

# JON COLLINS

3/19 Torenplein, Hasselt 3500  
Limburg, Flanders, Belgium

(+32) 0468 14 33 48  
[jon.collins@uhasselt.be](mailto:jon.collins@uhasselt.be)  
[GitHub](#)

EDUCATION	<b>University of Salford</b> , Greater Manchester, UK Master of Science <b>Physics</b> <b>Grade:</b> First Class with Honors <b>Graduated:</b> July 2014 Participated in international exchange program at <a href="#">University of Toledo</a>	2010 - 2014
RELEVANT EXPERIENCE	<b>PhD Researcher</b> , <a href="#">Center of Molecular and Materials Modeling</a> Present Advisor: Prof. Michael Deleuze <ul style="list-style-type: none"><li>- Research project to investigate graphene materials by using an AI to narrow the search for materials</li><li>- I have so far developed a software package to allow simultaneous investigation multiple systems</li><li>- My current work is to expand this to allow the system to make decisions about how to direct the investigation in more depth, and allow for more advanced calculations</li><li>- I also collaborate with a group at the National Taiwan Institute on the Q Chem software package</li></ul> <b>Web App Development</b> , <a href="#">4Energy Ltd</a> July 2015 - August 2015 <ul style="list-style-type: none"><li>- Designed and developed a web app to calculate the energy use for climate control systems</li><li>- The app uses inputs from the client to calculate projected energy use</li><li>- I was responsible for modeling the systems and designing in collaboration with a contact within the company. My work can be seen at the company website, <a href="http://www.4energy.co.uk/calculator">http://www.4energy.co.uk/calculator</a></li></ul> <b>Physics Tutor</b> , Royal Oak, MI August 2014 - May 2015 <ul style="list-style-type: none"><li>- Tutored three high school AP Physics students with the goal of improving grades</li><li>- I first identified each student's problems with the material, then used resources from my own learning and online to teach the students</li><li>- All three students improved their grades over this time, from F to C, F to D and C to B</li></ul> <b>Research Intern</b> , <a href="#">Daresbury Laboratory</a> September 2013 - May 2014 Advisor: Prof. Stanko Tomić <ul style="list-style-type: none"><li>- Masters level research project using Korringa-Kohn-Rostoker method to investigate the relativistic nature of the spin-orbit interactions in semiconductors</li><li>- I managed to complete my workload ahead of schedule, so also included several II-VI semiconductors</li><li>- Also worked on a secondary project to investigate the effect on band structure of GaSb by varying the concentration of Bismuth doping</li><li>- As the code was still in development I was responsible for bug fixes and error reports, writing in Fortran</li></ul>	September 2015 -

Advisor: Prof. JD Smith

- Ab-initio simulation of black hole collisions during galaxy mergers
- I wrote the description of the physical system and came up with an algorithm to solve the problem, focusing on minimising computation time while reaching the desired accuracy
- Discovered that the combined mass determines the merger time and that stellar sized masses would not converge within the Hubble time

**Student Research, The Co-Operative Group** January 2012 - May 2012 Advisor: Dr. Lisa Simmons

- As part of a team of five we designed a mobile application for Android tablets to monitor home energy use and set manageable targets
- Our team used the scrum development method, I was chosen as project owner as well as my primary role writing the back end code in C++
- The approach and design were commended by several professors in the physics department, and was further developed by the university to monitor the energy use in buildings on campus

**TECHNOLOGIES**

C++	Fortran	Java	HTML	CSS	JavaScript
Blender	Unity with C#	Visual Studio	Eclipse	L <sup>A</sup> T <sub>E</sub> X	SQL

**EXTERNAL PROJECTS****Personal Server Build**

- During my internship at Daresbury I had trouble transferring large amounts of data, so I built a small server where I could host the data
- I wrote a piece of software to extract the desired results from the vast amount of data I produced which saved me many hours and allowed me to concentrate on more important work
- I was able to maximise my computing time on the laboratory's systems and work on analysis over the weekends, meaning I completed the project ahead of schedule and could expand the project to investigate additional compounds

**Parallel Test System**

- I have built a system of raspberry pi 2 in parallel which is used by our department to run test systems for calculations
- We have reduced the departmental spending on credit for the HPC systems, and reduced the amount of time needed to prepare calculations as we are no longer restricted by the queue system.
- I also have much greater control over this system and
- This system has also been useful in developing methods for running calculations using different codes and comparing results, an important part of my work toward my thesis.

**Physics Engines**

- I have written an engine in Java for 2D graphics, which I use to plot functions that require unusual extrapolations that cannot be achieved with standard software or researching many body problems.
- For my research group in Hasselt I have been writing a 3D engine to render molecular transitions through chemical kinetic reactions. This project uses C++ and GLFW and will be used for highlighting material properties