

DIANA PRADO LOPES AUDE CRAIK

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HPF C7, ETH Zürich, Otto-Stern-Weg 1, 8093 Zürich, Switzerland

EDUCATION AND EMPLOYMENT

ETH Zürich

SNSF Assistant Professor of Physics

Zürich, Switzerland

March 2025 – Now

- Principal investigator leading research group using quantum control to investigate fundamental physics.

Lecturer, Postdoctoral Research Assistant, Marie Curie Fellow (until 2023)

July 2022 – March 2025

- Precision measurement with trapped ions.

Massachusetts Institute of Technology, Center for Ultracold Atoms

Global Marie Skłodowska-Curie (MSCA) Fellow

Cambridge, MA, USA

September 2019 – July 2022

- Precision measurements of isotope shifts in trapped ytterbium ions to probe for dark matter
- Prof. Vladan Vuletić's research group.

Harvard University

Postdoctoral Fellow

Cambridge, MA, USA

October 2017 - August 2019

- Research on NV-diamond magnetometry in Prof. Ron Walsworth's and Prof. Evelyn Hu's groups

University of Oxford

Doctor of Philosophy in Atomic and Laser Physics

Oxford, UK

2011 – 2016

Postdoctoral Research Associate

2017

- Ion Trap Quantum Computing group; supervisors: Prof. Andrew Steane and Prof. David Lucas

Massachusetts Institute of Technology (MIT)

Bachelor of Science in Physics

Cambridge, MA, USA

2006 – 2010

University of Cambridge, Trinity College

Cambridge-MIT Exchange Program student - Part II (3rd year) Physics

Cambridge, UK

2008 – 2009

INVITED TALKS

- Invited speaker at NACTI 2026 (North American Conference for Trapped Ions), MIT, July 2026
- Invited speaker at Wilhelm und Else Heraeus Foundation workshop on the “Quest of New Physics at the Precision Frontier”, Berlin, August 2026
- (Declined, maternity) Invited speaker at Quantum SynQretism Conference, Crete, 2026
- (Declined, maternity) Invited speaker at DPG Spring Meeting SAMOP, March 2026
- Key speaker in ECT* workshop on “New perspectives in the charge radii determination for light nuclei”, Trento, Italy, July 2025
- Colloquium at Physikalisch-Technische Bundesanstalt (PTB) in Braunschweig, May 2025
- Colloquium at the Paul Scherrer Institut, March 2025
- Invited speaker at Cold atoms and molecules for fundamental physics - ICAP satellite conference, Cambridge UK, July 2024
- Atomic and Laser Physics Seminar, Oxford University, UK, April 2024
- AMO Seminar, University of Connecticut, Storrs, CT, USA Feb 2023
- Invited speaker at SPIE Photonics West, San Francisco, CA, USA, Jan 2023
- Guest lecturer, course on “Quantum Technologies for Searches of New Physics”, ETH Zürich, Nov 2022
- Invited talk at NACTI 2022 - North American Conference on Trapped Ions, Duke University, USA, Aug 2022
- Invited talk at DAMOP 2022, Topical Group on Precision Measurement & Fundamental Constants Workshop, Orlando, USA, Jun 2022

- Harvard Quantum Initiative Next-Gen Quantum Investigator Colloquium, Harvard University, Feb 2022
- (Declined, unable to attend) Invited speaker at SPIE Photonics West, San Francisco, USA, Jan 2022
- Invited speaker at MIT PRISM conference, Feb 2021
- Invited speaker at Quantum Innovators Workshop, IQC, University of Waterloo, Oct 2019
- (Declined, unable to attend) Invited speaker at Diamond for Quantum Applications, Royal Society's Theo Murphy Meeting, London, UK, Jun 2019
- Condensed Matter Seminar, Ohio State University, Mar 2019
- Quantum Materials and Devices Seminar, Harvard University, Feb 2019
- Invited talk at IEEE RAPID Conference, Miramar Beach, FL, USA, Aug 2019

SELECTED CONTRIBUTED TALKS

- Hot topics speaker at International Conference on Laser Spectroscopy (ICOLS), Elba, June 2025
- Selected speaker at International Conference on Precision Physics of Simple Atomic Systems, PSAS'2024
- Selected speaker at 'Searching for New Physics at the Quantum Technology Frontier', Ascona, July 2023

GRANTS, HONORS AND AWARDS

- [SNSF Starting Grant](#) (1.8 million CHF = US\$2 million) in 2024.
- Best experimental poster award at the ETH Quantum Center meeting at Schwägalp, 2024
- Talk prize for talk on "Precision Isotope Shift Measurement in Yb^+ Search for New Boson" at the MIT-Harvard Center for UltraCold Atom's Retreat, 01/2020.
- [Marie Skłodowska-Curie Individual Fellowship Grant](#) (€265,840.20 = US\$270k), 2017
- Harvard Center for Integrated Quantum Materials Postdoctoral Fellowship (2018-2019).
- Winner of the 2015 EPSRC (Engineering and Sciences Research Council) Science Photography Competition, amongst over 250 entries. [Phys.org](#)
- American Friends of Christ Church Graduate Scholarship, University of Oxford, 2013

LECTURE COURSES

Lecturer, Experimental Techniques in Quantum and Electro-Optics, ETH Zürich Fall 2023-25
Co-lectured with Daniel Kienzler a new course on Experimental Techniques in Quantum and Electro-Optics to Physics and Quantum Engineering Masters and PhD students. Developed lecture notes for the first half of the course, on control theory, electronics and noise.

