

SPIE. **STUDENT
CHAPTER**
UNIVERSITY OF
SOUTHAMPTON



2016 – 2017
ANNUAL REPORT

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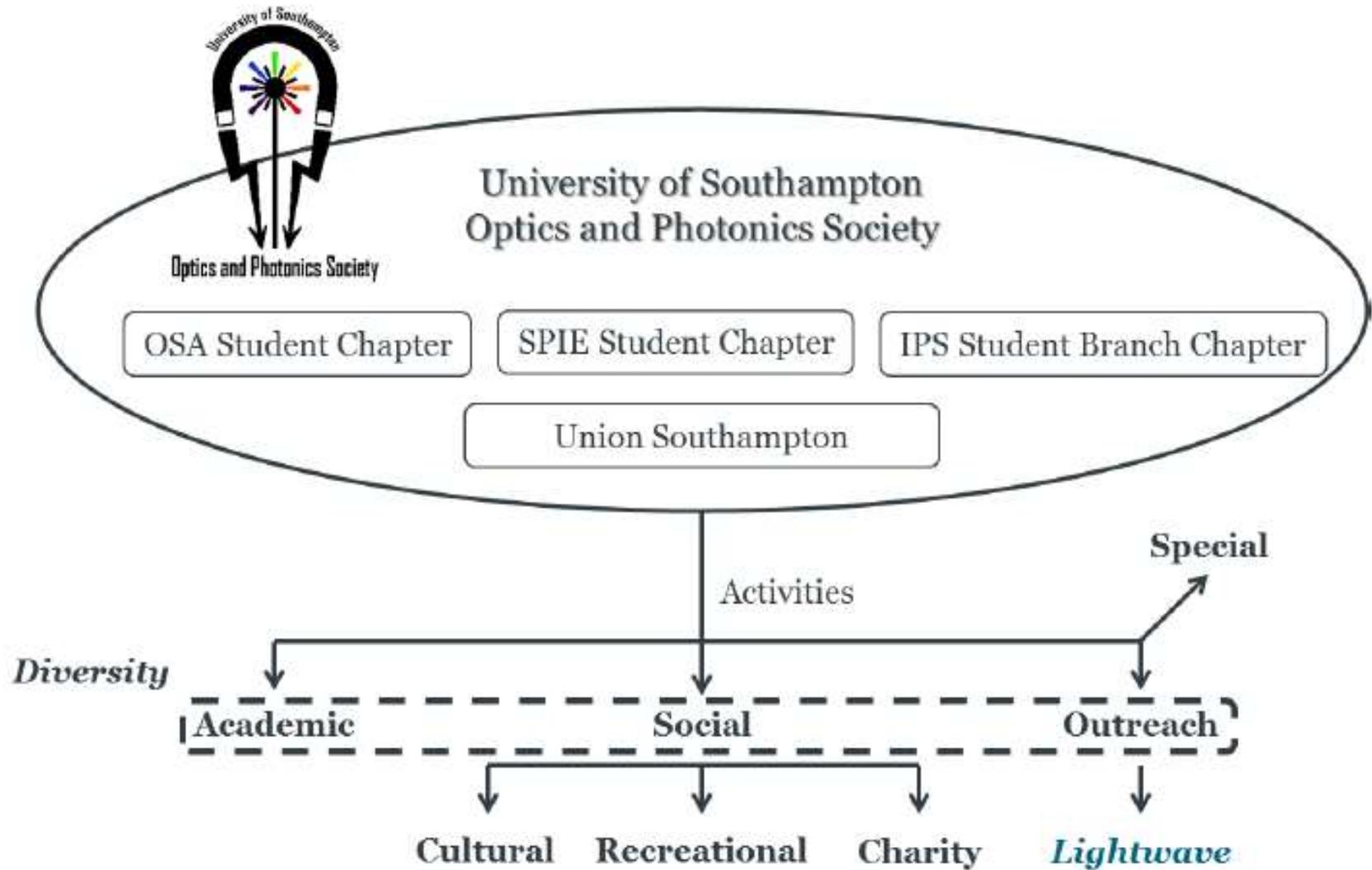
1. INTRODUCTION – VISION AND GOALS

The University of Southampton SPIE student chapter was established on the 28th January 2011. Our society is known as the University of Southampton Optics and Photonics Society (OPSoc) and upholds affiliations as an Optical Society of America (OSA) student chapter, an IEEE Photonics Society (IPS) student branch chapter, and our university's student union Union Southampton (US). Our members are mostly Postgraduate students within the Faculty of Physical Science and Engineering. In particular, our members are mainly research students from the Optoelectronics Research Centre (ORC), the schools of Physics & Astronomy (P&A), Electronics & Computer Science (ECS). Furthermore, our activities helped us to include PhD student members from other departments, as well as Masters and undergraduates.

