

# Huangfei Xiao

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## Education

- Stony Brook University (State University of New York at Stony Brook) NY, USA  
*Master of Art in Physics* Aug. 2021 - Present
- Jilin University (985-, 211-, “Double First-rate”- Project) Jilin, China  
*Bachelor of Science in Physics, GPA: 86.52/100.00* Sept. 2015 - Jul. 2019

## Selected Awards

- The Scholarship for Academic Excellence, Jilin University 2016, 2017, 2018
- The First Prize of College Students’ Innovative Research Training Plan Program, Jilin University 2019
- Honorable Mention in Mathematical Contest in Modeling (MCM) of USA 2017
- The Best Performance in the Physics Experimental Exploration Competition, Canton 2017

## Technical Skills

- **Languages:** Python, C, C++, MATLAB, Fortran,  $\LaTeX$ , HTML
- **Operating:** Linux, High-Performance Computing Cluster
- **Astronomical Tools:** CIAO, DS9, AIPS, PGPLOT, DIFMAP, KIVS
- **Literature & Databases:** ADS, Skyview, NED, Vizier

## Research Experience

**Graduate Research Assistant,** Feb. 2022 - current **Supervisor:** Dr. Vivian Miranda

*C.N. Yang Institute for Theoretical Physics, Stony Brook University, New York, United States*

**Project:** Study Dark Energy Anisotropic Stress in the Universe

- Base on cosmology perturbation theory
- Adapt Boltzmann codes in CLASS in C and CAMB in FORTRAN for models of dark energy anisotropic stress under fluid description
- Constrain models using the latest large-scale structure and CMB data through Cocoa and Cobaya

**Undergraduate Research Assistant,** Feb.2019 - Sept.2019 **Supervisors:** Dr. Wei Zhao, Dr. Tao An

*Shanghai Astronomical Observatory, Chinese Academy of Sciences, Shanghai, China*

**Project:** Study the jet and outflow of Seyfert 2 galaxy NGC3079 by Very Long Baseline Array (VLBA) observation with Very Long Baseline Interferometry (VLBI) technology

- VLBA data reduction for 5GHz-continuum of nuclear region ( $< 10 pc$ ) of NGC3079 in AIPS and DIFMAP
- Analysis of components’ flux density and positional relation in Python
- Interpretations for still puzzling components: 1) jet interacts with nuclear ISM under different environments, 2) starburst occurs there.

**Undergraduate Research Assistant,** Aug. 2018 - Oct. 2018 **Supervisor:** Dr. Virginia Kilborn

*Centre for Astrophysics & Supercomputing, Swinburne University of Technology, Melbourne, Australia*

**Project:** Find Neutral Hydrogen depletion (HI hole) in the center of spiral galaxies of Westerbork observations of neutral Hydrogen in Irregular and SPiral galaxies (WHISP)

- Estimated HI holes in the center of 257 galaxies of WHISP by viewing in KIVS software
- Used SAOImage ds9 and Python for angular-momentum-model fitting which conducts radius profile, as well as 3D-visualization for directly showing inner situation (with a HI hole or not) of galaxies
- Twenty-one galaxies (such as UGC09753, UGC09649 with proper position angles and sizes) have HI holes for further discussion of the formation and evolution of spiral galaxies

## **Undergraduate Research Assistant, Jan. 2018 Supervisor: Dr. Song Wang**

*National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China*

**Project:** Learn the high-energy astrophysics data reduction method (e.g. CIAO for Chandra Telescope)

- Chandra data with 4-dimensional (2 spatial, time, energy) handle in Chandra Interactive Analysis of Observations (CIAO) for calibration, image, digging estimable information
- In Linux, used together with ds9, python, ChIPS, by commands to download, reprocess, extract spectrum, detect source, plot data, model spectra, etc.

## **Undergraduate Research Assistant, Jul. 2016 Supervisors: Dr. Jifeng Liu, Dr. Yu Bai**

*National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China*

**Project:** Search Compact X-ray Binary candidates in the 2nd ROSAT all-sky survey catalogue (2RXS)

- Found X-ray sources from No.50000 to No.90000 objects in 2RXS by restriction on parameters
- Searched lighth-curves, optic counterparts and spectra of sifted X-ray sources and used multi-wavelength approach for recognizing and classifying them
- Twenty desirable sources have high-value as candidates for further analysis, such as investigation of intermediate-mass black holes, the dynamical interaction and accretion, etc.

## **Undergraduate Research Training, Oct.2016 -Aug.2017 Supervisor: Dr. Hongdong Li**

*The State Key Laboratory of Superhard Materials, Jilin University, Changchun, China*

**Project:** Preparation of BDD film and application in electrochemical sensor for harmful environment hormone detecting

- Prepare the Boron Doped Diamond (BDD) Film forming gold nanoparticles on the surface as a sensor for detecting pernicious polychlorinated biphenyl-77 (PCB-77)
- The detection limit can be improved to a high accuracy at  $3.2 \times 10^{-16} (mol/L)$  through using this electrochemical detecting sensor.
- Learn spectrum analysis of properties of superhard materials and electrochemical measurement method

## **Selected Course Project**

- Stars - Investigate the GAIA data and explore stellar properties (e.g. make an HR diagram to study the current distribution of stellar masses) Fall 2021
- Astrostatistics - Regression and curve fitting on Python (Fit a trinary system HD126614A data to a Keplerian orbit) Fall 2021

## **Leadership**

- Vice Chairman of the Student Association of Science and Technology of Jilin University Oct.2017 - Oct.2018
- Director of Observational Department of Jilin University Astronomy Society Sept.2016 - Jul.2017

## **Non-Academic Activities**

- Honor online Volunteer in COVID-19 pandemic 2020
- Excellent Volunteer in National Universities Camp for Science 2017
- Excellent Volunteer of China Foundation for Poverty Alleviation 2016
- Organizer and Volunteer in Outreach activity for field astronomical observation 2016, 2017
- Third place in Jilin University Student Badminton Championship 2016

## **Posters**

**2019** Xiao, H. F., W. Zhao, T. An, Investigation of Seyfert 2 galaxy NGC 3079 with VLBI technology. East Asia SKA Science Workshop 2019. Shanghai,SH.

**2019** Xiao, H. F., V. Kilborn, Is there an HI hole in the center of spiral galaxies. East Asia SKA Science Workshop 2019. Shanghai,SH.

## **Presentations**

**2022** Dark Energy in Cosmology, Physics Grad Seminar, Stony Brook University, NY

**2019** Jet and outflow of Seyfert 2 galaxy NGC 3079, Undergraduate thesis defense, College of Physics, Jilin University, Changchun, JL

**2017** Astronomy in X-rays, Cross-Strait Undergraduates' Technology-Culture Camp - 18th Fu Lan Physics Festival, Canton, GD

**2017** Preparation of BDD film and application in electrochemical sensor for harmful environment hormone detection, Undergraduate research training program defense, Jilin University, Changchun, JL