

Chong-Chong He

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EDUCATION & EMPLOYMENT

Postdoctoral Fellow, RSAA, The Australian National University 2023 -
Supervisor: Mark Krumholz
Ph.D. (Astronomy), University of Maryland College Park 2023
Advisor: Massimo Ricotti
Thesis: *Multiscale Radiation-MHD Simulations of Compact Star Clusters*
B.S. (Physics, GPA: 3.92/4) WITH HIGHEST HONOR, Jilin University, China 2016
Visiting Honors Student at Georgia Institute of Technology 2015

RESEARCH GRANTS AND FELLOWSHIPS

Star Formation and Feedback in a Turbulent Interstellar Medium 2024
National Computational Merit Allocation Scheme, NCI Australia
Allocation: 16 MSU CPU + 17.6 MSU GPU
Chief Investigator

Metal Loading of Galactic Winds 2024
SummitPLUS, National Center for Computational Sciences, Oak Ridge National Laboratory, USA
Allocation: 115k node hours (=25 MSU)
Chief Investigator

Multiscale RMHD Simulations of Compact Star Clusters and the Formation of Intermediate-Mass Black Holes 2021 – 2024
Future Investigators in NASA Earth and Space Science and Technology (FINESST, formerly known as NESSF)
US\$ 135,000
Future Investigator

Jacob K. Goldhaber Travel Grant, University of Maryland 2023
US\$ 400

Ann G. Wylie Dissertation Fellowship, University of Maryland (declined) 2021
US\$ 15,000

SELECTED TALKS

Dissertation Talk, 241st AAS Meeting | American Astronomical Society 2023/1
Invited, Star Formation/ISM Seminar | Princeton University 2022/12
Invited, the Center for Relativistic Astrophysics Seminar | Georgia Tech 2022/11
Aspen Winter Conference | Aspen Center for Physics 2022/3
iPoster presentation, 237th AAS Meeting | American Astronomical Society 2021
Invited, the Anton Pannekoek Insitute for Astronomy | University of Amsterdam 2020
Invited, the Emmy Noether Research Group on Massive Star Formation | University of Tübingen 2020

TEACHING/MENTORING EXPERIENCE

Undergraduate Research Mentor 2021 – 2022

Graduate Teaching Assistant, University of Maryland 2016 – 2021

- Check my [teaching portfolio](#)
- Courses taught include *Introduction to Astronomy, Galaxies, Cosmology, Origin of the Universe, Stars and Stellar Systems, Solar System Astronomy, and Life in the Universe.*
- Responsibilities include leading classroom discussions and labs, preparing homework and exam solutions, grading, and holding office hours to provide additional guidance to students.

SKILLS

Professional Programming Experienced in MPI Parallel Programming, Hydrodynamics Simulations and Data Analysis
Python, Julia, LaTeX (advanced); C, Fortran, Mathematica, MATLAB (proficient); C++, HTML/CSS, JavaScript (basic)

Data Science Knowledge of Machine Learning, including Deep Learning and Neural Networks ([Coursera certification](#))

PROFESSIONAL SERVICES

Referee: MNRAS 2020 -
Member: American Astronomical Society 2018 -

SELECTED PRESS COVERAGE

2020 Amsterdam Science, “Cosmic Flashlights in the Early Galaxies”, Retrieved on Oct 6, 2020 from [this link](#) (page 20).

SELECTED OUTREACH

Computational Science Blog 2022 –
[Link] A blogging site I created where I write articles on computational astrophysics and machine learning for the general public with college or high school background

The Great Conjunction 2020 2020
[Link] Produced animations for the outreach program by the Astrophysics Group at the University of Exeter. Video links: [Video1](#) and [Video2](#) (retrieved 2020-12-8). [Source code](#).

GRAD-MAP Python Bootcamp 2018 – 2020
[Link] Lecture Assistant for the GRAD-MAP Python Bootcamp, University of Maryland

List of Publications: Chong-Chong He

Check NASA/ADS for a list of [full publications](#) or [refereed/under-review publications](#), or check my [Google Scholar profile](#).

PAPERS UNDER REVIEW

- ¹**C.-C. He** and M. Ricotti, “Formation of Large Circumstellar Discs in Multi-scale, ideal-MHD Simulations of Magnetically Critical Pre-stellar Cores”, [arXiv preprint: 2403.09779 \(2024\)](#).
- ²**C.-C. He**, B. D. Wibking, and M. R. Krumholz, “A novel numerical method for mixed-frame multigroup radiation-hydrodynamics with gpu acceleration implemented in the quokka code”, [arXiv preprint: 2407.18304 \(2024\)](#).

FIRST-AUTHOR REFEREED PUBLICATIONS (124 CITATIONS)

Including first-author papers by students I (co-)mentored.

- ¹**C.-C. He**, B. D. Wibking, and M. R. Krumholz, “An asymptotically correct implicit-explicit time integration scheme for finite volume radiation-hydrodynamics”, [MNRAS 531, 1228–1242 \(2024\)](#).
- ²**C.-C. He** and M. Ricotti, “Massive pre-stellar cores in radiation-magneto-turbulent simulations of molecular clouds”, [MNRAS 522, 5374–5392 \(2023\)](#).
- ³**R. Hix**, **C.-C. He**, and M. Ricotti, “Bimodal star formation in simulations of strongly magnetized giant molecular clouds”, [MNRAS 522, 6203–6216 \(2023\)](#).
- ⁴**C.-C. He**, “A Fast and Accurate Analytic Method of Calculating Galaxy Two-point Correlation Functions”, [ApJ 921, 59, 59 \(2021\)](#).
- ⁵**C.-C. He**, M. Ricotti, and S. Geen, “Simulating star clusters across cosmic time - ii. escape fraction of ionizing photons from molecular clouds”, [MNRAS 492, 4858–4873 \(2020\)](#).
- ⁶**C.-C. He**, M. Ricotti, and S. Geen, “Simulating star clusters across cosmic time - i. initial mass function, star formation rates, and efficiencies”, [MNRAS 489, 1880–1898 \(2019\)](#).
- ⁷**C.-C. He** and L. Keek, “Anisotropy of X-Ray Bursts from Neutron Stars with Concave Accretion Disks”, [ApJ 819, 47, 47 \(2016\)](#).

PAPERS WITH SIGNIFICANT CONTRIBUTIONS

- ¹D. K. Galloway, Z. Johnston, A. Goodwin, and **C.-C. He**, “Robust Inference of Neutron-star Parameters from Thermonuclear Burst Observations”, [ApJS 263, 30, 30 \(2022\)](#).

Explanation of my roles:

- ¹I wrote the code `DiskAnisotropy` which is a core module of the code presented in this paper.

PAPERS IN PREPARATION

- ¹**C.-C. He** and M. Ricotti, “Mock spectra of proto-globular clusters at $z > 6$ and its implications on cluster density and escape of ionizing photons”, [in prep. \(2023\)](#).

SELECTED CONFERENCE PROCEEDINGS/ABSTRACTS

- ¹**C. He**, “Destructing Molecular Clouds with Photoionization Feedback and the Escape of Ionizing Photons”, in [American Astronomical Society Meeting Abstracts, Vol. 53 \(Jan. 2021\)](#), p. 329.03.