Chrysovalantis Constantinou

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Education

2017   **Ph.D., Physics**, *University of Notre Dame*, Notre Dame, Indiana, USA
Thesis title: "Natural orbitals for the no-core configuration interaction approach" (M. A. Caprio, advisor)

2014   **M.S., Physics**, *University of Notre Dame*, Notre Dame, Indiana, USA

2009   **Diploma, School of Applied Mathematics and Physical Sciences**, *National Technical University of Athens*, Athens, Greece
Thesis title: "Characterization of the energetic profile of the neutron beam produced by $d(d,{}^{3}\mathrm{He})n$ reactions at the Athens Tandem Accelerator of the NCSR Demokritos" (M. Kokkoris, advisor)

Professional Appointments

Sept 2024–Nov 2024   **Postdoctoral Research Fellow in Medical Imaging AI**, *The Cyprus Institute*, Computation-based Science and Technology Research Center (C. Dovrolis, supervisor)

Jan 2023–Aug 2024   **Associate Research Scientist**, *The Cyprus Institute*, Science and Technology in Archaeology and Culture Research Center (E. Nikita, T. Rehren, supervisors)

Sept 2023–Apr 2024   **Visiting Teacher of Physics (Part-time)**, *The International School Of Paphos*, Department of Science

Oct 2019–Dec 2022   **Computational Scientist**, *The Cyprus Institute*, Computation-based Science and Technology Research Center (C. Alexandrou, supervisor)

Jan 2018–Sept 2019   **Visiting Assistant Professor**, *Monmouth College*, Physics Department

Oct 2016–Dec 2017   **Postdoctoral Research Associate**, *Yale University*, Physics Department (F. Iachello, advisor)

Sept 2015–Sept 2016   **Graduate Research Assistant**, *University of Notre Dame*, Physics Department

Aug 2009–Aug 2015 **Graduate Teaching Assistant**, *University of Notre Dame*, Physics Department

Publications

Skeletal Sex Estimation for Human Remains from Archaeological Contexts: Machine Learning Models based on Roman and early Byzantine Dion, Greece - Ch. Constantinou, E. Nikita, P. Tritsaroli, International Journal of Osteoarchaeology, *submitted*, (2025)

Age Classification based on Dental Development: The applicability of Vision Transformer and EfficientNet Transfer Learning - Ch. Constantinou, P. Georgiades, M. B. Rizky, A. Hadzi Selmanagić, E. Derviševic, M. Moukarzel, A. Franco, N. Angelakopoulos, Journal of Forensic and Legal Medicine, *submitted*, (2025)

Testing the accuracy of the SexEst software for sex estimation in a modern Greek sample - Paraskevi-Anna Nikita, Nefeli Garoufi, Eustratios Valakos, Ch. Constantinou, Efthymia Nikita, Maria-Eleni Chovalopoulou, International Journal of Osteoarchaeology, e3283, (2024)

AgeEst: An open access web application for skeletal age estimation employing machine learning - Ch. Constantinou, M.E. Chovalopoulou, E. Nikita, Forensic Science International: Reports 7, 100317 (2023)

Natural orbitals for the ab initio no-core configuration interaction approach - P. J. Fasano, Ch. Constantinou, M. A. Caprio, J. P. Vary, P. Maris, Phys. Rev. C 105, 054301 (2022)

SexEst: An open access web application for metric skeletal sex estimation - Ch. Constantinou, E. Nikita, International Journal of Osteoarchaeology, 32(4), 832 − 844 (2022)

Natural orbital description of the halo nucleus ^{6}He - Ch. Constantinou, M. A. Caprio, J. P. Vary, P. Maris, Nucl. Sci. Tec. 28, 179 (2017)

Generalized seniority with realistic interactions in open-shell nuclei - M. A. Caprio, F. Q. Luo, K. Cai, Ch. Constantinou, and V. Hellemans, J. Phys. G 39, 105108 (2012)

Generalized seniority for the shell model with realistic interactions - M. A. Caprio, F.Q. Luo, K. Cai, V. Hellemans, Ch. Constantinou, Phys. Rev. C 85, 034324 (2012)

Characterization of the neutron flux distribution at the Athens Tandem Accelerator NCSR Demokritos - R. Vlastou, M. Kokkoris, M. Diakaki, Ch. Constantinou, C.A. Kalfas, A. Kotrotsou, A. Lagoyannis, M. Lambrou, V. Loizou, E. Mara, V. Paneta, G. Provatas, A. Tsinganis, Nucl. Instr. Meth. Phys. Res. B269, 3266 (2011)

Conference Proceedings

Generalized seniority in a major shell with realistic interactions - M. A. Caprio, F. Q. Luo, K. Cai, Ch. Constantinou, and V. Hellemans, in Beauty in Physics: Theory and Experiment, ed. R. Bijker et al., AIP Conf. Proc. No. 1488 (AIP, Melville, New York, 2012), p. 212

Talks

Linking Ancient Cities: Network Analysis of the Roman Transportation System - American Physical Society April Meeting, Sacramento & Virtual, California, April 2024

NI4OS-Europe via an example service: SexEst - Hungarian Open Science Forum, Virtual, Hungary, October 2022

