

Samantha Usman

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EDUCATION

University of Chicago

PHD CANDIDATE, ASTRONOMY & ASTROPHYSICS

Chicago, IL | October 2018 - Current

Cardiff University

MPHIL, PHYSICS & ASTRONOMY

Cardiff, Wales | July 2016 - August 2018

Thesis: Rapid Parameterization & Estimated Inclination of Gravitational Waves from Binary Systems

Syracuse University

BS, PHYSICS & MATH (DOUBLE MAJOR), FRENCH MINOR, SUMMA CUM LAUDE

Syracuse, NY | August 2012 - May 2016

Thesis: The PyCBC Search for Gravitational Waves from Compact Binary Coalescence

WORK EXPERIENCE

UNIVERSITY OF CHICAGO | GRADUATE RESEARCH ASSISTANT

Advisor: Prof. Alexander Ji

Chicago, IL | August 2021 - Current

- Identifying and constraining abundances of elements in galactic halo stars

FERMI NATIONAL LABORATORY | SUMMER RESEARCH INTERN

Computer Science Division. Supervisor: Dr. Brian Nord

Batavia, IL | Summer 2020

- Creating a pipeline which generates simulations of the cosmic microwave background to train machine learning algorithms to remove distortion in astronomical data

UNIVERSITY OF CHICAGO | TEACHING ASSISTANT

Chicago, IL | October 2018 - June 2021

- Ran lab sections for eight quarters of astronomy classes
- Classes Taught: Matter, Energy, Space & Time; Galaxies; The Big Bang; Exoplanets; Cosmic Microwave Background

NASA GODDARD | SUMMER RESEARCH INTERN

Gravitational Astrophysics Laboratory. Supervisor: Dr. John G Baker

Chicago, IL | Summer 2019

- Testing changes to the data analysis pipeline which constrains parameters of gravitational waves from supermassive black hole binary systems.

CARDIFF UNIVERSITY | MASTERS RESEARCH ASSISTANT

Gravitational-Wave Astrophysics Group. Advisor: Prof. Stephen Fairhurst

Cardiff, Wales | July 2016 - August 2018

- Improved methods of quickly identifying parameters of gravitational waves from binary star systems.
- Explored LIGO's ability to distinguish between the inclination and the distance of binary systems.

SYRACUSE UNIVERSITY | UNDERGRADUATE RESEARCH ASSISTANT

Gravitational Wave Astrophysics Group. Advisor: Prof. Duncan Brown

Syracuse, NY | May 2013 - May 2016

- Aided on the detection of gravitational waves from compact binary mergers with LIGO.
- Tested the sensitivity of LIGO's binary neutron star search to astrophysical sources.
- Evaluated search pipeline topologies, template bank placement techniques, and tests for the consistency of gravitational-wave signals in the LIGO detector network.

CALIFORNIA INSTITUTE OF TECHNOLOGY | SUMMER RESEARCH INTERN Pasadena, CA | Summer 2015
Laser Interferometer Gravitational-Wave Observatory (LIGO) Group. Advisor: Prof. Alan Weinstein

- Investigated the deformability of neutron stars and determined its effect on the detectability of gravitational waves from binary neutron stars.

LABORATOIRE DE L'ACCÉLÉRATEUR LINÉAIRE | SUMMER RESEARCH INTERN Orsay, France | Summer 2014
Laser Interferometer Gravitational-Wave Observatory Group. Advisor: Dr. Florent Robinet

- Determined the effect of non-Gaussian noise transients in the LIGO and Virgo detectors on the search for gravitational waves from binary neutron stars.

PUBLICATIONS

Constraining the Inclination of Binary Mergers from Gravitational-wave Observations 2019

SAMANTHA A. USMAN, JOSEPH C. MILLS, STEPHEN FAIRHURST

THE ASTROPHYSICAL JOURNAL, 877, 2.

The PyCBC search for gravitational waves from compact binary coalescence 2016

SAMANTHA A. USMAN ET AL

CLASSICAL AND QUANTUM GRAVITY 33, 215004.

Observation of Gravitational Waves from a Binary Black Hole Merger 2016

B. P. ABBOTT ET AL. (THE LIGO SCIENTIFIC COLLABORATION AND VIRGO SCIENTIFIC COLLABORATION)

PHYSICAL REVIEW LETTERS 116, 061102.

GW150614: First Results from the search for binary black hole coalescence with Advanced LIGO 2016

B. P. ABBOTT ET AL. (THE LIGO SCIENTIFIC COLLABORATION AND VIRGO SCIENTIFIC COLLABORATION)

PHYSICAL REVIEW D 93, 122003.

Characterization of transient noise in Advanced LIGO relevant to gravitational wave signal GW150914 2016

B. P. ABBOTT ET AL. (THE LIGO SCIENTIFIC COLLABORATION AND VIRGO SCIENTIFIC COLLABORATION) CLASSICAL AND QUANTUM

GRAVITY 33, 134001.

The Rate of Binary Black Hole Mergers Inferred from Advanced LIGO Observations Surrounding GW150914 2016

B. P. ABBOTT ET AL. (THE LIGO SCIENTIFIC COLLABORATION AND VIRGO SCIENTIFIC COLLABORATION)

THE ASTROPHYSICAL JOURNAL LETTERS, 833, 1, L1, 8.

