Chrysovalantis Constantinou

Physics Ph.D. — Machine Learning & Scientific Computing

Paphos, Cyprus — cconsta1@alumni.nd.edu — cconsta1.github.io

Research Profile

Interdisciplinary nuclear physicist experienced in *ab initio* nuclear theory, machine learning, and scientific software development. My research spans nuclear structure and computational many-body methods, medical imaging AI, and forensic anthropology, with an emphasis on data-driven modeling and deployable research tools. I have contributed to and led projects across fundamental physics, applied machine learning, and international open-science initiatives.

Research Interests

Ab initio nuclear theory; nuclear structure; computational many-body methods; algebraic and group-theoretical methods; machine learning applications in physics and osteoarchaeology; medical imaging AI; forensic anthropology and osteoarchaeology; scientific software and web-based research tools; high-performance computing

Academic and Research Appointments

Independent Researcher 2025–present

Visiting Researcher, Université Libre de Bruxelles May–June 2025

Postdoctoral Research Fellow, The Cyprus Institute (CaSToRC) Sept–Nov 2024

Associate Research Scientist, The Cyprus Institute (STARC) Jan 2023–Aug 2024

Computational Scientist, The Cyprus Institute (CaSToRC) Oct 2019–Dec 2022

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

Postdoctoral Research Associate, Yale University Oct 2016–Dec 2017

Education

Ph.D. in Physics, University of Notre Dame, USA 2017

Thesis: *Natural orbitals for the no-core configuration interaction approach*

M.S. in Physics, University of Notre Dame, USA 2014

Diploma in Applied Mathematics and Physical Sciences, National Technical University of Athens, Greece 2009

Selected Publications

Classifying Legal Age of Majority (≥18 years) from Panoramic Radiographs with Transfer Learning: Benchmarking ViT and EfficientNetV2. *Journal of Forensic and Legal Medicine*, under review (3rd

major revision), 2025.

Skeletal Sex Estimation for Human Remains from Archaeological Contexts. *International Journal of Osteoarchaeology*, 2025.

AgeEst: An open access web application for skeletal age estimation employing machine learning. *Forensic Science International: Reports*, 2023.

Natural orbitals for the *ab initio* no-core configuration interaction approach. *Physical Review C*, 2022.

SexEst: An open access web application for metric skeletal sex estimation. *International Journal of Osteoarchaeology*, 2022.

Full publication list available upon request.

Selected Talks

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

Open access web application for metric skeletal sex estimation, *EOSC Regional Event*, Budapest, 2022.

Deploying machine learning models for forensic anthropological applications, *DockerCon*, Virtual, 2022.

Teaching Experience

Advanced Electromagnetism; Classical Mechanics; Mathematical Methods for Physicists; Introductory Physics I–II; AS and A-Level Physics.

Professional Service

Reviewer for *PLOS ONE* and *IEEE Journal of Biomedical and Health Informatics*.

Co-lead, NI4OS-Europe Work Package on Open Science and FAIR data.

Technical Skills

Programming: Python, C/C++, MATLAB, Mathematica, JavaScript

Machine Learning & Data: PyTorch, XGBoost, scikit-learn, pandas

Web & Deployment: Docker, Streamlit, Dash/Plotly, React, Three.js

Systems: Linux, shell scripting, macOS

References

Available upon request.