

Dr Nicolas Hadjipantelis

PhD DIC MEng A.M.ASCE

Lecturer of Structural Engineering
Department of Civil and Environmental Engineering
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As Lecturer of Structural Engineering at the University of Cyprus, I conduct research in the area of steel structures and teach courses on structural steel design and structural stability at undergraduate and postgraduate level.

I am the founder and leader of the Steel Structures Laboratory at the University of Cyprus. My vision is to develop a prominent Steel Structures Group comprising high-calibre researchers and producing research excellence for the benefit of the environment, and the Cypriot and wider society.

My research philosophy is based on three pillars, namely innovation, quality and impact. My principal research interests lie in the areas of wire arc additive manufacturing (WAAM), prestressed steel structures, cold-formed steel structures and structural stability. My research activities include the production of WAAM structures, structural testing, numerical and analytical modelling, and the development of structural design rules.

I hold a PhD in Steel Structures from Imperial College London and a First Class MEng degree from the University of Bristol, as part of which I studied and conducted research for one year at the University of California, Berkeley.

PART 1: BACKGROUND

EMPLOYMENT

Lecturer – *University of Cyprus* 2020–

- Founder and Director of the Steel Structures Laboratory
- Established the first WAAM facility in Cyprus and produced more than 100 kg of specimens
- Research on WAAM, prestressed steel structures, cold-formed steel and structural stability
- Teaching courses on structural steel design, structural stability and strength of materials (laboratory)
- Ongoing collaborations: *Imperial College London, University of Bath, National Technical University of Athens*

Research Associate – *Imperial College London & The Alan Turing Institute* 2019–2020

- Participated in the full-scale verification tests on the MX3D bridge, the world's first metal 3D printed bridge
- Collaborations: *University of Cambridge, MX3D, Ayrshire Metals*

EDUCATION

PhD in Steel Structures 2015–2019

Imperial College London

- Thesis title: Prestressed cold-formed steel beams (Supervisors: Prof. Leroy Gardner & Prof. M. Ahmer Wadee)
- Awarded the prestigious President's PhD Scholarship (3.5 years)

MEng in Civil Engineering with Study Abroad

University of Bristol 2011–2015

- First Class Honours – 76% – Cohort ranking: 3/76
- Final year design project: The Ocean Skyscraper (highest mark)

University of California, Berkeley 2013–2014

- Overall GPA: 3.91/4.0 – 6 Grade A (5 in Structures) & 1 Grade B+
- Research on macrocell and microcell corrosion in reinforced concrete beams (Supervisor: Prof. Claudia Ostertag)

SCHOLARSHIPS

Total: €88,836

- 1. President's PhD Scholarship** 2015–2019
Imperial College London – Awarded to 50 researchers based on academic excellence (3.5 years) €84,416
- 2. ICE Benevolent Fund** 2015–2017
Institution of Civil Engineers – Student grant €1,833
- 3. Student Grant** 2012–2014
Cyprus Cooperative Bank – Based on academic excellence €2,587

HONOURS & AWARDS

- 1. IStructE 20th Young Researchers' Conference** 2018
Institution of Structural Engineers – 3rd prize for oral presentation ([video](#))
- 2. ICE Student Prize** 2015
Institution of Civil Engineers – Best performance in Years 3–4
- 3. Top 3 students in cohort over entire course** 2015
University of Bristol – Cohort ranking: 3/76
- 4. Highest mark in final year design project** 2015
University of Bristol – Project title: The Ocean Skyscraper
- 5. Top 10 students of Faculty of Engineering** 2014
University of Bristol – Based on performance in Year 3

TECHNICAL STRENGTHS

Key areas: Metal 3D printed structures || Cold-formed steel || Hot-rolled steel || Prestressed steel structures

Experimentation: Material, member & full-scale testing || Digital image correlation || 3D laser scanning

Metal 3D printing: Production, testing and modelling of WAAM structures

Numerical modelling: Geometrically & materially nonlinear finite element analysis with imperfections
ABAQUS || ANSYS || CUFEM || cFSM

Analytical modelling: Classical structural mechanics || Energy methods || Nonlinear stability

Structural design: European standards || North American standards || Reliability analysis

Programming: Matlab || Python || L^AT_EX

Parametric & CAD: Rhino || Grasshopper || Revit || AutoCAD || Inkscape

PART 2: RESEARCH ACTIVITIES

RESEARCH GRANTS

Total: €270,716

- 1. Onisilos Fellowship Programme** 2023–2025
H2020-MSCA-COFUND – *University of Cyprus* €118,560
Project title: Seismic behavior of unreinforced masonry walls with 3D printable steel reinforcement
Role: Co-Supervisor (second); Co-Supervisor – PI: Assoc. Prof. M. Yekrangnia
- 2. Internal Funding Scheme** 2023–2025
University of Cyprus €60,000
Project title: Strengthening of unreinforced heritage masonry structures
Role: Co-Investigator (second); Co-Supervisor – PI: Dr M. Mavros

