Liang Wang

Email : wangleonard.021@gmail.com
Webpage: https://leonard-wang-673.github.io/

1 Education

Shanghai Jiao Tong University *2021.09 - 2025.06*

Bachelor of Science (Physics,Tsung-Dao Lee Honor Class)
Grades: 86/100
Graduate Courses:
Group Theory(86) Gauge Field Theory(Audit) QFT(93) GR(93)
Relevant Courses:
Computational Physics(100) Quantum Information (96) Topology(93) Advanced Optics(93) Quantum Mechanics 1 (92) Number Theory (91) Quantum Mechanics 2 (90) Analytical Mechanics (87) Electrodynamics(87) Thermodynamics and Statistical Physics(87) Fluid Mechanics(87)

University of New South Wales *2023.09 - 2023.12*

Exchange(Physics)
Grades: 87/100
Relevant Courses: Particle Physics(96) TOR Research(91)

Université Paris-Saclay *2025.09 - 2026.06*

Master (Physics Complex systems M2) *expected*

2 Academics Experience

Workshops & Advanced Summer Schools

- 3rd and 4th Southeast University Frontier Summer School on String Theory, Field Theory, and Holography.
- SooChow University's 2nd SUIAS workshop on High Energy Physics, covering topics such as Gravitational Waves, String Theory, and Quantum Field Theory.
  - Joint TDLI and INPAC summer school in particle physics.
  - Workshop on Muon Physics at the Intensity and Precision Frontiers
  - SUT-PSI School of Muon and Neutron Physics

3 Research Experience

(gr-qc)Inflation and Early Universe *2023.09 - 2024.06*

Under the guidance of *Prof. Yvonne Wong* (The University of New South Wales), I studied cosmology and mainly focusing on early universe fluctuations and their connection to the CMB temperature.

Under the guidance of *Prof. HongJian He*(Shanghai Jiao Tong University), I researched and studied cosmological perturbation theory and basics on cosmological collider properties.

(hep-th) Holography

1. Duality between photon ring and black hole *2024.04 - 2024.06*

I investigated the duality between the photon ring and the Quasi Normal Modes(QNMs) of Schwarzschild-like black holes with *Prof. Tower Wang*(East China Normal University). It is known that a set of canonical variables for the photon ring possesses $SL(2,R)$ symmetry that QNMs also have. We attempted to extend this duality to astrophysical black holes. Though we only have a trivial extension.

2. Summer research study on AdS_5/CFT_4 *2024.06 - 2024.07*

In FuSEP summer research program at the University of Science and Technology of China, I studyed the building of AdS/CFT under *Jianxin Lu*'s supervision. I presented a reading report on how to build the correspondence between $AdS_5 \times S^5/CFT_4$ through D_3 Branes on the action level.

3. SYK,Wormhole and Teleportation *2024.11 - 2025.05*

Under *Prof Antonio Garcia*'s supervision (SJTU), I learned in depth the properties of the SYK model, JT/SYK duality, and the Maldacena-Qi model(which has wormhole interpretation). I further explored the Keldysh dynamics of the open system SYK and looked into how measurements in the SYK model can be interpreted within its dual gravitational system.

4. N=(0,2) Super-Symmetric SYK and higher spin *2024.12 - Now*

Given N=(0,2) Super-Symmetric SYK-like model, with μ as a parameter indicating the number ratio of chiral and fermionic super-fields, it demonstrates higher spin properties in specific μ. I am supervised by *Prof Cheng Peng*(KITS-UCAS) and we are currently studying dual between J-type model and E-type model.

(Others)Other Research

Research on Muon Source feasibility *2023.01 - 2024.02*

Working in *Prof. Kim Siang Khaw* 's group in Tsung-Dao Lee Institute, we used GEANT4-based simulation software to simulate particle interaction processes, and optimize the target to maximize muon production rate. Our group's work is demonstrated as follows.

Preprint: *Simulation studies of a high-repetition-rate electron-driven surface muon beamline at SHINE* arXiv:2503.01597

4 Skills

- Language & Coding:

  Tofel(105/120),Python, C++, Linux, Matlab, Mathematica, LaTeX, HTML

- Program:

  CAMB(Cosmology) MESA (Astro) ROOT,Geant4,Paraview(hep-ex)