Winebarger
Talking points

I participated in two simultaneous sounding rocket experiments this past summer and it was a great learning experience. The rocket program gives a scientist an opportunity to go through the entire process of developing an instrument, proposing an instrument, building an instrument, testing it to make sure it meets the scientific requirements, flying the instrument, retrieving the instrument and processing the data.

For the two rockets this past summer, I was in charge of doing a lot of testing to verify the instrument met its requirements. For Hi-C, I was responsible for calculating the throughput of the telescope and estimating an exposure time for the camera. This was a very important calculation because if the exposure time was too short, the images would be underexposed, if the exposure time too long, the images would be saturated. Either way, we wouldn't be able to see the coronal structures that Jonathan talked about. Additionally, the rocket flight is only 300 seconds, there isn't really any time to adjust the exposure time during flight. The exposure time had to be just right. This calculation kept me up many nights, but luckily, the exposure time I calculated was the correct one.

After all the work was done at our home institutions, we went to White Sands Missile Range. Our team was there for 5 weeks and most days were over 12-hours. We had to finish integrating the instrument while we were there and do some testing on the instrument to make sure we understood its performance. Then, the instrument gets integrated with the other components, like the attitude control and the telemetry portions of the rocket. After the rocket is completely built up, it has to go through several tests including a shake test. Winebarger1 shows the two rockets during testing; Hi-C is in the foreground of this image. Nothing ever went perfectly and there wasn't a day that we were at White Sands that something didn't come up that needed to be fixed. In fact, most days I thought we weren't going to be able launch. These problems made the time at White Sands very stressful, but, in the end, working through the problems was probably my favorite part of the experience. Our team would get together and brainstorm to determine the best plan of action and we were able to fix all the problems on the fly. It really gave me a sense of what working at NASA and on the sounding rocket program was all about.

Eventually the rocket gets loaded onto the launcher. Winebarger2 shows the team members that got to attend the launch in front of Hi-C on the launcher. Even though the rocket is much smaller and cheaper than a satellite instrument, has a faster timeline and a very short flight, it requires the expertise of many people to make it successful. There are at least 30 people from more than six institutions on the Hi-C team.

The launch occurred on July 11 and it was a great day. My three daughters were able to attend the launch and they were so excited to see the rocket go up at the end

of the countdown. Finally, after all the work we had done preparing the telescope, we get to recover the rocket and look at the data. I had the opportunity to fly in the helicopter to recover the other payload that was launched 6 days previous to Hi-C; Winebarger3 is an image of us on that recovery. After the Hi-C launch, we downloaded the data onto my laptop computer and I started analyzing the data on our drive from White Sands to Las Cruces. As soon as we saw the data, particularly the images that Jonathan showed you earlier, we knew we had a very special data set and that we had achieved our goal of taking the highest-ever resolution images of the solar corona.