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 (katie@vaticanobservatory.org) or call (+1 (520) 795-1694).

Brother Guy Consolmagno, S.J.
Director, Vatican Observatory
President, Vatican Observatory Foundation
President’s Message
by Br. Guy Consolmagno, S.J.

organizations like ours that support Catholic works always ask for your prayers as well as your money. I confess I used to think that was just being “pious.” But in the two years I have been president of the Vatican Observatory Foundation, and the year since I was named director of the Vatican Observatory itself, I’ve learned better. Sure, this job is about raising money; but none of what we do with that money would be possible — much less, worth doing — without your emotional support, your encouragement, and even more… your prayers.

All sorts of wonderful things have happened for us, out of the blue, over these past two years. You’ve read about some of them in these newsletters. Whether it was our remarkable Chile trip, or an unexpected $100,000 gift, I have realized that all of the best things that have happened to us have been beyond my control or anyone’s control. Our only role has been to accept these blessings, with thanks, and try to use them as best we can to give glory and honor to the Creator whose works we praise with our work.

Among those blessings are the people I get to work with. I would be overwhelmed juggling my two jobs, head of the Foundation and head of the Observatory, if I had to do it on my own. Fortunately, I’m not alone. I have a fantastic set of collaborators. My brother Jesuits and the lay staff in the US and Castel Gandolfo have all been incredibly helpful to me; they too have been guided by the Spirit. We’ve gotten wonderful help from all the folks at the Vatican we deal with every day, from secretaries to Cardinals. The Foundation board has been a bedrock of help and support.

But it’s you folks reading this newsletter… it must have been your prayers that have made such a difference. (Maybe it’s all your prayers together; maybe one of you in particular is a hidden saint!) All I know is that I have felt a constant reassuring presence accompanying us, both in the astronomy we do at the Observatory and the engagement of the public with our astronomy that I need your prayers to help guide me in whatever role I play at the Congregation. I’ll also need your prayers to support the Foundation and the Observatory, which will have to function without any input from me for most of October and November. But even as I’m locked away at the congregation, know that my prayers and thoughts will be with you. Please, don’t forget us!

Deirdre Kelleghan is an Astronomer, Artist and Educator. She invents, designs and enacts creative workshops to help children understand our solar system through drawing. Her activities take place in schools, libraries, science centres and observatories in Ireland and abroad. In practice her work is always engaged in the NOW. A recurring feature of connecting with her audiences is being actively attentive to astronomy or space events that are ongoing in real time. ICT, eLearning and blended learning play a key role in many of her programs. Her Action Sun workshop opened Building the Scientific Mind 2013 Colloquium at Bosscha Observatory West Java Indonesia, a UNESCO / The Learning Development Institute event. In 2011 Deirdre was awarded the Science Prize for Online Resources in Education. The workshop was Deadly Moons; the awarding body was the American Association for the Advancement of Science. She is also the co-author of Sketching the Moon: an Astronomical Artists Guide.

Dr. Michelle Francl joins the Vatican Observatory

Bryn Mawr Professor of Chemistry, Michelle Francl, has been named one of nine adjunct scholars of the Vatican Observatory. As an adjunct scholar, Francl will visit Rome regularly and have the opportunity to work with the Jesuit physicists who are the observatory’s full-time staff. What I’m most excited about is the chance to work in the observatory’s library, which includes material on the early history of science in Europe,” says Francl.

Projects Francl plans to be involved with include thinking about the chemistry and material science of meteorites and working with issues of faith and science, from both a historical and philosophical perspective.

A prolific writer, Francl is a regular contributor to the column “Catholic Spirituality” on the Philadelphia Archdioceses’s news site, CatholicPhilly.com, and her reflections on struggling to live a contemplative life in the midst of the everyday chaos that comes with being a working wife and mother can be found in a number of print and online venues.

Deirdre Kelleghan

Dr. Michelle Francl

Michelle Francl, Professor of Chemistry

160 St Cronans’ children queue up to see the smallest planet in our solar system pass in front of the sun in Deirdre’s telescope

NOW Mercury!