Our main objective is to unite and engage the community of students promoting a friendly work environment, diversity and equality in the workplace, optics and science in general to a non-scientific audience. Hence, our activities can be categorised into three main groups:

- Educational and professional development activities (Academic officers)
- Youth education and community outreach (Outreach officers)
- Social and networking activities (Social officers)
- Diversity and equality (Diversity officers)

Despite the division of roles, we strongly rely on teamwork and collaborations with other student bodies to enhance the impact of our events.



The University of Southampton Optics and Photonics Society: affiliations and activities

2. STUDENT CHAPTER MEMBERS

Committee members are elected at the beginning of the academic year. The current committee members, elected in November 2016, are:

No.	Position	Title	First Name	Last Name	SPIE ID	Email Address
1	President	Mr	Andrea	Ravagli	3749363	ar1e15@soton.ac.uk
2	Vice President	Mr	Alexander	Jantzen	3710078	A.Jantzen@soton.ac.uk
3	Secretary ¹	Mr	Norberto	Ramirez	4025843	njrm1n15@soton.ac.uk
4	Treasurer	Miss	Angeles	Camacho	3728474	alcr1g15@soton.ac.uk
5	Academic Officer	Miss	Neda	Baktash	3592082	nb4g15@soton.ac.uk
6	Academic Officer ¹	Mr	Yang Kun	Chew	3610743	ykc1u16@soton.ac.uk
7	Social Officer	Miss	Amy	Tong	3682527	askt1g10@soton.ac.uk
8	Social Officer ¹	Mr	Fernando	Guzman	4025884	fagc1n15@soton.ac.uk
9	Outreach Officer ¹	Mr	Dean	Clarke	4025905	dtc1u16@soton.ac.uk
10	Outreach Officer ¹	Mr	Jake	Prentice	4025881	jjp1u16@soton.ac.uk
11	Publicity Officer	Mr	Henry	Stenhouse	4026012	hgs1g09@soton.ac.uk
12	Diversity Officer	Miss	Kasia	Grabska	4010748	kmg1r15@soton.ac.uk
13	Diversity Officer ¹	Mr	Hao	Li	4025848	hl4n15@soton.ac.uk
14	Webmaster ¹	Mr	Mathias	Weisen	4026037	mjlw3u16@soton.ac.uk
15	Chapter Advisor	Prof.	Johan	Nilsson		jn@orc.soton.ac.uk

¹First year PhD students, representative of their students year.



2016-2017 OPSoc executive committee

Current SPIE members

Seyed Mohammad Abokhamis Mousavi
 Francesco De Lucia
 Matthew Posner
 Lieke Van Putten
 Huaiyang Zeng

Theo Chen Sverre
 Tina Parsonage
 Miranda Turvey
 Nicholas Wong

Total: 20 students + 12 alumni (updated April 2017)

3. ACTIVITIES

The activities we organised this year include academic activities (e.g. seminars, workshops, etc...), networking events, social events and outreach. The total number run this year is 47 (August 31st 2017). This section will summarise the events organised by type of events.

3.1. Academic activities

The academic activities run this year were 13, divided in 6 seminars, 2 student chapter exchanges, 2 software workshop, 1 company visit, 1 student conference attendance, and 1 visit to a thematic museum.

- **Company Visit**

One of the first academic/career development activities held this year was an industry visit to the company Fianium (now part of NKT Photonics) who manufacture ultrafast fiber lasers. 8 students were transported there on a minibus hired from our student union. An overview of their industry, interesting economic figures and applications were given to us by their CEO. A tour of the manufacturing facilities was then at the end of the day.



Group picture from company visit to Fianium (now part of NKT Photonics)

- **Seminars**

The organisation of seminars was aimed to enhance the professional and personal opportunities of the students through the experience of researchers from different subjects and other PhD students.

In January 2017 we had the opportunity to invite Prof. Ursula Gibson from NTNU, in Norway. The program for the day included a meeting between the students and

Prof. Gibson, followed by a tour of our research facilities at the Optoelectronics Research Centre and a talk by Prof. Gibson focus on her research on semiconductor-core optical fibres. The visit of Prof. Gibson resulted in an interaction between students and staff researchers, which led to new collaborations.



Group picture after Prof. Gibson's Talk

Other academics researching in different field from optics were also invited. In July 2017, Dr. Themis Prodromakis from ECS at University of Southampton and Dr. Anna Hickman from the National Oceanographic Centre (NOC) at the University of Southampton were invited to give talks on their respective fields of research. In particular, Dr. Prodromakis describes the recent advances in nanoelectronics whilst Dr. Hickman introduced the audience to the impact of optics and photonics in oceanographic studies. The events attracted both students and senior researchers bringing new perspectives in our daily work at the ORC. Before both events, a networking session was held over a coffee break.



