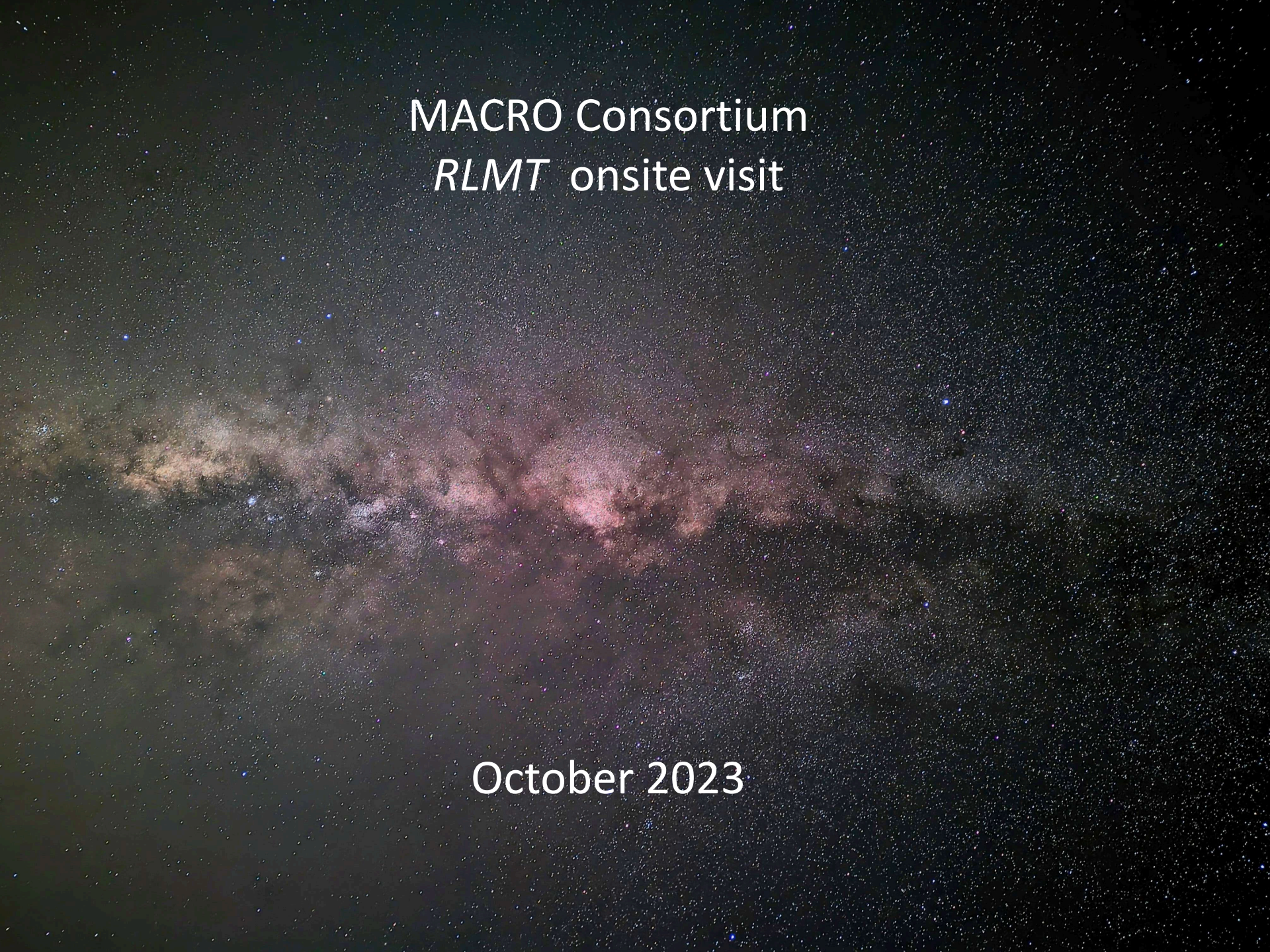
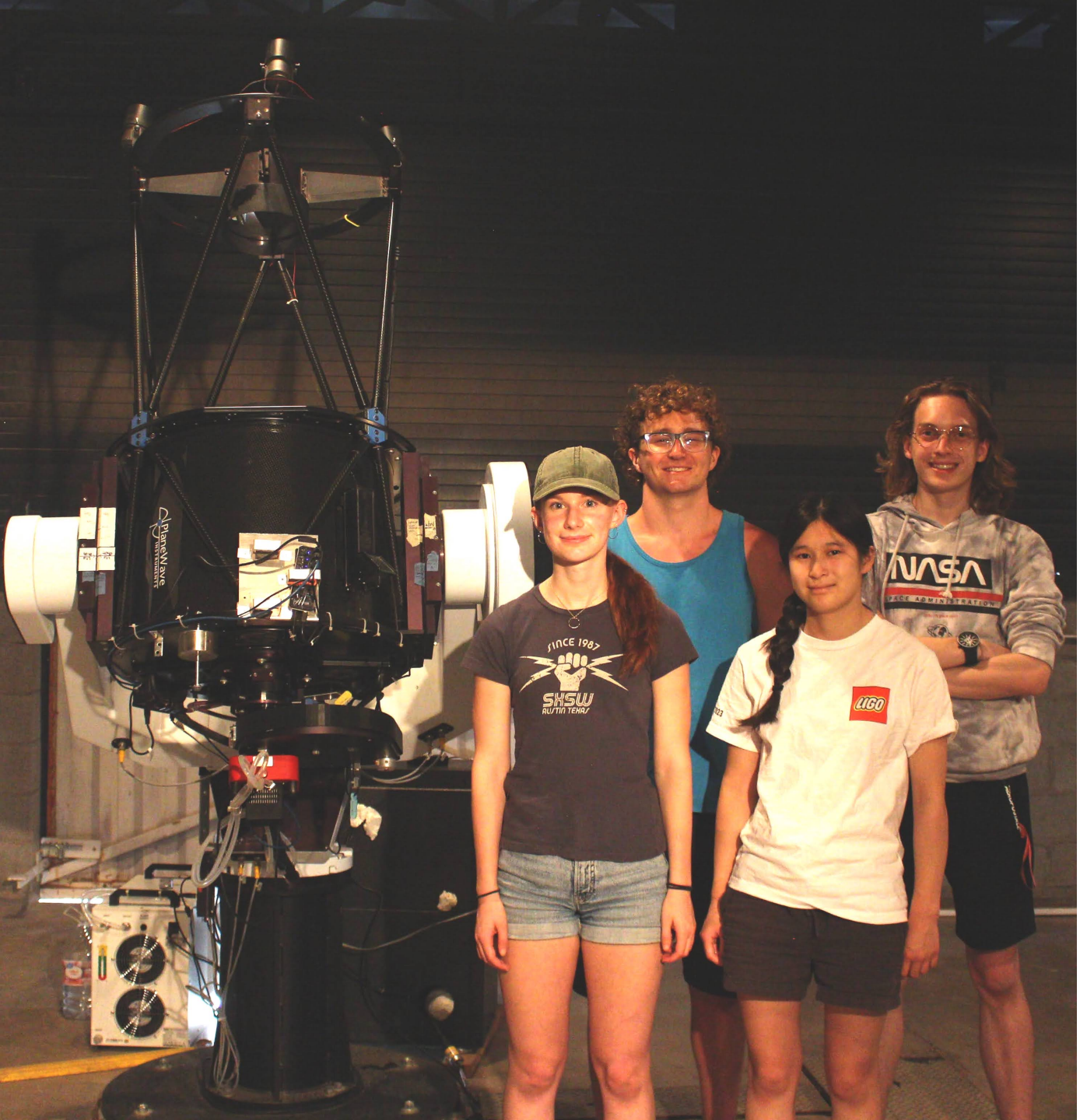