The Newest Catholic Astronomer Blogger comes from Ireland

Read the articles and connect on www.vofoundation.org/blog
On May 29th, 23 students representing 19 countries converged on Castel Gandolfo for the 15th Vatican Observatory Summer School (VOSS). These represented some of the best and brightest young astronomers and scientists, all at the end of their undergraduate or the early stages of graduate studies. The theme this year was "Water in the Solar System and Beyond." Pope Francis greets VOSS students and faculty on the 125th anniversary.

On Saturday morning, 11 June, Pope Francis addressed the participants in a summer course organized by the Vatican Observatory, reminding them how diversity enriches scientific research, which in turn draws us ever closer to our Creator. The fifteenth installment of the Vatican Observatory's summer courses for astronomers falls on the 125th anniversary of the Observatory's founding.

Reaching for the Heavens

The 15th Vatican Observatory Summer School: Water in the Solar System and Beyond
Br. Bob Macke, S.J.

In recent years, through space missions and improved telescopes, scientists have learned an incredible amount about water in many planetary bodies throughout the solar system, and the time was right for a VOSS on this theme.

To convey this new learning, we gathered a top-notch faculty. The chair, Menakshi Wadhwa, is the director of the Center for Meteorite Studies at Arizona State University. She spoke about asteroid spectroscopy. These faculty were joined by our own Br. Guy Consolmagno S.J. and Fr. Jean-Baptiste Kikwaya S.J., who filled in their own areas of expertise. Br. Bob Macke S.J. served as dean.

The intense series of lectures were supplemented by a list of accomplished guest speakers, such as Seth Shostak of the SETI Institute, Lynn Rothschild of the NASA Ames Research Center, Bethany Elhmann of the Jet Propulsion Laboratory, Diego Turini of the Italian National Institute for Astrophysics, and retired astronaut Scott Parazynski M.D.

This school marked the inauguration of a new structure at the Specola Vaticana, slated for use as a refectory and multifunction meeting space for the Specola. Sala Clavius, or "Clavius Base" as the students called it, could accommodate all of the students, faculty, and staff for lunch, and in the evenings it served as a social gathering place for the students. With an attached kitchen, students prepared a few "cultural dinners" featuring the food of their home countries.

The academic program was broken up by several outings, including Tivoli, Florence, and Ostia Antica. The highlight of the school was a visit to the Pontifical Academy of the Sciences, followed by an audience with Pope Francis.

On Tuesday, 30 May, a press conference followed by an audience with Pope Francis concluded the 15th summer course organized by the Vatican Observatory. This impressive facility has been expanded and modernized over the years, the Observatory has sought to fulfill its original purpose by employing new scientific instruments as well as the tools of dialogue and cooperation with other centres of research.

"Your presence at this summer school is also a sign that the desire to understand the universe, God's creation, and our own place in it, is shared by men and women of very diverse cultural and religious backgrounds. All of us dwell under the same sky. All of us are moved by the beauty revealed in the cosmos and reflected in the study of the heavenly bodies and substances. In this sense, we are united by the desire to discover the truth about how this marvelous universe operates; and in this, we draw ever closer to the Creator.

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I am happy to welcome you, the professors and students of the summer course organized by the Jesuit Fathers of the Vatican Observatory. This impressive representation of persons from various countries and different cultures is a sign of how diversity can greatly enrich scientific research. I thank Fr. Paul Mueller, the Vice-Director of the Observatory, and the professors who generously accompany you young astronomers in the complex and exciting activity of studying the universe, the incomparable gift of the Creator. Your presence at this summer school is also a sign that the desire to understand the universe, God's creation, and our own place in it, is shared by men and women of very diverse cultural and religious backgrounds. All of us dwell under the same sky. All of us are moved by the beauty revealed in the cosmos and reflected in the study of the heavenly bodies and substances. In this sense, we are united by the desire to discover the truth about how this marvelous universe operates; and in this, we draw ever closer to the Creator.

I cordially invite you to remember me in your prayers.

Pope Francis Greets VOSS Students and Faculty on the 125th Anniversary of the Observatory
Fr. Jean Baptiste Kikwaya-Eluo Visits High Schools

For the budding Catholic scientist, many pundits present two exclusive and diverging paths. A person can take the path of science, reason and logic, or the path of religion, dogma and the intangible.

