Dazhi Zhou – Résumé

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Nationality	Chinese		

Personal Profile

I'm an undergraduate at Physics Department of Wuhan University and also in Hongyi Honor College, which is called "Mount Everest Plan" in China. Now, I'm working in our School's Astrophysics Center. Although so far, I haven't decided which path to choose in the future yet, I have wide interests on astronomy research especially about stellar astrophysics, high-energy astrophysics and cosmology. I am currently doing a project about the water maser and sometime I'm also analysing the data from HXMT(The Hard X-ray Modulation Telescope) in order to do another project about the spin of the black hole as well.

Education

2015-Now   **Wuhan University**

              BSc Hons, School of Physics and Technology & Hongyi Honor College
Averaged Grade: 87.8%
Major GPA: 3.71
Overall GPA: 3.68

Spring 2018   **University of California, Santa Barbara**

              Exchange Student

Research Experience

**Jan 2018 -
Now**   Astrophysics Center, School of Physics an Technology, Wuhan University
Undergraduate Researcher / Team Leader

There are **two projects** I am currently doing:

- The first one is to **calculate the spin of the black hole**. Last year, Hard X-ray Modulation Telescope(HXMT) was launched to observe black holes, neutron stars, AGN and other phenomena based on their X-ray and gamma-ray emissions. Analyse the the iron $K\alpha$ lines from HXMT's data to get the spin of the black hole is our main goal. As we know, $K\alpha$ lines are probably broadened by relativistic motions and gravitational redshifts. It is the one of the three simple methods currently in use to try and measure black hole spin. Our task also includes anaylse the properties around the black hole.

- Another project is about **the origin of the AGN maser**. This research focuses on the relation between the inner radius of the dust torus and the maser disk size. We want to know the distribution of the AGN maser to verify the unified model of AGN. Using the data from Chandra and Nustar, we can get the radii of the innermost dust torus from our model. In the meantime, we also used Monte Carlo Simulation and other method(Fe $K\alpha$ line, interference, etc.) to verify our result.

Keywords: Megamaser, Radiative transfer model, Monte Carlo Simulation, Fe $K\alpha$ line, Spin.

Jun 2018 -
Aug 2018
Experimental Cosmology Group, Department of Physics, UC Santa Barbara
Undergraduate Researcher

This research is focuses on **the simulation for the laser phased array**. My project is related to both the DE-STAR (planetary protection against asteroids) and Starshot (laser sail) projects that director Prof. Philip Lubin is working on. The intensity(2D) around a certain target is our interest. For each sub-aperture, we can use far field diffraction to get the result. But the 2D intensity plot will look like near field diffraction result if we take the whole laser phased array into account.

Keywords: Laser, Diffraction simulation, Atmospheric propagation, Laser-phased array.

Jun 2018 -
Aug 2018
ENIGMA Research Group, Department of Physics, UC Santa Barbara
Undergraduate Researcher

It is more or less like a research training in observation. My main goal was to **draw the light curve and calculate the structure function for the Damped Random Walk Model**(a stochastic process), which is a repeat of the procedure from a paper (Modeling the Time Variability of SDSS Stripe 82 Quasars as a Damped Random Walk). Meanwhile, I also got some basic knowledge about the CCD Astronomy while doing this project.

Keywords: Damped Random Walk Model(DRW), Quasar, Power spectral distribution(PSD).

Jan 2018 -
Feb 2018
Institute of Physics, Chinese Academy of Sciences, Beijing, China
Intern

This research focuses on the experiment about **the solid state quantum computing**(using nitrogen-vacancy center spin in diamond). The electron spin of Nitrogen-vacancy(NV) center has very long coherence time and can be initialized , manipulated and readout by optical and microwave pulses. Our task was to complete this experiment with other graduate students.

Keywords: Solid state quantum computing, Spin dynamics, Nitrogen-vacancy(NV) center, Optically detected magnetic resonance(ODMR).

Summer School

2016 **Columbia University**

2017 **Peking University**

Programming Skills

- **Programming Languages**

  Python, C/C++, Julia, PHP

- **Software**

  Mathematica, Matlab, Jupyter, Latex
  ROOT **(Hep)**
  MESA, Polaris, RADMC-3D, HXMT Data Analysis Software **(Astro)**

Interests

- **Ping Pong, Tennis, Swimming, Cycling, Badminton, Running**
- **Saxophone**
- **Photography**