My educational background in astrophysics and my experience with research, teaching, and outreach has motivated a pursuit to join graduate studies in astrophysics at the Bonn-Cologne Graduate School (BCGS). My research experience in the interstellar medium and star formation led me to my primary research interests and has provided me with skills in programming, data reduction and analysis, and scientific communication which have prepared me well for graduate research.

For my first summer project, I analyzed James Clerk Maxwell Telescope (JCMT) observations of molecules in Perseus dense cores. I investigated tracers of core infall and the relationship between core contraction and core stability using Python analysis. This project continued as a full year research course and led to a first-author paper that was written in my spare time over the following year which has been resubmitted for publication in the ApJ and incorporates improvements in response to the referee. I was also accepted to present a poster on this research at the Canadian Conference for Undergraduate Women in Physics. This project has been a great opportunity for me to carry out my own project from start to finish and to learn how to communicate my research through writing a paper as well as presenting my research poster at a conference.

This past summer at Leiden University, I constructed a Python code that analyzes observations of molecules in a star forming region made with the Atacama Large Millimeter/submillimeter Array. My code performs molecular line identification and creates intensity, velocity, and velocity dispersion maps as well as temperature and column density maps. This project introduced me to the topic of computational astrophysics, which was an exciting way to advance my programming skills and broaden my research interests.

For my year long undergraduate thesis, I analyzed JCMT and Herschel Space Telescope (HST) continuum images of a massive star forming region to investigate how the resolution degradation of HST affects flux density measurements. Using Python, I convolved a 450 μm JCMT image to the resolution of a 500 μm HST image (a factor of ~ 4 difference) and compared flux density measurements made using the convolved JCMT map and the native resolution HST map. This project allowed me to learn about the complexities of massive star forming regions and their related instrumentation effects.

My ultimate goal is a career in research with an opportunity for teaching and outreach. Last year I was a Teaching Assistant (TA) for an astronomy course where I led discussion-based tutorials. I am currently TAing additional courses where I again run discussion-based tutorials, mark, respond to students emails, and run help sessions. I am also the Outreach Director for the Astronomy and Space Exploration Society where I organize public astronomy events and have participated in many other astronomy-related outreach activities. I find these experiences very rewarding and they have motivated me to pursue a career in astrophysical research.

I have a strong interest in programming and data reduction/analysis techniques as well as early star formation, the interstellar medium, astrochemistry and radio astronomy, though I am very curious and would be excited to apply my skills to new areas of research. The BCGS offers many opportunities to challenge my potential for research and offers excellent courses on star formation and radio astronomy which would be exciting opportunities to advance my knowledge in the field. These research and learning opportunities strongly motivate me to wish to join the BCGS and I hope to be given the chance to learn from and contribute to your community.