POSTERS

Exploring Low-Frequency Gravitational Waves with LISA 2019

USMAN, SAMANTHA A. AND JOHN G. BAKER

POSTER PRESENTED AT NASA GODDARD POSTER SESSION.

Improvements to the Search for Gravitational Waves from Compact Binary Coalescence with PyCBC 2015

USMAN, SAMANTHA A.; MARCEL KEHL; IAN HARRY; THOMAS DENT; HARALD PFEIFFER AND DUNCAN BROWN

POSTER PRESENTED AT 2015 LIGO-VIRGO COLLABORATION MEETING IN PASADENA, CA..

Comparison between the single-and two-stage ihope CBC search 2014

USMAN, SAMANTHA A.; DUNCAN BROWN; IAN HARRY AND JOSHUA WILLIS

POSTER PRESENTED AT THE 2014 LIGO-VIRGO COLLABORATION MEETING IN PASADENA, CA.

TALKS

Teaching Computers to Analyze the CMB

PRESENTATION TO THE SOCIETY OF PHYSICS STUDENTS

December 2, 2019

How to Find a Gravitational Wave

PRESENTATION AT COLUMBIA UNIVERSITY

June 16, 2016

Inferring the Nuclear Equation-of-State Using Gravitational Waves

PRESENTATION ON SUMMER RESEARCH GIVEN AT CALTECH

August 20, 2015

DetChar and DQ Flags' Effect on Background Noise in the CBC search

PRESENTATION ON SUMMER RESEARCH GIVEN AT THE LABORATOIRE DE L'ACCÉLÉRATEUR LINÉAIRE D'ORSAY

July 30, 2014

PRESENTATION ON SUMMER RESEARCH GIVEN AT UNIVERSITY OF FLORIDA

August 13, 2014

Gravitational Waves & LIGO

PRESENTATION GIVEN AT NIKHEF IN AMSTERDAM, NLD.

May 30, 2014

PRESENTATION GIVEN AT CALIFORNIA STATE UNIVERSITY, FULLERTON.

May 22, 2014

AWARDS & HONORS

- UNIVERSITY RESEARCH ASSOCIATION FELLOWSHIP 2020
- ILLINOIS SPACE GRANT 2019
- SPECIAL BREAKTHROUGH PRIZE 2016
- CARDIFF UNIVERSITY USA EXCELLENCE SCHOLARSHIP 2016
- UNIVERSITY SCHOLAR 2016
- NORMA SLEPECKY UNDERGRADUATE RESEARCH PRIZE 2016
- RENÉE CROWN HONORS PRIZE 2016
- PAUL M. GELLING FELLOWSHIP FUND 2016
- ASTRONAUT SCHOLARSHIP 2015
- GOLDWATER HONORABLE MENTION 2014, 2015
- SYRACUSE UNIVERSITY DEAN'S LIST Fall 2012 - Spring 2016 (8 Consecutive Semesters)

VOLUNTEER, OUTREACH & ADDITIONAL ACTIVITIES

UChicago Plus

FOUNDER & PRESIDENT OF LGBT+ SOCIAL NETWORK FOR GRADUATE AND UNDERGRADUATE STUDENTS.

RECOGNIZED STUDENT GROUP UNDER THE CENTER FOR IDENTITY & INCLUSION (220 MEMBERS)

October 2020 - Current

UChicago Grappling Club

PRESIDENT AND INSTRUCTOR. MANAGES CLUB ADMINISTRATION. TEACHES INTRODUCTORY JIU JITSU CLASSES.

October 2018 - Current

Department of Astronomy & Astrophysics Graduate Student Mentor

MENTOR TO INCOMING GRADUATE STUDENT TO THE DEPARTMENT OF ASTRONOMY AND ASTROPHYSICS

August 2020 - June 2021

Equity, Diversity and Inclusion Mentor

MENTOR TO AN INCOMING LGBT+ STUDENT TO UNIVERSITY OF CHICAGO, PHYSICAL SCIENCES DIVISION

July 2020 - June 2020

Women in Physics Mentorship Program

MENTOR TO FOUR UNDERGRADUATE WOMEN INTERESTED IN PURSUING RESEARCH IN ASTROPHYSICS

October 2018 - June 2020

Adopt-a-Physicist

PROGRAM CONNECTING HIGH SCHOOL PHYSICS STUDENTS TO PHYSICISTS TO DISCUSS RESEARCH

October 2015 - 2019

Out in PSD

PARTICIPATED IN A MONTH-LONG CELEBRATION OF LGBT SCIENTISTS RUN BY THE PHYSICAL SCIENCES DIVISION.

October 2019

International LGBT+ in STEM Day

EVENT ORGANIZER AT CARDIFF UNIVERSITY. INVITED SPEAKERS TO SPEAK ABOUT THEIR EXPERIENCES.

PLANNED AND MANAGED EVENT CELEBRATING AND RECOGNIZING THE HISTORIC STRUGGLES OF LGBT+ SCIENTISTS.

July 2017