



Annual Report

1 December 2015

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# 1. INTRODUCTION – VISION AND GOALS

The first year of the Exeter student chapter has seen the society go from strength to strength, taking its membership from both postgraduate and undergraduate physics students.

The Exeter chapter has chosen to focus its aims on two main objectives: The first of these is to promote science to a non-specialist audience, most commonly pre-university students, and the second is the professional development of its members. The chapter has run activities in local schools and has plans to run more of these events. . The chapter has organised trips to the Met Office in Exeter, which employs a large number of physics graduates. The chapter also runs events which gives members a relaxed atmosphere in which to develop important communication skills. Over the course of the next year the society aims to develop stronger links with schools in the area by running a range of events and to increase the opportunities for professional development of its members.

## 2. STUDENT CHAPTER MEMBERS

Committee members are elected at the AGM held in Exeter's Spring Term. The current (2015-16) committee were elected on 27<sup>th</sup> April 2015. Our current committee members are as follows:

Position	Name	e-mail Address	SPIE membership #
President	Chris Beckerleg	<a href="mailto:cb362@exeter.ac.uk">cb362@exeter.ac.uk</a>	3642282
Vice President	Rayko Stantchev	<a href="mailto:ris202@exeter.ac.uk">ris202@exeter.ac.uk</a>	3642383
Secretary	Lauren Barr	<a href="mailto:lb499@exeter.ac.uk">lb499@exeter.ac.uk</a>	3652546
Treasurer	Chris King	<a href="mailto:cgk203@exeter.ac.uk">cgk203@exeter.ac.uk</a>	3645964
Outreach	Joe Wahab	<a href="mailto:jw542@exeter.ac.uk">jw542@exeter.ac.uk</a>	3645894
Alumni co-ordinator	Martin Gentile	<a href="mailto:m.j.gentile@exeter.ac.uk">m.j.gentile@exeter.ac.uk</a>	3600303

Our non-officer student chapter members are (as of 23-11-15)

Tom Collier  
Aldo De Sanctis  
Dan Hewson  
Ben Hogan  
Peter Karlsen  
Kishan Menghrajani  
Alba Paniagua Diaz  
Illia Starshynov  
Martha Vardaki  
Natalie Whitehead  
Claire Woollacott

Total number of members: 17

Our faculty advisor is Prof. Paul Reynolds (email: [p.reynolds@exeter.ac.uk](mailto:p.reynolds@exeter.ac.uk))

### 3. Activities

- Social in Boston Tea Party

To kick off the start of a new academic term the SPIE chapter ran a social event in a local teashop. The event was aimed at giving new members a chance to meet the committee in a relaxed atmosphere. We discussed ideas for the upcoming term and ended up getting a lot of positive feedback and excitement about these events.

- Student Lecture Series

At the beginning of this term, it was decided by the chapter that an opportunity to formally share our work with a wide audience within the University would both enhance presentation skills and improve collective knowledge. In order to achieve this, a Student Lecture Series (SLS) was organised, where chapter members give a short presentation on their research, an interesting piece of physics or a recent paper with an exciting result. In our first session, talks were given by chapter members Rayko Stantchev and Martha Vardaki on "Single Pixel THz Imaging", and "Deep Raman Spectroscopy for Cancer Diagnosis". A great turnout from both staff and students highlighted the interest within the department in the cutting-edge research SPIE members are involved in, and set the tone for the following lectures in the coming months.



- SPIE – Mad Presentations

The Spring Fling is an annual multi-disciplinary event organised by physics postgraduate students. In May 2015, the Exeter chapter contributed their own fun event in the form of a presentation skills competition for a few of the faculty. In the weeks leading up to the occasion chapter members prepared a few slides on a topic of their choice – the more obscure the better! Entries included themes such as, "Selfies", "The Mechanics of Banana Peels" and "Why Do Engineers Love Cheese?" A handful of brave staff members put themselves forward to randomly select one of these presentations blind, and to present it to a room full of their students and colleagues. The crowd then voted for their favourite Mad Presentation by cheering the loudest, and the winner was awarded with a small prize. With plenty of biscuits and laughs all round, this endeavour proved to be one of the most memorable of the year.



- **Industrial visit to the Met Office.**

On the evening 12<sup>th</sup> August three of our members attended an outreach event organised by the IOP at the Met Office in Exeter; one of the world leaders for weather and climate prediction. This was attended by a total of about forty people. The event began with a tour of the modern, picturesque building and an informal chat with some of the scientists as they were on the job, including experts in day to day forecasting, the use of satellites and marine weather forecasting. The tour also included a visit to the powerful supercomputers used for storing and processing the large volumes of data required for weather forecasting. The evening concluded with two talks by experts giving an introduction to the science of weather prediction and climate change. The event was an excellent opportunity for members to get an impression of how science is used outside an academic environment.

