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# Chrysovalantis Constantinou

## 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  $d(d, {}^3\text{He})n$  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

## Publications

**Dental Age Classification using Machine Learning: The applicability of Vision Transformer and EfficientNet Transfer Learning** - Ch. Constantinou, P. Georgiades, M. B. Rizky, A. Hadzi Selmanagić, E. Dervišević, M. Moukarzel, E. Nikita, N. Angelakopoulos, *in preparation*, (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  ${}^6\text{He}$**  - 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. B* 269, 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

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## 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  ${}^7\text{Li}$  and  ${}^7\text{Be}$**  - 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

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## 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 Esprofler 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