

How to implement a physics-related micro placement into a physics degree

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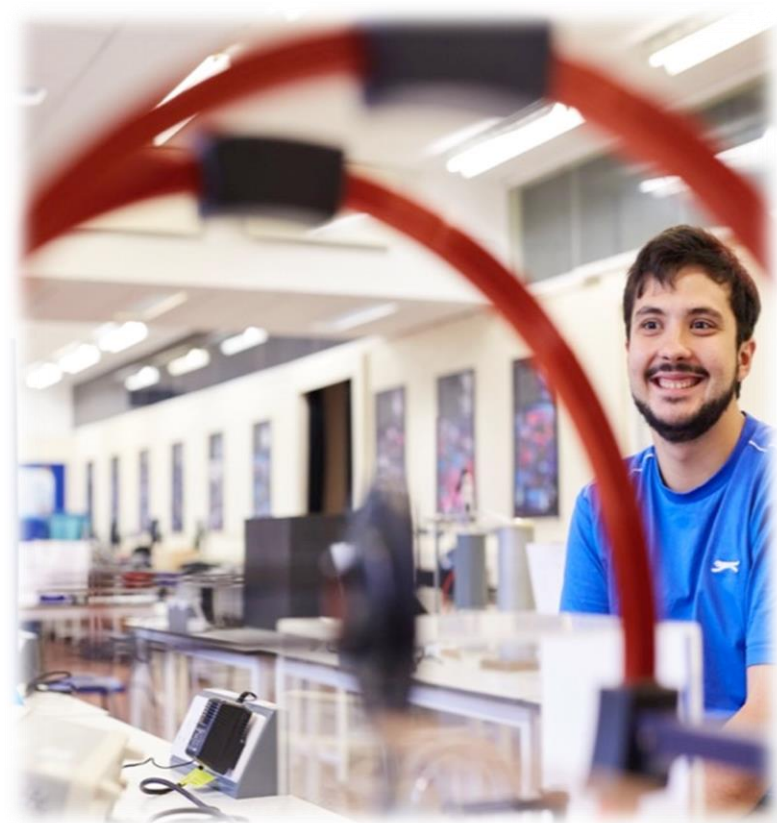


@SamLP

Employability for Physics Undergraduates

Guiding principles

- Commercial / Industrial Experience
- Student Owned Learning
- Authentic Assessment



Business or Industrial Experience

- Year in Industry
- Summer internships
- Group Industrial Project module
- **Physics into Work micro-placement module**



Physics into Work module

Year 3 optional module

Opportunity to work with
local businesses

30 hours work experience
plus reflection



Finding companies to take students

- Speculative applications
 - Personal contacts
- University-sourced placements
 - Existing relationships
 - Local SMEs
 - University spin-outs



Promoting the opportunity to businesses

✓ Web Design

Develop or maintain websites

✓ Databases

Creating and managing databases

Running queries and extracting data

Developing spreadsheets, and building formulae and macros into it

✓ Marketing

Designing digital graphics for advertising

Engaging audiences on social media accounts

Developing sales strategies to maximise profits

✓ Programming

Write computer programs to analyse and automate processes

✓ Writing

Writing blogs or articles on a technical topic, or for a technical audience

Write technical reports presenting data insights

✓ Research

Conducting research through literature reviews, labs and surveys

Competitor research

✓ Finances

Assisting in budgeting and forecasting

Processing invoices and receipts and preparing balance sheets

✓ Data Analysis

Collect, organise and interpret statistical information

Set up automated data processes

Benefits to Business

“It’s been a really positive experience for us, it’s something that we definitely want to do again because we’ve seen the benefits it can bring to our business and also we recognise that it’s really important for businesses to offer experiences like this so that students are prepared for the workplace, it’s been mutually beneficial.”

Olivia Gaunt, Group Finance Manager, Aire Global

Assessment

Principle of authentic assessment

- *Poster presentation*
- *Employer rating*
- *Individual reflective writing*



Authentic Assessment

“Authentic assessment helps students contextualise their learning to see how real-life conditions or situations, in all their unpredictability, ambiguity and complexity, affect their theoretical knowledge.”

<https://teaching.unsw.edu.au/authentic-assessment>

Omri Nolan 28/4/22



Rezatec

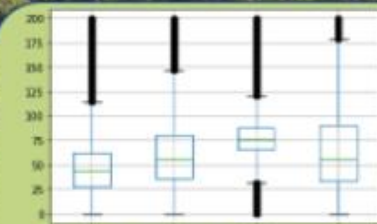
Geospatial AI for environmental applications

I undertook a 4-day placement with Rezatec, an Oxford-based start-up that uses machine learning algorithm satellite imagery to aid industries and agencies to manage environmental assets.



My tasks:

- Data analysis on satellite images.
- Making datasets easier to use and compare by standardizing them across years.
- For example, can analyze how many new houses that have been built in a floodplain, and update risk accordingly



Boxplot showing the band calibration

New skills developed:

- Improved Python skills- Jupyter Notebook, Pandas and xarrays, useful for manipulating datasets.
- Drawing conclusions from statistics and presenting them – boxplots.
- Team work - bouncing ideas off other coworkers and regularly talking about progress.