Anna Hickman and audience from her talk "Shedding light on ocean productivity"

This year we had the honour to invite Prof. Vasudevan "Vengu" Lakshminarayanan as part of the SPIE visiting lecturer program. The program of the visit was extended

over two days in which a variety of activities with different themes was hold. The program included:

Day 1

- 10:00-11:00 am: Welcome coffee and cake with the student chapter
- 11:00 – 12:00: Visit of photonics labs of University of Southampton Optoelectronics Research Centre
- 12:00 – 13:30 : Lunch
- 13:30-15:00 lecture, with refreshments
- 15:00-16:00: Presentation of chapter activities
- Evening: visit of the city of Winchester, dinner.

Day 2

- 10:00-11:00: Careers in optics and photonics discussion, with refreshments.
- 11:00-12:30: Visit of the University of Southampton Mountbatten Cleanroom Complex and Integrated Photonics Cleanroom.
- 12:30-13:30: Lunch
- 13:30-15:00 Opportunity for meetings

Both days had a strong student attendance, especially during Vengu’s lecture and career focused activities. The total number of people engaged by the events exceeded 60 and many more are expected for the next year.



Careers in optics and photonics session with Vengu.

Other seminars were held with students as speakers. In December 2016 Matthew Posner gave a talk summarising his summer-long outreach experience in North America. The talk was a great opportunity for the attendees to understand how universities professional societies such as SPIE can be engaged to create outreach opportunities opening our respective research to a wider audience. Between March and April 2017, OPSoc collaborate with the ORC to hold the annual “2nd year talk” competition. In this series of seminars (4 in total), doctoral students

attending the 2nd year of their degree are challenged to give 15 minutes talks focused on a scientific or engineering subject they are not familiar with. The aim of the event is to strengthen the communication skills of the participants preparing them for crucial talks in their career during conferences, seminars and other professional contexts. The winner of this year was Alex Jantzen with his talk entitled "Detecting the Impossible - Particle Detection".



Award ceremony of the 2017 "2nd year talk". Center right, Alex Jantzen, winner; Center left, Andrea Ravagli, second place.

- **Other academic events**

This year OPSoc continued the series of student chapter exchanges result from the development of a UK chapters network in the previous years. In December 2016, a group representative of the ORC student body visited the University of Oxford being guests of the local student chapter. The day included scientific seminars, laboratory visits, presentations reporting the activities held by the chapters and the future directions of both. The visit led to an enhanced interaction between us and the University of Oxford with a return visit to be scheduled in the near future.

A similar schedule was followed during the exchange with the student chapter of Exeter. In March 2017 a group of representatives of our student chapter had the chance to be guest of the University of Exeter student chapter. For the visit, talks on outreach activities were given aiming to improve our impact.

Further interactions with students and chapters were also sought to expand our network and develop new collaborations. This year, the officers Angeles Camacho and Fernando Guzman had the chance to represent our student chapter during IONS Paris 2017 in June with OPSoc and the ORC partly funding their trip. The conference was a great opportunity for their personal and professional development which resulted in the current contacts with academics located in Scotland and representatives of the European Physical Society (EPS). Furthermore,

Angeles and Fernando developed a stronger understanding about the organisation of academic events, which will be of much help for our future intention to host a student conference in Southampton.



Oxford-Southampton chapters during a laboratory tour.

A software workshop on Python was organised as part of skills development activities. The workshop was organised in collaboration with Dr. Devin Smith, senior researcher at the ORC. The contents ranged from basic functions to principles of advanced applications in order to address the needs of a large number of users. The event exhibited the strong interest of students for this kind of activities. Future workshops will be focused on other software such as Origin Lab, Latex, etc...



Alex Jantzen (right) awarding the certificate of congratulations to Dr. Smith (left).

A second software workshop on the introduction to COMSOL was held. This workshop was delivered by Dr Peter Horak from the Optoelectronics Research Centre. After being advertised, the event was fully subscribed within a day with a good number of individuals on a waiting list. Given the positive feedback we had from this workshop and the interest still present, we expect that another workshop of this kind will be run again in the future.



COMSOL workshop delivered by Peter Horak (Right) and the award certificate given to him by Amy Tong (Center) and Neda Baktash (Left) for him volunteering his time.

In June 2017, the chapter visited the thematic museum Bletchley park, United Kingdom. The park is located in an old military site used during the second world war. The site was the location in which the German telecommunications were decrypted with the aid of the Turing machine created by Alan Turing. Despite the non-scientific connotation of the park, it was of great appreciation of the student the possibility to explore such a critical historical event from a different perspective. Importantly, it highlighted the importance that secure communication has played in the past and its contrasts its future. More visits of this kind will be considered in the future because of the success of this event.