Open access web application for metric skeletal sex estimation - EOSC Regional Event, Budapest, Hungary, September 2022

FAIR data and FAIR principles - NI4OS-Europe End-Users training event, Nicosia, Cyprus, June 2022

Deploying machine learning models for forensic anthropological applications with Docker and Streamlit - DockerCon 2022, Virtual, USA, May 2022

Open science and FAIR principles - NI4OS-Europe capacity-building event, Nicosia, Cyprus, October 2020

Natural orbitals for the no-core configuration interaction approach - Workshop on *ab initio* nuclear theory, Ames, Iowa, December 2017

Cluster orbitals for the mirror nuclei ^{7}Li and ^{7}Be - Division of Nuclear Physics Meeting, Pittsburgh, Pennsylvania, October 2017

Ab initio no-core configuration interaction calculations of electromagnetic observables for p-shell nuclei - Division of Nuclear Physics Meeting, Vancouver, British Columbia, Canada, October 2016

Accelerating the convergence of no-core configuration interaction calculations using natural orbitals - Midwest Theory Get-Together, Argonne National Laboratory, Chicago, Illinois, September 2016

Ab initio no-core configuration interaction calculations in the natural orbital basis - Division of Nuclear Physics Meeting, Santa Fe, New Mexico, October 2015

The natural orbital basis for no-core configuration interaction calculations - Midwest Theory Get-Together, Argonne National Laboratory, Chicago, Illinois, September 2015

Scaling properties for no-core configuration interaction calculations using the harmonic oscillator basis and the JISP16 interaction - American Physical Society April Meeting, Savannah, Georgia, April 2014

Teaching

Spring 2024	**AS Level Physics, A Level Physics**, *International School of Paphos*, Paphos, Cyprus
Fall 2023	**AS Level Physics, A Level Physics**, *International School of Paphos*, Paphos, Cyprus
Spring 2019	**Advanced Electromagnetism**, *Monmouth College*, Monmouth, Illinois
	Introductory Physics II, *Monmouth College*, Monmouth, Illinois
Fall 2018	**Introductory Physics I**, *Monmouth College*, Monmouth, Illinois
	Classical Mechanics, *Monmouth College*, Monmouth, Illinois
	Mathematical Methods for Physicists, *Monmouth College*, Monmouth, Illinois
Summer 2016	**Review of Fundamental Physics II**, *University of Notre Dame*, Notre Dame, Indiana

Professional Activities

2023–present Reviewer: PLOS ONE, IEEE Journal of Biomedical and Health Informatics

Extracurricular Projects and Tutoring

Web Development
- Upgraded the 3D website section of Aquaglide using `three.js` and `React.js`
- Created a 3D tool for Esprofiler using `three.js` and `Vue.js` to showcase digital products
- Created and deployed a professional website for a law practice

Private Tutor
- Tutored university students in MCAT preparation, physics for architects, and `MATLAB` programming, with successful outcomes including graduates from Politecnico di Milano (Architecture) and admission to Oakland University William Beaumont School of Medicine
- Guided high school students through AS and A Level physics exams, leading to admissions at prestigious universities such as the University of Cambridge, UCL, and King's College London

Amazon Marketplace Seller
- Sold used textbooks, laptops, and tech products salvaged from thrift stores.
- Managed inventory, pricing strategies, and customer service, maintaining a consistent 5-star rating.

Research and Professional Interests

Computational
- High-performance computing
- Machine learning applications
- Web and game development

Physics
- Nuclear structure and group theoretical methods
- *Ab initio* nuclear theory
- Computational quantum many-body systems

Complexity
- Agent-based modelling
- Complexity theory
- Mobility simulations

Management and Administration

Oct 2019–Dec 2022 **National Initiatives for Open Science in Europe, Work Package 6 co-leader**
- Organized workshops and prepared project deliverables
- Supported researchers in on-boarding services to NI4OS-Europe
- Disseminated Open Science and FAIR principles through talks and training materials
- Project received positive reviews from European Committee representatives

Military Service

Cypriot National Guard, Sergeant, Army Corps

Outreach

June 2017   **Nuclear physics: The strong many-body problem**, *Yale Young Scholars Showcase Program*, New Haven, Connecticut

Awards

2003   **State Scholarship Foundation of Greece**, *National Technical University of Athens*, Athens, Greece

Recognized for achieving the highest score in the entrance examinations for the School of Applied Mathematics and Physical Sciences

Programming

Languages	C/C++, Python
Web Dev	JavaScript, HTML, CSS, NPM
Systems	Linux, Windows, OS X
Technologies	Docker, Git
Simulation	NetLogo
Packages	Mathematica, MATLAB
Game Dev	Unity3D

Languages

Greek	Fluent (Native)
English	Fluent
French	Basic

Professional Affiliations

American Physical Society

Division of Nuclear Physics of the American Physical Society

References

Prof. Mark A. Caprio, mcaprio@nd.edu

Prof. Efthymia Nikita, e.nikita@cyi.ac.cy

Prof. Georgios Artopoulos, g.artopoulos@cyi.ac.cy

Prof. Pieter Maris, pmaris@iastate.edu

Interests

Boxing, Reading, Billiards, Digital and AI Art