MACRO Consortium
RLMT onsite visit

October 2023

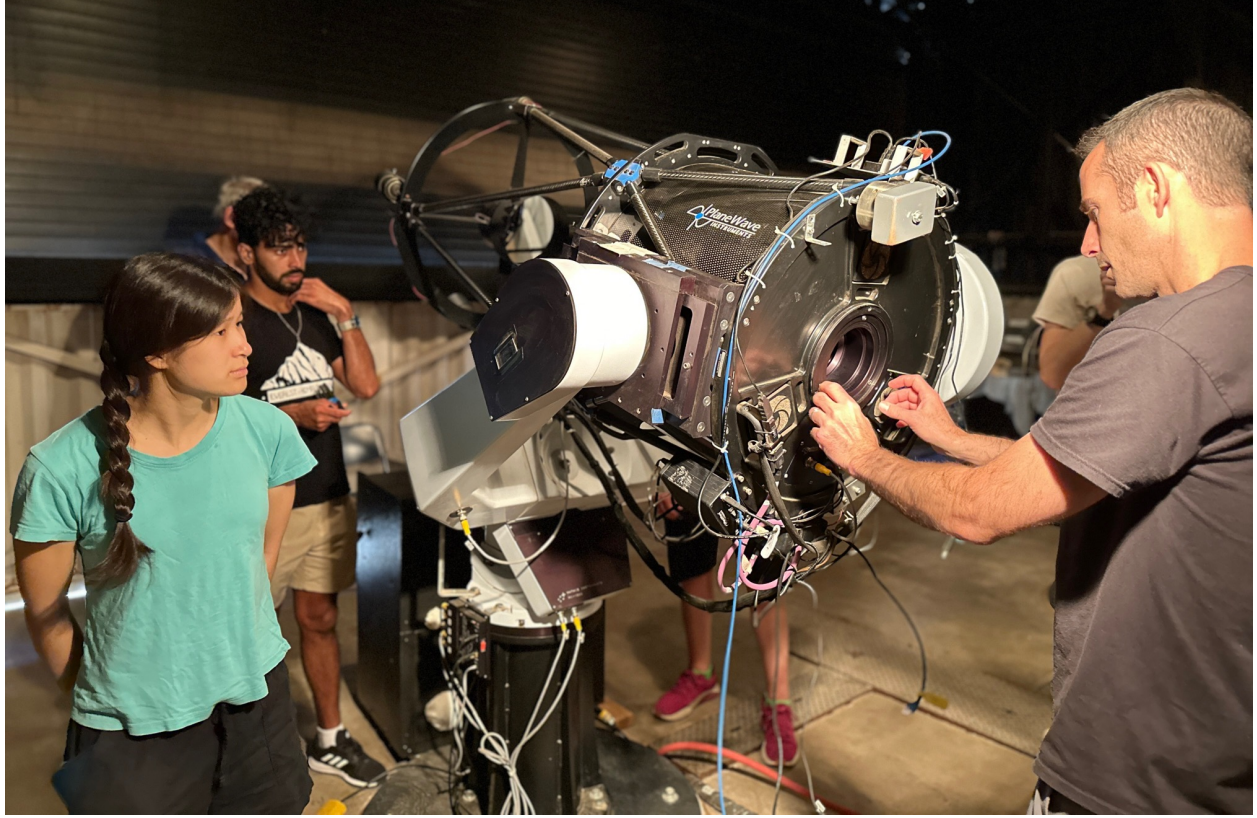
The MACRO Consortium at the Winer Observatory, Sonoita AZ. Left to right: James Wetzel (Coe), Brian Adams (Macalester), Philip Griffin (Iowa), Will St John (Macalester), Lila Schisgal (Macalester), Cain Rinkoski (Macalester), Olivia Laske (Macalester), David Fowler (Macalester class of 1975), John Cannon (Macalester), Bill Peterson (Augustana), Amit Sharma (Coe)



