



WORK PLACEMENTS FOR PHYSICS STUDENTS

Case studies and tips from employers

SEPnet

South East Physics Network **Employability**

ABOUT SEPnet

SEPnet (The South East Physics Network) is a consortium of nine partner university physics departments working together to advance and sustain physics as a strategically important subject for the UK economy and its science base in the South East of England. SEPnet's Employer Engagement Programme provides 8-week summer placements and other employer engagement opportunities for physics students.

SEPnet works with industry to address skills needs and creates opportunities for industry and SEPnet partners to work more closely together. There has never been a better time to study physics. STEM graduates, especially those in physics, are in great demand in many sectors including defence, energy, engineering, finance, IT and many more.

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WHY PLACEMENTS ARE IMPORTANT

There is strong evidence that placements are extremely valuable to students for improving academic performance and employability. Placements can provide the opportunity to:

- Gain knowledge specific to your subject
- Develop transferable (employability) skills required for the world of work eg communication, problem-solving, team-working, commercial awareness, project management
- Learn about an industry or sector and make better informed decisions about career choices
- Make useful contacts
- Provide evidence of skills and experience on your CV

- Get a reference
- Gather useful examples to use in competency-based job applications or interviews.

Employers, especially SMEs (small and medium-sized enterprises), seek graduates with the employability skills to hit the ground running.

Work experience can help develop the skills you need to succeed in a competitive job market.

Employers are increasingly using work experience as an integral part of their recruitment strategy. A recent survey of employers shows 69% of students on placements were offered graduate jobs (ASET).

This booklet includes tips from employers on applying for placements and jobs and provides placement case studies giving first-hand accounts of the benefits to students and employers.

"Work experience can help students make contacts and build up a portfolio of evidence to support their applications. It can also help students figure out which occupations and industries they do not want to work in." (HECSU)



"I wanted to do something worthwhile with my summer by gaining invaluable experience which would let me tailor my final year at university. I am now able to choose appropriate modules, go to exciting events related to tech start-ups and perhaps get further relevant experience in the industry." Third year student, Queen Mary University of London

"When you get a good candidate then it's really worthwhile for a small company like us. It's also great for networking and building new relationships." SME

HOW TO MAKE A SUCCESSFUL APPLICATION - TIPS FROM EMPLOYERS

Whether you source your own placement, apply to a company scheme or through programmes such as SpIN (Space Industry Network) or SEPnet, you should get support from your Careers Service as well as following the tips below:

CVs and covering letters

- Apply early to make your application stand out; it shows you are keen and well-organised!
- Make sure your covering letter is addressed correctly and tailored to the role
- CVs should be neat, checked for spellings and not too long
- Covering letters and CVs should be in the same font throughout
- Make sure your CV shows how your studies are relevant to the role
- Show evidence of relevant academic and professional skills in your CV – e.g. computing, presentation skills etc
- Your covering letter should state why you are interested in the project and include relevant academic modules and projects
- Show evidence of your skills with examples
- Draw on relevant outside interests/experience - *“the impressive candidates had CVs which showed a good balance between academic success and getting their hands dirty with real-world modelling problems, or data science-type techniques/projects outside of their university work.”* (SME)

Interviews

- Research the topic of the project and the organisation before the interview
- If you mention anything in your CV or covering letter, be prepared to talk about it at interview
- Be prepared for technical questions on relevant material
- Be willing to have a go at questions even if you don't know the answer
- Revise basic physics
- Show enthusiasm for the placement project/your subject
- Gain some interview practice. The successful candidates *“answered questions clearly and well and demonstrated skills with well-explained examples.”* (SME)

SUMMER PLACEMENT CASE STUDIES



Student: Lennart Balkenhol,
University of Sussex
Placement: Touch
Fantastic
Role: Software Developer

Describe a typical day:

I worked on developing applications for iOS. This broke down into raw programming, as well as design and user experience work.

Why did you decide to do a placement?

I genuinely enjoyed the programming part of my degree and was intrigued by new programming languages. I was interested in the application of skills I acquired during my degree in a modern work environment.

Would you recommend doing a placement?

I can most certainly advise everyone to participate in a placement, even in fields you would not immediately consider a career in.

How do you think doing a placement has benefited you for the future?

Through my placement I expanded my skills as a programmer, this is going to be useful as programming will remain a part of my physics degree. The internship also enhanced my logical thinking and problem-solving skills which are essential to being a good

physicist. Furthermore this placement gave me the opportunity to explore software development as a possible career path for myself.

