DAWEI XIAO

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Personal Hompage

EDUCATION

Master of Science in Physics and Astronomy | *Theoretical Physics Track*   Sep. 2024 – Present
University of Amsterdam   Current GPA: 8.5 / 10

Master of Science | *Physics*   Sep. 2022 – Sep. 2023
King's College London   Pass with Distinction (75)

Bachelor of Engineering with Honours | *Materials Science and Engineering*   Aug. 2018 – Aug. 2022
Queen Mary University of London   Upper Second-Class Honours (67.5)

Bachelor of Engineering | *Materials Science and Engineering*   Aug. 2018 – Aug. 2022
Northwestern Polytechnical University (joint program with QMUL)   83.5/100

PROJECTS AND RESEARCH

Master thesis project   Sep. 2025 –
Supervisor: Prof. Jan Pieter van der Schaar, University of Amsterdam

Application of the Newman-Janis Algorithm to wormhole spacetimes   Feb. 2023 – Aug. 2023
Supervisor: Prof Sarben Sarkar, King's College London

- 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   Nov. 2021 – Apr. 2022
Supervisor: Prof Hu Rui, NPU and Prof Andy Bushby, QMUL

- 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.