Chuang, Chen-Yu

Website: https://franklin0404.github.io/
Email: cychuang@asiaa.sinica.edu.tw
Publications: My ADS Library
ORCID: 0000-0003-2069-9413

Education

National Tsing Hua University (NTHU) Hsin-Chu, Taiwan
Master of Science in Astronomy 2021–Present

- GPA: 4.25/4.30

National Taiwan University (NTU) Taipei, Taiwan
Bachelor of Science in Biomechatronics Engineering 2016–2021

- GPA 3.77/4.30; ranked 6th of 37; won Presidential Award (top 5% of the class) 1 time.

Academic Experience

Institute of Astronomy, NTHU Hsin-Chu, Taiwan
Master student, Supervisors: Dr. Yen-Ting Lin, Dr. Hsiang-Yi Karen Yang Sept. 2021–Present

- Developed a new abundance matching scheme that outperforms previous research in the prediction of stellar mass and galaxy two-point correlation function. (First author of paper [3], submitted to ApJ)
- Collaborate with Cosmology X Data Science Group, Center for Computational Astrophysics, Flatiron Institute. Developed a deep learning model that is able to predict baryonic properties of galaxies from dark matter properties extracted from halos along the full assembly history of the galaxies. (First author of paper [4], in preparation)

Institute of Astronomy and Astrophysics, Academia Sinica (ASIAA) Taipei, Taiwan
Research assistant, Supervisors: Dr. Naomi Hirano, Dr. Yusuke Aso Feb. 2021–Aug. 2021

- Pioneered a deconvolution method based on deep learning for radio interferometry.
- Submitted two Atacama Large Millimeter Array (ALMA) proposals.

C4Lab (bioinformatic laboratory), Department of Biomechatronics Engineering, NTU Taipei, Taiwan
Undergraduate student, Supervisor: Dr. Chien-Yu Chen July 2019–Jan. 2021

- Applied deep learning algorithms to predict protein structures and transcription factor binding sites on DNA.
- Cooperated with faculties and students from the Graduate Institute of Medical Genomics and Proteomics to inspect the autism spectrum disorder from DNA sequence by algorithm programs such as GATK, GO, KEGG, etc.

Institute of Astronomy and Astrophysics, Academia Sinica (ASIAA) Taipei, Taiwan
Undergraduate student, Supervisors: Dr. Naomi Hirano, Dr. Yusuke Aso July 2018–Jan. 2021

- Conducted research on star formation and molecular line observation. Compared the observation with simulations through radiative transfer and synthetic observation. (First author of paper [1], published by ApJ)
- Chosen as a 2019 ALMA observation proposal

Publications

[1] **Chen-Yu Chuang**, Yusuke Aso, Naomi Hirano, Shingo Hirano, and Masahiro N. Machida, "ALMA Observations toward the S-shaped Outflow and the Envelope around NGC 1333 IRAS 4A2", *The Astrophysical Journal*, vol. 916, no. 2, p. 82, Aug. 2021. arXiv: 2105.04224 [astro-ph.SR].

[2] Chuan-Jui Li, You-Hua Chu, **Chen-Yu Chuang**, and Guan-Hong Li, "The Shellless Supernova Remnant B0532-67.5 in the Large Magellanic Cloud", *The Astronomical Journal*, vol. 163, no. 1, p. 30, Jan. 2022, arXiv: 2111.02900 [astro-ph.GA].

[3] **Chen-Yu Chuang** and Yen-Ting Lin, "A New Stellar Mass Proxy for Subhalo Abundance Matching", submitted to *The Astrophysical Journal*, Nov. 2022., arXiv: 2211.09136 [astro-ph.GA].

[4] **Chen-Yu Chuang**, Christian Jespersen, Yen-Ting Lin and Shirley Ho, "Leaving no branches behind: An accurate model for predicting galaxy properties from full sets of merger trees of host dark matter halos", in prep.

[5] You-Hua Chu, **Chen-Yu Chuang** and Chuan-Jui Li, "A Comprehensive Anatomy of the Superbubble NGC 2014 (N57) in the Large Magellanic Cloud", in prep.

