

HAOTIAN SONG

☎ (+86) 138-5688-1893 ✉ haotian.song@student.manchester.ac.uk
💻 Personal Web: <https://haotian-song.github.io/>

EDUCATION

University of Manchester, Manchester, UK	Aug 2020 - Jul 2021
MPhys(Hons) Physics	
Xi'an Jiaotong University, Xi'an Shaanxi, China	Sep 2017 - Jun 2020
Tsien Hsue-shen Talented Program (top 10%), Bachelor of Science in Physics (Honors)	
GPA: 89.37/100	
Peking University, Beijing, China	Jul 2020 - Aug 2020
Visiting student, Summer school program	

HONORS & AWARDS

• Outstanding Graduate Thesis Award (Top 1%), Xi'an Jiaotong University	Jun 2021
• Everest Scholarship, Xi'an Jiaotong University	Jun 2021
• Tsien Hsue-shen Academic Research Award	May 2021
• Academic Research Award, Xi'an Jiaotong University	Nov 2020
• Provincial Award for China Undergraduates Innovation and Entrepreneurship Competition	2020
• First Prize of the 5th Chinese Undergraduate Physics Experiment Competition	Jul 2019
• Outstanding Student Cadre, Xi'an Jiaotong University	Nov 2019
• Third-Class Scholarship, Xi'an Jiaotong University	Nov 2019
• First Prize of the Contemporary Undergraduate Mathematical Contest in Modeling	Dec 2018
• Outstanding Student, Xi'an Jiaotong University	Nov 2018
• Second-Class Scholarship, Xi'an Jiaotong University	Nov 2018
• Second Prize of Everest Scholarship, Xi'an Jiaotong University	Oct 2018

RESEARCH EXPERIENCES

I. X-ray Astronomy	Aug 2018 - Present
Advisor: Zhaoyu Zuo, Professor, Xi'an Jiaotong University	
<ul style="list-style-type: none">• Won one provincial award out of 200 teams as a team leader.• Statistical work on super-fast X-ray transients observation and illuminated their possible mechanism and relations with high-mass X-ray binaries.• Proposed an idea of correlation in radiation angle of Ultra-luminous X-ray Sources, which significantly improve the fitness of simulation.• Programmed wind Roche-lobe overflow mechanism in population synthesis code and MESA.• Obtained the detailed statistic data of Ultra-luminous X-ray sources' progenitor neutron star via population synthesis and contribute to several discussions in evolution path. [1]• Simulated the Ultra-luminous sources via both wind overflow and Roche-lobe overflow in Ring galaxies, compared with X-ray observation, and wrote a first-hand manuscript of paper. [2]	
II. Quantum Optics, Correlation Imaging & Spectroscopy	Aug 2019 - Present
Advisor: Marlan O. Scully, Professor, Texas A&M University	
<ul style="list-style-type: none">• Conceived an idea of sub-Nyquist (0.8%) imaging via Deep Learning (DL), designed a CNN framework, performed DL programming under CNN framework; helped experimental part at TAMU.[3]• Claimed a universally applicable DL-based convoluted speckle generation process; used this technique to retrieve complicated objects in a lower sample rate.[4]	

III. Atom, Molecule and Optics

Aug 2020 - Present

Advisor: Zhedong Zhang, Assistant Professor, City University of Hong Kong

- Programmed workflow for deep-learning process and contributed to the idea of the structure of Deep-Learned Time-Resolved Coherent Raman Spectroscopy. [5]
- Realized time- and frequency-resolved Raman spectroscopy using entangled photons by Liouville approach, utilize the deep-learning approach for Liouville equation.

IV. Other Research Area

Sep 2019 - Oct 2020

Advisor: Lei Zhang, Professor, Xi'an Jiaotong University

- Conducted experiment on quartz crystal microbalance and explored the effect of polyelectrolyte with different electrical properties on immobilization and activity of tyrosinase.
- Won one national award out of 200 teams as a team member.

PROFESSIONAL SKILLS

- Programming Languages: Matlab, Python, Fortran, LaTeX, Linux(super-computing), C++
- SDSS queries

PUBLICATIONS

- [1]. Z. Zuo†, **H. Song**, H. Xue, "Population synthesis on ultra-luminous X-ray sources with an accreting neutron star: Wind Roche-lobe overflow cases". A&A 649, L2 (2021)
- [2]. **H. Song**, Z. Zuo†, "Ultra-luminous X-Ray sources with wind Roche lobe overflow in Ring galaxies".
- [3]. **H. Song**, X. Nie, H. Su, H. Chen, Y. Zhou, X. Zhao, T. Peng†, M. O. Scully, "0.8% Nyquist noise-free computational ghost imaging via non-experimental deep learning", submitted to Scientific Report, arXiv:2108.07673
- [4]. T. Peng†, **H. Song**, Z. Zhang†, and M. O. Scully, "Deep-learned speckle patterns and its application to ghost imaging".
- [5]. Y. Ma, Z. Han, **H. Song**, T. Peng†, Z. Zhang†, and M. O. Scully, "Deep-Learned Time-Resolved Coherent Raman Spectroscopy".