- **Optics lessons at Exeter Deaf Academy**

As part of enthusing children about optics, the SPIE chapter organised a visit to the Exeter Deaf Academy. We had a great morning with the students and teaching them different principles of light. We were able to work with students from a range of different year groups and abilities. Communication wasn't a problem as they had plenty of staff to translate for us and the visual nature of our experiments made it really easy for them to understand what was going on and work with minimal input. We got lucky too, because they were selling cake to raise money for charity! We ate cake together and agreed to do the same next year.

- **Optics Workshop for trainee teachers (PGCE students)**

The local teacher training course overseers are always on the look out for professionals to come in and demonstrate simple yet interesting experiments. On Thursday 22<sup>nd</sup> October, several members of the Exeter chapter demonstrated a series of optical experiments to trainee science teachers. The aim of this workshop was to give teachers inspiration for lessons in their science classrooms. The experiments that the SPIE members demonstrated were:

1. How to build a hand-held spectrometer for visible light, where we provided the links for the diffraction gratings and a paper cut-out nets for the construction of the hand-held spectrometers,
2. The polarized nature of light using two cross-polarizers as well as what happens when you sandwich a birefringent material (sellotape in our case, in-between the two polarizers);
3. We show how to measure the diffracted orders when a laser is incident onto a CD.

For each experiment, we provided an adaptable worksheet complete with resources for teachers. The trainee teachers were impressed by the relatively simple experiments and the physics behind them, they all appreciated our demonstrations and looked keen to try them in class.



- **The Big Bang South West 2015**

The Big Bang South West was held on Thursday 25th June 2015. The event was hosted by the University of Exeter in collaboration with the Devon Education Business Partnership. The event is the largest celebration of science, technology, engineering and maths for young people in the UK, and is attended by 1,700 students aged 7-19 years from schools in the South West.

The Exeter SPIE student chapter hosted a stand throughout the event to showcase a number of different optics experiments. Children, parents and teachers were able to interact with the crew at the stand by asking questions about the demonstrations and trying out the experiments, thereby deeply engaging them with exciting physics at hand in a fun and interactive way.



- **Norman Lockyer Observatory Trip**

In November 2014, the chapter organised a trip to the Norman Lockyer Observatory, located near Sidmouth, just outside Exeter. This event was open to members and non-members of all ages, as an enjoyable and educational outreach activity. During the visit, the attendees had the opportunity to learn about the history of the observatory and the man behind its name. Norman Lockyer himself discovered Helium in the sun's corona in 1868, and founded the journal Nature in 1869. In addition, everyone enjoyed a private tour of the several telescopes on site, watched as meteors were detected in real time, and finished off the evening watching the stars above; unfortunately the night was overcast, so the stars were provided by the state-of-the-art planetarium the observatory boasts! The trip was a huge success, and another has been planned for this year.

- Photo competition and exhibition to celebrate IYL2015

In order to celebrate the International Year of Light and excite the general public about science the SPIE chapter hosted a photo competition on the theme of "Light". This event proved to be a huge success, reaching over 8,000 people on social media and the current president of the Institute of Physics Prof. Roy Sambles was on hand to award the prizes. The winning entry is shown below.



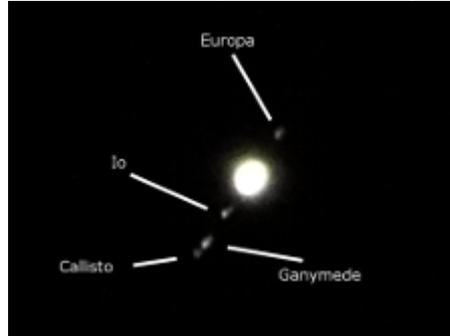
- Partial eclipse viewing party

On the 20<sup>th</sup> March, a partial eclipse occurred in the UK, and the Exeter chapter took part in its celebration and observation. Setting up our small telescope, laptop with Stellarium installed and a few pairs of solar eclipse glasses, many students got to observe the crescent sun, and became aware of our fledgling chapter.



- Observing night on campus with telescopes

On 29<sup>th</sup> April, the Exeter chapter hosted an observing night on campus with the help of three telescopes, and a big bag of food. We had a superbly clear night, and were able to make observations of Mercury, Venus, craters on the Moon, and the bands and moons of Jupiter. We had a total of around twenty physics undergraduates in attendance, and a pleasant evening was had by all.