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|---|----------------------|
| 3. Proof of Concept for Technology / Knowhow Applications <i>Research and Innovation Foundation, Cyprus</i> Project title: Strengthening of unreinforced heritage masonry structures Role: Co-Investigator (second); Co-Supervisor – PI: Dr M. Mavros | 2023–2024 €40,000 |
| 4. Start-up Grant <i>University of Cyprus</i> Project title: Wire and arc additive manufacturing facility at the University of Cyprus Role: Principal Investigator | 2021–2023 €50,000 |
| 5. Dame Julia Higgins Postdoc Collaborative Research Fund <i>Imperial College London, Faculty of Engineering</i> Project title: Metal 3D printed structures – Evaluating the effect of residual stresses Role: Principal Investigator | 2019 €2,156 |

REFEREED JOURNAL PUBLICATIONS

1. Shah I.H.[†], **Hadjipantelis N.**[†], Walter L., Myers R.J.* & Gardner L.* (2023). Environmental life cycle assessment of wire arc additively manufactured steel structural components. *Journal of Cleaner Production*, **389**, 136071.
2. **Hadjipantelis N.***, Weber B., Buchanan C. & Gardner L. (2022). Description of anisotropic material response of wire and arc additively manufactured thin-walled stainless steel elements. *Thin-Walled Structures*, **171**, 108634
3. Kyvelou P.*, Nethercot D.A., **Hadjipantelis N.**, Kyprianou C. & Gardner L. (2020). The evolving basis for the design of light gauge steel systems. *International Journal of Structural Stability and Dynamics*, **20(13)**, 2041008.
4. Wadee M.A., **Hadjipantelis N.***, Bazzano J.B., Gardner L. & Lozano-Galant J.A. (2019). Stabilization of steel truss compression elements by means of prestressed cables. *Journal of Constructional Steel Research*, **164**, 105790.
5. **Hadjipantelis N.***, Gardner L. & Wadee M.A. (2019). Finite-element modeling of prestressed cold-formed steel beams. *Journal of Structural Engineering, ASCE*, **145(10)**, 04019100.
6. **Hadjipantelis N.***, Gardner L. & Wadee M.A. (2019). Design of prestressed cold-formed steel beams. *Thin-Walled Structures*, **140**:565–78.
7. **Hadjipantelis N.**, Gardner L.* & Wadee M.A. (2018). Prestressed cold-formed steel beams: Concept and mechanical behaviour. *Engineering Structures*, **172**:1057–72.

[†] Co-first authors

* Corresponding author(s)

Forthcoming:

- Evans S.I., **Hadjipantelis N.** & Wang J. (2024). Structural testing of wire arc additively manufactured outstand elements. *Journal of Constructional Steel Research*.
- **Hadjipantelis N.**, Wadee M.A. & Gardner L. (2024). The art of prestressing steel structures: Review and fundamental principles. *Journal of Structural Engineering, ASCE*.
- Huang C., **Hadjipantelis N.** & Gardner L. (2024). Material behaviour of WAAM elements at low temperatures. *Engineering Structures*.

REFEREED CONFERENCE PUBLICATIONS

1. Panagiotopoulos V.*, **Hadjipantelis N.** & Gantes J.C. (2023). Evaluation of effects of printing parameters on geometric and mechanical properties of wire arc additively manufactured elements. *Proc. of 10th Hellenic National Conference of Steel Structures*, Athens, October 19–21, 2023; (in Greek).

2. **Hadjipantelis N.**^{†,*}, Shah I.H.[†], Walter L., Myers R.J. & Gardner L. (2023). Metal additively versus conventionally manufactured structures – An environmental life cycle assessment. *Proc. of 10th European Conference on Steel and Composite Structures, Eurosteel*, Amsterdam, Netherlands, September 12–14, 2023.
3. Evans S.I.^{*}, **Hadjipantelis N.** & Wang J. (2023). Effects of deposition rate on local stability of wire arc additively manufactured outstand elements. *Proc. of 10th European Conference on Steel and Composite Structures, Eurosteel*, Amsterdam, Netherlands, September 12–14, 2023.
4. **Hadjipantelis N.**^{*}, Weber B. & Gardner L. (2021). Characterisation of the anisotropic response of wire and arc additively manufactured stainless steel. *Proc. of 9th European Conference on Steel and Composite Structures, Eurosteel*, Sheffield, UK, September 1–3, 2021.
5. **Hadjipantelis N.**^{*}, Kyvelou P., Gardner L. & Wadee M.A. (2019). Numerical modelling of prestressed composite cold-formed steel flooring systems. *Proc. of 7th International Conference on Structural Engineering, Mechanics and Computation*, Cape Town, South Africa, September 2–4, 2019.
6. **Hadjipantelis N.**^{*}, Gardner L. & Wadee M.A. (2018). Prestressed cold-formed steel beams – Parametric studies and design recommendations. *Proc. of 9th International Conference on Advances in Steel Structures*, Hong Kong, China, December 5–7, 2018.
7. **Hadjipantelis N.**^{*}, Gardner L. & Wadee M.A. (2018). Prestressed cold-formed steel beams – Conceptual development. *Proc. of 8th International Conference on Thin-Walled Structures*, Lisbon, Portugal, July 24–27, 2018.
8. **Hadjipantelis N.**^{*◊} (2018). Prestressed cold-formed steel beams. *Proc. of 20th Young Researchers’ Conference of the Institution of Structural Engineers*, London, United Kingdom, April 10, 2018.