Macalester students with the *RLMT:*

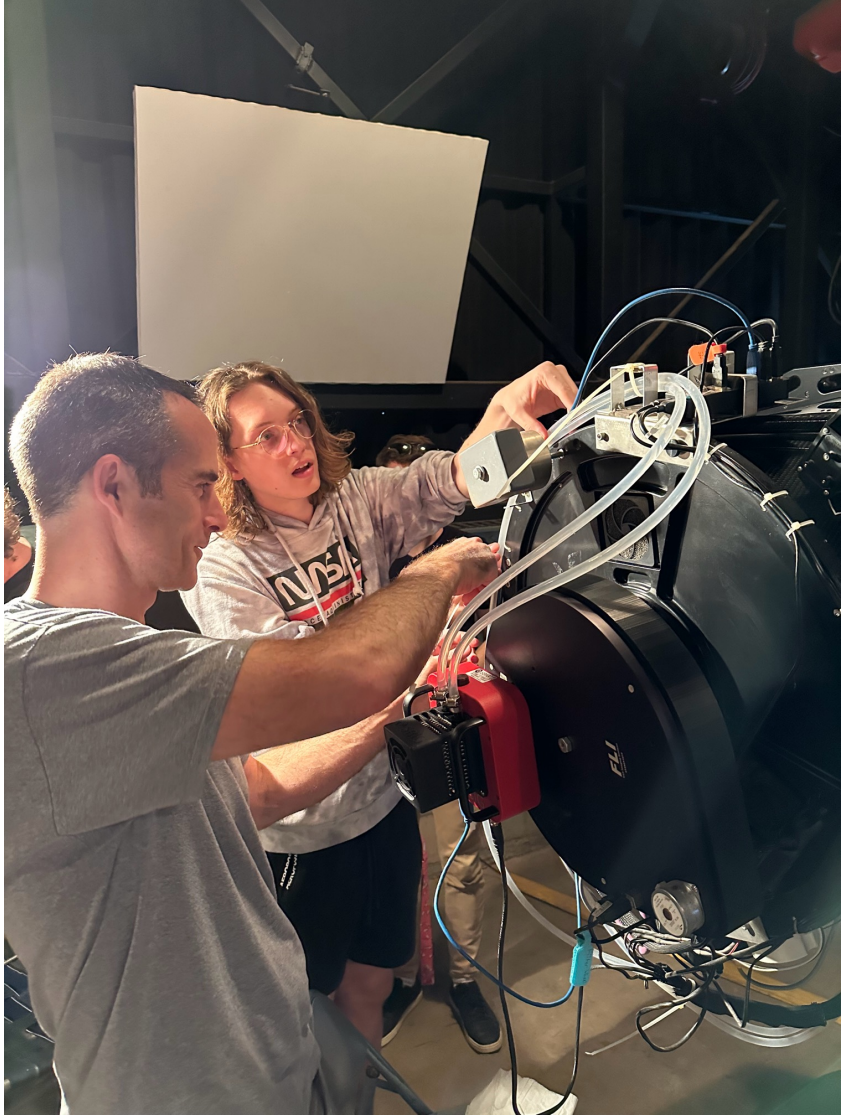
Lila Schisgal, Will St John, Olivia Laske, Cain Rinkoski

Olivia Laske works on the *RLMT*



"I am eternally grateful for such an incredible and unique opportunity. After working with the RLMT during the spring as part of the Remote Observatory Operations course at Macalester and after preparing the daily observing schedules, I gained deep respect for all of the hard work that goes into ensuring smooth telescope operation, particularly with the complex code base. However, the physical components of the RLMT were still a mystery to me. Being in Arizona, physically in front of the telescope, was quite enlightening and insightful, as I was able to demystify how each of the pieces of the telescope fit together. I am especially grateful that I was able to participate in maintenance activities such as balancing the telescope, and cleaning the focuser gears, lens, and filter wheel. One aspect of the trip I especially appreciated was being able to directly contribute to the code that generates darks and flats as well as the code that creates the master darks and flats. There is something about seeing the images appear in the directory - in real time with the camera just a staircase away - that is especially incredible. While at times the work was long and difficult, I am now even more in awe that we are able to observe such distance sources with an entirely robotic system." --- Olivia Laske, Macalester class of 2024