- IOP conference "Focus on light"

On Friday 5th June four of our members attended a meeting at the University of Bristol entitled "Focus on light" organised by the IOP's History of Physics Group. This consisted of many varied and interesting academic talks around the theme of light to promote the international year of light. The presentations covered a range of topics from the history of light and light technologies to cutting-edge research in quantum information and light in biological systems. Lunch provided the opportunity for socialising and networking.

## 4. FINANCES

Before receiving funding from SPIE in 2014 and 2015, we provided draft budgets to indicate how the funds would be used. The actual expenditures for the chapter are given in the table below. It should be noted that significant savings were made on some of the proposed activities and therefore enabled us to use savings in other ways.

For both the Norman Lockyer Observatory and Met Office trips, £117.30 was allocated for a 17 seater minibus. However, given the number of people who had cars and were able to provide transport, we found that money could be saved by paying for drivers' petrol and using taxis for the remaining people. The astronomical observing trip to Dartmoor was unfortunately not possible due to the weather. However, an equally fulfilling and popular gathering observing the night sky was held in Exeter and therefore led to savings in transport and food of £113.42. With the savings made, we thought it appropriate to use the money for advertising the chapter through our Facebook page by purchasing a camera and uploading photos of our events, a 'pop-up' banner to be kept at the entrance to the physics building at the university and specially designed T-shirts to be worn at outreach events. As a result our Facebook page is thriving and we are continually gaining wider interest across the university and getting new members.

Although, we were not able to make use of the visiting lecturer program as planned (to which £265 was set aside), we instead plan to do an exchange visit with the University of Southampton student chapter, the details of which are provided in the final section.

Event	Description	Income	Expenditure
Grants and Funds	2014 SPIE funding	£434.54	
	2015 SPIE funding	£589.62	
	Outreach	£6.98	
Norman Lockyer Observatory trip	Admissions (£3 per SPIE member), petrol and taxis		£130.80
Photo competition	Booking forum and display and printing costs		£134.25
	Catering		£20.81
Lecturer presentation skills competition	Wine for winner		£9.99
"Focus on Light" conference	Petrol		£33.00
Optics lessons at Exeter Deaf Academy	Petrol		£5.00
Advertising	T-shirts		£39.26
	"Pop-up" banner		£115.00
Equipment	Camera		£59.99
	Polarising films and diffraction gratings		£71.98
Optics and Photonics conference	Poster		£27.00
Met Office trip	Petrol		£5.00
Total		<b>£1031.14</b>	<b>£652.08</b>

Closing balance: **£379.06**

## 5. OUTLOOK

Events in planning:

- *Norman Lockyer Observatory and Planetarium trip 2015.* Last year we organized a trip to a local observatory. It was a great success and thus we are organizing it again this year. Hopefully we have a clear night sky this year.
- *Student lecture series #2.* We have decided that an easy way to give current students a chance to improve their presentation skills is to start a monthly 'lecture' type series where people volunteer to give 20 min presentations on a general science topic or their own research. We ensure the event is adequately advertised.
- *Primary schools experiments day in March 2016.* The idea is to give the opportunity for some young school students, aged between 7 and 13, to perform experiments that investigate the nature of light using the equipment in our university. We will invite pupils to submit questions, on the theme of light, which can be answered by performing experiments. Example questions: "Can light travel through water?" and "Does light travel around solid objects?" We will then select the best questions and the pupils who asked these questions will come to the University find their answer by performing an experiment.
- *Unforeseen presentations.* This was a comedy type event where we show the importance of knowing what is on the next slide of your presentation. In short, we put together some presentations and get some of our academics to present these presentations without ever seeing them until the moment that they are presenting them. We did this last year, however we booked a room too small for everyone that showed up and thus this event raised the local awareness of our chapter a lot. We are hoping to have this as an annual event every spring.
- *Exchange visit with Southampton University student chapter.* As we are a new chapter, we have no connections to other student chapters. To start building connections, we are currently organizing with the chapter at Southampton University to visit us in January 2016. The hope is that they can teach us from their successes and failures, and we will show them our facilities and keep them entertained. There is a plan for us to visit them in 2016 but we don't know when as of yet.
- *Send an officer to Optics + Photonics.* We have asked current members if they would like to travel to one of the available conferences and, more importantly, their reason for wanting to go and how they hope this would benefit the chapter. We currently have 3 applicants, all of which want to go to *Optics + Photonics*, and the committee is currently in the process of deciding who to select.