

PRESS RELEASE

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The Vatican's flagship telescope has been transformed into a fully automated, robotic telescope.

The *Vatican Advanced Technology Telescope* (VATT), located on Mt. Graham in Arizona (USA), has been outfitted with a new automated control system. The system was built by ProjectSoft HK, an engineering firm in Hradec Kralove, Czech Republic. The installation of the system was concluded on June 3, 2024 - on-time and on-budget. The conclusion of installation marked the beginning of a testing, training, and "shakedown" phase of the system (currently taking place) involving members of the Vatican Observatory community and staff from the University of Arizona.

The automated control system has been named "Don" in honor of Donald M. Alstadt (1921-2007), the former chairman and CEO of Lord Corporation. "Don" was made possible by a grant from *The Thomas Lord Charitable Trust* and a gift from Mrs. Judith Alstadt honoring her husband.

The VATT's name comes from its radical design, now found in the world's largest telescopes. The VATT (its full proper name is the *Alice P. Lennon Telescope*, housed in the *Thomas J. Bannan Astrophysics Facility*) turned thirty years old last September. The "Don" system is transforming the VATT, which already boasts excellent telescope optics and a location with outstanding atmospheric quality for astronomical research, so that in the future the Observatory can do the research that its staff wants to do, and attract collaborators interested in joining in that research.

This is ProjectSoft's thirtieth telescope installation. Interestingly, ProjectSoft's main business is industrial automation—they have automated breweries, for example! The "Don" system is modular, based on Beckhoff industrial Programmable Logic Controllers, Renishaw encoders and EMLO drives. Its software is designed to remain stable regardless of computer updates. It will steer the telescope's mount, pointing the VATT with high precision—3 seconds of arc (rms). That is roughly the size of a marble seen from across a large outdoor sports stadium. "Don" can track celestial objects for 20 minutes with excellent precision

without guiding. Fr. Paul Gabor, Vice-Director of the Vatican Observatory's Arizona wing, says, "This is really exciting." "Don" will also control numerous support systems: a weather station, the telescope dome and the dome slit shutters, the oil system for the mount's hydraulic bearings, the cooling system for the VATT's primary mirror, and more.

"Don" will offer several operational modes. The most basic, and the first to be available, will be the "legacy mode". An astronomer on-site at the telescope will operate it, but there will be no need to walk around and manually start up and later shut down each subsystem of the telescope. There will also be less time needed for aligning and focusing the telescope's optics, and for acquiring targets in the sky.

The next step up is "remote mode". This will allow astronomers using the telescope to work from their own locations, without the need to be on site. Observatory staff will even be able to control the VATT in Arizona from the Vatican Observatory's headquarters in Castel Gandolfo south of Rome. In the most sophisticated "scripted mode", "Don" will run a sequence of instructions prepared by an astronomer, operating the VATT without direct human monitoring and control. Various teams of users will develop their own scripts.

"Don" was installed on schedule despite challenges including some uncooperative weather. Two unseasonably late snowstorms arrived within days of each other in late March and early April, just as the equipment for "Don" was scheduled to be moved to the VATT. Nevertheless, with good planning by VATT facility manager Gary Gray, the equipment crates were moved up the mountain between the storms, using a front loader outfitted with tire chains for the snowy ground [IMAGE 1].

The shakedown phase is proceeding apace, as this photo of the globular cluster M3 illustrates [IMAGE 2]. The VATT's robotic future is promising!

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Images:



IMAGE 1: Crates being moved between storms on Mt. Graham.

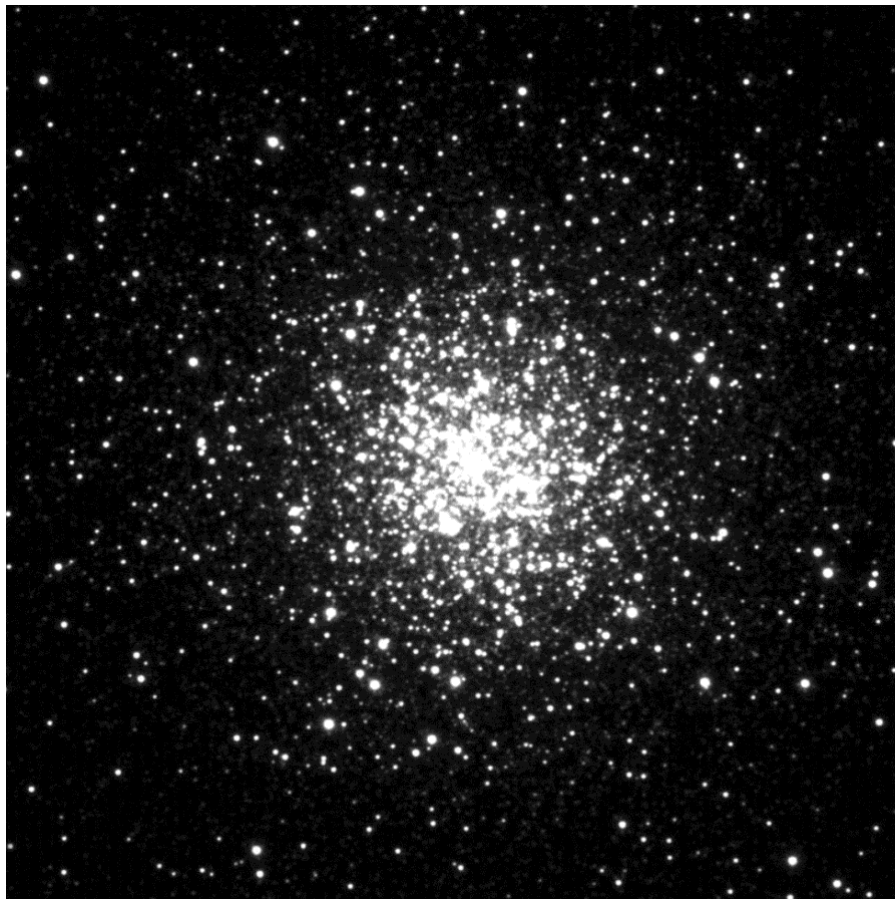


IMAGE 2: The Globular Cluster Messier 3, 34,000 light-years away; one of the first images “Don” took using the VATT’s camera.