# Samuel Edward Hatfield

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## EDUCATION

**DPhil Environmental Research, University of Oxford** 2015 - present

- Advisors: Prof. Tim Palmer and Dr. Peter Düben
- Expected date of completion: August 2019
- Thesis title: *Numerical precision and ensemble data assimilation*
- Thesis topics: Data assimilation, numerical weather prediction, model error, observation error

**MSci Physics, University of Bristol** 2010 - 2014

- First-class honours, average mark 78%
- Final year project advisor: Dr. Simon Hanna
- Final year project title: *Knots in geometrically-confined polymers: nanochannels and other geometries*, mark 82%

## PEER-REVIEWED PUBLICATIONS

- 2018: **Choosing the optimal numerical precision for data assimilation in the presence of model error**, Sam Hatfield, Peter Düben, Matthew Chantry, Keiichi Kondo, Takemasa Miyoshi and Tim Palmer, *Journal of Advances in Modeling Earth Systems*, **10**, 2177-2191, doi: 10.1029/2018MS001341
- 2018: **Improving weather forecast skill through reduced precision data assimilation**, Sam Hatfield, Aneesh Subramanian, Peter Düben and Tim Palmer, *Monthly Weather Review*, **146**, 49-62, doi: 10.1175/MWR-D-17-0132.1

## CONFERENCES

- January 2019: **The 7th Annual International Symposium on Data Assimilation (poster presentation)**, Kobe, Japan
  *Single-precision in 4D-Var: The impact of rounding errors on the tangent-linear and adjoint models*
  S. Hatfield, P. Düben, A. McRae, T. Palmer,
- April 2018: **SIAM Uncertainty Quantification (oral presentation)**, Los Angeles, USA
  *Reducing Precision in Ensemble Data Assimilation to Improve Forecast Skill*
  Samuel Hatfield, Peter D. Düben, Matthew Chantry, Tim Palmer
- March 2018: **The 6th Annual International Symposium on Data Assimilation (poster presentation, €500 travel support)**, Munich, Germany
  *Lowering precision in an atmospheric ensemble data assimilation system*
  S. Hatfield, T. Palmer, P. Düben
- April 2017: **EGU General Assembly (oral presentation)**, Vienna, Austria
  *Improving Weather Forecasts Through Reduced Precision Data Assimilation*
  Sam Hatfield, Peter Düben and Tim Palmer

- February 2017: **RIKEN International Symposium on Data Assimilation (oral presentation)**, Kobe, Japan
  *Improving Weather Forecasts Through Reduced Precision Data Assimilation*
  Sam Hatfield, Peter Düben and Tim Palmer
- July 2016: **The 5th Annual International Symposium on Data Assimilation (poster presentation)**, Reading, UK
  *The use of inexact hardware in data assimilation for improved weather and climate prediction*
  Sam Hatfield, Peter Düben, Aneesh Subramanian and Tim Palmer

**TEACHING**

- October 2016 - present: Computing demonstrator for Oxford undergraduate students in Physics. **Senior Demonstrator from October 2018 - June 2019.**
- Autumn 2017: Python demonstrator for Environmental Research 1st year students

**AWARDS AND SCHOLARSHIPS**

- October 2018 - June 2019: **Jesus College Graduate Scholarship**, £900 grant
- June - August 2017: **Japan Society for the Promotion of Science (JSPS) Summer Programme**
  Fully funded 2 month research stay at the RIKEN Advanced Institute for Computational Science (AICS), Kobe, Japan hosted by Dr. Takemasa Miyoshi
- November 2016: **Elsevier travel grant**
  Awarded for poster and presentation at Oxford Environmental Research student conference, £1000 cash prize
- July 2014: **Undergraduate Awards Highly Commended** Awarded for MSci thesis, *Knots in geometrically-confined polymers: nanochannels and other geometries*

**DEPARTMENTAL SEMINAR TALKS**

- Marine Meteorology Division, Naval Research Laboratory, Monterey, USA April 2018
- Scripps Institution of Oceanography, San Diego, USA April 2018
- RIKEN Advanced Institute for Computational Science (AICS), Kobe, Japan July 2017
- Atmosphere and Ocean Research Institute (AORI), University of Tokyo July 2017
- Japan Meteorological Agency (JMA) July 2017
- The Japan Agency for Marine-Earth Science and Technology (JAMSTEC, Yokohama Institute for Earth Sciences, Japan) July 2017

**PEER REVIEW**

- Quarterly Journal of the Royal Meteorological Society

## TRAINING

- July 2018: CUDA Programming on NVIDIA GPUs, Mathematical Institute, University of Oxford
- June 2016: E2SCMS Summer School (Earth-System modelling), Helsinki
- March - May 2016: Training courses on data assimilation, predictability of weather and climate and numerical methods, ECMWF

## OUTREACH

- Oxford Department of Physics Autumn 2018 Newsletter: *Five minutes with Samuel Hatfield*

## OTHER EXPERIENCE

**Microcosm Ltd., Bristol** August 2014 - August 2015

- Worked on the front- and back-ends of a two-factor authentication system, SmartSign
- Learned PHP, JavaScript, CSS and HTML

**Surrey Space Centre, University of Surrey** Summer 2013

- Designed and built a Cherenkov radiation detector
- Developed MATLAB scripts for processing data from geostationary satellites on the radiation belts

**Earth Sciences Department, University of Bristol** Summer 2012

- Studied exploration geophysics, specialising in gravity surveys
- Analysed data from geophysical surveys of Lamb Leer cave in Somerset, using MATLAB

## TECHNICAL EXPERTISE

- Proficient in: FORTRAN 90, Python (incl. Iris, Numpy), UNIX command line, Git
- Have experience with: C/C++, Matlab

## SUPERVISORS' CONTACT INFORMATION

**Professor Tim Palmer**
Atmospheric, Oceanic and Planetary Physics
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**Dr. Peter Düben**
European Centre for Medium-Range Weather Forecasts
Reading, UK
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