



Mars Organic Molecule Analyser

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College Park Scholars – Science & Global Change Program

Computer Science and Economics

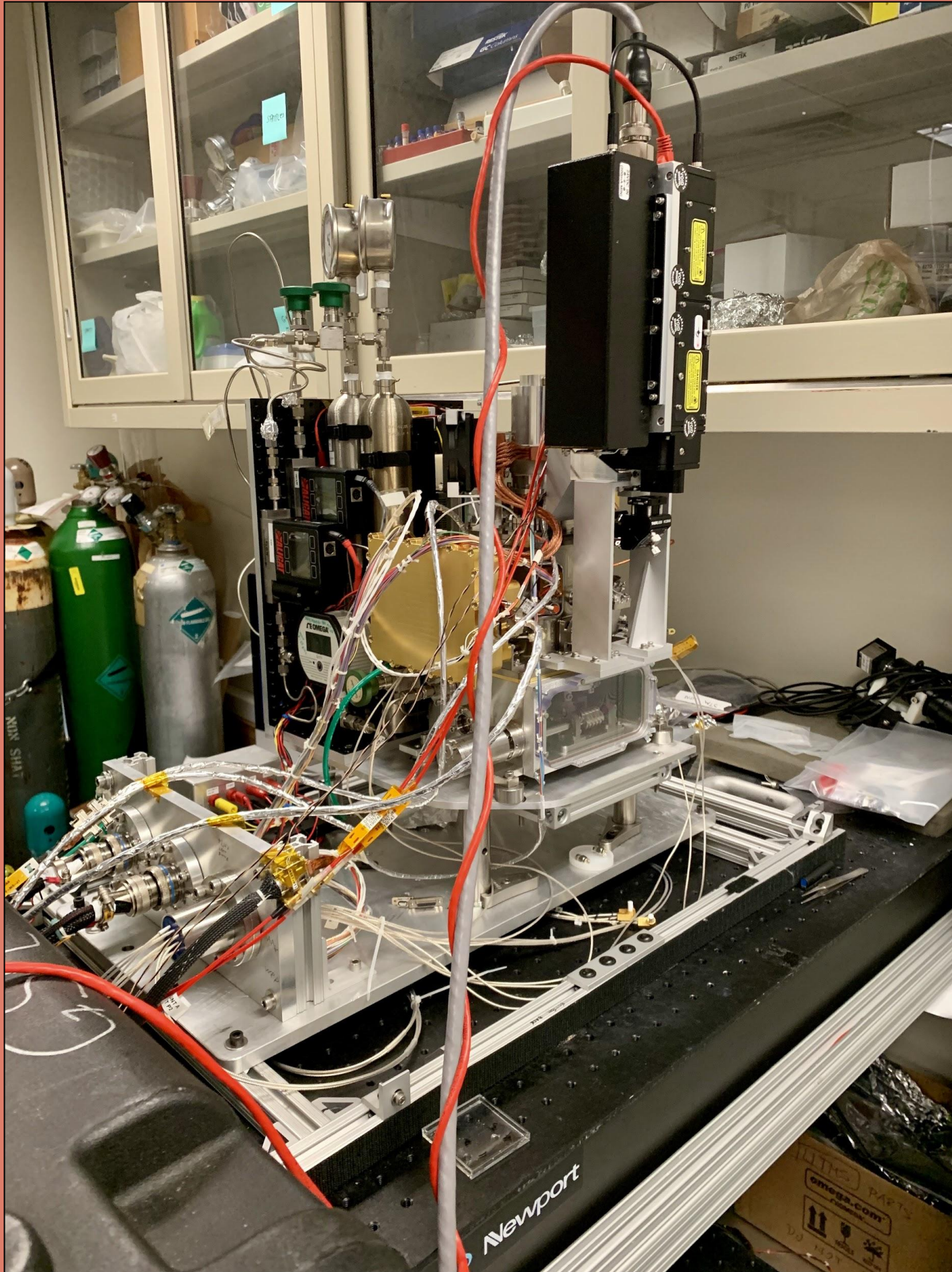
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Introduction

For the Winter 2020 term, I was able to intern at NASA GSFC as an Software Engineer under the MOMA project. During this time, I was able to work with different teams to develop software that was used by scientists in NASA for data processing



This was one of the prototypes for the MOMA instrument

Site Information:

Name of Site NASA GFCS

Address 8800 Greenbelt Rd, Greenbelt MD 20771

Your supervisor Jerome Hengilimle

The site mission: Develop MOMA

The particular goals of the site you were at: Develop backend data processing for incoming data

Issues Confronting Site:

For my Winter 2020 term, I was unable to work on/ further optimize my software as I was significantly restricted by time. For the site as a whole, I have learned that generally there are many bureaucratic hurdles which I have not anticipated and it often deters the workflow of the projects. Another important issue was communications, since I was only staying onsite for 3 weeks during the winter term, I was unable to receive proper communication regarding campus status and meetings.