Cain Rinkoski and
John Cannon working
on the *RLMT*



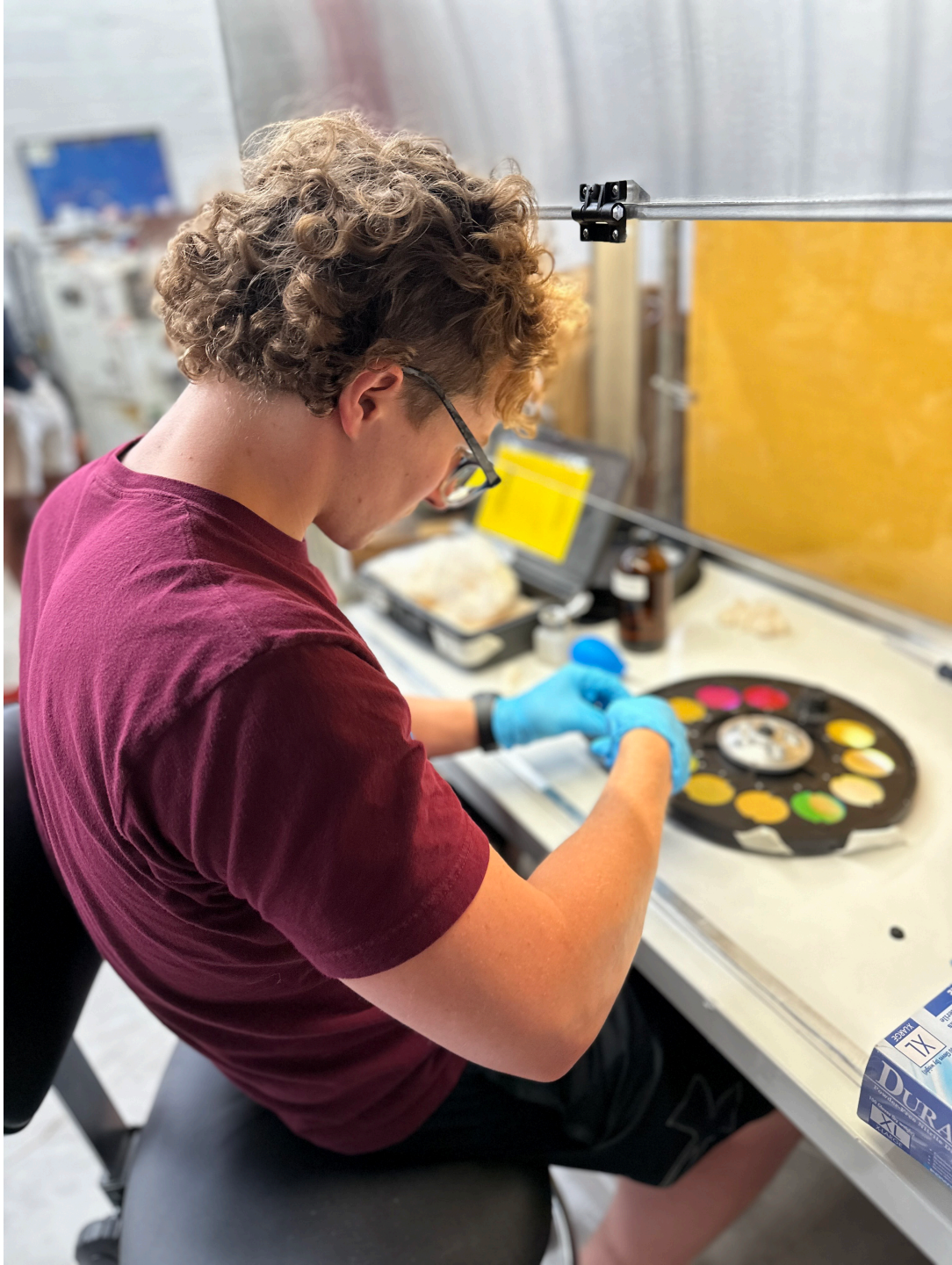
“This is one of the best trips I've ever been on, academic or otherwise. I learned so much, met and/or got to know better so many amazing people, and saw so many amazing things. The opportunity to observe and handle advanced astronomical equipment myself was exciting, informative, and rewarding. I was able to exercise my problem solving abilities while contributing to something that felt very real and important. I was able to escape from the (immense) stress that comes from college life, and fully enjoy the opportunity to experience real astronomy and interact with great people. I will never forget the time I spent at Winer, and will look forward to any future visits. ” -- Cain Rinkoski, Macalester class of 2025

Lila Schisgal
(Macalester College)
with the *RLMT*

"I thought the trip was a really special experience because I got to be immersed in physics in a way I haven't been before. Not only did I get hands on experience at Winer but I got to hear about what projects people were currently working on, at the observatory and at their respective colleges, and everyone was more than happy to answer as many questions as I had. I learned about the telescope's hardware, how to write and use the telescope's software, and the details of taking and calibrating an image. I also learned the constellations, how to derive an electromagnetic theory problem I was stuck on, and advice about continuing my education. It was an experience with a lot of breadth that I'm glad I got to have. I feel much more confident and capable in my understanding of optical telescopes and I know, if I ever have more questions, that anyone I met would be happy to help me figure them out." --- Lila Schisgal, Macalester class of 2025

