

# 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

- 2023–present **Associate Research Scientist**, *The Cyprus Institute*, Science and Technology in Archaeology and Culture Research Center (E. Nikita, T. Rehren, supervisors)
- 2023–2024 **Visiting Teacher of Physics (Part-time)**, *The International School Of Paphos*, Department of Science
- 2019–2023 **Computational Scientist**, *The Cyprus Institute*, Computation-based Science and Technology Research Center (C. Alexandrou, supervisor)
- 2017–2019 **Visiting Assistant Professor**, *Monmouth College*, Physics Department
- 2016–2017 **Postdoctoral Research Associate**, *Yale University*, Physics Department (F. Iachello, advisor)
- 2015–2016 **Graduate Research Assistant**, *University of Notre Dame*, Physics Department
- 2009–2015 **Graduate Teaching Assistant**, *University of Notre Dame*, Physics Department

## Freelancing

- 2021–present **Web Developer**
- Maintained 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
- 2009–present **Private Tutor**
- Tutored university students in MCAT preparation, physics for architects, and MATLAB programming
  - Assisted high school students with AS and A Level Edexcel International A Level physics exams
- 2009–2019 **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
- Finite-Difference Time-Domain (FDTD) method

### Physics

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

### Complexity

- Agent-based modelling
- Complexity theory
- Mobility simulations

## Publications

**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. Helleman, J. Phys. G 39, 105108 (2012)

**Generalized seniority for the shell model with realistic interactions** - M. A. Caprio, F.Q. Luo, K. Cai, V. Helleman, 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. Helleman, 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  ${}^7\text{Li}$  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

## Teaching

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

## Professional Activities

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

## Management and Administration

2019–2023 **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

2001–2003 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



# Interests

Boxing, Reading, Billiards, Digital and AI Art