What are your next steps?

After finishing my internship at Touch Fantastic I will continue working for the company on a part-time basis during my studies.

Employer perspective:

It was great to have Lennart as part of the team for the summer. He joined us at a very busy and exciting time and he played a key part in bringing a new product to market. We're looking forward to having his support on a part-time basis as he continues with his studies.



Student: Sophie Bashforth,
Royal Holloway University of
London

Placement: Culham Centre for
Fusion Energy (CCFE)

Role: Research into tritium
plant analytical spectroscopy

Describe a typical day:

The work I did each day varied which meant I got to experience a lot of the different sides to working at CCFE. I spent most of my day working on a written report for the Active Gas Handling System (AGHS) operators which focused on useful spectroscopy techniques that could be implemented in their subsystems.

Why did you decide to do a placement?

I wanted to get some work experience in a physics-related environment to help me decide whether to pursue a career in physics. I knew that it would help me to develop a lot of valuable skills, as well as give me an opportunity to learn first-hand about an area of physics I had not previously studied in much detail.

Would you recommend doing a placement?

Most definitely! I had no idea what to expect of my placement before I arrived but it has been incredibly useful to me in so many ways. I have a much better insight into what it would be like to work in a research-based environment and it has really encouraged me to pursue a career in physics. I have also met a lot of really lovely people whom I hope to stay in touch with!

"I had no idea what to expect of my placement before I arrived but it has been incredibly useful to me in so many ways."

How do you think doing a placement has benefited you for the future?

Having this work experience on my CV will be highly beneficial. It enables me to actively demonstrate a lot of valuable skills to a potential employer. I have learnt an incredible amount about fusion energy as well as a wide range of spectroscopy techniques which, I imagine, will be very useful to me in the future.

Employer perspective:

Sophie has surpassed all of our expectations completing a very large amount of high quality work in the short amount of time she's been with us. The report that she has completed will be extremely beneficial to the whole group and will influence changes we plan to make to the JET tritium handling plant.



Student: Brennan Hackett,
University of Surrey
Placement: IPROS Cube
Role: Business Analyst

Describe a typical day:

IPROS Cube is located in the Surrey Technology Park, inside an incubator. This open office contains other small software start-ups with non-competing objectives. My typical hours were from 9:00 to 17:00, however these times were flexible and I had the option to complete my assignments from home. As my supervisor was

frequently attending meetings and travelling, most of my work was done independently. I would begin my day by either emailing or discussing an objective with my supervisor and work towards that objective for the rest of the day. I would then email or discuss my progress with my supervisor.

Why did you decide to do a placement?

In order to keep my options open. I wanted to work over the summer in an area that applied what I had studied in my degree. I also wanted to have some work experience before I applied for year in industry opportunities.

Would you recommend doing a placement?

Definitely, it was a great way to reaffirm my studies over the long summer break and gave me some financial freedom once term started again.

How do you think doing a placement has benefited you for the future?

This placement has widened my skills base and demonstrated my credibility. The opportunity to independently execute my own project has built my confidence and gives me a topic of discussion when attending interviews and completing applications.

What are your next steps?

I hope to continue working with databases or learn another programming language next summer. This has already opened many doors for internships and Insight weeks in information technology positions and I look to pursue those fields in future.

“The opportunity to independently execute my own project has built my confidence.”



Student: Thomas Mann,
University of Portsmouth
Placement: QinetiQ
Role: Training Scientist

Describe a typical day:

In the first two weeks I worked on a number of scientific and computational projects. From week three I had a specific project assigned to me, along with a budget. This advanced optics project was to research an alternative 3D technical demonstration method for large groups. My solution was to design and develop a custom 3D projection suite from scratch. The hardware research was interesting as well as the software requirement of developing escalation of violence scenarios in commercial software to integrate into existing demos.

Why did you decide to do a placement?

I wanted something on my CV to distinguish me from others when applying for jobs. I have learnt technical skills, applying my physics knowledge and common sense to the projects. These include developing electrical knowledge, a greater understanding for engineering principles and software development of scenarios. This placement has enabled me to work as a member of a team on some projects and as project lead on my main project.

Would you recommend doing a placement?

I would have no hesitation in recommending a placement. I gained experience, developed a good network of contacts and picked up the routine of working quickly. A successful placement shows potential future employers you are capable of applying your physics

Knowledge, developing your critical thinking skills for an industrial project and understand what employment entails.

