

DAWEI XIAO

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[Personal Homepage](#)

EDUCATION

Master of Science in Physics and Astronomy | Theoretical Physics Track
University of Amsterdam

Sep. 2024 – Present
Current GPA: 8.5 / 10

Master of Science | Physics
King's College London

Sep. 2022 – Sep. 2023
Pass with Distinction (75)

Bachelor of Engineering with Honours | Materials Science and Engineering
Queen Mary University of London

Aug. 2018 – Aug. 2022
Upper Second-Class Honours (67.5)

Bachelor of Engineering | Materials Science and Engineering
Northwestern Polytechnical University (joint program with QMUL)

Aug. 2018 – Aug. 2022
83.5/100

PROJECTS AND RESEARCH

The phase of Euclidean path integral in de Sitter space
Supervisor: Prof. Jan Pieter van der Schaar, University of Amsterdam

Sep. 2025 –

- TBD

Application of the Newman-Janis Algorithm to wormhole spacetimes
Supervisor: Prof Sarben Sarkar, King's College London

Feb. 2023 – Aug. 2023

- The Newman-Janis (NJ) Algorithm is an *off-shell* solution-generating algorithm that generates a stationary axisymmetric rotating solution from a static solution. Recently, it was found this algorithm can be generalized to the Taub-NUT metric, the non-zero cosmological constant case, and even the electromagnetic field utilizing the Einstein field equation. We review various extensions and explanations of this algorithm.
- We examine the application of the Newman–Janis algorithm to the Morris–Thorne wormhole and find that it fails to generate a rotating solution; the resulting metric remains static. We provide an explanation for this failure based on the Simpson–Visser substitution.

First Principles Investigations of Symmetric Tilt Grain Boundary in γ -TiAl
Supervisor: Prof Hu Rui, NPU and Prof Andy Bushby, QMUL

Nov. 2021 – Apr. 2022

- Grain boundary (GB) in polycrystalline materials will significantly influence their microstructure evolution and mechanical properties. We constructed the atomic structures of γ/γ tilt GBs in the γ -TiAl phase and analysed their structures and energetics using the first-principles method.
- We systematically analyzed the GB formation energy, excess free volume and interplanar spacing of the GB face of models. We further analyzed the superlattice type of the model and studied the effect of Ta segregation on GB formation energy. Finally, we verified the existence of some low-energy grain boundaries by experiments.

PUBLICATIONS

- Gao, Z., Hu, R., Xiao, D., et al. "First-principles investigation on electronic structures and energetic characteristics of γ/γ tilt grain boundaries in γ -TiAl intermetallic," *Intermetallics*, vol. 151, 2022, 107723.

HONORS AND AWARDS

The Scholarship of QMUL Engineering School, NPU Sep. 2021
Recognition for students in academics at QMES over the academic year

China College Students' 'Internet +' Innovation and Entrepreneurship Competition Nov. 2020
International Track Silver Award

The Scholarship of QMUL Engineering School, NPU Sep. 2019
Recognition for students in academics at QMES over the academic year

SKILLS

Languages: Mandarin (Native), English (IELTS 7.0, taken in 2022).

Programming: LaTeX, Mathematica, Material Studio and Maple.

Hobbies: Football, Board games, Synth music and light music.