

# 2024 Annual Report



Vatican Observatory Foundation 2017 East Lee Street Tucson, AZ 85719 USA



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## THE FOUNDATION

The Vatican Observatory Foundation (VOF) is a 501(c)3 non-profit organization created to support the scientific and educational endeavors of the Vatican Observatory, including the maintenance and modernization of the Vatican Advanced Technology Telescope (VATT).

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Cover Photo: Sr. Raffaella Petrini, F.S.E., with VOF Treasurer John Lally, Development Director Chris Kennedy and Vatican Observatory Vice-Director Fr. Paul Gabor, S.J., at the VATT during a VOF Board Meeting in March, 2024.

# **2023-2024 DIRECTORS**

### **EX OFFICIO**

**Br. Guy J. Consolmagno**, **SJ**; Director, Vatican Observatory; President, Vatican Observatory Foundation **Sr. Raffaella Petrini**, **FSE**; President of the Governorate of Vatican City State

### **OFFICERS**

Mr. Paul Pohl, Chairman; Of Counsel, Jones Day Fr. Christopher Corbally, SJ, Secretary; Astronomer, Vatican Observatory Research Group Mr. John M. Lally, Treasurer; Partner, Lally & Co.

### **MEMBERS**

Fr. Richard D'Souza, SJ; Jesuit Community Superior; Astronomer, Vatican Observatory
Dr. Guy Di Spigno; President (retired), Executive Synergies, Inc.
Fr. Paul Gabor, SJ; Vice Director of VORG
Dr. Linda Lapos; Gastrointestinal Surgeon
Dr. Larry Lebofsky; Astronomer, University of Arizona (retired)
Mr. James Renn; Community Volunteer
Msgr. David A. Rubino; Diocese of Erie (retired)
Ms. Pamela Moore Snyder; Community Volunteer

### **COUNCIL OF ADVISORS**

Fr. David Brown, SJ; Astronomer, Vatican Observatory
Ms. Jane G. Belford, Esq.; Chancellor, General Counsel, Archdiocese of Washington
Mrs. Stacye DeJulius; Catholic Schools Advancement
Mr. Patrick J. Finneran, Jr.; President, Accelerated Performance Solutions
Mr. Brian Fitzpatrick; Squarespace (retired)
Mr. Richard C. Gordon, Esq.; Partner, Snell & Wilmer
Mr. J. Michael Kelly; CPA, Ashton Park Associates
Mr. Claude Lamoureux; Director, Home Capital
Rev. Joseph M. McShane, SJ; President, Fordham University (retired)
Ms. Kathryn R. Reimer; President, Full Circle Communications
Mr. Joseph B. Starshak; Starshak Winzenburg Companies
Mr. Andrew J. Strenio, Jr., Esq; Partner, Sidley Austin LLP (retired)
Mr. Paul Wirth; Communications Director, Diocese of Allentown (retired)

# CHAIRMAN'S Report



### LOOKING FORWARD TO CONTINUED SUCCESS OF The vatican observatory foundation in the future

The Vatican Observatory Foundation ("VOF") is an Arizona non-profit corporation with 501 (c)(3) status under the U.S. Internal Revenue Code. Its primary purpose is to raise funds and provide resources to support the global work of the Vatican Observatory. VOF has responsibility for funding the operation and maintenance of the Alice P. Lennon Vatican Advanced Technology Telescope ("VATT") which is part of the Steward Observatory on Mt. Graham, Arizona. VOF also is responsible for funding the Vatican Observatory Summer Schools which bring together some of the world's most promising astronomy students from around the globe. The summer school is held at the Vatican Observatory's headquarters at Castel Gandolfo, outside of Rome. VOF's program of renewal and growth began in March 2022, (as described in this letter last year) and has made great progress on all fronts throughout 2024. It continues in earnest. Thanks to the great efforts of VOF's Board of Directors, its Council of Advisors, its Committees, the Jesuit community, the Jesuit astronomers, VOF's officers, its Development Director and others who assist – and especially of its growing list of donors – VOF's finances and operations have shown great improvement.

