

Luv Jotwani

Master's in Astrophysics - Specialized in programming

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EDUCATION

University of Glasgow, MSc Astrophysics

SEPT 2023 - DEC 2024

Graduating in December 2024 – completed with 2:1. Required courses taken can be found here: [Astrophysics \[MSc\] – Postgraduate study](#).

Optional courses taken: Physics Computational Labs (Bash, Linux, C++), Mathematical Methods 2, Research Skills, Statistical Mechanics, Imaging and Detectors.

University of Dundee, BSc Physics with Astrophysics

OCT 2020 - APR 2023

4 year course, completed in 3 (Jumped to second year). Completed with 2:1. Courses taken can be found here: [Teaching and assessment – Physics with Astrophysics BSc \(Hons\) | University of Dundee, UK](#).

International American School, IB (International Baccalaureate)

SEPT 2018 - MAY 2020

Subjects: Mathematics Higher Level (HL), Physics HL, Chemistry HL, Psychology HL, English A, French AB Initio

EXPERIENCE

Digital Marketing and Product Placement, Warsaw

JAN 2023 - PRESENT

Managing online product placement for BM sp z.o.o. Involves writing code to manage up-to-date information, and strategically adding offers to manage product relevance.

Workshop on Machine Learning and Quantum Computing, Warsaw

SEPT 2022

Attended the WMLQ2022 conference in Warsaw. Contained talks, interactive workshops (for quantum computing tools), and gave an opportunity to interact with many professors from universities across Europe.

ADVANCED SKILLS

Python (+ numpy, scipy, astropy, PyQt6)

Blender (3D)

Matlab

Linux

LaTeX (+ Scientific Writing)

SOFT SKILLS

Problem solving

Teamwork

Critical Thinking

Task management and planning

Communication (primarily scientific)

OFFICIAL AWARDS

University of Glasgow – 10,000 GBP Scholarship

University of Dundee – 2,000 GBP Scholarship

Scholar's cup – Winning team

INTERMEDIATE SKILLS

Bash HTML

C++ PyTorch

C# Multisim

Teaching Assistant for Programming labs, Dundee

SEPT 2021 - DEC 2021

Assisted 2nd year physics students during python programming labs in the University of Dundee. Involved debugging students' code and teaching them relevant concepts.

University Content Creator Programme, Glasgow

FEB 2024 - AUG 2024

Created promotional video material for the University of Glasgow, used to introduce new students to student life and expectations.

FULL-SCALE PROJECTS

Volumetric ray tracer

Developed a volumetric ray tracer to simulate radiative transfer through gas clouds. Cloud properties (eg. absorption/emission coefficients as a function of frequency), distribution, and structure can be customized. Ideal for studying protostars.

Solar wind's effect on LISA

LISA is a planned space-based gravitational wave detector. Simulated the solar wind's effect on LISA, and analyzed how the predicted parameters for the black holes would deviate from real values based on the added solar wind effect. Developed in Python.

Analysis of Bjerknes forces

Analyzed Bjerknes forces on lipid-coated air bubbles in a saline solution, developing an automatic way to track bubbles from an image series for further analysis. Useful for developing targeted drug delivery methods in medicine.

Glasgow Big-Bounce

Created a presentation (research + script + artwork) about the Sloan Digital Sky Survey (SDSS), and presented its uses and functionality alongside colleagues at the Glasgow Big-Bounce festival. Additionally, designed and created cover art for colleague's children's book

SMALL-SCALE PROJECTS

DEAP (dark matter detector) Neural Network

Created a basic neural network in Python that locates an event based on the readings of the surrounding detectors for the DEAP project.

CSS Unity
SQL Godot

LANGUAGES

English

Polish

French

Hindi

Lit. Review: Existence of Tetraneutrons

Conducted a literature review on the existence of tetraneutrons.

Tetraneutrons are a set of 4 bound/resonant neutrons, with research showing conflicting results.

Lit. Review: Cosmic Microwave Background Anisotropies

Conducted a literature review on the causes and implications of CMB anisotropies. Temperature and polarization anisotropies can be used to study the early universe and its composition, and to verify models of the universe.

Controlled Experiment: Galaxy Imaging

Imaged a distant galaxy (M81) using remote access to real telescopes.

Used python to process FITS files and generate a 3 color + H-alpha image.

Controlled Experiment: Star Cluster Analysis

Used python to process GAIA data and isolate a star cluster from background stars with available star data. Used isochrone fitting to verify the selection.