12 July 2025

Forrest Ward  
Guidance, Navigation, and Control Manager  
Firefly Aerospace  
Cedar Park, TX

Dear Mr. Ward,

I'm writing to express my interest in the Fall 2025 GNC Internship at Firefly Aerospace. I was especially drawn to Firefly after following the success of Blue Ghost Mission 1, which achieved a precise and sustained commercial lunar landing. As someone interested in sharpening my skills in trajectory optimization and contributing to high-reliability GNC systems, I’m excited by the opportunity to support missions like these. With hands-on experience developing estimation filters, conducting Monte Carlo analysis, and building simulation tools at Varda, SDL, and Blue Origin, I’m confident I can bring value to Firefly’s fast-moving, flight-proven team.

At Varda, I conducted trade studies on gravity models and Kalman filters to support re-entry mission planning and built a GPS error modeling system validated with hardware-in-the-loop tests. I also designed an Extended Kalman Filter for initial orbit determination and ran Monte Carlo simulations to ensure flight safety and robustness. At SDL, I implemented advanced filters and perturbation models—including J2, third-body effects, and solar radiation pressure—to refine orbit estimation across scenarios.

Outside of internships, I developed an Earth-to-Mars transfer optimization tool that solved Lambert’s problem across a range of dates, generated porkchop plots, and used SLSQP to refine launch windows and minimize total ΔV. I visualized the results in 3D and animated trajectories using Blender, integrating both technical depth and clear communication. This project deepened my understanding of trajectory design, optimization, and spacecraft mission analysis—skills I’m eager to apply and expand at Firefly.

Thank you for considering my application; I would welcome the opportunity to contribute to and learn from your team.

Sincerely,  
Scott Nguyen