VOF showed a modest but positive net income in the fiscal year which ended on June 30, 2024. VOF's fundraising continues to improve as we have held a series of fundraising events, most notably at the Apostolic Nunciature in Washington, D.C. Other such events were held in Florida, Chicago and Arizona during 2024.

VOF provided almost \$700,000 in funds which allowed us, with the great assistance of our Property and Facilities Committee, to complete the purchase and installation of a sophisticated robotics package on the VATT. This robotics package (which has been named "Don" to honor Donald M. Alstadt, the late husband of a major donor) allows remote positioning and operation of the telescope and permits greater utilization. Additional capital needs have been identified and work to fund them continues.

Special thanks also must go to Sr. Raffaella Petrini, FSE, one of VOF's Board members appointed by The Holy See, for her wonderful cooperation and assistance to VOF. She had served as Secretary General of The Vatican City-State but in March 2025, Pope Francis named her President of The Vatican City-State. As Chairman of the Board, I would be remiss if I did not also express my deep appreciation to Br. Guy Consolmagno, S.J., Director of the Vatican Observatory and the President of VOF for his wisdom, collegiality and tireless efforts. I also express my gratitude to every officer of VOF as well as every member of our Board of Directors and our Council of Advisors. We have done much; but so much remains to be done.

The efforts and enthusiasm of these talented individuals in support of our sacred mission bodes well for continued success of VOF in the future.

Mickey Pohl

**PAUL "MICKEY" POHL** Chairman of the Board Vatican Observatory Foundation



The 2023 - 2024 VOF Board of Directors honors Major General Charles Frank Bolden, Jr.

## PRESIDENT'S Report



### EVERY OBSERVATORY DOES SCIENCE AND OUTREACH. What makes the vatican observatory special is why we do it: for the greater glory of god...

Scientists look at the very large and the very small, the very close and the very distant, using complicated instruments to see things that the unaided human eye can't see. But the great thing about astronomy is that some of the things we enjoy studying are things that anyone can see for themselves.

I've described elsewhere (in my new book, A Jesuit's Guide to the Stars) about the time when, as a young scientist, I stepped out of a lecture about the moons of Jupiter, only to look up and see Jupiter itself in the evening sky. That brilliant speck of light above me was the very thing we were talking about! Of course, you still need a telescope to see its moons. But anyone can see an eclipse. On April 8, 2024, anyone outdoors on a line from Texas to Montreal could see the sky darken and (assuming no clouds) the Sun itself become covered by the disk of the Moon, its brilliant disk replaced by the ghostly ring of light that is the Sun's corona. The event only lasted a few minutes, but it was preceded by years of anticipation... and it was followed by hours of walking in a daze recalling what the sky had shown us.

With your support, the Vatican Observatory and its Foundation played its role in describing and explaining the significance of this eclipse. Chris Graney (adjunct historian of astronomy at the Vatican Observatory, and regular contributor to our Sacred Space Astronomy pages) and I took part in a gathering of scientists and religious - including a bishop and several priests - that weekend at the Franciscan's Mother of the Redeemer Retreat Center in Bloomington, Indiana.

Its organizer, Fr. Timothy Saupeé, and many of the scientists presenting there were alumni of our Astronomy for Catholics in Ministry and Education (ACME) program. (Every other January, we immerse two dozen pastors and teachers into the world of professional astronomy in Tucson; next one is January 2026!) And the morning of the eclipse, Chris and I took part in a Zoom presentation to Jesuit universities in the path of totality.

This sort of outreach is an essential part of the mission of the Vatican Observatory, given to us by



Total solar eclipse of April 8, 2024

Pope Leo XIII in 1891 and renewed by every pope since then: to show the world that the Church supports science. But we also have to have the science, the astronomy, that we can share with the world. And that science is made possible by you, through your support of the Vatican Observatory Foundation.

