

# danunderwood

dan.underwood88@gmail.com | <http://www.danunderwood.me>

## contact

39 Christchurch Street  
Cambridge  
CB1 1HT  
United Kingdom  
(+44) 07460 024 504

## languages

English mother tongue  
Spanish fluency

## programming

### scientific:

C++  
Fortran  
Python

### back end:

Java  
.NET (C#/VB)  
Node.js  
PHP

### front end:

Javascript  
jQuery/Angular.js  
CSS3, HTML5

### data:

SQL  
MongoDB  
Kafka

## interests

### professional

Computational physics  
Spectroscopy  
Quantum mechanics  
Astrophysics  
Software engineering  
Data science  
Machine learning  
Web development

### personal

Music  
Piano  
Fitness  
Travel  
Reading  
Drawing  
Graphic design

## education

2016	<b>PhD Physics</b>	University College London
2011	<b>MSci Astrophysics - First Class Honours</b>	University College London

## experience

Current	<b>Computer Laboratory, University of Cambridge</b> <i>Research Associate</i> Research & development for the Isaac Physics project: <a href="https://isaacphysics.org">https://isaacphysics.org</a> . Data-driven research to facilitate outreach and engagement of school students learning physics via an online, technology-enhanced learning platform. Responsibilities & skills: <ul style="list-style-type: none"><li>On-going development of online web platform (Java backend, Angular.js frontend);</li><li>Statistical analyses of user interaction data via machine learning and data scientific methods;</li><li>Teaching and various outreach duties.</li></ul>	Cambridge, United Kingdom
2016–2017	<b>Janus Technology</b> <i>Software Engineer</i> Design, coding and testing of software provided to multiple clients for a variety of different systems, including firmware and user interface applications, using a variety of technologies.	Cambridge, United Kingdom
2016	<b>Stemcell Technologies</b> <i>Application Developer</i> Development, maintenance and modernisation of in-house, PLM enterprise applications. Systematic analysis of legacy data/software and subsequent re-factoring and re-design of front-end applications to adhere to software development best practices, using a Microsoft stack.	Vancouver, Canada
2012–2015	<b>ExoMol Group, University College London</b> <i>PhD Researcher in Physics</i> Computation & analyses of spectroscopic data to provide experimental physicists with tools for characterising and understanding astronomical and industrial environments. Implementation of physical models via highly-optimised code to run on high performance computing architecture. Responsibilities & skills: <ul style="list-style-type: none"><li>Development of bespoke code (Fortran/C++) to compute quantum mechanical data from first-principles;</li><li>Data analyses (Python) and publication of work to the scientific literature;</li><li>Teaching and various outreach duties.</li></ul>	London, United Kingdom

2011–2012 **Intuitive Ltd.**

London, United Kingdom

*Developer*

Full stack, agile development for the design and maintenance of a technology solution used by many large travel company websites. Back-end, server-side development (ASP.NET) for the processing of product sales, as well as front-end development of both the client CMS and customer-facing website, built on a Microsoft stack.

## publications

- 2013 **An ab initio variationally computed room-temperature line list for SO<sub>3</sub>**  
*D.S. Underwood, J. Tennyson, S.N. Yurchenko, Phys. Chem. Chem. Phys., 15, 10118 – 10125*  
<http://dx.doi.org/10.1039/C3CP50303H>
- 2014 **Rotational spectrum of SO<sub>3</sub> and theoretical evidence for the formation of sixfold rotational energy-level clusters in its vibrational ground state**  
*D.S. Underwood, J. Tennyson, S.N. Yurchenko, P. Jensen, J. Chem. Phys., 140, 244316*  
<http://dx.doi.org/10.1063/1.4882865>
- 2016 **ExoMol molecular line lists - XIV: The rotation-vibration spectrum of hot SO<sub>2</sub>**  
*D. S. Underwood, J. Tennyson, S.N. Yurchenko, X. Huang, D.W. Schwenke, T.J. Lee, S. Clausen, A. Fateev, MNRAS, 459, 3890 – 3899*  
<http://dx.doi.org/10.1093/mnras/stw849>
- 2016 **The ExoMol database: Molecular line lists for exoplanet and other hot atmospheres**  
*Jonathan Tennyson, Sergei N. Yurchenko, Ahmed F. Al-Refaie, Emma J. Barton, Katy L. Chubb, Phillip A. Coles, S. Diamantopoulou, Maire N. Gorman, Christian Hill, Aden Z. Lam, Lorenzo Lodi, Laura K. McKemmish, Yueqi Na, Alec Owens, Oleg L. Polyansky, Tom Rivlin, Clara Sousa-Silva, Daniel S. Underwood, Andrey Yachmenev, Emil Zak, J. Mol. Spec., 327, 73 – 94*  
<http://dx.doi.org/10.1016/j.jms.2016.05.002>
- 2016 **ExoMol molecular line lists - XVII: The rotation-vibration spectrum of hot SO<sub>3</sub>**  
*D. S. Underwood, S.N. Yurchenko, J. Tennyson, A. F. Al-Refaie, S. Clausen, A. Fateev, MNRAS, 462, 4300 – 4313*  
<http://dx.doi.org/10.1093/mnras/stw1828>