

AAYUSHI VERMA

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I am a data scientist with a background in scientific computation through my BSc in Astrophysics. I am currently working full-time as a research data scientist, and am also pursuing my MS in Data Science. I am passionate about data-driven research and methodologies.

EDUCATION

Master of Science in Data Science <i>Pace University</i>	May 2022 – current <i>Online Program</i>
Bachelor of Science (Honours) in Astronomy, Minor in Mathematics <i>University of Canterbury</i>	Feb. 2018 – Nov. 2021 <i>Christchurch, NZ</i>
Study Abroad Program – Fall Semester 2019 <i>Queen's University</i>	Sep. 2019 – Dec. 2019 <i>Kingston, Canada</i>

TECHNICAL SKILLS

Languages: Python, R, SQL, Shell (Bash), HTML/CSS, Markdown, LaTeX, Matlab

Libraries: numpy, scipy, pandas, matplotlib, astropy, seaborn, scikit-learn

Software: Git/Github/BitBucket, Anaconda, VS Code, MySQL, PostgreSQL, Tableau, Weka

Relevant University Coursework: Bayesian statistics, time-series analysis, Fourier analysis, linear algebra, multivariate calculus, physical modeling, climate modeling

Research Skills: writing + producing technical documentation, scientific visualization, journal publications

WORK EXPERIENCE

Data Science Fellow <i>Institute for Defense Analyses</i> <ul style="list-style-type: none">Work on numerous data science projects.	Jul. 2022 – current <i>Alexandria, VA</i>
Data Scientist <i>SmartGreen Solar</i> <ul style="list-style-type: none">Created data pipelines to ingest data from various sources and platforms, and created a MySQL database to continuously integrate the streams of data. Created executive dashboards in Google Data Studio with data from the database, to visualize sales data and salesperson performance. Created company GitHub repository to store all data cleaning scripts, and to promote data collaboration culture in the company.	Mar. 2022 – Jul. 2022 <i>Providence, RI</i>
Python Programmer <i>CallCruncher, Inc.</i> <ul style="list-style-type: none">Agent performance KPIs: Developed Python scripts to process daily call detail records (CDR), per client basis for agents' performance index calculation. More duties include: generating statistics for incoming calls on a daily basis, computing agents' presence time for total calls in the day, reporting outliers outside 1-SD, ranking agents based on presence data and abandoned calls count, and other metrics.	Apr. 2021 – Jun. 2022 <i>United States (Remote)</i>

RESEARCH PROJECTS AND INTERNSHIPS

Senior Thesis Research Project <i>University of Canterbury</i> <ul style="list-style-type: none">Developed 3 pipeline scripts and 2 function repositories to ingest, transform, analyze and visualize image datasets (400GB+) from an astronomy observatory, using Python and Shell.Developed analytics, such as plots and analysis logs for pipeline scripts, additional feature includes API for web querying of database.Unit-tested code, open-source and publicly available on Github.These pipelines are currently being used by Mt. John Observatory for processing image datasets.	Feb. 2021 – Nov. 2021 <i>Christchurch, NZ</i>
Undergraduate Research Project <i>University of Canterbury</i>	Aug. 2020 – Feb. 2021 <i>Christchurch, NZ</i>

- Developed [Python code](#) for querying and retrieving data about a comet from a web database and local CSV files, and analyzing and visualizing the data to produce a joined table and plots, utilizing Astropy, Numpy, Pandas and Matplotlib libraries.
- Developed [Python code](#) for querying and retrieving an astronomical target's visibility information from a web database, and outputting results as plots, using Numpy and Astropy libraries.

Laureate Internship

Jan. 2020 – Feb. 2020

Research School for Astronomy and Astrophysics, Australian National University

Canberra, Australia

- Developed multiple Python scripts for analyzing 3-dimensional data cubes of galaxies, including data cleaning, wrangling, analysis, and visualization.
- Performed operations like ASCII file manipulation, linear interpolation of data, polynomial curve fitting, and other mathematical transformations using Numpy.
- Contributed frequently to private group repository, wrote and maintained multiple function and class scripts in the repository.
- [Publication](#) for this project is currently in review in Astrophysical Journal (Mar. 2022).

Research Project

Oct. 2019 – Dec. 2019

Queen's University

Kingston, Canada

- Developed Python code for querying and retrieving data about a young star's formation (astronomy) from multiple web databases, and analyzing and visualizing the data to learn more about the young star, utilizing Numpy, Pandas and Matplotlib.