In this report you'll find a detailed account of the work of one Jesuit, Fr. Jean Baptiste Kikwaya Eluo, S.J., using the Vatican Advanced Technology Telescope: the Alice B. Lennon Telescope and Thomas J. Bannan Astrophysics Facility. This past year, thanks to donations from the Thomas Lord Charitable Trust and other VOF donors, that telescope has been successfully upgraded and automated with the "Don" robotic system, keeping "Advanced Technology" in the VATT's name.

But let me also mention here some of the other science that has occurred this year at the VATT, thanks to you. Fr. Richard Boyle, S.J. and Fr. Robert Janusz, S.J. completed the observation and analysis of ten galactic (open) star clusters using a special set of filters developed with their collaborators in Vilnius, Lithuania, to classify stars even when they are embedded in clouds of gas and dust. Fr. David Brown S.J. and his colleagues in Germany used the powerful Potsdam Echelle Polarimetric and Spectroscopic Instrument (PEPSI) connected to the VATT to determine the composition of target stars where exoplanets are being discovered. Fr. Chris Corbally S.J. used the VATT to take exquisite spectra of "peculiar" binary stars - which vary not only in brightness but apparent chemical composition - in order to test theories for their origin and unusual composition.

Cutting edge science, all of it. But there is one more element to the work that we do.

After I'd arranged to do that Zoom program about the science and history of eclipses with Chris Graney,



Br. Guy and Chris Graney during the Eclipse Zoom-cast

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I arrived in Bloomington only to discover that that there was neither internet nor even cell phone coverage at the retreat center! How could we Zoom? In a panic, I drove into town to see if there might be a parking lot someplace where we could at least connect via cell phone. Just then, I got a message from a friend from Michigan who had driven down to Indiana for the eclipse . As it happened, she was staying nearby with a cousin, who just happened to be an IT specialist at Indiana University. His home had great connectivity. So at the last minute, Chris and I invaded the living room of total strangers (they even treated us with local donuts and coffee) and the show was saved!

My Michigan friend whispered to her cousin, "Br. Guy is probably going to claim that this was an answer to a prayer." Indeed, that is exactly what I claim.

I once had a retreat director who referred to those little "happened to" moments in life as divine coincidences. They're small miracles, unexpected events that remind us how much we rely on God. And the fact is, everything we do at the Vatican Observatory depends on such small miracles. Every donation we receive from our supports is an example of such a miracle, and every prayer said our way is an invitation to more such miracles. I thank you all for your part in making those miracles happen.

Every observatory does science and outreach. What makes the Vatican Observatory special is why we do it: for the greater glory of God... and those wonderful little moments when we see Him smiling on us.

**BR. GUY CONSOLMAGNO, SJ** President, Vatican Observatory Foundation Director, Vatican Observatory

### ADDENDUM

As this report is going to press, we learned the sad news of the passing of Pope Francis. His Holiness was a great supporter of the Vatican Observatory and its work, and he was a dear friend to all of the Jesuits. A number of memorials to him can be found on our website, and next year's Annual Report will cover his legacy in depth.

We now look forward with hope and joy to working with Pope Leo XIV!



# **2024 FOUNDATION FINANCIAL REPORT**

# WE ARE GRATEFUL TO BE STEWARDS OF YOUR GENEROSITY, A RESPONSIBILITY WE TAKE WITH THE UTMOST CARE.

The Vatican Observatory Foundation finished their financial year ending June 30, 2024 with a surplus of \$494,452 Gross income, exclusive of restricted donations, grew by \$286,113 or 19.3%, while expenses remained stable, decreasing by \$10,012. In fiscal year 2023, the Vatican Observatory Foundation received \$500,000 of donations restricted for the robotization of the VATT that was completed and operational in June 2024. *A copy of our fully audited financial report is available upon request.* 

## **FISCAL YEAR RESULTS**

### INCOME

	2024	2023	
Contributions & Pledges	\$ 786,568	\$ 1,128,165	
🛑 Vatican Block Grant	\$ 360,000	\$ 360,000	
📕 Jesuit Salaries (in-kind)	\$ 250,000	\$ 250,000	
Program & Contractual	\$ 59,234	\$ 33,868	
🛑 Net Investment Return	\$ 214,806	\$ 185,467	
Cther	\$ 46,273	\$ 23,268	
Total	\$ 1,766,881	\$ 1,980,768	
12.5% 3.5% 14.5% 219	45.8 ⁄o	9%	
FY 2024 INCOME			

