

# Ioannis Nikiteas

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## Education

### PhD in Computational Nuclear Physics

IMPERIAL COLLEGE LONDON

London, UK

Dec. 2018 – Apr. 2022

- Researched and authored algorithms for error estimation used in multidimensional adaptive mesh refinement
- Wrote performant and scalable algorithms for massively parallel architectures (ARCHCER & ARCHER2 HPCs)
- Performed advanced data visualisation of multidimensional data
- Software developer at FETCH2 and Fluidity, using Fortran, C, C++ and Python
- Funded via Imperial College, Cambridge University & Open University (ICO) CDT and **Jacobs Engineering**

### MSc in Advanced Nuclear Engineering

IMPERIAL COLLEGE LONDON

London, UK

Sept. 2017 – Sept. 2018

- Obtained knowledge and developed skills on the fields of Material Science, Nuclear, Mechanical and Chemical Engineering
- Thesis on Dynamic Load balancing on angular adaptive mesh refinement for radiation transport.

### BSc in Experimental Physics

ROYAL HOLLOWAY UNIVERSITY OF LONDON

Egham, UK

Sept. 2014 – May. 2017

- Graduated with 1st Class Honours
- Obtained fundamental skills for analysing and solving problems in the fields of Physics and Mathematics
- Dissertation title: Investigating the transition from Molecular Dynamics to Smoothed Particle Hydrodynamics

### International Baccalaureate Diploma

THE MORAITIS SCHOOL

Athens, Greece

2012 – 2014

- Overall Score 36/45 with; Physics HL: 7/7, Math HL: 6/7, Chemistry SL: 5/7

## Awards & Scholarships

### SCHOLARSHIPS

2017 **Alexander S. Onassis Public Benefit Foundation**, Scholarship for academic excellence £13,000

Athens, Greece

## Publications

### Load balancing angular adaptivity on energy dependent reactor problems

NIKITEAS, IOANNIS, DARGAVILLE, STEVEN, SMITH, PAUL N. SMEDLEY-STEVENSON, RICHARD P. PAIN, CHRISTOPHER C.

*EPJ Web Conf.* 247 (Feb. 2021) p. 03025. 2021

### Reentrant melting and multiple occupancy crystals of bounded potentials: Simple theory and direct observation by molecular dynamics simulations

I. NIKITEAS, D. M. HEYES

*Phys. Rev. E* 102 (4 Oct. 2020) p. 042102. American Physical Society, 2020

### Impact of load balancing on parallel performance with Haar wavelets angular adaptivity

I. NIKITEAS, S. DARGAVILLE, C. C. PAIN, P. N. SMITH, R. P. SMEDLEY-STEVENSON

*International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering, (M&C 2019)*, 2019

### Bounded inverse power potentials: Isomorphism and isosbestic points

I. NIKITEAS, D. M. HEYES

*J. Chem. Phys.* 150.14 (Apr. 2019) p. 144504. American Institute of Physics Inc., 2019

## Projects

### fortls – Fortran Language Server

AUTHOR – MAINTAINER

London, UK

Jan. 2022 – PRESENT

- Author and maintainer of the **fortls** Language Server for Fortran
- Provides cross-platform, cross-editor, IDE features when writing Fortran, like hover, autocomplete, gotos, reference finding and many more
- For more information, visit the **fortls** documentation

### Findent PyPi

AUTHOR – MAINTAINER

London, UK

Sep. 2021 – PRESENT

- Author and maintainer of the Python wrapper for the Fortran formatting tool findent

## Modern Fortran Visual Studio Code – The Fortran Programming Language

London, UK

Co-AUTHOR – MAINTAINER

Oct. 2019 – PRESENT

- Project is the most popular Fortran extension in VS Code and has +500k Downloads & +200k installs
- Provide full IDE support for Fortran in VS Code, i.e. linting, syntax highlighting, debugging, formatting, LSP integration etc.
- For more information, visit the **Modern Fortran GitHub** repository

## Load balancing for adaptive radiation transport simulations

London, UK

M.Sc. THESIS

Feb. 2018 – Sep. 2018

- Studied the use cases between spatial and angular discretisation methods e.g. FDM, FEM, FVM, DGFEM,  $S_n$ ,  $P_n$  and wavelets
- Wrote a report on the application of global and goal based adaptive methods on transport problems
- Benchmarked, improved and optimised existing code in FETCH2 for load balancing of radiation transport problems

## Investigating the transition from Molecular Dynamics to Smooth Particle

### Hydrodynamics

Egham, UK

B.Sc. DISSERTATION

Sept. 2016 – Apr. 2017

- Investigated the existence of a continuous transition between Molecular Dynamics (MD) and Smooth Particle Hydrodynamics (SPH) by creating computational models in C++ and Python
- Using principals of statistical mechanics e.g. RDF, VAF, MSD, quantitative observations were made for the transition limits between the two models
- A continuous transition between MD and SPH was discovered for the first time for a small range of parameters of the pair potential

## Gallery with... ELPIDA (Hope)

Athens, Greece

NON-PROFIT ORGANISATION

May. 2012

- Organised a 3-day art gallery focused on charity, with the aid of Piraeus Bank Group Cultural Foundation and the Association of Friends and Children with Cancer "ELPIDA"
- Displayed 152 art pieces from the 1st workshop of Athens's Art School raising a total of €75,000
- The profits were used for two purposes:
  - Support the noble cause of the Association of Friends and Children with Cancer "ELPIDA" and its president's Marianna V. Vardinoyannis
  - Aid in the combat of the high rates of youth unemployment in the Arts, by employing and promoting young artists

## Experience

### StudentShapers Placement - Research Computing and Data Science Exemplars (ReCoDE)

London, UK

IMPERIAL COLLEGE LONDON

Jul. 2022

- Reviewed, edited and improved Computational & Data Science projects targeted training PhD candidates in their fields of study
- Worked on 5 projects in vastly different fields: Computer Vision & Convolutional Neural Networks, Nuclear Engineering using Diffusion theory, Physics modelling using Markov Chain Monte Carlo, RNA sequencing of biological data, COVID-19 Transmission modelling using Bayesian inference
- Worked with various programming languages: Python, Fortran, R, STAN

### Graduate Teaching Assistant

London, UK

IMPERIAL COLLEGE LONDON

Dec. 2018 – Dec. 2022

Taught various principles of programming, linear algebra, numerical methods and computational modelling to both final year Undergraduate students and Master's students:

- Module: 375 Advanced Programming C++
- Module: ACSE-5 Numerical methods with C++
- Module: ACSE-6 Parallel Programming using MPI

### Intern Engineer, Maintenance of Alumina, Non-Invasive Testing Methods

Viotia, Greece

ALUMINIUM OF GREECE

July. 2016 – Aug. 2016

- Was part of a team responsible for the optimisation and maintenance of equipment used in the production of aluminium oxide (alumina).
- Was familiarised with methods and techniques used to investigate for structural failures in industrial equipment.
- Performed non-destructive testing (e.g. Ultrasonic testing, liquid penetrant, eddy-current testing, remote visual inspection).

## Skills and Interests

<b>Programming</b>	Python, C/C++, Fortran, TypeScript, Bash and many more...
<b>Other Software</b>	Git, LaTeX, Markdown, Microsoft Office, Inkscape, FreeCAD, GMSH, Logger Pro 3
<b>Languages</b>	English, Greek, French
<b>General Skills</b>	Communication, Leadership, Multidisciplinary Teamwork, Risk assessment, Report authoring, Experimental design
<b>Interests</b>	Coding, Interactive data visualisation, Active member of the Fortran Programming Language Organisation, Chess