ADAM JAMES BARKER

PERSONAL INFORMATION

email	ajbarker93@gmail.com
phone	(M) +44 7853 176126
date of birth	1 September 1993

I am a 4th year DPhil student at the University of Oxford where I study the coldest matter in the observable universe. My interests extend to machine learning and optimisation methods, as well as the teaching of science. My extra-curricular pursuits include golf, rowing and competing in triathlons.

EDUCATION

2016-2020 **University of Oxford, United Kingdom**

DPhil in Atomic and Laser Physics

(In progress) Member of Magdalen College. Working thesis title: *Investigating Non-Equilibrium Dynamics and Universality using Two-Dimensional Quantum Gases*, Supervisor: Prof. Christopher Foot

2012-2016 **University of Cambridge, United Kingdom**

MSci and BA in Natural Sciences

First Class · Member of Pembroke College. Specialising in Experimental and Theoretical Physics.

2007-2012 **Ponteland High School, United Kingdom**

A-Levels

Mathematics A* · Further Maths A* · Extended Project A* · Physics A* · Chemistry A

SKILLS

Intermediate	Linux, ThinkCell, C++, SQL, Seaborn, Bayesian statistics
Advanced	python, Machine Learning, TensorFlow, Pandas, LaTeX, MATLAB, Mathematica, Linear Algebra
Other Courses	Neural Networks for Machine Learning, Python for Data Science & TensorFlow courses
Github	github.com/ajbarker93

PUBLICATIONS

Applying machine learning methods to the optimization of a quantum gas experiment, Machine Learning, Science and Technology 1 (2020), *arXiv*: 1908.08495, collaboration with Google DeepMind

Multiple-RF dressed potentials for atom interferometry, *in preparation*

Inelastic collisions in radiofrequency-dressed mixtures, *arXiv*: 1912.02737

Probing multiple-frequency atom-photon interactions with ultracold atoms, New J. Phys. 21 073067 (2019)

Anisotropic light-shift and magic-polarization of the intercombination line of Dysprosium atoms in a far-detuned dipole trap, Phys. Rev. A 98, 040502(R) (2018)

Ultracold atoms in multiple radio-frequency adiabatic potentials, Phys. Rev. A 97, 013616 (2018)

Quasiparticle energy in a strongly-interacting homogeneous Bose-Einstein condensate, Phys. Rev. Lett. 118, 210401 (2017)

Species-selective confinement of atoms dressed with multiple radiofrequencies, J. Phys. B: At. Mol. Opt. Phys. 50, 094002 (2017)

WORK EXPERIENCE

Aug 2019-present: **Data Science Consultant, Clippd**

Clippd

Responsible for statistical and machine learning-based analysis of golf-related data using TensorFlow and numpy. Production of graphical illustrations using Seaborn and other libraries.
Reference: Piers Parnell · piers@clippd.io

Feb–Apr 2018: **Invited Researcher, College de France**

College de France

Implemented new hardware on a world-leading quantum gas experiment, resulting in a factor-of-5 increase in performance. Experimental results are now published in a high-impact journal.
Reference: Prof. Jean Dalibard · jean.dalibard@lkb.ens.fr

Jun–Aug 2016: **Programme Director, CBL International Programmes**

CBL International

Ran an 8-week educational summer school at the University of Cambridge for 14-18 year olds. Responsibilities included the organisation of the academic timetable and excursions, along with the daily routine of 150 students.
Reference: Tina Jiang · tinajiang@worldstrides.org

Jul 2015–Jun 2016 Research Intern, Physics Department, University of Cambridge

University of Cambridge

Internship in Prof. Hadzibabic's group, University of Cambridge with responsibilities including the design and construction of a Bragg diffraction apparatus, producing experimental results published in a high-impact journal.
Reference: Prof. Zoran Hadzibabic zh10001@cam.ac.uk

Jul–Aug 2014 Intern, KPMG Strategy Group

KPMG

6-week consulting internship at KPMG Strategy Group. Completion of quantitative analysis for a national broadcaster and an international tour operator.
Reference: David York david.york@kpmg.co.uk

Jul–Aug 2013 Intern, HSBC Wealth Management

HSBC

7-week internship with the Wealth Management programme. Performed quantitative analysis into the performance of managed portfolio and the operation of retail bank branches in general.
Reference: David Ferguson-Rhoades david.e.ferguson-rhoades@hsbc.com

teaching experience

Apr 2017-Jun 2019 Stipendiary Lecturer in Physics, Magdalen & St Peter's Colleges

Lecturer in Physics

Tutored 1st and 2nd year mathematics, electromagnetism and statistics courses. Led development and delivery of physics access course for students from under-represented backgrounds. Interviewed >75 prospective undergraduates and assisted with admissions process.
Reference: Prof. Zhong You · zhong.you@magd.ox.ac.uk

other roles

OU Golf Club, Junior Treasurer (2018-19): Organisation of finances, accounts and budget

Pembroke College 1347 Committee, President (2015-16): Alumni relations, fundraising and development committee

CU Golf Club, Junior Treasurer (2013-14, 2014-15): Organisation of finances, accounts and budget

other information

Awards and Prizes

2015, 2016 · Pembroke College Scholar
2015, 2016 · Peter May Sports Prize Winner
2015, 2016, 2017, 2019 · Full Blue, Golf
2016 · EPSRC Doctoral Training Scholarship
2016 · STFC PhD Scholarship (declined)
2011 · Guitar - Grade 8, Piano - Grade 8
2011 · CREST Award - Gold
2010 · Bar National Mock Trial Regional Winner

Conference Proceedings

2020 · Alumni seminar on applications of machine learning, Oxford University
2019 · Invited seminar talk, Oxford University
2018 · Poster presentation at Frontiers of Matter-Wave Optics, Crete, Greece
2018 · Invited seminar talk, Newcastle University
2017 · Poster presentation at Engineering Quantum Systems, Austria
2017 · Poster presentation at Frontiers of 2D Quantum Systems, Italy

Languages

English	·	Native
French	·	Intermediate (conversational)
Chinese (Mandarin)	·	Very Basic (simple words and phrases only)

Interests

Golf (hcp 4) · Cycling (850-mile charity ride in 2012) · Running (Great North Run 2012, 2013 and 2016) · Rugby Union (College 1st XV) · Magdalen College 1st XIII Rowing · Ironman 70.3 Weymouth · OUBC Squad 2019-2020