Recent Scientific Talks & Posters

1. *(Invited)* **Lecture, Bioinformatics Algorithms** (Course held by Prof. Chien-Yu Chen) 08/11 2021
   Special Topic on Protein Structure Prediction
2. **Talk, JCMT SCUBA2 Transient Project Meeting** 07/20 2021
   Data Analysis of the JCMT Observation on S255 Molecular Cloud Complex
3. *(Invited)* **Talk, Journal Club, Max Planck Institute for Extraterrestrial Physics** 05/19 2021
   ALMA Observations toward the S-shaped Outflow and the Envelope around NGC1333 IRAS4A2
4. *(Invited)* **Talk, ASIAA Paul's Meeting** 11/02 2020
   ALMA Observations toward the S-shaped Outflow and the Envelope around NGC1333 IRAS4A2
5. *(Awarded)* **Poster & Talk, ASROC Annual Meeting 2020** 09/03 2020
   ALMA Observations toward the S-shaped Outflow and the Envelope around NGC1333 IRAS4A2
   - **Awarded the winner of the student poster competition**
6. **Talk, East-Asian ALMA Science Workshop 2019** 02/21 2020
   ALMA Observations toward the S-shaped Outflow and the Envelope around NGC1333 IRAS4A2
7. **Talk, ASROC Annual Meeting 2019** 05/19 2019
   ALMA Observations toward the S-shaped Outflow and the Envelope around NGC1333 IRAS4A2
8. **Talk, ASIAA Summer Student Program Presentation** 08/31 2018
   ALMA Observation of Two SO Transitions –The Case of NGC1333 IRAS4A

Astrophysical Courses

- **Advanced Astronomical Observation: A+** NTU
  - Final project: Reimplement deconvolution algorithm for interferometry (*CLEAN*) from scratch in Python
- **Galaxy Formation and Evolution: A+** NTU
  - Final: Debate upon whether planes of satellite galaxies exist (I read over **30 relevant papers** for the debate)
- **General Astronomy: A+** NTU
- **Interstellar Medium: Audit** NTU
  - Selected to give a presentation at the JCMT SCUBA2 Transient Project Meeting
  - **Complete paper [2]** with Professor You-Hua Chu
- **Introduction to Astrophysics: A+** NTU
  - Final report: The Planes of Satellite Galaxies
- **Computational Astrophysics: A+** NTHU
  - Final project: Build a graph neural network from scratch in Julia code

- **Cosmology: A+** NTHU
  - Final essay: Review of the Millennium Simulations
- **Interstellar Medium: A+** NTHU
  - Final project: How different ISM models affect the SED fitting result of galaxies in the *IllustrisTNG* simulation
- **Observational Astronomy: A** NTHU
  - Final observation proposal: "Searching for the Jet Hα and [S II] Line Emission Scattered by Dust in the HH2 Region"
- **Stellar Astrophysics: A+** NTHU
- **Special Topic: Scientific Writing and Short Talks: TBD** NTHU

Extracurricular Activities

Astronomy Club of University Union in Taiwan (ACUUT) Taipei, Taiwan
Lecturer in the Stargazing Guide Division 2021–Present

- Design teaching materials about Chinese constellations and give lectures on how to guide the audience in a star gazing event.

International Companions for Learning Taichung, Taiwan
Lecturer at Cheng-Kung Elementary School Summer 2020–Winter 2021

- Collaborated with a Vietnamese exchange student to teach Vietnamese culture in English to a class of 10 students at Cheng-Kung Elementary School voluntarily for one semester, one hour per week.

NTU Azalea Festival Taipei, Taiwan
Project member Summer 2019

- Cooperated with 6 team members to design a magic cube-solving robot and present a working prototype at the festival, attracting hundreds of attendees to visit the booth.
- Designed a program to identify the colors of magic cubes through a web camera using python and JAVA.

ASIAA Paul's Meeting Taipei, Taiwan
Meeting organizer 2018–2019

- Designed agenda for the year-long speech series at Academia Sinica and invited 17 researchers to give a total of 17 speeches with a total of 450+ attendees.
- Increased the total number of attendees from 6 to 30 per speech through marketing campaigns.

NTU Astronomy Club Taipei, Taiwan
Chief of General Affairs 2017–2018

- Organized 4 three-day-observation camps with 8 partners and each event attracted over 40 participants.
- Led and designed observation activities in constrained environments (in a mountain over 2000 meters high), including coaching participants on operating telescopes, recognizing stars, and identifying nebulae in the sky.
- Managed the club budget (∼NTD 400,000) for club events and year-round operations with positive net profits.

National Museum of Natural Science – Kenting Observatory Pingtung, Taiwan
Winter intern Winter 2018

- Selected to join the 2018 KTO observation training to operate a professional telescope.
- Identified observation targets, automated telescope operation, and processed data through programming.

Computer Science

- **Language:** Python, Julia, C/C++, Linux shell, JAVA, Fortran, LaTeX, HTML(advanced); Assembly, SQL (basic)
- **Software:** TOPCAT, CASA, RADMC-3D, vis_sample, DS9, CARTA, IRAF, APT, ParaView, SolidWorks
- **Domain Knowledge:** Data Structures and Algorithms, Numerical Analysis, Deep Learning, Robotics