

# MIGUEL RIVERA

✉ miguel.rivera@hotmail.fr    m-rivera    Miguel Rivera    mig-rivera    michaelriver

+44 (0)7 48 11 89 300

Computational Chemistry Lecturer (Teaching). Fast learner with experience in communication and collaborative work environments.

## SKILLS

---

- **Programming**

- Expert in Python with five years of experience, and providing programming support within my research group.
- Experience working with Fortran and C/C++ legacy research codes, adapting them and refactoring them which made them useable in my group's in-house research.
- Experience scripting in bash and perl.

- **Best Practices**

- Led the development of an open source programming library ([fromage](#)).
- Wrote [technical documentation](#) for my open source project using Read the Docs.
- Experience fostering an open source project community, presenting talks and posters at conferences which resulted in external research groups using my software.
- Proficiency in designing and planning test-driven development, thanks to self-teaching of:
  - \* Version control with Git
  - \* Unit testing with pytest
  - \* Continuous integration with TravisCI
  - \* Code quality control with LGTM

- **High-Performance Computing**

- Worked on national, regional, and institutional computer clusters using MPI, and OpenMP.
- Used a Linux desktop as a principal work computer for five years, making me very comfortable with maintaining Unix-like systems.

- **Numerical Simulations**

- Generation and organisation of high dimensional and correlated data in the form of computational simulations of quantum systems and the study of their application for eco-friendly, cheap, and flexible light-interacting materials.
- Development of hybrid modelling schemes which combine pre-existing quantum simulation methods which now allows for the modelling of previously under-researched materials.

- **Data Science**

- Two in-progress publications applying newly developed modeling methods to large numbers of chemical systems, using regression analysis to aid materials design.
- Two publications on chemical theory based on comparison with experiment, advancing the field of optical technology.
- Personal project neural network experience with Kaggle using Keras.

- **Communication**

- Six publications at different stages of completion, three as lead author, presented at multiple conferences.
- Trained three graduate research students to use computational chemistry software, including my own.
- Volunteered to demonstrate computational research techniques to year thirteen students at the Queen Mary Summer School.
- Attended the Hermes Summer School 2018 with a focus on science communication.

## Miscellaneous

- Fluent in English, French, and Spanish.
- User of vim, L<sup>A</sup>T<sub>E</sub>X, Inkscape, and MS Office.
- Data visualisation with matplotlib, seaborn, Jupyter and gnuplot.
- Image manipulation using Inkscape and GIMP.
- Worked in a cross-disciplinary group of 3-8 members with different levels of experience.

## PROFESSIONAL EXPERIENCE

---

<b>UCL</b>	<i>02/2022 - present</i>
Lecturer (Teaching) in Computational Chemistry	
<b>Imperial College London</b>	<i>04/2020 - 01/2022</i>
Research Assistant in the Department of Materials	
<b>Queen Mary University of London</b>	<i>10/2016 - 03/2020</i>
Doctoral researcher in <i>Methods for Photochemistry in Molecular Crystals</i>	
<b>Queen Mary University of London</b>	<i>01/2017 - 03/2020</i>
Teaching demonstrator in <i>Computational Chemistry</i> and <i>Introduction to Scientific Programming</i>	
<b>The Happy Hour Collective</b>	<i>12/2014 - present</i>
Semi-professional guitarist for a jazz function band	

## REPRESENTATIVE PUBLICATIONS

---

ONIOM(QM:QM') Electrostatic Embedding Schemes for Photochemistry in Molecular Crystals  
 - **Miguel Rivera**, Michael Dommett, and Rachel Crespo-Otero  
*Journal of Chemical Theory and Computation* 2019 (*preprint*)

Fromage: A Library for the Study of Molecular Crystal Excited States at the Aggregate Scale  
 - **Miguel Rivera**, Michael Dommett, Amir Sidat, Warda Rahim, and Rachel Crespo-Otero  
*Journal of Computational Chemistry* 2020 (*preprint*)

Molecular and Crystalline Requirements for Solid State Fluorescence Exploiting Excited State Intramolecular Proton Transfer

- Michael Dommett, **Miguel Rivera**, Matthew T. H. Smith, and Rachel Crespo-Otero

*Journal of Materials Chemistry C* 2020 (*preprint*)

## AWARDS

---

<b>2 Talk prizes</b>	Material Research Institute 2018, Thomas Young Centre Student Day 2018
<b>2 Poster prizes</b>	Computational Molecular Science 2019, Molecular Quantum Mechanics 2019
<b>5 Grants</b>	Computing time from Materials Chemistry Consortium, total ~ £2500

## EDUCATION

---

<b>Queen Mary University of London, UK</b>	<i>10/2016 - 04/2020</i>
PhD in Computational Chemistry with Rachel Crespo-Otero	
<b>University College London, UK</b>	<i>10/2012 - 05/2016</i>
MSci in Physics with David Bowler	
<b>Lycée International des Pontonniers, Strasburg, France</b>	<i>09/2009 - 07/2012</i>
French Baccalaureate with International Option in English	