

# Ioannis Nikiteas

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## Education

### Ph.D. in Nuclear Physics & Computational System Modelling

IMPERIAL COLLEGE LONDON

London, UK

Oct. 2018 - PRESENT

- Investigating global and goal based error metrics for space-angle adaptive refinement of nuclear simulations

### M.Sc. in Advanced Nuclear Engineering

IMPERIAL COLLEGE LONDON

London, UK

Sept. 2017 - Sept. 2018

- Thesis on Dynamic Load balancing on angular adaptive mesh refinement for radiation transport.

### B.Sc. 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

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

PHYSOR2020 conference proceedings, 2020

### 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

### Load balancing for adaptive radiation transport simulations

M.Sc. THESIS

London, UK

Feb. 2018 - PRESENT

- Study and outline the use cases between FDM, FEM, FVM, DGFEM,  $S_n$ ,  $P_n$  and wavelets.
- Understand the functionality of different linear iterative solvers: Jacobi, Gauss-Seidel and Symmetric Successive Over Relaxation.
- Study the application of global and goal based adaptive methods on transport problems.
- Benchmark, improve and optimise existing code for load balancing of radiation transport problems.

## Investigating the transition from Molecular Dynamics to Smoothed 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 computer simulations in C++ and performing data analysis in Python.
- Used an only repulsive pair potential to simulate a fluid with periodic boundary conditions.
- Parameters of the pair potential were altered resulting into a weakening of the interatomic forces and “softening” of the force distribution of the fluid.
- Using principals of statistical mechanics such as Radial Distribution Functions (RDF), Velocity Autocorrelation Functions (VAF) and Mean Square Displacement (MSD), quantitative observations were made for the transition limits between the two models (MD and SPH).
- It was deduced that there exists a continuous transition between MD and SPH for a small range of parameters of the pair potential. Weak pair potentials force the particles into clusters with infinitely small separation distances. For very weak potentials, the fluid could be accurately approximated by an ideal gas. The SPH limit could be approximated but never fully obtain a uniform distribution of forces between the particles, due to physical limitations of the potential (compared to Lucy or Monaghan potentials).

## Gallery with... ELPIDA (Hope)

Athens, Greece

NON-PROFIT ORGANISATION

May. 2012

- Organised, with two more individuals, a 3-day art gallery focused on charity, with the aid of *Piraeus Bank Group Cultural Foundation* and *Association of Friends and Children with Cancer “ELPIDA”*.
- Intent of the gallery, was to promote hope and give back to people who were in need during times of hardship.
- 152 art pieces from the 1st workshop of Athens’s Art School, were displayed, in Moraitis 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.
  - Contribute in the combat of youth unemployment by employing and promoting young artists.

## Experience

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### Graduate Teaching Assistant

London, UK

IMPERIAL COLLEGE LONDON

Dec. 2018 - Dec. 2021

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 Inerests

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<b>Programming</b>	Python, C/C++, Fortran, Git, Bash, DOS-Batch, Wolfram Language
<b>Other Software</b>	LaTeX, Microsoft Office, Inkscape, GIMP, Logger Pro 3
<b>Languages</b>	English, Greek, French
<b>People</b>	Communication, Leadership, Multidisciplinary Teamwork, Organisation
<b>Laboratory</b>	Risk assessment, Report writing, Experimental design
<b>Interests</b>	Coding, Chess, Trading (Algorithmic trading), Politics.