Will St John (Macalester College) cleans the *RLMT* filters

"I had a great time on this trip. I learned technical skills related to the functionality of a robotic telescope, gained experience writing scripts to automate the telescope's processes, saw first-hand the methods by which scientific optical images are created, and saw what scholarly work outside of a classroom could look like. Overall I had an amazing time and would love to go back. I feel I gained a more personal connection to the other members on this trip that could not have been accomplished in any other setting. I am very thankful for the opportunity to go on this trip and for the level of support I received from professors on the trip. I am especially grateful for the funding provided by Macalester for this trip. Additionally, all of my professors were very accommodating for my absence of class during the week of this trip, which allowed me to focus on the experience of working with the telescope and this fun group of people." -- Will St John, Macalester class of 2026

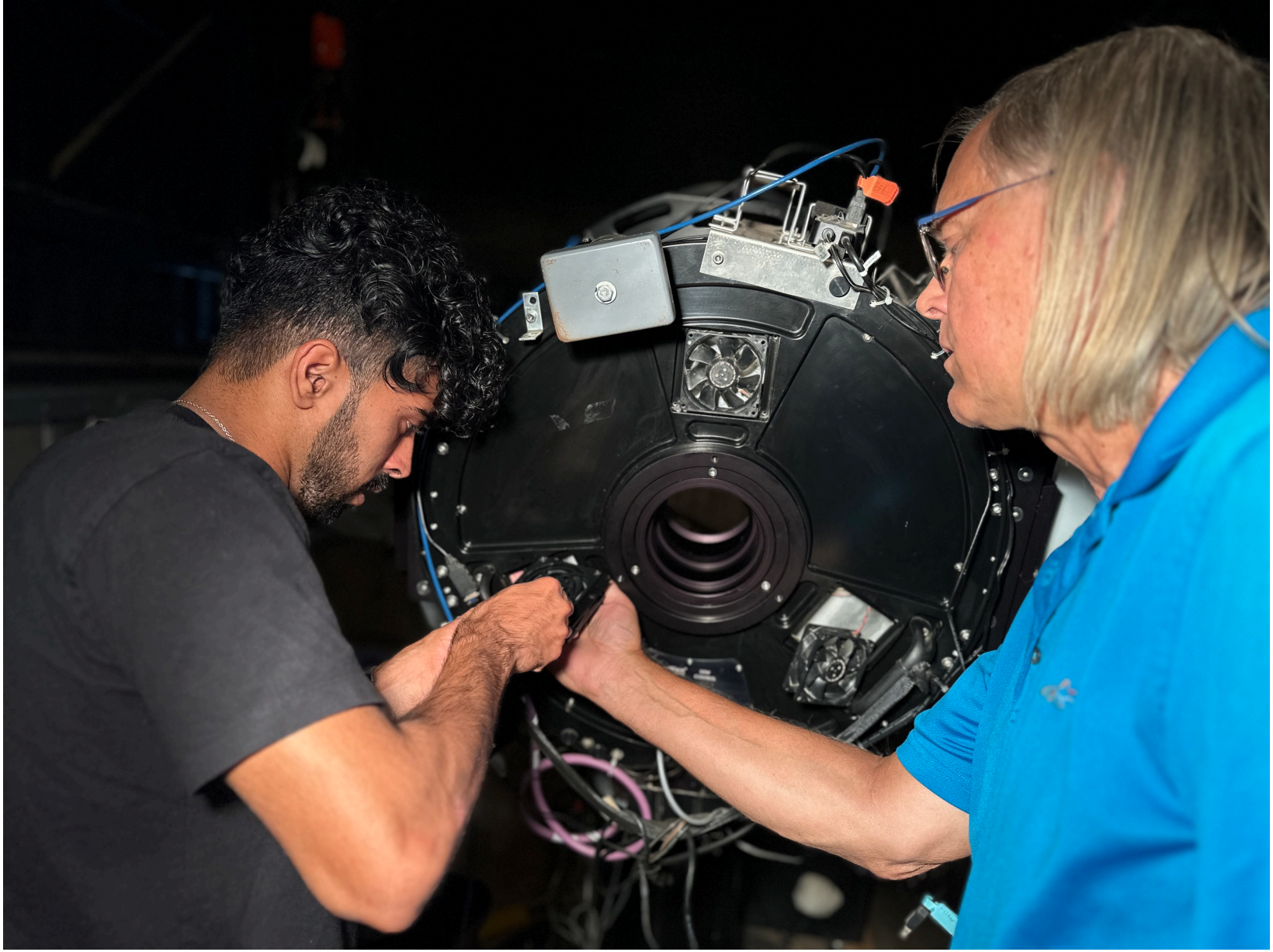


Brian Adams and John Cannon (Macalester College)

James Wetzel (Coe College) troubleshoots a problem with the help of Cain Rinkoski (Macalester College)

Lila Schisgal and Olivia Laske enjoy the spectacular scenery outside of the observatory

The *RLMT* silhouetted against Polaris and circumpolar stars



David Fowler (Macalester class of 1975) and Amit Sharma (Coe College) work on the *RLMT*

David Fowler (Macalester class of 1975) and Olivia Laske (Macalester College) work on images and code that will become part of Olivia's honors thesis in computer science. David is an external project advisor, working alongside Professors Bret Jackson (Macalester MSCS) and John Cannon (Macalester Physics and Astronomy).