**EXPENSES** 

Total	\$ 1,272,429	\$ 1,282,441
🛑 Mgt. & General	\$ 265,082	\$ 228,558
Fundraising	\$ 285,385	\$ 344,022
🔲 Program	\$ 721,962	\$ 709,861
	2024	2023



# METEORS, FIREBALLS AND NEAR EARTH OBJECTS, OH MY!

Fr. Jean Baptiste Kikwaya Eluo, S.J., has been interested in small bodies in the Solar System since his earliest studies in Belgium on the mathematics of planetary dynamics and in France at Paris Observatory on binary systems of asteroids, particularly 146 Lucina. A member of the Vatican Observatory since 2012, he is now one of the principal users of the Vatican Advanced Technology Telescope (VATT)—the Alice P. Lennon Telescope and Thomas J. Bannan Astrophysics Facility—on Mt. Graham, Arizona. Some of his recent science and how it ties into current NASA spacecraft missions is detailed below.

## THE DART MISSION

## IS IT POSSIBLE TO DEFEND THE EARTH FROM POTENTIAL HAZARDOUS CELESTIAL IMPACTS, PARTICULARLY ASTEROIDS?

### That was the question that the Double Asteroid Redirection Test (DART) was designed to address.

On November 23, 2021, the NASA space probe DART was launched in California. Its target was a binary system of asteroids, 65803 Didymos (Fig. 1) (The larger asteroid is Didymos with a diameter of 780 m or 2960 feet, and the smaller one is Dimorphos, with a diameter of 160 m or 525 feet). DART was designed to collide with the little moon Dimorphos, changing its orbit around Didymos and therefore changing the rate at which they orbit around their common center of mass... a change that could be observed with telescopes here on Earth. And the Vatican Advanced Technology Telescope was one of those telescopes looking to see that change.

After the collision occurred on September 26, 2022, a campaign of observations of the Didymos system was



FIG. 1: The Didymos-Dimorphos binary system, imaged as DART approached impact with Dimorphos (background). Source NASA/JHAPL



FIG. 2: Very precise lightcurve of Didymos from two nights of observation with VATT. Its expected rotation of 2.2599h is reproduced..

launched across the world. From September 26, 2022, to February 2023, observatories were made with telescopes ranging from the 6.5-meter Magellan Baade Telescope at Las Campanas in Chile to the 0.5-meter T72 Telescope from Deep Sky Chile Observatory also in Chile, resulting in 224 separate lightcurves, traces of how the brightness of the system varied with time, which shows the period of the orbiting moon and how much that period was changed by the DART impact.

The Vatican Observatory with its 1.8-m telescope on Mount Graham collaborated in the project. Fr. Kikwaya Eluo observed the Didymos system for two full nights (September 26, right after the impact, and September 29, 2022) and provided its lightcurve (Fig. 2) to the international team which worked to determine the change of the orbital elements of the system resulted from the kinetic impact. The paper "Photometry of the Didymos System across the DART impact Apparition", published in the February 2024, issue of Planetary Science Journal, confirmed a decrease of 33 minutes in the period of the binary system. Before the spacecraft hit Dydamos, the brightness of the system as seen from Earth fluctuated over a period of 11h 55 minutes, but after the kinetic impact the orbit of the moon sped up and now a full period lasted only 11h 22 minutes. The DART mission represented a first step planning for the defense of Planet Earth against impacts, and the Vatican Observatory was a part of that step.



### REV. JEAN-BAPTISTE Kikwaya Eluo, S.J., Phd

#### Priest. Scientist. Teacher.

Hailing from the Democratic Republic of Congo, Fr. Kikwaya's work at the Vatican Observatory and NASA collaborations centers on meteors, fireballs, and Near Earth Objects. However, he is first and foremost a priest, remembering the words of his superior, "Being a priest, you need to be one wherever you are, and whenever you are."

