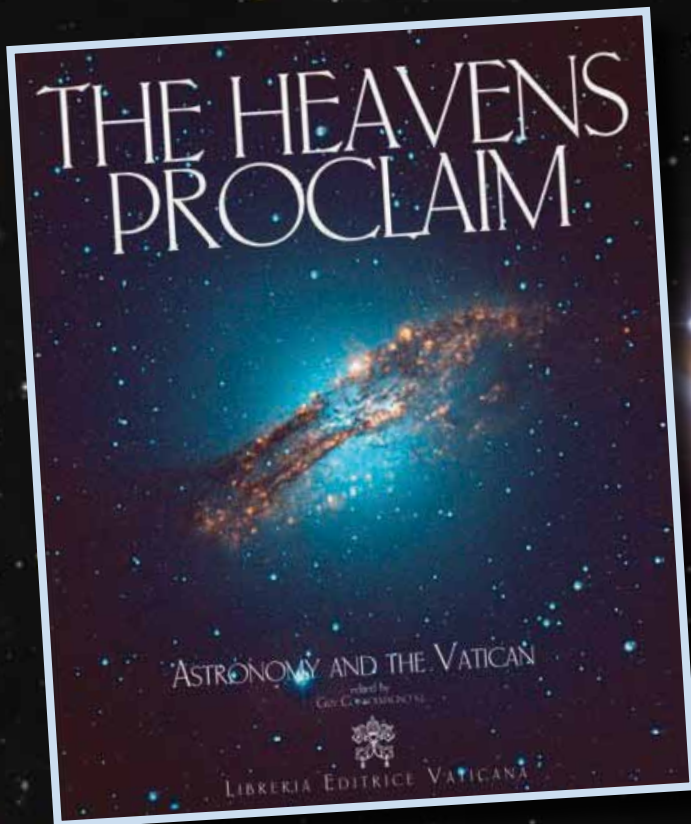
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## INSIDE

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#### Available Now!

Two years ago, Giovanni Cardinal Lajolo, the head of the Vatican City government, suggested an interesting idea to Vatican Observatory director Father José Funes: would the observatory be interested in producing a popular book about astronomy and the Vatican? And so, **The Heavens Proclaim: Astronomy and the Vatican** is now available at Amazon.com.

Every member of the Vatican Observatory contributed to the book. Chapters range from the history of calendars and the Galileo episode, to the latest results on galaxy clusters and the search for planets around other stars. Photos from the Vatican telescopes and historical pictures from the archives provide a rich visual tapestry in which our story is told. One of the more exciting chapters is a selection of papal statements, from 1891 to the present, that illustrate unambiguously the support of the Vatican for our science. The book has been arranged in a large format, like that of a fine art book, by the Vatican Press's book designer, GianCarlo Olcuire. By happy coincidence, the publication date of the book is tied in with the International Year of Astronomy.