Macalester students and Professor James Wetzel (Coe College) in the *RLMT* control room.

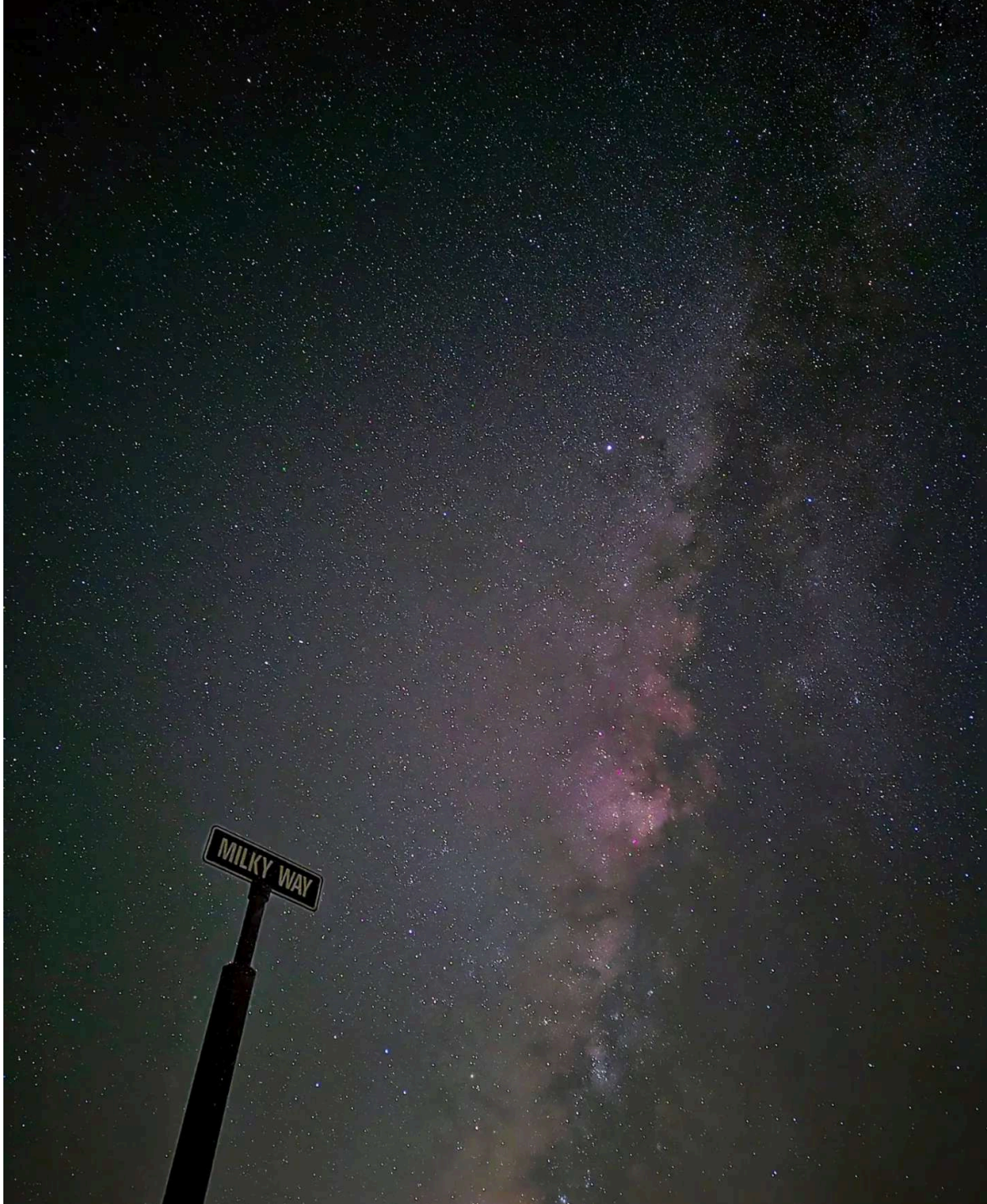
During the *RLMT* visit, Macalester students and John Cannon performed a remote observing session with the 100m *Green Bank Observatory (GBT).* Located in West Virginia, the *GBT* is the largest fully steerable radio telescope in the world. Dwarf galaxy Dw1533+67 is nicely detected!