## THE LUCY MISSION

## SEEKING TO REVEAL A FULLER UNDERSTANDING OF THE FORMATION & EVOLUTION OF THE SOLAR SYSTEM

#### NASA Collaboration

A fossil of primitive Australopithecus afarensis hominin, who lived around 3.85 million years ago, was unearthed in 1974 in Eastern Africa (Ethiopia, Kenya, Tanzania). Nicknamed "Lucy", its discovery contributed to advancing the understanding of the entire history of human race. Now the NASA space mission Lucy shares the same ambition, to reveal a fuller understanding of the formation and the evolution of the solar system.

Launched on October 16, 2021, Lucy will visit Jupiter's Lagrange points L4, and L5; these are orbital positions at the same distance from the Sun as Jupiter but traveling well ahead, and well behind, Jupiter itself. Jupiter's Lagrange points, due to a balance of gravitation forces between Jupiter and the Sun, first derived in 1772 by Joseph-Louis Lagrange, are populated by asteroids called Trojans – they are given the names of heroes from the Trojan wars. *(continued)*  Page : **12** 

En route, on April 20, 2025, it encountered the main-belt asteroid (52246) Donaldjohanson. It is now continuing its journey toward Jupiter L4, and L5. It will fly by several objects of L4 Trojan cloud, particularly (3548) Eurybates and its satellite Queta on August 12, 2027, (15094) Polymele on September 15, 2027, (11351) Leucus on April 28, 2028, and (21900) Orus on November 11, 2028. Then on March 2, 2033, Lucy will make a flyby of (617) Patroclus and (617) Menoetius, a binary system of Trojans, its only target in L5 cloud.

In September 2024 and October 2024, the orbit of the Patroclus-Menoetius system carried it directly opposite the Earth from the Sun, providing an ideal geometry to observe it from the Earth. An international campaign was put together to observe it and gather precise measurements necessary to support and calibrate the instruments of Lucy in readiness for its flyby to Patroclus-Menoetius system.

For seven nights, between September 29 UT to October 06 UT, 2024, Fr. Kikwaya Eluo and his colleagues, especially Carl W. Hergenrother, supervisor of Ascending Node Technologies, LLC in Tucson, used the VATT to gather more than a thousand images of the system. These results appeared in the paper ("Observations of Patroclus and Menoetius mutual events with Vatican Advanced Technology Telescope (VATT)") led by Fr. Kikwaya Eluo and published by Minor Planet Bulletin in 2024.

Two nights (September 30, 2024, and October 02, 2024) clearly showed "mutual events", when the moon of the asteroid passed in front of the asteroid.

On September 30 they collected 285 images, and the resulting photometry showed an obvious event, with an incomplete lightcurve as the target set below the elevation limit of the telescope (Fig. 3).

On October 2 from only 87 images, the first 18 minutes of a mutual event were recorded from 42 degrees elevation to 30 degrees, limit for VATT (Fig. 4). These results will help the NASA team (which also includes Vatican Observatory astronomer Br. Robert Macke, S.J.) to plan for precisely where and when to direct their instruments when the spacecraft arrives at the Patroclus-Menoetius Trojan system.











## NEOS ( NEAR EARTH OBJECTS )

## EARTH DEFENSE AGAINST ASTEROIDS AND TARGETS FOR FUTURE SPACE MISSIONS

Among the many reasons why scientists are interested in studying NEOs (Near Earth Objects), there are two particularly strong motivations: the defense of the Earth against potential hazardous asteroids, and the choice of asteroids that may be targets for future space missions. For these two reasons, we need to research ahead of time the physical characterization and internal structure of these asteroids. Observations at the VATT support that effort by studying and surveying "fast rotator" Near Earth Asteroids.