But to Br. Guy Consolmagno, director of the Vatican Astronomical Observatory, these paths are complementary. He believes science and religion are not mutually exclusive. In fact, from the Catholic perspective, both are resolutely necessary to understanding the full nature of our existence.

“Science does not prove. Science describes, and our descriptions are constantly getting better,” said Consolmagno. “It’s not about proving a pile of facts. It’s not about getting the quote ‘right answer.’ It’s about leading us to a deeper understanding.”

Consolmagno said a primary misconception contributing to the “split” is the belief that science is a “big book of facts that have been proven.” However, he said that science never set out to prove the universe, but rather to model it. Facts are constantly changing as new research and ideas challenge old perceptions.

This ongoing process of refinement should not be feared as an assault on our ability to comprehend truth, said Consolmagno. Rather, it should be embraced as humanity’s collective journey towards enlightenment.

Consolmagno has also done tremendous work promoting scientific literacy for the general public. He has authored several popular science books, has spoken at various events and on TV programs such as The Colbert Report and was recently awarded the Carl Sagan Medal in recognition of his efforts.

Consolmagno describes science as a “beautiful blend of insight, inspiration and the hard work of reason and data taking.” He said we need faith to have confidence in its worthwhileness and accuracy. However, the inverse is also true. Our faith also needs the empiricism and methodology of science to have confidence in its relevance and truth.

A healthy sense of faith must be grounded in our experiences, what he refers to as “the data of the transcendent.”

“God made the universe, and He made it logical. But He didn’t have to make it so beautiful. He didn’t have to make Maxwell’s equations so beautiful. He didn’t have to make the fundamental principles so beautiful. But He did.”

During the spring semester 2016, students in several high schools around the country took part in an astrophotography project with the Vatican Observatory for the second year in a row.

First the students had to determine which deep sky object or objects they would like to image so they could send the coordinates to Fr. Rich Boyle in Tucson. The students searched the skies for a suitable object — something that was more than 20 degrees above the horizon at the established time, but more than ten degrees away from the zenith, and an object that was not too bright, not too big.

The object had to be less than fifth magnitude i.e. not the Moon or a visible planet, since that would have swamped the CCD chip. Nor could it be too big. The total field of view of the camera is 12.5 arc minutes square, but nothing much larger than 8 arc minutes by 8 arc minutes was recommended to be certain that it fit in the field of view of the camera.

With the coordinates in hand, Father Boyle used the sensitive science-grade electronic camera on the VATT to take three digital images, in red, green, and blue filters, did the basic flat-fielding to remove the chip flaws, and sent the students raw images.

The students then worked with the data created with the VATT, trying to develop the best images possible. The students determined how to combine the images into a full color image — and voila! they have their first astrophotograph! However, as the students also discovered, a creative juxtaposition of images can produce unique works of art.

Father Boyle complemented the students saying, “Nice work! Nice job with registering the three FITS images into the RGB composite, showing stars come in different colors from their different atmospheric temperatures. Congratulations!”

The project was a success! As one teacher said, “Since this was the first time any of my students had ever tried anything like this, it was a tremendous learning experience for them and each one of them is extremely grateful to you for providing this unique opportunity.”

High School Astrophotography

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VATICAN OBSERVATORY FOUNDATION

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Fall 2016

Reaching for the Heavens

Two Paths or One?
Robert Adragna, Toronto student and “Youth Speaks” reporter interviewed Br. Guy during his recent visit and published a similar article for the “Catholic Reporter”

Fr. Jean Baptiste Kikwaya-Eluo, SJ, spoke recently to juniors and seniors at the Cristo Rey school, San Miguel High School, in Tucson.

Besides talking about Near Earth Objects (NEOs) Father told the students about his life that started in Kinshasa, Democratic Republic of the Congo, where he had practically no opportunity to study. Thanks to a few Jesuits and a new school he was given what he described as the great gift of education. He is now a Jesuit priest, a Ph.D. in Astrophysics and on the spring semester of 2016 he was given what he described as the great gift of education.

But to Br. Guy Consolmagno, director of the Vatican Astronomical Observatory, these paths are complementary. He believes science and religion are not mutually exclusive. In fact, from the Catholic perspective, both are resolutely necessary to understanding the full nature of our existence.

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