Lead Teaching Assistant, Quantum Information Processing I, ETH Zürich Spring 2023
Taught Quantum Information Processing to >100 Masters and PhD students, including giving 25% of the lectures, leading a team of seven teaching assistants and overseeing the preparation of the final exam.

REVIEWER ACTIVITIES

- Reviewer for Nature, Physical Review A, Physical Review Applied.

OUTREACH

- Participated in the Swiss Academy of Sciences [Portrait Series on Women in Quantum Physics](#)
- Talk at the opening of the "Atome Sehen" ("See Atoms") exhibit at the Swiss Science Center Technorama.
- Gave a professionally-filmed [talk on ion trapping](#) at the Boston Museum of Science in April 2019
- Guest scientist in the Boston Museum of Science's '[Ask a Scientist: quantum computing](#)'
- Presenter at the [UK National Quantum Technology Showcase](#) 2016 and 2015, London, UK

- Participated in the COST (European Cooperation in Science and Technology) network's *Ion Traps for Tomorrow's Applications* video (<https://www.youtube.com/watch?v=zAuDonQFIo4>)

PUBLICATIONS

An entanglement protocol to measure atomic parity violation at sub 0.1% precision

D. P. L. Aude Craik, [Phys. Rev. A. 113, 032802](#), [arXiv:2503.20003 \[quant-ph\]](#), 2025

Nonlinear calcium King plot constrains new bosons and nuclear properties

A. Wilzewski*, L. J. Spieß, M. Wehrheim, S. Chen, S. A. King, P. Micke, M. Filzinger, M. R. Steinell, N. Huntemann, E. Benkler, P. O. Schmidt;

L. I. Huber, J. Flannery, R. Matt, M. Stadler, R. Oswald, F. Schmid, D. Kienzler, J. Home, D. P. L. Aude Craik;*

M. Door*, S. Eliseev, P. Filianin, J. Herkenhoff, K. Kromer, K. Blaum; V. A. Yerokhin, I. A. Valuev, N. S. Oreshkina; C. Lyu, S. Banerjee, C. H. Keitel, Z. Harman; J. C. Berengut; A. Viatkina, J. Gilles, A. Surzhykov; M. K. Rosner, J. R. Crespo López-Urrutia; J. Richter*, A. Mariotti*, E. Fuchs

[Phys. Rev. Lett. 134, 233002](#) – [arXiv:2201.03578 \[atom-ph\]](#), 2024 – Featured in [Physics](#), [ETH News](#), [Phys.org](#)

**These authors contributed equally (ETH team is joint main experimental contributor). Note: In this collaboration between several groups, the ETH team's author list is italicized.*

Evidence of Two-Source King Plot Nonlinearity in Spectroscopic Search for New Boson

J. Hur*, D. P. L. Aude Craik*, I. Counts* *et al* [Phys. Rev. Lett. 128, 163201](#) – [arXiv:2201.03578 \[atom-ph\]](#), 2022 – Featured in [Physics](#)

** These authors contributed equally*

Nonlinear Isotope Shift in Yb⁺ Search for New Boson

I. Counts*, J. Hur*, D. P. L. Aude Craik *et al* [Phys. Rev. Lett. 125, 123002](#) – [arXiv:2004.11383 \[atom-ph\]](#), 2020 – PRL Editor's Suggestion – Featured in [Physics](#), [Scientific American](#), [Phys.org](#), [Physics World](#), [BBC Science Focus](#)

** These authors contributed equally*

Microwave-assisted spectroscopy technique for studying charge state in nitrogen-vacancy ensembles in diamond

D. P. L. Aude Craik *et al* [Phys. Rev. Applied 14, 014009](#) – [arXiv:1811.01972 \[cond-mat\]](#), 2020

Quantum diamond spectrometer for nanoscale NMR and ESR spectroscopy

D. B. Bucher, D. P. L. Aude Craik *et al*, [Nature Protocols 14, 2707](#) – [arXiv:1905.11099 \[app-ph\]](#), 2019

High-fidelity spatial and polarization addressing of ⁴³Ca⁺ qubits using near-field microwave control

D. P. L. Aude Craik *et al*, [Phys. Rev. A 95, 022337](#) – [arXiv:1601.02696 \[quant-ph\]](#), 2017

Hybrid quantum logic and a test of Bell's inequality using two different atomic isotopes

C. J. Ballance *et al.*, [Nature 528, 384](#) – [arXiv:1505.04014 \[quant-ph\]](#), 2015

Microwave control electrodes for scalable, parallel, single-qubit operations in a surface-electrode ion trap

D. P. L. Aude Craik *et al*, [Appl. Phys. B 114, 3–10](#) – [arXiv:1308.2078 \[quant-ph\]](#), 2014

SOFTWARE PACKAGES

qdSpectro A Python package to run spectroscopy experiments on nitrogen vacancy centers in diamond

D. P. L. Aude Craik, DOI: 10.5281/zenodo.1478113 – <https://gitlab.com/dplaudcraik/qdSpectro>, 2019