Jashanpreet Singh

+91 8847242013 | astrodingra@gmail.com | github.com/dingra11 | www.astrodingra.in | astrodingra

Amritsar, Punjab, India

Summary

MSc. FYIP Physics student and ML researcher applying deep learning, state-space/transformer models and large-scale data pipelines to astrophysics and medical imaging. Author of an open-source galaxy-analysis package (under review at MNRAS), IUCAA computational grant holder, and founder of two AI startups building LLM/LMM systems.

Education

Guru Nanak Dev University - MSc. FYIP Physics - CGPA 9.10/10 **2024 – June 2027**
Amritsar, Punjab, India

The Millennium School - Non Medical - 84.2% **2022 – 2024**
Patiala, Punjab, India

IELTS Academic: Overall 7.0 (C1) | Listening 7.0 | Reading 7.5 | Speaking 6.5 | Writing 6.0

CSE Coursework	Institution	Year
CS50x: Introduction to Computer Science (Completed Oct 21)	Harvard University	*2026*
Supervised Machine Learning: Regression and Classification	Stanford University	*2025*
Discrete Mathematics (NPTEL)	IIT Ropar	*2024*
Data Structures and Algorithms (NPTEL)	IIT Delhi	*2025*
Design & Analysis of Algorithms (NPTEL)	IIT Kanpur	*2025*
Database Management Systems (NPTEL)	IIT Madras	*2025*
Operating Systems (NPTEL)	IIT Delhi	*2025*
Computer Architecture (NPTEL)	IIT Delhi	*2025*

Technical Skills

Machine Learning: Deep Learning, CNNs, Transformers, GNNs, State Space Models (Mamba), RAG, LLM Fine-tuning (LoRA, QLoRA, PEFT), Agentic AI
Frameworks: PyTorch, TensorFlow, JAX, Scikit-learn, HuggingFace, OpenCV, LangChain, LangGraph
MLOps & Tracking: MLflow, Airflow, Docker, Kubernetes, Git, Linux
Languages: Python, C++, C, R, Fortran, MATLAB, Bash, Assembly
Backend & Data: FastAPI, REST API, MERN, PostgreSQL, MySQL, MongoDB, Redis, Elasticsearch, FAISS, Pinecone
Cloud & Compute: AWS, GCP, Azure, HPC clusters (IUCAA Pegasus)
Scientific Python: NumPy, SciPy, Astropy, Matplotlib, Seaborn, Plotly
Core CS: Data Structures & Algorithms, Object-Oriented Programming

Positions & Experience

- **Summer Student** | *IUCAA* (May 2026)
- **Summer Student** | *CAMK Poland* (May 2026)
- **Winter Student** | *TIFR* (December 2025)
- **Visiting Student** | *IUCAA* (September 2025)
- **Intern** | *Tor Project* (August 2025)
- **Summer Student** | *IIST* (July 2025)
- **Summer Student** | *Univ. of Minnesota* (2025)
- **Active Member** | *HackClub* (2022)

Funded Startups & Featured Projects

Sitee (sitee.in) **2025 – Present**
Founder & CTO - Startup

- Founded and developed Sitee, an AI-powered platform that generates full-stack websites from natural-language prompts using a `custom 1.2B+ parameter LLM`.
- Integrated vector databases, including FAISS and Pinecone, for context retrieval, code generation, and scalable AI workflows.

Brepline (brepline.vercel.app) **2026 – Present**
Founder & CTO (Early Stage - Startup)

- Developing `a 7.9B+ parameter large mechanical model (LMM)` for AI-driven 3D modeling, generating parametric CAD models in STEP/B-Rep formats from natural-language prompts and sketches.
- Integrating AI with SolidWorks through custom plugins for AI-assisted CAD design, parameter editing, and automated engineering workflows.

Galamo (www.galamo.org) **2026**
Open-Source Galaxy Analysis

- Built an open-source Python package combining deep learning and statistical methods for automated galaxy morphology classification, kinematics, photometry and spectral analysis.
- **V1.0.0 - Accepted: Production du Bulletin de la SRSL**

SunFLAAR (sunflaar.vercel.app) **2026**
Open-Source Solar Flare Analysis

- Developed an open-source Python package for multivariate time-series forecasting, active region classification, and imbalanced data metrics to aid space weather research.

PRIN (GitHub) **2025**
Tor Project Internship

- Developed a cybersecurity platform to crawl dark web onion sites, extracting leaked emails, BTC IDs, PGP keys, and IP addresses via proxy protocols to aid cyber police and to directly reduce dark market.

Publications

1. **A Unified Deep Learning Framework for Automated Morphological Classification and Photometric Analysis using DECaLS Legacy Imaging** **(Latest Version MNRAS Accepted - 13/10/2026)**
   - Built **Galamo**, an open-source Python package combining deep learning and statistical methods for automated galaxy morphology classification, kinematics, photometry and spectral analysis.