Every month, several nights at the VATT are dedicated to the observation of newly discovered NEOs as reported by the Minor Planet Center (MPC) in Cambridge, Massachusetts. Because With Fr. Kikwaya Eluo's observations of asteroids, the scientific world has a better idea of the sort of bodies that come near to the Earth – which ones might be worth exploring for resources or for science, and how we might deflect those which pose a threat. His work is possible because of the VATT's unique abilities to observe faint objects soon after their discovery, or for long periods of time.

the VATT is larger and more sensitive than most other telescopes used in these surveys, we specialize in observing those bodies that are the hardest to characterize: very faint (visual magnitude between 18 and 19) asteroids that are spinning very rapidly. Since the beginning of our research program, Fr. Kikwaya Eluo and his colleagues have worked on physical characterization of hundreds of these "fast rotator" near Earth asteroids.

For each of them, they carefully follow 4 main steps: observation, reduction, analysis, and classification. The classification work seeks to place each object within the three major classes of asteroids (S-type, C-type, and X-type).

As an example of how Fr. Kikwaya Eluo and his colleagues proceed in this work, we'll examine their observations of the asteroid 2024 TU. 2024 TU is an Apollo asteroid (i.e., one whose orbit crosses the orbit of Earth) with an absolute magnitude of 25.39 (Fig. 5). (Absolute magnitude measures how bright an object



FIG. 5: 2024 TU observed on October 4, 2024

would be at a standard distance from Earth; where the higher the number, the fainter the object. An object with this absolute magnitude is only visible to us while it is very close to the Earth and thus it must be very small).

It was initially reported by Catalina Sky Survey on October 2, 2024, and observed at the VATT just two days after its discovery, on October 4, 2024. They gathered around 150 images in the V-filter ("visual", centered near green in the spectrum of light visible to the naked eye), to plot its lightcurve – how the brightness of the light reflected from

(continued)

its surface changes with time. From this they found that 2024 TU was a fast rotator with a rotation period of 0.03220+/-0.0002 hours: it completes one rotation in less than two minutes (Fig. 6).

They alternated the observations in V-filter with those in B (blue)-filter, R (red)-filter and I (infrared)filter. They used these four filters to compute a measure of the color of 2024 TU which could then be compared in plots of the relative difference in colors (B-V versus V-R, and V-I versus V-R colors) (Fig. 7). They also compared these colors against the spectra of other well-characterized asteroids (Fig. 8).

From these plots, they could see that the color of

(B-V) versus (V-R)-Neo-2024TU Type C Type D 0.95 Type M Type S 0.9 o-2024TU 0.85 2-8 0.8 0.750.7 0.65 0.6 0.35 0.4 0.45 0.5 0.55 0.6 0.65 V-R

this asteroid matched well to the general range of such colors typical of an S-type asteroid. The S-type asteroids are associated with dry, stony meteorites...







FIG. 7: The Two-color plots indicates 2024 TU to be of S-complex taxonomy



FIG. 8: The relative reflectance of 2024 TU (left) and relative reflectance of 2024 TU compared with observed asteroid spectra.

typical of the asteroids that originated in the inner asteroid belt, but not a likely target if you are looking for minerals rich in water or carbon (C or D types) or rich in metal (M types).

Recent NASA and Japanese spacecraft missions have targeted NEOs that were rich in water; observations like these would rule out 2024 TU from such a mission. But if this asteroid should eventually pose a threat of hitting the Earth, knowing what it was made of could determine the best way of nudging it out of its collision course... as demonstrated by the DART mission!

With Fr. Kikwaya Eluo's observations of asteroids the scientific world has a better idea of the sort of bodies that come near to the Earth – which ones might be worth exploring for resources or for science, and how we might be able to deflect those which pose a threat. His work is possible because of the unique abilities of the VATT to observe faint objects soon after their discovery, or for long periods of time.



