

National Center for Supercomputing Applications
University of Illinois, Urbana Champaign
Gravity Group
1205 W. Clark St., Room 3101
Urbana, IL 61801
website: khanx169.github.io

Asad Khan

Curriculum Vitae

Current Position

PhD Candidate in the Department of Physics, University of Illinois Urbana-Champaign

Research Interests

Multimessenger Astrophysics
Gravitational Waves, Early Universe
Machine Learning, Deep Learning, Data Science, Statistics
Quantum Computing
High Performance Computing
Computer Vision, NLP, Reinforcement Learning

Education

University of Illinois, Urbana-Champaign — *PhD Physics*

September 2015 - Ongoing, Urbana USA

University of Minnesota, Twin Cities — *BS Mathematics, BS Physics*

September 2012 - May 2015, Minneapolis USA

Senior Thesis: "Study of Source of Timing Variations in ECAL using Z to ee events"

Supervisor: Professor Yuichi Kubota

Awards

Excellent Teaching Assistant, University of Illinois (Fall 2016, Spring 2016)

Dean's List, University of Minnesota (Spring 2014, Fall 2012, Spring 2012)

Ramanujan Math Award, Hofstra University (Spring 2012)

Provost's Scholar, Hofstra University (Fall 2011)

Conferences

AstroInformatics, Caltech

June 24 - 27, 2019

Delivered a talk presenting results and techniques from my research in applications of Deep Learning.

Deep Learning for Multimessenger Astrophysics: Real-time Discovery at Scale, NCSA

October 16 - 19, 2018

Data Visualization And Exploration in the LSST Era, NCSA

June 19 - 21, 2018

SPIDER Collaboration Meeting, Princeton University

January 1 - February 3, 2018

Participated in the meeting to plan the launch of the balloon-borne experiment SPIDER: a polarimeter designed to search for primordial gravitational waves imprinted on the Cosmic Microwave Background (CMB).

CMB Detectors And Instrumentation, University of Chicago

August 7 - 11, 2017

Participated in the summer school at the Kavli Institute for Cosmological Physics

Research

National Center for Supercomputing Applications — Gravity Group

June 2018 - Present

The NCSA Gravity Group is an interdisciplinary research team and has a broad research portfolio across multiple areas of contemporary gravitational wave astrophysics, astrodynamics and multi-messenger astrophysics. Our research includes the exploitation of the Blue Waters supercomputer and XSEDE for large scale gravitational wave data analysis and numerical relativity, development of machine and deep learning algorithms for the detection, characterization and scientific exploitation of gravitational wave signals and their electromagnetic and astro-particle counterparts.

Observational Cosmology — SPIDER

Research Assistant, September 2016 - May 2018

SPIDER is a balloon-borne experiment designed to study the genesis of the early universe, probing fundamental physics at energy scales that are far beyond the reach of terrestrial particle accelerators.

Teaching

Teaching Assistant for:

- Physics 212: Electricity and Magnetism (Fall, 2015 - Spring, 2016)
- Physics 214: Quantum Physics (Summer, 2016)
- Physics 211: Mechanics (Fall, 2016)
- Physics 221: Enrichment Mechanics (Spring, 2017)
- Physics 101 Lab: Mech and Heat (Summer, 2018)

Computer Skills

Programming Languages: Python, Java, C, Mathematica, Matlab, Verilog, LabView, shell scripting, HTML, CSS

Deep Learning APIs: Keras, Tensorflow, PyTorch

Version Control: git, gitlab, GitHub

Scientific Software: Numpy, Pandas, SQL, Matplotlib

Operating Systems: Linux, OSX, Windows

Languages

English	Fluent
Urdu	Native
Pashto	Native
German	Beginner
Saraiki	Intermediate

Publications

Deep learning at scale for the construction of galaxy catalogs in the Dark Energy Survey, Physics Letters B, arXiv:1812.02183

Deep Learning for Multi-Messenger Astrophysics: A Gateway for Discovery in the Big Data Era, arXiv:1902.00522v1

280 GHz Focal Plane Unit Design and Characterization for the SPIDER-2 Suborbital Polarimeter, arXiv:1711.04169v2