

# Arnau Quera-Bofarull

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Department of Physics  
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## EDUCATION

- Ph.D.     Astrophysics and Data Science, Durham University, UK (Expected 2022)
- M.S.     Physics, Heidelberg University, Germany, 2017
- B.S.     Physics, University of Barcelona, Spain, 2015
- B.S.     Mathematics, University of Barcelona, Spain, 2015

## RESEARCH EXPERIENCE

- 2017–     Institute for Computational Cosmology, Durham University, UK  
Development of HPC code to calculate black hole outflows.
- 2020–     United Nations Global Pulse, USA  
Modelling the spread of Covid-19 in refugee camps with agent-based simulations.
- 2020–     Institute for Data Science, Durham University, UK  
Main developer of the JUNE codebase, an agent-based model to simulate the spread of Covid-19 with fine grained population data.
- 2019     Centre for Computational Sciences, Tsukuba University, Japan  
Modelling of Active Galactic Nuclei accretion discs with HPC simulations.
- 2019     Centre for Research on Education and Social Justice, York University, UK  
Application of Machine Learning algorithms to predicting progression to postgraduate studies in England.
- 2019     Boeing Digital Aviation & Analytics, Germany  
Computer vision for process tracking in aircraft ground operations.
- 2018     Ibex Innovations, UK  
Computer vision for X-ray medical image segmentation.

## PUBLICATIONS

### Journal Articles

- 2021     Carolina Cuesta-Lazaro, Arnau Quera-Bofarull, Joseph Aylett-Bullock, Bryan N. Lawrence, Kevin Fong, Miguel Icaza-Lizaola, Sedgewick Aidan, Henry Truong, Ian Vernon, Julian Williams, and Frank Krauss. Vaccinations or Non-Pharmaceutical Interventions: Safe Reopening of Schools in England. *Submitted to Nature Comms., preprint*, September 2021
- 2021     Joseph Bullock, Carolina Cuesta-Lazaro, Arnau Quera-Bofarull, Anjali Katta, Katherine Hoffmann Pham, Benjamin Hoover, Hendrik Strobelt, Rebeca Moreno Jimenez,

- Aidan Sedgewick, Egmond Samir Evers, David Kennedy, Sandra Harlass, Allen Gidraf Kahindo Maina, Ahmad Hussien, and Miguel Luengo-Oroz. Operational response simulation tool for epidemics within refugee and IDP settlements. *PLOS Computational Biology (Accepted)*, January 2021
- 2020 Joseph Aylett-Bullock, Carolina Cuesta-Lazaro, Arnau Quera-Bofarull, Miguel Icaza-Lizaola, Aidan Sedgewick, Henry Truong, Aoife Curran, Edward Elliott, Tristan Caulfield, Kevin Fong, Ian Vernon, Julian Williams, Richard Bower, and Frank Krauss. June: open-source individual-based epidemiology simulation. *Royal Society Open Science*, 8(7):210506
- 2020 Arnau Quera-Bofarull, Chris Done, Cedric Lacey, Jonathan C. McDowell, Guido Risaliti, and Martin Elvis. Qwind code release: a non-hydrodynamical approach to modelling line-driven winds in active galactic nuclei. *Monthly Notices of the Royal Astronomical Society*, 495(1):402–412, June 2020
- 2018 Carolina Cuesta-Lazaro, Arnau Quera-Bofarull, Robert Reischke, and Björn Malte Schäfer. Gravitational corrections to light propagation in a perturbed FLRW universe and corresponding weak-lensing spectra. *Monthly Notices of the Royal Astronomical Society*, 477(1):741–754, June 2018

### Conference Proceedings

- 2019 Joseph Bullock, Carolina Cuesta-Lázaro, and Arnau Quera-Bofarull. XNet: a convolutional neural network (CNN) implementation for medical x-ray image segmentation suitable for small datasets. In *Medical Imaging 2019: Biomedical Applications in Molecular, Structural, and Functional Imaging*, volume 10953, pages 453–463. SPIE, March 2019

### INVITED TALKS

- 2020 “JUNE: Modelling the spread of Covid-19 in England”. Public Health England modelling group, Cambridge, UK. Jul 3.
- 2020 “Simulating UV line-driven winds in AGNs.” Hokkaido University, Japan. Feb 5.
- 2019 “Computer vision for X-ray medical image segmentation.” Rutherford Appleton Laboratory, UK, Mar 5.

### Campus Talks

- 2021 “10 reason why I use (and love) Julia” Institute for Computational Cosmology, Durham, UK, Mar 29.
- 2019 “Deep Learning and graph networks” Institute for Data Science, Durham, UK, Oct. 17
- 2018 “Simulating AGN feedback.” Institute for Computational Cosmology, Durham, UK, Dec 18.

### CONFERENCE ACTIVITY

#### Talks

- 2021 “UV line-driven winds: Dependence on black hole properties.” Black hole accretion disc winds. Durham, UK. Sep 6–9.
- 2019 “Computer vision for X-ray medical image segmentation.” Beyond the Lab. Edinburgh, UK. Jan 24.

## **Poster presentations**

2019 “UV line-driven winds”. Feedback and its role in galaxy formation. Spetses, Greece. June 25–29.

## **Sessions Organized**

2021 STFC Data Intensive Science Summer School 2021. Durham, UK. Sep 13–17.

## **GRANTS AND AWARDS**

### **Awards and Honors**

2021 RAMP Early Career Investigator Award (RECIA), Royal Society  
2020 Department of Physics Award for Excellence 2020, Durham University  
2019 No-Bull award (Carmen Optimization Workshop), Boeing

### **Grants and Fellowships**

2019 JSPS Short Term Pre/Postdoctoral Fellowship (£6,500).  
2017- STFC CDT Scholarship

## **TEACHING**

### **Durham University**

Planets and Cosmology (2017,2018,2020)  
Version control with Git (2020, 2021)

## **OUTREACH**

2019 “Changing Cosmic Perceptions”. Durham, UK.  
2018,19 “Celebrate Science”. Durham, UK.  
2018 “From Atoms to Galaxies”. Durham, UK.

## **LANGUAGES**

Catalan (Native)  
English (Fluent)  
German (Intermediate)  
Japanese (Elementary)  
Spanish (Native)

Updated September 2021