Acknowledgments:

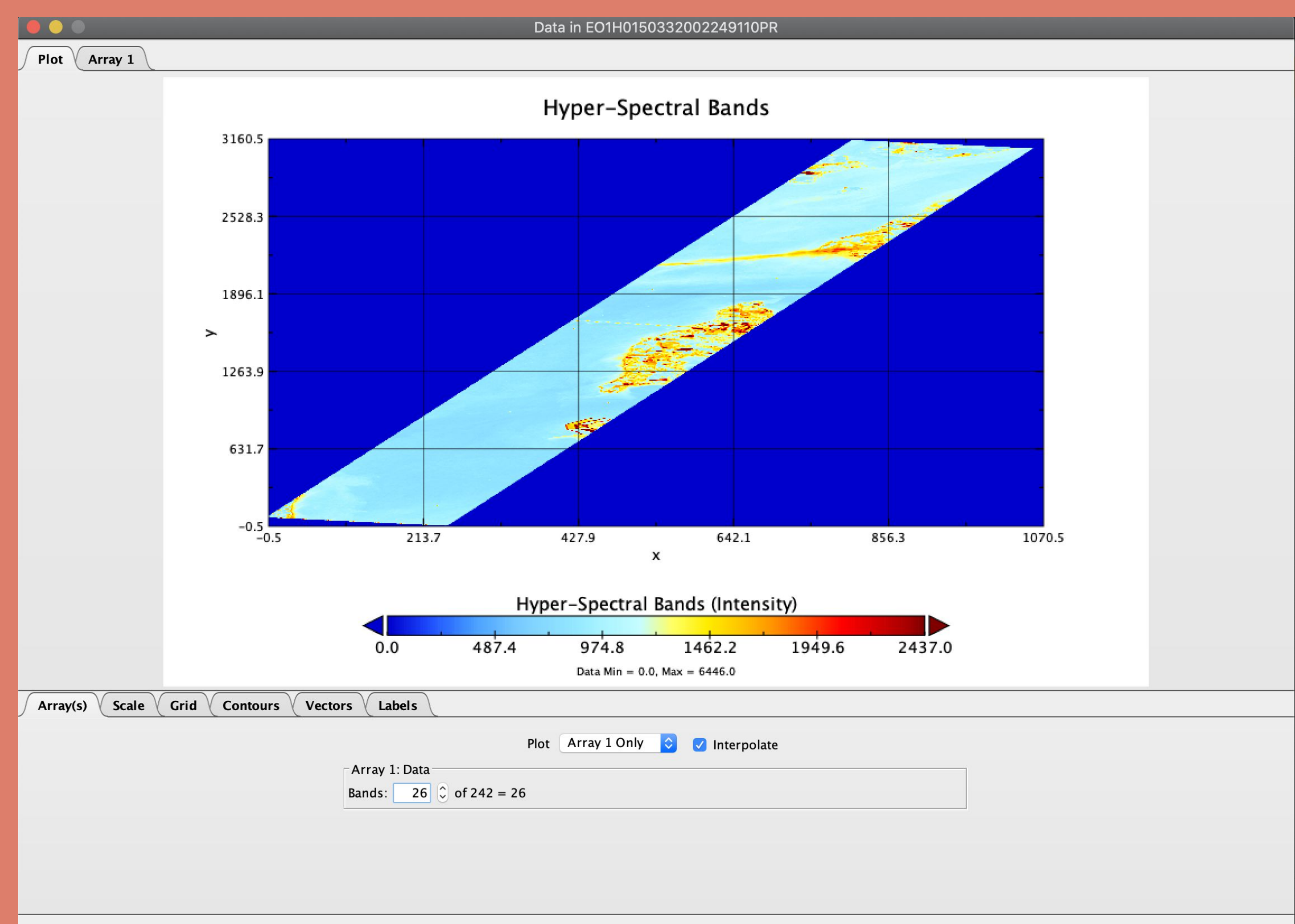
This opportunity was only possible because of the support from my SGC professors, Dr.Holtz and Dr.Mercks who has been with me since Day 1 of my UMD career as well as my site supervisor, Jerome Hengilimile, who was able to guide me through the different obstacles

Activities:

During my internship, I was able to primarily focus on proof of concept by converting data from Pace OCI satellite as well as past data from EO1/Hyperion satellite. After converting the data to speed up data processing times, I was able to develop a simple machine learning model which was used as a proof of concept for the MOMA data, which was very similar to the data that these satellites were sending back.

Impact:

By converting these data to a format called netCDF, I was able to significantly increase the speed at which programs such as the machine learning program was able to process the data(Multiple Gigabytes per image) as well as prove the capabilities of Machine learning



This is a view of the Chesapeake bay from EO1 satellite, which captures spectrum bands humans cannot see. The current view is for Band 26, or about the color of green, however there are 242 spectral bands for the machine learning to analyze so there is immense data which we have to convert before running the programs.

Future Work:

The future plan is for the Exomars Rover to go on mars and search for organic material, and hopefully we would find evidence of life or we could further determine the habitability of mars. The software that I was able to develop will help scientists apply the data to various different tests and experiments to further the knowledge of mankind.

