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Avinash Kumar

Research Experience

Senior Project Associate ARIES, Nainital **20 Sep 2022 - 25 Jan 2023**

Working for the ARIES and ISRO collaboration on data processing and development for the dedicated Aditya L1 Science Support Cell for the Indian space mission to study the Sun; funded by ISRO.

Junior Research Fellow UC Berkeley SETI - Amity node **8 Nov 2021 - 18 Sept 2022**

Using FPGAs for high-speed data capture for the search for advanced extraterrestrial life

Building a pipeline for the SETI backend for the upgraded Giant Metrewave Radio Telescope (uGMRT) to process raw voltage data and utilising visibility data for imaging the source of interest; Funded by Breakthrough Listen Initiative.

Research Intern RAD@home India **1 Aug 2018 - 31 Oct 2021**

Black Hole and Galaxy co-evolution under Dr Ananda Hota

Multiwavelength analysis using GMRT's TGSS ADR1 all-sky archival data; Built rgbmaker a python-based astronomy web app to communicate with different astronomical services, fetch FITS images from NASA Skyview and numerical data from TGSS and NVSS catalogue (a manuscript on this is in preparation).

Summer Research Associate UM-DAE CEBS **14 May 2018 - 13 July 2018**

Summer Associate Research Programme 2018, Centre for Excellence in Basic Sciences, University of Mumbai-Department of Atomic Energy, Mumbai (14 May - 13 July 2018)

Black Hole and Galaxy co-evolution using the DAE-funded GMRT and RAD@home under Dr Ananda Hota

Education

M.Sc Physics **2016 - 2018**

Ewing Christian College (autonomous) - a constituent college of the University of Allahabad

Semester 4: 71.8% (Spec. in Electronics)
Semester 3: 68.5% (Spec. in Electronics) Condensed Matter, Nuclear Phy, Analog & Dig, Microwaves
Semester 2: 57.0% (QM-II, Statistical Mech, Solid State Elec, Atomic & Molecular)
Semester 1: 58.0% (Mathematical Phy, Classical Mech, EMT, QM-I)

B.Sc (Physics, Computer Application, Mathematics) **2013 - 2016**

Ewing Christian College (autonomous) - a constituent college of the University of Allahabad

Workshops and Online Courses

Machine Learning by Stanford University on Coursera certificate **2022**

Lectures covering the basic concepts of Machine Learning algorithms, Supervised and Unsupervised Learning, Neural Networks, Anomaly Detection, Multivariate Gaussian Distribution, Recommender system, Stochastic Gradient Descent etc; Problems and programming challenges; 11 Weeks;

Accretion processes around black holes and the emergence of AGN jets **2022**

Lectures on standard accretion disc theory, Advective accretion regime, Magneto-Rotational-Instability; Hands-on training on simulations with Pluto (25 March 2022; ASI meeting 2022)

10th IRAM 30-meter school on millimetre Astronomy certificate **2021**

Lectures covering instrumentation, observing techniques, and data processing; study of the chemistry of interstellar clouds, low and high mass star formation, in the Milky Way, in nearby galaxies, and at high-redshifts. (November 15-23, 2021)

Workshop on high-performance computing for astrophysics and astronomy certificate **2021**

Conducted by SKA-India Consortium and Indian Institute of Technology Kharagpur under the aegis of the National Supercomputing Mission in online mode (September 20-23, 2021)

Workshop on "The Morphology of Galaxies from Classical Techniques to Deep Learning" **2020**

Overview of various techniques adopted for the detection and measurement of the morphology of galaxies at optical and near-IR wavelengths in the local and distant Universe, and some astrophysical consequences of these explorations (February 13, 2020; ASI Meeting 2020)

Data-driven Astronomy by The University of Sydney on Coursera certificate **2019**

The course taught how to investigate the challenges of working with large datasets, implement algorithms that work, use databases to manage your data, and how to learn from the data with machine learning tools. Certificate earned on Thursday, February 14, 2019, 3:33 PM GMT