† Co-first authors; * Oral presentations; ◊ 3rd prize for oral presentation

Forthcoming:

- **Hadjipantelis N.**, Kontovourkis O., Ioannou I. & Mavros M. (2024). Wire arc additive manufacturing to the rescue of heritage masonry structures. *15th Nordic Steel Construction Conference*, Luleå, Sweden, June 26–28, 2024 (Abstract submitted).
- Huang C., **Hadjipantelis N.** & Gardner L. (2024). Mechanical properties of WAAM steels at polar temperatures. *10th International Conference on Steel and Aluminium Structures*, Rio de Janeiro, Brazil, June 5–7, 2024 (Abstract submitted).
- Mavros M., **Hadjipantelis N.**, Ioannou I. & Kontovourkis O. (2024). 3D printed steel reinforcement for strengthening historic unreinforced masonry structures. *18th World Conference on Earthquake Engineering*, Milan, Italy, June 30–July 5, 2024. (Abstract accepted; Paper submitted and under review).

OTHER PUBLICATIONS

1. **Hadjipantelis N.** (2021). Metal 3D printing in the construction sector: prospects and challenges. *The Civil Engineer*. Issue July 2021. Cyprus Association of Civil Engineers; (in Greek).
2. **Hadjipantelis N.** (2019). Prestressed cold-formed steel beams. *PhD Thesis*. Imperial College London.

TECHNICAL REPORTS

1. Buchanan C., **Hadjipantelis N.**, Kyvelou, P. & Gardner, L. (2020). Summary of the September 2019 MX3D Bridge test programme. *Amsterdam Municipality*.
2. **Hadjipantelis N.**, Dong, Q. & Gardner, L. (2019). Digital Twins. *British Constructional Steelwork Association, New Steel Construction magazine*.

PART 3: TEACHING & SUPERVISION

TEACHING

Lectures – University of Cyprus 2020–

- MSc – CEE541: Structural Stability || created the course
- Year 4 – CEE441: Design of Steel Structures II || restructured and redeveloped the course
- Year 3 – CEE342: Design of Steel Structures I || restructured and redeveloped the course
- Year 2 – CEE:232: Strength of Materials (laboratory) || renewed the course material

Lectures – Imperial College London 2019

- MSc – Structural Stability (2 sessions)
- MSc – Plated Steel Structures (1 session)

Graduate Teaching Assistant – Imperial College London 2015–2019

- Tutorials – 190 hours in total – Structural Stability (MSc, Yr3), Steel Design (Yr2), Structural Mechanics (Yr2, Yr1)

PART 4: PROFESSIONAL ROLES

ROLES AT UNIVERSITY OF CYPRUS

Department of Civil and Environmental Engineering

- Chair of International Relations & Promotion Committee 2022–
- Coordinator and administrator of departmental and social media accounts website 2021–
- Member of International Relations & Promotion Committee 2020–2022
- Member of Strategy Committee (Research Group) 2021

Faculty of Engineering

- Member of International Relations & Promotion Committee 2022–
- Member of Faculty Council 2021–2022

Internal PhD Examiner

- Papargyri L. *Numerical modelling of material and structural integrity of crystalline silicon photovoltaics.* 2024
- Triantafyllaki A. *Structural integrity of offshore pipelines crossing active faults.* 2022

MEMBERSHIPS TO PROFESSIONAL BODIES

- Greek Steel Structures Research Society || Full 2022–
- Cyprus Scientific and Technical Chamber (ETEK) || Full 2019–
- Cyprus Association of Civil Engineers (CYACE) || Full 2017–
- American Society of Civil Engineers (ASCE) || Associate 2017–
- Institution of Structural Engineers (IStructE) || Graduate 2011–

REVIEWER FOR INTERNATIONAL JOURNALS

1. Resources, Conservation & Recycling (Elsevier)
2. Journal of the International Association for Shell and Spatial Structures (IASS)
3. Journal of Structural Engineering (ASCE)
4. Journal of Constructional Steel Research (Elsevier)
5. Structures and Buildings (Institution of Civil Engineers)

6. Engineering Structures (Elsevier)
7. Thin-Walled Structures (Elsevier)
8. International Journal of Steel Structures (Springer)
9. Structures, IStructE (Elsevier)

INTERNATIONAL CONFERENCE SCIENTIFIC COMMITTEES

1. Hellenic National Conference of Steel Structures

2023-