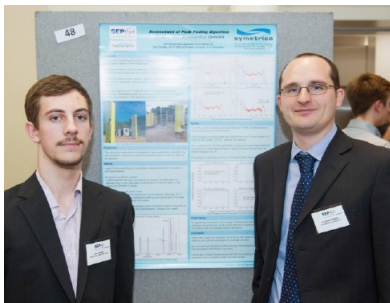
What are your next steps?

I may not have considered QinetiQ, or any company in this sector, in the past but this has opened my eyes to the many interesting career paths available. I have been asked back to an open day for graduates and secured a position with QinetiQ on their Simulation Systems Engineering Graduate Scheme.

Employer perspective:

Thomas had learned a great deal about simulation techniques applied to training and about the software packages used by the training simulation section. Thomas came up with a novel simulation scenario to demonstrate a 3D display project he was working on, demonstrating a good level of critical thinking.

"Being given a lead role and responsibility for the budget was excellent experience and has enabled me to put something on my CV that differentiates me from others."



Student: Sam Rowley,
University of Southampton
Placement: Symetrica
Security Ltd.
Role: Algorithms Team Intern

Describe a typical day:

I would start by having a meeting with my supervisor to discuss my aims for the day or the week, along with a discussion of results from the previous day or any problems I had encountered. Days would generally be spent analysing data from previous experiments and drawing conclusions from that data. I would also run my own simulations on that data and write up my findings. Some days were spent collecting test data at Symetrica's on-site test facility.

Why did you decide to do a placement?

I decided to do a placement to boost my CV and to get an inside perspective on physics in industry. This internship enabled me to do both.

Would you recommend doing a placement?

Definitely, I had an excellent experience. Team-working was crucial and I developed my communication skills along with some valuable computing experience and data analysis skills. I also had the chance to develop my report writing and scientific writing style.

How do you think doing a placement has benefited you for the future?

Not only has the internship helped me develop many valuable skills but now I also know that at some point I would like to work in a physics-related industry.

What are your next steps?

The internship inspired me to perform better than I ever have previously - having seen what I am working towards. I plan on applying for a PhD or industry position next year.

Employer perspective:

Working with students over the summer gives benefits to both Symetrica and the students. Being able to introduce students to the experience of working in a physics-based SME provides an insight for them into the differences between academia and industry and the additional skills required for industry. For the company having skilled physics students can provide an injection of new ideas as well as additional effort and critical analysis of projects. Sam took on and succeeded in all the analytic and experimental challenges given to him.

"The internship inspired me to perform better after having seen what I am working towards."



Student: Jessica Schonhut,
University of Hertfordshire
Placement: HCL/Xerox
Role: Statistician/Process
Engineer

Describe a typical day:

On a typical day I worked on my statistical model, building different simulations. For this I was mostly left to my own devices to work out the software. This is how I like to learn, however I always knew there was support if I needed it. Some days there would be a meeting to discuss how I was getting on. I also worked with other process engineers to do hands-on tasks such as fixing machines and during my time

completely dismantled and reassembled a machine. This was valuable engineering experience you do not gain with a physics degree.

Why did you do a placement?

I wanted to gain experience outside of study time to enhance my CV and help me have an edge when coming to choosing my career. It was also useful to have the extra income in the summer months.

Would you recommend a placement?

YES! They are invaluable for gaining knowledge and skills that you cannot get in the classroom! Employers also seek people with experience and the company you work for may even suggest you come back when you finish or invite you back for a further placement.

What benefits have you gained from this placement?

I gained valuable engineering skills which I otherwise would not have. I also learned to use complex statistical modelling programs which will be helpful in my chosen career in astrophysics.

What are your next steps?

To complete my degree and move on to a PhD.

Employer perspective

The main reason for employing a student is to get fresh ideas, use those new ideas, raise the profile of the team internally and become a centre of excellence. It also looks good for the student on their CV. HCL are on the SEPnet employer panel and strongly support their ideas and strategy.

"I gained valuable engineering skills which I otherwise would not have."



Student: Jake Simpson,
University of Sussex
Placement: Brighton &
Sussex University Hospital
Role: Radiotherapist

Describe a typical day:

I worked on a piece of software to analyse the qualities of X-rays. A typical day was largely coding in the medical physics department offices.

Why did you decide to do a placement?

I felt I needed work experience previous to trying to get a medical placement for future employability. I found myself strongly considering medical physics as a future career but realised I had no real idea of what it entailed.

Would you recommend doing a placement?