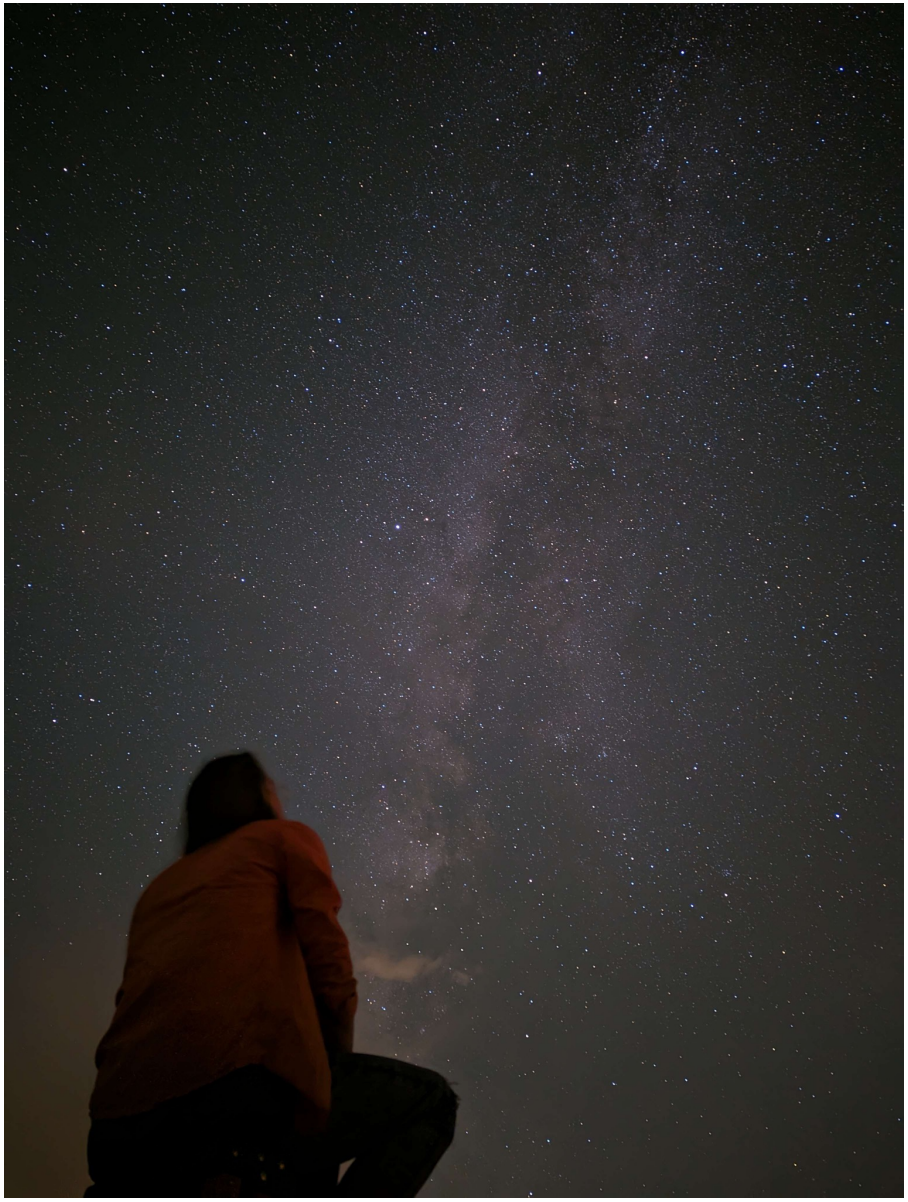
Cain Rinkoski (Macalester) and Amit Sharma (Coe College) enjoy the spectacular scenery outside of the observatory

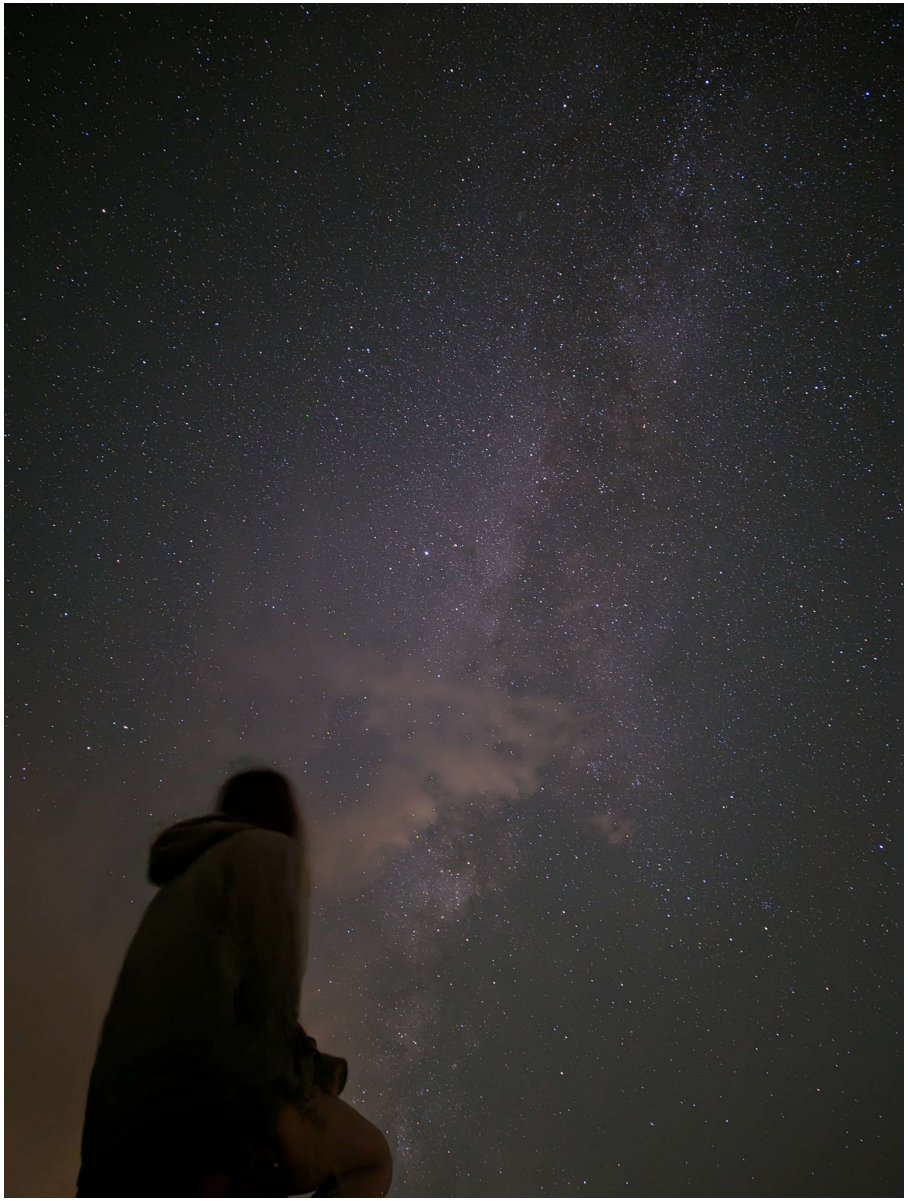
“Home”