Research Project

Nov. 2018 – Feb. 2019

Brown University

Providence, RI, USA

- Developed Python code and Bash shell scripts for analyzing datasets of dark matter around galaxy clusters.

Undergraduate Research Project

Jul. 2018 – May 2019

University of Canterbury

Christchurch, NZ

- Developed Python code for processing and analyzing astronomical image datasets.

PUBLICATIONS AND OTHER WORKS

Journal Publications

- Bannister et al. (2022). (preprint)
- Lister, T., Kelley, M. S. P., Holt, C. E., Hsieh, H. H., Bannister, M. T., Bodewits, D., Knight, M. M., Bauer, J., Chatelain, J., Dobson, M. M., Fernandez-Valenzuela, E., Gardener, D., Gyuk, G., Hammergren, M., Huynh, K., Jehin, E., Moulane, Y., Kokotanekova, R., Lilly, E., Man-To, H., McKay, A., Opitom, C., Protopapa, S., Schambeau, C., Schwamb, M. E., Snodgrass, C., Usher, H., **Verma, A.A.**, Wierzechos, K., Yanamandra-Fisher, P. A., Ye, Q., Gomez, E., Greenstreet, S. (2022). [The LCO Outbursting Objects Key Project: Overview and Year 1 Status](#). *PSJ*. Manuscript submitted for publication.
- Grasha, K., Chen, Q.H., Battisti, A.J., Ridolfo, S., Poehler, E., Mably, S., **Verma, A.A.**, Hayward, K.L., Kharbanda, A., Acharyya, A., Poetrodjojo, H., Seibert, M., Rich, J.A., Madore, B.F., and Kewley, L.J. (2022). [Metallicity, ionization parameter, and pressure variations of HII regions in the TYPHOON spiral galaxies](#). *ApJ*. Manuscript submitted for publication.
- **Verma, A.** (2019). [The Morphology of Galaxies](#). *Southern Stars*, 58(2), 7–10.

Technical Documentation

- **Verma, A.** & Lane, Z. (2022). B&C 0.61-metre telescope procedure checklist. Unpublished manuscript.
- **Verma, A.**, Gunn, F., Bannister, M., Tristram, P., et al. (2021). 1.8-m telescope user manual. Unpublished manuscript.
- **Verma, A.** (2019). Celestron telescope manual. Unpublished manuscript.

SCHOLARSHIPS, GRANTS, AWARDS AND HONORS

3rd Place in 2022 Lubin School - Dataiku Hackathon <i>Seidenberg School of Computer Science and Information Systems, Pace University</i>	Nov. 2022 (Honor)
Graduate Merit Scholarship <i>Seidenberg School of Computer Science and Information Systems, Pace University</i>	Mar. 2022 (Scholarship)
Travel Grant <i>School of Physical and Chemical Sciences, University of Canterbury</i>	Dec. 2021 (Grant)
Summer Research Scholarship <i>School of Physical and Chemical Sciences, University of Canterbury</i>	Oct. 2021 (Scholarship)
Astronz Grant <i>Astronz</i>	Jun. 2021 (Grant)
Travel Grant <i>School of Physical and Chemical Sciences, University of Canterbury</i>	Jun. 2021 (Grant)
Summer Research Scholarship <i>School of Physical and Chemical Sciences, University of Canterbury</i>	Nov. 2020 (Scholarship)
RASNZ Presidents' Award for Best Presentation: First Prize <i>Royal Astronomical Society of New Zealand</i>	May 2019 (Award)
Astronz Grant <i>Astronz</i>	Mar. 2019 (Grant)
UC Excellence Scholarship <i>University of Canterbury</i>	May 2018 (Scholarship)

TEACHING AND MENTORING EXPERIENCE

Internship Supervisor <i>University of Canterbury Mt. John Observatory</i> <ul style="list-style-type: none">Supervisor for 3 undergraduate student interns and 1 graduate student at the Mt. John Observatory. In charge of training them on 2 telescopes, aiding them with their observations, mentoring them, and answering questions related to their astronomy research projects.	Nov. 2021 - Feb. 2022
Teaching Assistant and Tutor <i>University of Canterbury</i> <ul style="list-style-type: none">TA for approximately 30 first-year and 30 second-year Astronomy students. In charge of holding tutorial sessions to familiarize students with class content, helping and answering questions, marking assignments, helping the lecturer with class demonstrations and extra marking, and monitoring the online class forum to answer student questions.	Feb. 2021 - Nov. 2021
Astronomy Camp Assistant <i>University of Canterbury</i> <ul style="list-style-type: none">RA for 'Elaine P Snowden Astronomy Camp'. In charge of 20 high school students and duties including: assisting with the running of the camp, planning activities for students, showing them around the university and telescopes at Mt John Observatory, taking them to their lectures, and engaging them with astrophysics.	Apr. 2021

