QIANHANG CHEN

+31 0645599453 ◇ Amsterdam, The Netherlands ◇ erwin.chen@student.uva.nl ◇ personal website

EDUCATIONAL BACKGROUND

Master's Degree in Astronomy & Astrophysics Sep 2024 – Jul 2026 (expected)
University of Amsterdam, Amsterdam, The Netherlands
Specialization: High-Energy Astrophysics
Thesis on neutron-star X-ray binaries (XRISM/XMM-Newton spectroscopy)

Bachelor's Degree in Applied Physics Sep 2019 – Jun 2023
University of Shanghai for Science and Technology, Shanghai, China
Average Score: 80.54/100
Graduation Project (Dissertation):Calculation of Geodesics in the Schwarzschild Black Hole (94/100);

RESEARCH EXPERIENCE

Master's Thesis — Joint XRISM and XMM-Newton Study of the Ultra-Compact X-ray Binary 4U 1916–053 Sep 2025 – Jul 2026 (expected)
University of Amsterdam & SRON & ESO | Supervisors: Dr. Nathalie Degenaar; Dr. Elisa Costantini; Dr. María Díaz Trigo(ESO) *Amsterdam · Leiden · Garching, Germany*

- The detailed physical properties of accretion-disk atmospheres remain largely unknown and can only be constrained through **high-inclination X-ray binaries** such as 4U 1916–053.
- Conduct a joint **XRISM–XMM** investigation to study its ionized disk atmosphere and search for potential accretion-disk winds.
- Combine **XRISM/Resolve** Fe-K spectroscopy with **XMM-Newton** RGS and EPIC-pn soft-band data to obtain a **time- and phase-resolved** view of the plasma.
- Perform spectral modeling with photoionized absorption to derive the plasma's ionization, column density, and velocity, linking the soft and hard X-ray diagnostics into a self-consistent physical picture of the disk atmosphere and its outflows.

Systematic Search for Bow Shocks around X-ray Binaries (Astrovaria Project) Jan 2025 – Jul 2025
University of Amsterdam | Supervisor: Dr. Nathalie Degenaar *Amsterdam, The Netherlands*

- Bow shocks produced by X-ray binaries trace how compact objects interact with and shape the interstellar medium, yet only a few systems are known.
- Selected **74 HMXBs** and **140 LMXBs** from Gaia DR3 with $v_{\rm space} > 17.3\ {\rm km\,s^{-1}}$; searched **WISE W3/W4** for bow-shaped IR arcs and checked **RACS 887.5 MHz** for radio counterparts.
- Identified ∼8 HMXB and 2 LMXB **IR bow-shock candidates**; no RACS detections; only **Vela X-1** and **Cyg X-1** have confirmed radio bow shocks; noted a tentative extended radio feature near **4U 1630-47**.
- Concluded that XRB bow shocks are rare and radio-faint, suggesting weak jet–ISM coupling; proposed deeper follow-up with **MeerKAT/ATCA/JVLA** and NIR astrometry to confirm candidates.

Calculation of Geodesics for Schwarzschild Black Holes (Dissertation) Dec 2022 – Jun 2023
University of Shanghai for Science and Technology | Independent researcher *Shanghai, China*

- Solved differential equations to construct the Schwarzschild black hole model and analyze space-time structure.
- Studied geodesics for particles and photons under different masses; calculated structural forms of orbits.
- **Outstanding Undergraduate Thesis (94/100)**.

China Space Station Telescope (CSST) Summer School of Galaxy Science Jul 2022
Peking University | Summer School Student *Beijing, China*

- Python iso-illumination analysis of **UCG9476** (referencing NGC628 example).
- Quasar image decomposition with `galight`; fitted **CID 216** and computed host-galaxy light fraction.
- Galaxy disk/core decomposition using `astropy.modeling` on HSC i-band; single/two-component fits with **B/T, D/T** calculated.
- Installed **BayeSED 3.0**; estimated photometric redshift and stellar parameters; plotted posterior distributions.

Observation of Active Galactic Nucleus Based on HST and CSST Jul 2022 – Oct 2022
Shanghai Astronomical Observatory, Chinese Academy of Sciences | Research Group Member *Shanghai, China*

- Used HST archival data to study physical properties of galaxies and AGN; gained case and statistical study experience.
- **Produced special-source and statistical reports**, designed the future CSST observation scheme, and wrote the research report.
- Studied methods for the first JWST image and independently practiced JWST data processing.

First-Principle of Superconducting Materials Calculations Apr 2021 – May 2022
University of Shanghai for Science and Technology | Research Group Member *Shanghai, China*

- Studied first-principle superconductivity via theory and experiments.
- Obtained results for band structure, dispersion relations, magnetic susceptibility and dielectric under different variables.
- Developed literature retrieval, summarization and review-writing skills.

INTERNSHIP EXPERIENCE

Yunnan Observatories, Chinese Academy of Sciences Jul 2022
Intern

- Received solar physics training; studied CME, magnetic reconnection, solar approach detection.
- Programmed simple MHD equations on a supercomputer as part of a team.
- Gained early exposure to frontier solar physics research.

SKILLS & LANGUAGES

Data & Simulation: Numerical simulations, spectral fitting, large-survey data analysis
Programming: Python, Linux, MATLAB, C/C++, Mathematica
Scientific Tools: SPEX (spectral modeling), HEASOFT (X-ray data reduction), DISKLAB (disk modeling), MESA (stellar evolution)
Version Control & Collaboration: Git, GitHub
Languages: Chinese (Native), English (Advanced) [IELTS: 6.5 (6.0)]