Jing-Ze Ma (马竟泽) | Curriculum Vitae

Astrophysicist | jingze@mpa-garching.mpg.de | jingzema.com

RESEARCH INTERESTS

Theoretical astrophysics: massive stars, binary stars, asteroseismology, compact objects, (magneto-)hydrodynamics

EDUCATION

Sep. 2022 – present   **PhD candidate in Astrophysics**
Garching | Munich, Germany   *Max Planck Institute for Astrophysics | Ludwig-Maximilians-Universität München*
- Supervisor: Prof. Selma de Mink

Aug. 2018 – June 2022   **Bachelor of Engineering in Engineering Mechanics**
Beijing, China   *Tsinghua University*
- GPA: 3.80/4.00
- Background courses: Fluid mechanics, Computational fluid mechanics, General relativity, Thermodynamics and statistical physics, Astrophysics, Stars and planets
- Thesis: *Diverse stellar models with random transverse magnetic fields* (Outstanding bachelor's thesis in Tsinghua), supervised by Prof. Yu-Qing Lou

RESEARCH EXPERIENCE

Sep. 2021 – Feb. 2022   **Internship (remote)** | *Max Planck Institute for Astrophysics*
Garching, Germany   *Advisors: Prof. Selma de Mink, Dr. Robert Farmer | Stellar physics department*
Topic: Effects of period and metallicity on pre-supernova structures of binary-stripped massive stars

July 2021 – Oct. 2021   **Summer research (remote)** | *University of Nevada, Las Vegas*
Las Vegas, USA   *Advisor: Prof. Bing Zhang | Nevada Center for Astrophysics*
Topic: Relativistic magnetohydrodynamic shocks and reverse shock formation in GRB/FRB

Jan. 2020 – June 2022   **Undergraduate research** | *Tsinghua University*
Beijing, China   *Advisor: Prof. Yu-Qing Lou | Department of Physics*
Topic: The impact of radial magnetic forces on stellar structure and evolution

Apr. 2019 – Apr. 2020   **Student research training program** | *Tsinghua University*
Beijing, China   *Advisor: Prof. Yu Tian | State Key Laboratory of Tribology*
Topic: Surface tension in water strider locomotion and bio-inspired robot

TALKS AND CONFERENCES

Nov. 2022   **Contributed talk** | *ImBaSE 2022*
Garching, Germany   *Workshop on the Impact of Binaries on Stellar Evolution*
Topic: Are massive supernova progenitors more efficient element factories when stripped in binaries?

Nov. 2022   **Contributed talk (online)** | *SuperVirtual 2022*
Zoom   *A virtual conference on supernovae and related transients*
Topic: Are massive supernova progenitors more efficient element factories when stripped in binaries?

May 2022   **Invited talk (online)** | *Institute for Advanced Study at Tsinghua University*
Beijing, China   *Planet Group Meeting*
Topic: Are binary-stripped massive stars more efficient carbon factories: effect of metallicity and orbital period

Feb. 2022   **Invited talk (online)** | *Max Planck Institute for Astrophysics*
Garching, Germany   *Stellar Physics Seminar*
Topic: Are binary-stripped massive stars more efficient carbon factories: effect of metallicity and orbital period

Publications

7. Rob Farmer, Eva Laplace, **Jing-Ze Ma**, Selma E. de Mink, and Stephen Justham. "Nucleosynthesis of binary stripped stars". *submitted to ApJ*, 2023.

6. **Jing-Ze Ma**, Rob Farmer, and Selma E. de Mink. "Carbon yield from massive binary-stripped stars: effect of metallicity and orbital period". *in preparation*, 2023.

5. Taeho Ryu, Rosalba Perna, Ruediger Pakmor, **Jing-Ze Ma**, Rob Farmer, and Selma E. de Mink. "Close Encounters of Tight Binary Stars with Stellar-mass Black Holes". *MNRAS*:stad079, 2023.

4. Yu-Qing Lou and **Jing-Ze Ma**. "Supermassive stars with random transverse magnetic fields". *MNRAS*, 516:1481–1500, 2022.

3. **Jing-Ze Ma** and Bing Zhang. "Relativistic oblique shocks with ordered or random magnetic fields: tangential field governs". *MNRAS*, 511:925–937, 2022.

2. **Jing-Ze Ma** and Bing Zhang. "Reverse shock forming condition for magnetized relativistic outflows: reconciling theories and simulations". *MNRAS*, 514:3725–3735, 2022.

1. **Jing-Ze Ma**, Hong-Yu Lu, Xiao-Song Li, and Yu Tian. "Interfacial phenomena of water striders on water surfaces: a review from biology to biomechanics". *Zoological Research*, 41(3):231–246, 2020.

Outreach

Jan. 2022	**Invited talk (online)** | *Xinstitute*
Shenzhen, China	*Winter school that encourages college students across all disciplines to do scientific research*

Topic: An engineering student's pathway to astronomy

Programming Skills

Languages: Fortran, Python
Software: MESA, matplotlib, NumPy, Jupyter Notebook, MATLAB

Languages

Mandarin Chinese: native
English: fluent

Oct. 2021	*TOFEL Total: 106 Reading: 30 Listening: 30 Speaking: 23 Writing: 23*

Scholarships and honors

2022 (Top **5/140**)	**Outstanding bachelor's thesis**
Beijing, China	*Tsinghua University*
2021 (Rank **1/380**), 2020 (Rank **4/380**)	**Scholarship for Outstanding Scientific Research**
Beijing, China	*Tsinghua University*
2021 (Top 39/140), 2020 (Top 50/140), 2019 (Top 37/140)	**Scholarship for Academic Excellence**
Beijing, China	*Tsinghua University*
2020 (Top **50/3800**)	**Elected member, 14th *Spark* research scholar cultivation program**
Beijing, China	*Tsinghua University*
2020 (Top 19/140), 2019 (Top 6/140)	**Scholarship for Comprehensive Excellence**
Beijing, China	*Tsinghua University*