CONFERENCE PRESENTATIONS AND POSTERS

ASTEROID: A Data Reduction Pipeline for the MOA Telescope (Poster) <i>Royal Astronomical Society of New Zealand Annual Conference 2021</i>	Jul. 2021 Wellington, NZ
Characterizing The Activity Of New Comets Observed In The LOOK Project <i>Royal Astronomical Society of New Zealand Annual Conference 2021</i>	Jul. 2021 Wellington, NZ
Regular Contributor <i>University of Canterbury Planetary Sciences Journal Club</i>	Nov. 2020 - Dec. 2021 Christchurch, NZ
Galaxy Morphology and Classification <i>Royal Astronomical Society of New Zealand Annual Conference 2019</i>	May 2019 New Plymouth, NZ

EXTRACURRICULAR LEADERSHIP EXPERIENCE AND SERVICE

Social Media Manager

Mar. 2020 – Nov. 2020

New Zealand Students' Space Association at University of Canterbury

- In charge of managing social media presence of association on Facebook, Instagram, YouTube, Discord, LinkedIn, etc., promoting events, networking, creating and sending monthly newsletters, and other related duties.

President and Co-Founder

Dec. 2018 – Mar. 2020

New Zealand Students' Space Association: Christchurch Branch

- In charge of managing 10-person team, coordinating meeting minutes, organizing weekly tasks for team, managing and running events for association, networking to make connections for association, and other management duties.

Class Representative

Jul. 2018 – Jun. 2019

University of Canterbury

- Elected as class representative for 4 courses. Responsibilities included: acting as the first point of contact for peers, helping resolve class issues, and communicating between the lecturer of the course and the students.

COMMUNITY OUTREACH AND ENGAGEMENT

Speaker

Apr. 2021

Elaine P. Snowden School for Astronomy

(invited)

- Invited to talk to high school students on the Elaine P. Snowden Astronomy Camp about my experience as an Astronomy student at the University of Canterbury.

Speaker

Sep. 2020

Canterbury Astronomical Society

(invited)

- Presented a talk titled 'Adventures of an Astronomy Undergraduate Student', and detailed my experience as an undergraduate astronomy student.

Social Media Appearance

Nov. 2019

Queen's University

(invited)

- Invited to be filmed in a 30-second Instagram story talking about my passion for Astrophysics for Queen's University's outreach program for Dark Matter Day.

Demonstrator

Jul. 2019

University of Canterbury

(volunteered)

- Demonstrated various Astronomy and Physics experiments during the University of Canterbury's Open Day.

Speaker

Jul. 2019

University of Canterbury

(invited)

- Invited to talk to previous students of the Elaine P. Snowden Astronomy Camp about my experiences as an undergraduate Astronomy student at the University of Canterbury.

Demonstrator

Jul. 2019

Children's University

(volunteered)

- Demonstrated various Physics experiments to students aged 7-12 years old from Children's University.

Panelist

May 2019

New Zealand Space Agency

(invited)

- Invited to talk on the panel discussion titled '[NZTech TechWeek: Future of Space in New Zealand](#)', hosted by the New Zealand Space Agency and SpaceBase.

Speaker

Apr. 2019

Elaine P. Snowden School for Astronomy

(invited)

- Invited to present a talk on my undergraduate research project, titled 'Galaxy Morphology and Light Profile Analysis' to high school students participating in the Elaine P. Snowden School for Astronomy camp.

Panelist

Feb. 2019

Canterbury Astronomical Society

(invited)

- Invited to talk on the panel discussion titled 'IAU International Women and Girls in Astronomy Day' about my experience as a female undergraduate student in Astronomy at the University of Canterbury.

Speaker

Elaine P. Snowden School for Astronomy

Apr. 2018

(invited)

- Invited to talk to high school students on the Elaine P Snowden Astronomy Camp about my experience as an undergraduate Astronomy student at the University of Canterbury.

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