Fr. JB Kikwaya Eluo at the VATT



Fr. JB Kikwaya Eluo at work

ACME 2024: from L-R: Br. Bob Macke, Br. Guy, Fr. Chris Corbally, Fr. JB Kikwaya Eluo, Fr. David Brown

# 2024 CIRCLES OF GIVING Awards



### LEO XIII CIRCLE - \$500,000

Pope Leo XIII established the Vatican Observatory in 1891 "so that everyone might see clearly that the Church and her Pastors are not opposed to true and solid science, whether human or divine, but that they embrace it, encourage it, and promote it with the fullest possible devotion." He established telescopes on the Vatican walls and oversaw the Observatory's participation in the Carre du Ciel project creating a photographic map of the stars.

Arline and Thomas J. Bannan Foundation Jesuit Community of the Vatican Observatory The Kresge Foundation The Fred A. Lennon Charitable Trust Thomas Lord Charitable Trust Mr. William Payden † Mr. & Mrs. Mickey Pohl \*



### **GREGORY XIII CIRCLE - \$250,000**

Pope Gregory XIII was shown a beautiful meridian in the Tower of the Winds that demonstrated the need to reform the Julian calendar. Jesuit astronomers at the Roman College were active in the commission to create the new Gregorian calendar, which was promulgated in 1582. Thus began a tradition of Papal interest in astronomy, which would mature into the modern day Vatican Observatory over the next few centuries.

Jesuit Conference of Canada and the U.S. Vatican Observatory Research Group (VORG) Mrs. Billie Mullen † Ms. Barbara Henkels John Templeton Foundation The Stephen & Mary Birch Foundation, Inc. The Dan Murphy Foundation The Vatican Observatory Foundation honors individuals and organizations whose generosity over time has been vital to our mission. Each Circle of Giving is named for an individual notable either in the history of Astronomy, the Society of Jesus, or the Vatican Observatory.

### **PIUS XI CIRCLE - \$100,000**

Pope Pius XI foresaw the risks to the Vatican Observatory from obsolescence and the encroachment of city lights. He moved the Specola to the hills south of Rome at the Papal summer residence at Castel Gandolfo and provided it with modern instruments. He is truly the patron saint of the Vatican Observatory.

Mr. Bill Ahmanson † Judith C. Alstadt Charitable Fund Mrs. Judy Alstadt Mr. Bernard J. Bannan † Mrs. Anne S. Benninghoff † Mr. Hubert † & Mrs. Aldegonde Brenninkmeijer Ms. Susan M. Cianflone Ms. Rose C. Collins Mr. & Mrs. Richard Friedrich Mr. Justin Joseph Golden Homeland Foundation

#### The John B. & Nelly Llanos Kilroy Foundation Mr. Henry J. Knott † Mr. James & Mrs. Diane McGee John McShain Foundation Mr. George † & Mrs. Phyllis Muccianti Ms. Barbara Murphy F. J. O'Neill † Mr. Edward J. Piszek † Prior Family Foundation Ms. Bernadette Schurz



### ANGELO SECCHI CIRCLE - \$50,000

Known as the Father of Modern Astrophysics, Fr. Angelo Secchi S.J. was the first to classify stars according to their spectra. His scientific and engineering contributions ranged from the study of sunspots to doublestars to irrigation systems while creating an astronomical laboratory on the roof of Sant'Ignazio Church in central Rome. He contributed in an exceptional way to the tradition of high quality research at the Vatican Observatory.

> Mrs. Paula D'Angelo Dr. Guy & Mrs. Gisela Di Spigno \* Ms. Andrea M. Dudek Ms. Karen Gardner Mr. John & Mrs. Jean Henkels Istituto per le Opere di Religione Mrs. Kathleen McCarthy Kostlan Professor William E. Kovacic

#### The Thomas & Dorothy Leavey Foundation

Mr. Barry McCabe Dr. Eugene G. McCarthy † Dr. Edward Luther Oleen M. G. O'Neil † Pacific-Western Foundation Dr. Kenneth Rose Ms. Pamela Moore Snyder





### EUSEBIO KINO CIRCLE - \$25,000

Fr. Eusebio Kino S.J., a missionary in northern Mexico and Arizona, founded the famous San Xavier del Bac mission near Tucson. An expert in astronomy, cartography, and mathematics, he drew the first accurate maps of the region and demonstrated that Baja California was a peninsula, not an island. A defender of indigeous peoples, in 2020 Pope Francis named him a Venerable, an important step towards canonization.