- *Authors: Jashanpreet Singh Dingra, **Hum Chand** & **Madhu Sudan** —* **www.galamo.org**

2. **Atomic-Claim Evaluation and Source Attribution of Hallucinations in Large Language Model Generations** **(IEEE Under Review)**
   - Developed a benchmark and verification pipeline for measuring hallucination in LLM generations across diverse domains, decomposing model outputs into atomic claims and checking each against reliable knowledge sources to characterise where and why models fabricate information.
   - *Authors:* ***Jashanpreet Singh Dingra***

International Collaborations

1. **Evolutionary Destiny and Observational Deficits of JWST "Little Red Dot" Analogues in IllustrisTNG** **(Ongoing - 2026)**
   - Analysed IllustrisTNG simulation data, tracking main descendant branches to $z = 0$ to predict that early-universe Little Red Dots are progenitors of present-day Brightest Cluster Galaxies. A stacked temporal analysis aligned to the quenching epoch shows radiatively efficient AGN feedback drives their rapid star-formation cessation.
   - Supported by an **IUCAA Pegasus Cluster computational grant (2026)**.
   - *Authors:* ***Jashanpreet Singh Dingra, Hum Chand (Former PI ILMT, ARIES)***

2. **Exploring Active Galactic Nuclei in the Sloan Digital Sky Survey: A Multiwavelength Study** **(2026)**
   - Conducted under the **Nicolaus Copernicus Astronomical Center of the Polish Academy of Sciences, Warsaw**.
   - *Mentors & Collaborators:* ***Marzena Sniegowska (Czech Academy of Sciences), Biswaraj Palit (Copernicus Astronomical Center)***

Machine Learning & Research Projects

1. **Deep Learning Model for Alzheimer's Detection and MRI Brain Segmentation** **(2025)**
   - Engineered a CNN to classify Alzheimer's disease stages from brain MRI scans, with a semantic segmentation head delineating affected structures such as the hippocampus to aid early diagnosis.
   - *Authors:* ***Jashanpreet Singh Dingra*** *and Hardeep Kaur*

2. **Pipeline to Disentangle AGN Flux from Total Galaxy Flux using the PFVG Method** **(2025 - Present)**
   - Building a statistical pipeline to separate AGN flux variability from host-galaxy flux using the PFVG method on COSMOS survey data.
   - *Authors: Madhu Sudan,* ***Jashanpreet Singh Dingra****, Ankit Sarkar & Hum Chand*

3. **Galspar & RAGA - Automated Pipelines for Galaxy Morphology via GALFIT** **(2025 - Present)**
   - Developed `galspar` for precise photometric and morphological measurements on FITS galaxy images, and `RAGA`, an automated pipeline for large-sample statistical morphology studies with GALFIT.
   - *Authors:* ***Jashanpreet Singh Dingra****, Hum Chand and Madhu Sudan (Central University of Himachal Pradesh)*

4. **Stellar Velocity Dispersion of SDSS Galaxies with a MILES Template:** `vdisp_fit` **(2025 - Present)**
   - **IUCAA Visiting Student Project.** Developed a Python pipeline that fits SDSS spectra by convolving a MILES stellar template with a Gaussian broadening function and applying robust χ^2 minimisation to recover kinematic parameters.
   - *Authors:* ***Jashanpreet Singh Dingra*** *and Gulab Chand Dewangan (IUCAA)*

5. **N-body Simulation of Open Star Cluster Dynamics (4th-order Runge-Kutta)** **(2025)**
   - Implemented a numerical N-body integrator to model long-term gravitational evolution and dissolution of open clusters; analysed trajectories and stability over cosmic timescales.
   - *Authors:* ***Jashanpreet Singh Dingra*** *and Suprit Singh (IIT Delhi)*

6. **Crab Pulsar Spin-Down Rate Over 8 Years (2015–2023)** **(2024)**
   - Analysed archival X-ray timing data to measure the spin-down rate and braking index, and investigated timing noise and glitches.

Open-Source Contributions

Astropy — contributor to `astropy.coordinates` and other modules **(2025 - Present)**
PyTorch — contributor to `torch.*` and other modules **(2025 - Present)**
Triton — contributor to `triton.language` and other modules **(2025 - Present)**

Achievements

Hack4Hack AgentX Winner — **Full Stack Engineer Internship** 2026
AlgOlympia, Chandigarh Univ. (National) **Winner** — 50000 INR 2026
Pryas Punjab Fellowship (merit) — **Full Fee Waiver** 2026
HACKOWASP 7.0 (TIET) **Runner Up** — 150000 INR 2025
Ideathon, GNDU (Golden Jubilee Centre of Entrepreneurship) **Winner** — 15000 INR 2025
AdventureX (China's biggest hackathon) **Finalist**, Hangzhou 2025
ICNPA Best Oral Presentation Award 2024
JEE Mains AIR 231 2024
Breakthrough Junior Challenge Finalist 2021

Schools, Conferences & Talks

ESA Workshop: ML meets Galaxy Classification 2, ESAC, Spain 2026
HiSTAR (Himalayan School for Training in Astronomy Research), UPES, by IUCAA 2026
School on Galactic Astrophysics using UVIT, HST and JWST, IUCAA 2026
ZTF Summer School 2025, University of Minnesota, USA 2025
Summer School on Analysis and Statistical Modelling of Space Science Data, MCNS 2025
Summer School on Gravitational-Wave Astronomy, ICTS-TIFR, Bangalore 2025
National Conference on Active Galactic Nuclei, CUHP 2025
Intl. Conference on Nuclear Physics and Its Applications, New Delhi 2024

Leadership

Founder of Dingrastro Club, a global astronomy community with 200+ members
Tech Head, Guru Nanak Dev University SciRox - Official Science Club
ISRO Space Tutor (2023 - Present); IAAC Ambassador (2024 - Present)