Absolutely. It's been a rewarding experience that has shown me the kind of work I may find myself doing in the future.

How do you think doing a placement has benefited you for the future?

If I choose to pursue a career in the field, the relevant experience will help me beat competition. If not, the work experience will be still useful.

What are your next steps?

I need to finish my Physics BSc degree. Afterwards I will likely need a break from studying and work. I'll have to decide on a course of action then, whether to pursue medical physics or look to other careers.

Employer perspective:

Having a student to help with the project I've been running has been very helpful. It's something that has often been put to one side in favour of more pressing issues. I'd therefore say that this placement has been very successful. It just so happened that there was a project I wanted to run that could be done by someone with Jake's knowledge and experience level.

"I found myself strongly considering medical physics as a future career but realised I had no real idea of what it entailed."



Student: Joy Talbot,
Queen Mary University of
London
Placement: Neur
Role: Junior Data Scientist

Describe a typical day:

My role was to research and help build a new question and answer system for Neur's business intelligence service. I checked my emails and the team task board to see which tasks I needed to

complete, I read research papers and focused on particular areas of interest, aiming to find existing tools and techniques or enough information to build my own. This stage included team meetings to brainstorm ideas and design solutions. Following this, I wrote reports so that team members could follow them when building the system then wrote the algorithms for each individual component ensuring that they were easy to follow.

Why did you decide to do a placement?

I wanted to see how my physics degree could be applied in the real world. Whilst I knew I wanted to work in a fast pace, exciting environment involving analysis and problem-solving, I didn't know which role I would be best suited to. I wanted to use the placement to find out where my strengths lay, improve my current skills, build new ones and see what tasks I particularly enjoyed.

Would you recommend doing a placement?

I would absolutely recommend doing a placement. Not only have I developed personal and professional skills ranging from organisation to

programming but I have had my eyes opened to what it is like working for a tech start-up – something I had never considered before. Don't just do a placement, do one at a start-up!

How do you think doing a placement has benefited you for the future?

It has allowed me to vastly increase my programming skills in C#, learn how to write effective and accurate algorithms, improve on communication skills through continuously presenting my findings to the CEO and given me a deep understanding of natural language processing, machine learning and statistical analysis. This was my first experience of working in a professional environment which has taught me about what work will be like when I graduate and what will be expected of me.

What are your next steps?

I have been offered a graduate job which shows what a fantastic opportunity the placement is for making connections. I hope to continue developing the skills I have gained during my internship and look forward to returning to Neur!



Student: Rhiannon Williams,
University of Kent
Placement: Online Lubricants
Ltd.
Role: Customer profiling
through data management

Describe a typical day:

I'd be given mini tasks such as checking for any negative stock levels and investigating where they have come from and carrying out small surveys to find out how confident the sales team were in the stock levels shown on the system. The work involved desk and PC work so I liked to break my day up by visiting the warehouse and doing a few jobs like

counting stock. The placement made me realise that, although most jobs come with a certain amount of desk time, primarily I would like to be active during my working day.

Why did you decide to do a placement?

At the end of my third academic year it became apparent to me that a summer placement could be a crucial factor that may set me apart from other applicants when I complete my degree and start applying for jobs.

Would you recommend doing a placement?

I am so thankful that I took a summer placement between my third and final year and would advise everyone to try and do the same. Even if you don't get your ideal placement, you will still learn invaluable skills that you can take forward to your working life. Even if it just makes you a little more organised, it's all still worthwhile.

How do you think doing a placement has benefited you for the future?

I have learnt about being in a real working company where the work that I do actually affects the company and the way in which it is run. I was given a fair amount of responsibility and independence in my work and so it'll definitely benefit me in my final year of university and having a 9-4 routine every day, excluding travel time, has helped me with my time management.

"Even if you don't get your ideal placement, you will still learn invaluable skills that you can take forward to your working life."



Some of the many employers who have offered SEPnet placements:

Amec Foster Wheeler, BAE Systems, Culham Centre for Fusion Energy, Ensilica, eOsphere, Good Energy, HCL/Xerox, Lein Applied Diagnostics, Met Office, National Physical Laboratory, Online Lubricants, QinetiQ, Rutherford Appleton Laboratory, Selex ES, Symetrica, Thales Group, TWDK, Touch Fantastic, Ultra Electronics and Weald Technology.

For more information about the SEPnet summer placement scheme and employer engagement, email: employerengagement@sepnet.ac.uk



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Students' Expo photography: Paul Stead Photography www.paulsteadphotography.co.uk.
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