Mrs. Maxine A'Hearn **Ar-Hale Family Foundation** Mr. James M. Carney † Mr. Gery J. & Mrs. Sunny Chico Father George V. Coyne, S.J. † Mrs. Pam Cracchiolo † Mr. Ronny Cutshall William R. Dipippo Revocable Trust Dr. George & Mrs. Maureen Engeler Mr. Michael Figueroa Ltc. Ramon Daniel Fobes, Jr. Mr. William R. Grant † Mr. & Mrs. Peter Gruber † Dr. Gary & Mrs. Debra Gutt Mr. John & Mrs. Becky Halleron Mr. Patrick C. Harbour The Hearst Foundation. Inc.

Mr. James G. Hollywood Ms. Mercedes Hurley Hughes Ms. Anne B. Klick † Mr. Eligio & Mrs. Paula Maoli Mrs. Barbara Martino Mr. Ken & Mrs. Karen Miller Dr. Don & Mrs. Lauren Morel Mr. Mark & Lori Orvek Dr. & Mrs. Kenneth D. Schmidt, MD Mr. Tom & Mrs. Molly Sones The Steele Foundation, Inc. Dr. Michael & Mrs. Sylvia A. Szpak Dr. & Mrs. Brendan D. Thomson Mrs. Marletta L. Wagner West Pharmaceuticals Mr. James & Mrs. Megan White



### **CHRISTOPH CLAVIUS CIRCLE - \$10,000**

Mathematician, confidant of Galileo and major figure in the reform of the calendar, Fr. Christoph Clavius, S.J. was a key player in the transition of his times between old worldviews and the challenges of new discoveries. Facing them as a scientist, he confirmed Galileo's observations and established a tradition of true scholarship which contributed to the spirit embodied in the founding of the Vatican Observatory.religious creeds.

Ms. Marianne Augustine Avery Foundation Mr. Patrick Anthony & Mrs. Nancy Ann Birck Catholic Travel Centre Drs. William & Maria Chavira Ms. Ora De Concini † Mr. Joseph Consolmagno † Mr. Michael A. & Mrs. Deborah Cronin Davis-Rom Fund of the Community Foundation For Southeast Michigan Mr. Sam & Mrs. Ann De Francesco Mr. Lee & Mrs. Stacye DeJulius \* Mr. Michael & Mrs. Cheri Dersam Mrs. Constance D. Donahue

Mr. Hank & Mrs. Liz Frazee Mr. William Fruchterman Dr. Paolo Galaverni Mr. Roger D. Gamache Grainger Matching Charitable Gifts Program Prof. Chris & Mrs. Tina Graney William R. Grant Foundation Green Foundation Rev. James T. Gregory Mr. Rod & Mrs. Kerry Henkels Ms. Mary Louise Jackowicz Mr. Kenneth R. & Mrs. Denise Kilroy Mr. & Mrs. John & Kiera Lally \* Dr. Linda Lapos and Mr. Paul Wirth \* VOF 2024 Annual Report

### CHRISTOPH CLAVIUS CIRCLE - \$10,000

Continued

Mr. Sid & Mrs. Gloria Leach Drs. Michael & Stacey Lent Ms. Pamela Madden Mr. Greg & Mrs. Linda Maxon Lt. Gen. & Mrs. Fred McCorkle Mr. George & Mrs. Kathleen McCrimlisk Mr. Lawrence & Mrs. Mary Ann McNamee † Mrs. Rosemary O'Callaghan † Mr. Rosemary O'Callaghan † Mr. Conrad Plimpton Mr. William S. Prady Mr. Henry A. Quinn † Mr. Jim & Mrs. Jean Renn Drs. June Scobee & Don Rodgers

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### **GEORGES LEMAÎTRE CIRCLE - \$5,000**

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Rob Lorenz, SJ, right, at a Catholic ministries fair in Phoenix in February.

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