# Chrysovalantis Constantinou

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## Education

- **Ph.D., Physics, 2017**
  **M.S., Physics, 2013**
  University of Notre Dame, Notre Dame, Indiana, USA
  Thesis title: *"Natural orbitals for the no-core configuration interaction approach"*
  Advisor: Professor Mark A. Caprio
- **Diploma, School of Applied Mathematics and Physical Sciences, 2009**
  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"*
  Advisor: Professor Michael Kokkoris

## Research and Professional Interests

Nuclear structure. Group theoretical methods in nuclear physics. *Ab initio* nuclear theory. Computational methods for quantum many-body systems. High-performance computing. Machine learning applications. Web application development. Game development. Agent-based modelling

## Professional Appointments

- 2019-present, The Cyprus Institute, Computational Scientist, Computation-based Science and Technology Research Center
- 2017-2019, Monmouth College, Visiting Assistant Professor, Physics Department
- 2016-2017, Yale University, Postdoctoral Research Associate, Physics Department
- 2015-2016, University of Notre Dame, Graduate Research Assistant, Physics Department
- 2009-2015, University of Notre Dame, Graduate Teaching Assistant, Physics Department

## Management and Administration

- 2019-present, National Initiatives for Open Science in Europe, Work Package 6 co-leader

## Freelancing

- 2021-present, Completed projects involving rendering 3D models in websites, produced code that generates art pieces, and wrote a science popularization article for a website. I also offered private physics (thermodynamics) and programming tutorials (MATLAB)

## Military Service

- 2001-2003, Cypriot National Guard, Sergeant, Army Corps

## Publications

- **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)

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

**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**

- **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
- **The natural orbital basis for no-core configuration interaction calculations**
  Midwest Theory Get-Together, Argonne National Laboratory, Chicago, Illinois, September 2015
- ***Ab initio* no-core configuration interaction calculations in the natural orbital basis**
  *Division of Nuclear Physics Meeting*, Santa Fe, New Mexico, October 2015
- **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 of electromagnetic observables for $p$-shell nuclei**
  *Division of Nuclear Physics Meeting*, Vancouver, British Columbia, Canada, October 2016
- **Cluster orbitals for the mirror nuclei $^{7}$Li and $^{7}$Be**
  *Division of Nuclear Physics Meeting*, Pittsburgh, Pennsylvania, October 2017
- **Natural orbitals for the no-core configuration interaction approach**
  *Workshop on ab initio nuclear theory*, Ames, Iowa, December 2017
- **Open science and FAIR principles**
  *NI4OS-Europe capacity-building event*, Nicosia, Cyprus, October 2020
- **Deploying machine learning models for forensic anthropological applications with Docker and Streamlit**
  *DockerCon 2022*, Virtual, USA, May 2022
- **FAIR data and FAIR principles**
  *NI4OS-Europe End-Users training event*, Nicosia, Cyprus, June 2022

- **Open access web application for metric skeletal sex estimation**
  *EOSC Regional Event*, Budapest, Hungary, September 2022
- **NI4OS-Europe via an example service: SexEst**
  *Hungarian Open Science Forum*, Virtual, Hungary, October 2022

**Teaching**

- **PHYS 77031: Review of Fundamental Physics II**
  Notre Dame, Indiana, Summer Session 2016
- **PHYS 130: Introductory Physics I**
  Monmouth, Illinois, Fall Semester 2018
- **PHYS 132: Introductory Physics II**
  Monmouth, Illinois, Spring Semester 2018, 2019
- **PHYS 208: Classical Mechanics**
  Monmouth, Illinois, Fall Semester 2018
- **PHYS 303: Advanced Electromagnetism**
  Monmouth, Illinois, Spring Semester 2018, 2019
- **PHYS 311: Mathematical Methods for Physicists**
  Monmouth, Illinois, Fall Semester 2018

**Outreach**

- **Nuclear physics: The strong many-body problem**
  The talk was given to the Yale young scholars showcase program, New Haven, Connecticut, June 2017

**Awards**

- **State Scholarship Foundation of Greece, 2003**
  For achieving the highest score at the entrance examinations for the School of Applied Mathematics and Physical Sciences of the National Technical University of Athens

**Programming**

- Languages: `C/C++`, `python`
- Web Skills: `JavaScript`, `HTML`, `CSS`, `npm`
- Operating Systems: `Linux`, `Windows`, `OS X`
- Technologies: `Docker`, `Git`
- Mathematical Packages: `Mathematica`, `MATLAB`

**Languages**

- Native language: **Greek**
- Full professional proficiency: **English**
- Limited proficiency: **French**

**Professional Affiliations**

- American Physical Society
- Division of Nuclear Physics of the American Physical Society

**References**

- Prof. Mark A. Caprio (mcaprio@nd.edu)
- Prof. Christopher Fasano (cfasano@monmouthcollege.edu)
- Prof. James Vary (jvary@iastate.edu)

**Interests**

- Soccer, Boxing, Reading, Billiards, Running