Southern Ocean Satellites (SOS)

Master’s Thesis Project – Space, Earth, and Environment

The Southern Ocean remains the wild west of Earth science, a vast and unpopulated expanse of water with waves and winds on a different scale than anywhere else on the planet. Due to the difficulty of sailing those seas, very few in-situ scientific measurements have been made in this remote part of the world, and thus much of our knowledge of its behavior comes from satellite observations and models.

Recently there has been increased interest in the Southern Ocean because its variability is a significant unknown in predicting the future climate. As part of a broad effort to better understand the Southern Ocean, the field projects CAPRICORN and SOCRATES gathered in-situ data over the last couple years on ocean and cloud processes. Additionally, OceanRAIN data comprises millions of minutes of ship time in the Southern Ocean while logging rainfall characteristics as well as components of the water cycle.

This project will involve comparing satellite data to model data, validated against these new in-situ measurements from ships in the Southern Ocean. The data examined can include sea surface temperature, ocean winds, liquid clouds, and precipitation. After completing this analysis, some examination will be required to determine possible causes of significant discrepancies—such as ocean emissivity model errors or point-to-area effects.

Prerequisites: Basic programming experience, background in physics or Earth science is a plus

Contact:
David Duncan (david.duncan@chalmers.se)
Patrick Eriksson (patrick.eriksson@chalmers.se)