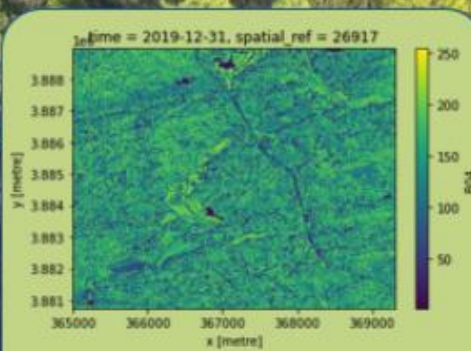


What I learned:

- Understood the use and applications of earth observations and the need for data analysis of the images to create useful products.
- Understood the whole cycle of a product, from design to consumer.
- Adapted to having flexible hours, including working from home, and a casual work environment.

Future improvements:

- Solidify Python knowledge.
- Improve my approach to coding problems.
- Ask more questions and make sure I know what is expected of me.
- Engage with other coworkers more regularly.
- Note down useful information as I work.



Example box taken from a forest dataset

Atala 201339077



**Oxford University Innovation
Rotary Generation Intern**

Task Overview

- Design electrical circuits and microgrid required for a turbine
- Conducted market research on potential investors for the renewable energy
- Organize and prepared a business case and source available funding as a means to finance the project
- Undertake re-research on potential use of molten salt battery

Things I Learned

- Teamwork and communication within a team
- Time management and prioritization between university and intern work
- Process of applying for a grant, venture capitalists, and competition
- Formal email writing to potential investors
- More insight on renewable energy especially wind turbine and molten salt battery as well as its application

How to Improve

- Read more on the topic of grants that cater to the field of renewable energy
- Become more proactive when dealing with emails
- Learn more on how to write applications and emails with appropriate detail
- Spent more time in research on molten salt batteries in order to provide a wider answer and solutions

Things I Enjoy

- Working with people of different backgrounds
- Stepping out of my comfort zone by working in an unfamiliar field
- Implementing soft skills I have from my Physics course

Benefit

Priceless real-life work experience for me to prepare and improve in my career later on as well as building relationship from colleagues in the renewable energy sector

Future Career

By doing this placement, I realized that field of renewable energy is not for me because it does not align with my passion of medical physics. However, the soft skills, exposure and knowledge I learned would be very beneficial in my future. Hence, I am very grateful for this opportunity

Balfour Beatty

with
National Grid

Presented by Lesley Meredith

Work Experience



Work Environment

During the first day I immediately felt at ease after introductions were made as the team were extremely friendly and eager to teach me. I noticed almost instantly that the work environment was extremely positive as it was clear to see there was a lot of trust, cooperation, and a strong work ethic. The eagerness and passion of the team made me confident that the experience was to be invaluable and provided me with the confidence to ask questions and make the most of the week.

Basic Description of Work

I got to experience first-hand and gain an understanding of all the various sectors of a project such as innovations, community engagement, quality control, health, safety, environmental and commercial. I saw the sheer amount of work and detail that gets applied at every stage of the project.

Throughout the week I took part in multiple site visits, each visit being with an employee from a different sector (i.e., health and safety advisor or environmental advisor).

In addition, I assisted the HSES manager in presenting data to senior management by compiling the data in excel, analysing them and creating graphs where I saw appropriate. Similarly, I also created a dashboard summarising vital information which is being used by the HSES manager in monthly progress presentations



Skills Developed & Improvements

Skills I've developed:

- Overall awareness of the industry, project operations & its different sectors
- Professionalism, organizational, analytical
- A lot of new technical knowledge

Skills I'd like to improve:

- Confidence within myself and the skills and knowledge I possess
- By studying and sitting a HSES test as a first step into the health and safety industry, there are more advanced courses and tests I'd like to take to develop my expertise



Future Career

Before the placement:

- Misconception of the operations of a large-scale project
- Naivety of the variety of work that can be undertaken
- Lack of confidence with graduate job

After the placement:

- Understanding of the variety of sectors involved in a project and the job roles & responsibilities within those sectors
- The number of people and businesses involved in a project,
- Awareness of the industry and how it ties into my graduate role
- More confident with the graduate role I've secured
- Increased workplace awareness
- Expanded my sphere of knowledge and gaining an interest in different fields



nationalgrid

Balfour Beatty

Personal Reflection – Why?

“In the past I have often completed tasks and never evaluated my performance even when feedback has been given to me.

Now I recognise the importance of this process and understand what a valuable skill it is to have as it can help me to not make the same mistakes and improve how I act in many situations.”

Skills identified by students

- Professionalism
- Confidence
- Teamwork
- Networking
- Communication
(verbal and written)
- Business acumen and commercial awareness
- Time management / organisational skills
- Reflection
- Data analysis and presentation
- Technical knowledge
- Research skills
- Coding / programming
- Decision making
- Critical thinking

“Now I feel more comfortable with communicating in a professional environment.”

Impact on career thinking

- Considering a role in a smaller company
- Understand how Physics skills can be put to use
- SMEs vs larger organisations
- On site / hybrid / home working
- Increased confidence
- Changes in career plans

“This appointment has taught me to be less afraid of challenging opportunities and to be more confident in my abilities.”

In summary...

- Employers create authentic meaningful experiences
- Students can identify skills
- Impact on career thinking and success

Thank you!

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*"I feel I am now
closer to realising
what I want from life
and my career"*