Xitian Huang

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Education

École Polytechnique **Sep 2022-Present**
Msc in High Energy Physics *Palaiseau, France*

The University of Manchester **Sep 2019-June 2022**
BSc in Maths and Physics (First Class Honours) *Manchester, UK*

Experience

Two Dimensional Border Collision Bifurcation **Feb – June 2022**
Undergrad Math Research Project | Supervised by Prof Paul Glendinning

- Studied the existence and behaviour of the attractor, absorbing region, periodic and chaotic orbits in the parameter spaces of a two dimensional border collision piecewise smooth systems.
- Analysed numerically and theoretically, the bifurcations in the geometry of the attractors under a small perturbation from the case similar to that of Markov partition.
- Studied other interesting behaviour of the bounding area under certain restrictions on the parameters.

Topological Structure of the Spherical Electromagnetic Field **Summer 2021**
Project | With idea from PhD student Liu Yang

- Studied if the number of singularities and Poincaré indices of a spherical EM field are constant by Poincaré-Hopf theorem. An extension to the idea from Phys. Rev. Lett. 122, 153907(2019).
- The resulted plots showed, however, the number indices are not fixed, contrary to the expectation. Project ended.

High-Resolution γ-Ray Spectroscopy **Nov – Dec 2020**
Undergrad Lab in Nuclear Physics | Supervised by Prof Hywel Owen

- Studied the working principle of Ge detector associated with the semiconductor's electron hole excitation and the γ-ray spectrum in relation to Compton scattering, photoelectric absorption.
- Calibrated the detector with known isotopes such as: ^{137}Cs ^{152}Eu ^{60}Co and their corresponding decay schemes.
- Calibrated the efficiency of the detector as a function of the energy of γ-ray, distinguished between full energy peak efficiency and total efficiency.
- Analysed the mud, rock samples and identified, qualitatively and quantitatively, the radioactive components.

Hornet(Halls of Residence Network Team) **Oct 2020 – Dec 2020**
Hornet Representative *Manchester, UK*

- Provided IT support to the residents in the student halls with the infrastructure of the university.

Skills

Programming: Fluent—MATLAB, Python, Mathematica, C#, Markdown, LaTeX | Basic—HTML, CSS
Tools: AutoCAD, Solidworks, Adobe Illustrator, CorelDRAW, Office, etc.
Electronic Repairs: Good at repairing TV, Computer, Smartphone, Mouse, etc. via hardware and software.
Languages: Mandarin(Native), English(Fluent)

Something Else

Data Security and Encryption | *Talk given to interested university students | Manchester* **Aug 2022**

- Introduced encryption methods including Key Exchange, (A)symmetric Encryption, RSA Algorithm using rigorous mathematics with number theory such as Discrete Logarithm, Euler's Function, etc.
- Explained with intuition and presented with related data leak incidents and historical development of cryptography.

Followed Online Courses (Not Exhaustive)

- 18.03 Differential Equations
- 8.04 Quantum Physics I
- 8.05 Quantum Physics II
- Finite Group Representations
- MATH 131: Topological Spaces
- MATH 55A: Algebra and Group Theory

Studied/Studying Books (Not Exhaustive)

- Classical Electrodynamics [Julian Schwinger]
- Principles of Quantum Mechanics [R. Shankar]
- Nonlinear Dynamics and Chaos [S. H. Strogatz]
- Algebra [Michael Artin]
- Mechanics [Landau & Lifshitz]