Zeng Tian

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EDUCATION AND TRAINING

[02/09/2024 – Current]

Msc.

City University of Hong Kong

City: Hong Kong | **Country:** China | **Field(s) of study:** Applied Physics

- Methods for scientists and engineers.

- Computational methods of physics, mainly Python.

- Basic knowledges and skills of modern physics.

[31/08/2020 – 30/06/2024]

BEng.

Northwestern Polytecnical University

City: Xi'an | **Country:** China | **Field(s) of study:** Aircraft Design and Engineering | **Thesis:** The evolution of angular momentum of gas in galaxy formation

- Basic knowledge of mathematics: Calculus, Linear Algebra, Complex Variable Functions and Integral Transforms...

- Basic knowledge of physics: Quantum Mechanics, Fluid Mechanics, University Physics, Electrical and Electronic Technology, Flight Mechanics, Engineering Thermodynamics...

- Practical skills: Python, C language, Making a hammer, Making a radio...

RESEARCH EXPERIENCE

[01/2024 – 05/2024]

The Evolution of Angular Momentum of Gas in Galaxy Formation

This study focuses on the evolution of angular momentum of gas during galaxy evolution and the potential underlying physical mechanisms. The research uses the data from the IllustrisTNG 50 project, dividing samples into disk galaxies and elliptical galaxies. The selection are based on the star formation rate (SFR or sSFR), the disk-to-bulge ratio of the galaxies, and other aspects such as merger history. Then the angular momentum (or specific Angular Momentum) of particles in each part of the chosen galaxies is tracked and their contributions to the total angular momentum are calculated. The contributions and influences of various particle types and different stellar populations on the angular momentum are analyzed, revealing their evolutionary patterns and trends. These patterns are summarized, and other galaxy samples are selected for verification, allowing for refinement of the initial theories. This iterative research process aims to derive a more universal law of gas angular momentum evolution. The derived laws might further elucidate the physical mechanisms of gas condensation and star formation.

[02/2023 – 03/2023]

Visiting Student: China Spallation Neutron Source Research Center, Institute of High Energy Physics, Chinese Academy of Science

- Won the internship opportunity under the recommendation of Professor Chu Xiangqiang from the City University of Hong Kong due to my excellent performance in the City University of Hong Kong and YutChun Program.

- Learned the wide application of spallation neutron source in biophysics, neutron scattering physics, etc. and the usage of the up-to-date experimental devices in the research center.

- Acted as a visiting student for experiment conducted in the universal science field.

[05/2022 – 05/2023]

Highly Accurate Spacecraft Gimbal System for Positioning and Collaborative Tracking Non-cooperative Targets in Dim and Weak Space with Limited Space-based Computing Power

- Abstract: This project proposed a spacecraft gimbal system for identifying, locating and cooperative tracking non-cooperative targets in dim and weak space with limited on-board computational power. The system could detect non-cooperative targets through their moving points, and then accurately located their positions through image and laser ranging combined positioning algorithm. An autofocus lens was designed by the system with autofocus algorithm to identify categories of non-cooperative targets. The positions of the non-cooperative targets were sent to the partner spacecraft gimbal for collaborative positioning and tracking, and would be

optimally estimated in real time by the Kalman filter data fusion algorithm to ensure the subsequent encircling capture of the non-cooperative targets.

- Background: the project contested in China College Students' 'Internet+' Innovation and Entrepreneurship Competition.

- Accomplishment: the project won the provincial gold medal and the national silver medal.

- Duty: in the project, I efficiently designed the optical systems and developed tracking algorithms based on image recognition for the spacecraft gimbal system which was targeted to monitor and counter space junk and UFOs (maybe) from orbiting spacecraft.

EXTRACURRICULAR ACTIVITIES

[05/2021 – 05/2022] **Head of Observation Department of Astronomy Society, Northwestern Polytechnical University**

- Organized and executed the Astronomy Society's regular stargazing activities, ensuring the smooth running of these events, while guiding members in scientific observation and recording.

- Responsible for making high-quality astrophotography during observational activities, showcasing the beauty and mystery of the night sky.

- Managed and maintained the Astrophotography portfolio of the Astronomy Society, categorizing, archiving, and displaying photographs so that both society members and the public can better understand and appreciate the cosmos.

- Continually explored and practiced to improve the society's astrophotography skills, offering technical guidance and assistance to society members in the field of astrophotography.

- Gave science popularization courses on astrophotography and basic astronomy to schoolmates on a long-term basis.

[06/2023 – 06/2024] **Intermediate Judge of The Largest Astrophotography Society in China**

- Selected award-winning works for various astronomical photography competitions hosted by Startshooter, China's largest astronomical photography website gathering 93483 astronomy enthusiasts in virtue of these works' originality, value in narrating astronomical and scientific events, technical maturity, picture composition and color accuracy, etc.

- Selected excellent astronomical photography works subscribed by astronomy enthusiasts for demonstration in the Top Pick column to attract more people to fall in love with astronomy and astronomical photography and ensure each photo was indicated with technical parameter to give photographers easy reference for their own creations.

- Gave specific scores, detailed evaluations and suggestions for improvement for photography works upon the request of photographers who could choose to post such comments on the website or reserve to themselves, since astronomical photography has an extremely high scientific demand than ordinary photography, as it and astronomy share a similar data gathering process, and its digital image process is close to that in scientific research work too.

Link: https://www.istarshooter.com/user/15721

HOBBIES AND INTERESTS

Calligraphy:

Practiced for 16 years, won two provincial-level awards;

Writing:

Won first award in national level competition

Enthusiast of Sports and Music:

I used to be a member of the school table tennis team as well as the badminton team at Civil Aviation University. And I am a lover of swimming and guitar as well.