The Milky Way galaxy is our home.

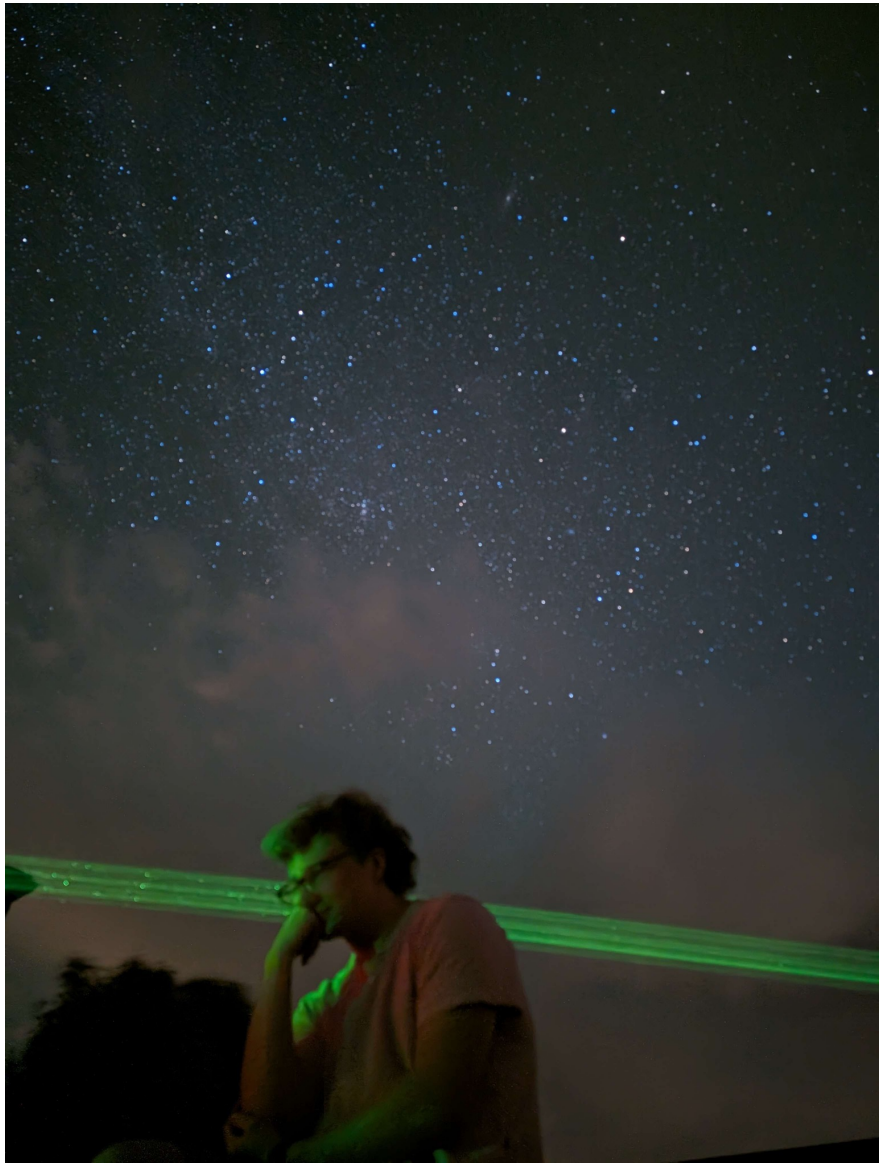
Winer Observatory’s home is on Milky Way.







Cain Rinkoski (left) and Lila Schisgal (right) ponder the wonders of the night sky above the observatory.



Olivia Laske (left) and Will St John (right) ponder the wonders of the night sky above the observatory.

Thanks to the hard work of all of the MACRO Consortium, the *RLMT* is ready for robotic operation in support of classes and research programs at the member institutions