3.2. Social and charity events

This year OPSoc ran 11 between social and charity activities. The common goals of these activities was to strengthen the bond between the members of our community promoting diversity and equality. We put particular emphasis on cultural events and gender equality events to make promote diversity as a point of strength of our world-wide student body. The events had an overall attendance of about 350 people in total raising a total of £433 for charity.

At the end of November 2016 we held our annual Arctic BBQ in one of the most characteristic local venues in Southampton. Both students and members of staff within the ORC, ECS and other departments of the faculty were invited. The event is our annual activity for recruitment and promotion of SPIE memberships. In addition, new students get a chance to meet colleagues and members of staff in an informal context which helps their integration in the faculty environment.



Pictures from 2016 Arctic BBQ

The connection between students and staff was also targeted through our series of Coffee and Cake breaks. They consisted of short breaks in which students and staff shared some home baked cakes over a coffee having a chance to chat and exchange opinions. The event was held every fortnight with an average attendance of 20 people between students and staff.



Exchanging knowledge over coffee and cakes

Other students focused social activities include a trampolining event (February 2017), a board game social event (March 2017) and a movie night (May 2017).



(Left) Trampolining team, (Centre) Board games evening and (Right) Movie night

In terms of diversity events, this year we organised a celebration for the Chinese new year (January 2017). For the event the attendees from all over the world cooked homemade Chinese dishes. The dishes were prepared as part of a friendly competition in which the winner won (chocolate) coins in a red envelope upholding the ancient Chinese tradition. Furthermore, a table tennis tournament was held and the winner was awarded of the same traditional prize.



Table tennis competition during the Chinese new year celebration

A similar event focused on international food was organised in February 2017. For this occasion students, senior researchers and staff were involved in cooking food from their respective country. A total of 40 people attended the event producing a selection of dishes from 10 countries (Italy, Scotland, India, Hong Kong, China, Mexico, Armenia, Thailand, Denmark, Saudi Arabia). The event was a great opportunity to see the multiculturalism of our community.



Part of the selection of dishes available during the International food day

For the occasion of the International women's day (IWD), we organised a gender equality focused networking lunch in collaboration with the Women's Physics Network (WPN) at the University of Southampton. The event was organised thank to the SPIE Women in science grant. It had an attendance of 40 people who have been involved in an open discussion about gender equality, women in science and other themes. The invitation was open to all the students, researchers and staff in the faculty. The debate produced good insights on how our society is changing in this respect. The event was a safe environment in which such relevant topics could be genuinely discussed and all the participants had a say in the debate. The discussion continued over lunch time were the attendees shared food and ideas. Other than debates, the event resulted in new ideas for equality focused activities which will be described in the outreach section.



Gender equality debate

As a charity activity, we organised a charity cake sale for the UK first Cancer Immunology Centre in April 2017. We invited staff and students from the departments to donate home-bakes to raise funds for a charitable cause. Our officers managed the sales and collection of donations and helped raise £433.65 devolved to the British Red Cross.



Volunteers for bake sale

As a social event intended on promoting cohesion and teambuilding, a bowling tournament was held at Hollywood bowling with a total of 16 participants. Teams of 4 were made and

two rounds were played. The invitation was initially released to society members and then extended to the rest of the postgraduate community at the university. An unexpected benefit from this has been the increased exposure of our society as well as our affiliations across the university. A promising lead that has come from this is the potential collaboration with another faculty society for organising joint technical seminars in future.



Bowling contestants excited to begin the tournament

The highest scoring contest and proud winner of our tournament was first year international PhD student Alan C. Gray from Ireland who joined the student chapter in May this year.



Bowling tournament winner, first year PhD student, Alan C. Gray

3.3. Outreach and public engagement activities

‘Lightwave’ is our outreach program designed to provide an exciting, interactive, and educational experience of optics to a non-scientific audience such as school pupils (6 to

18 years old), and members of the public. Over the years, the range of activities was enlarged and tailored in order to include elements of our research, covering telecommunications, lasers, novel glasses, fibre optics and photonic integrated circuits. The exhibition aspect of the program, also known as the Lightwave Roadshow, is highly popular amongst local schools and city council.

In collaboration with the Physics and Astronomy department's particle physics outreach show, Accelerate!, a publication on outreach in cathedrals was also published at 14th ETOP 2017. M. Posner, A. Jantzen, L. D. V. Putten, A. Ravagli, A. L. Donko, N. Soper, N. H. L. Wong, P. John, "Cathedral outreach: student-led workshops for school curriculum enhancement in non-traditional environments", at 14th Conference on Education and Training in Optics and Photonics, Hangzhou, China, 29 – 31 May 2017, (<https://eprints.soton.ac.uk/410730/>).

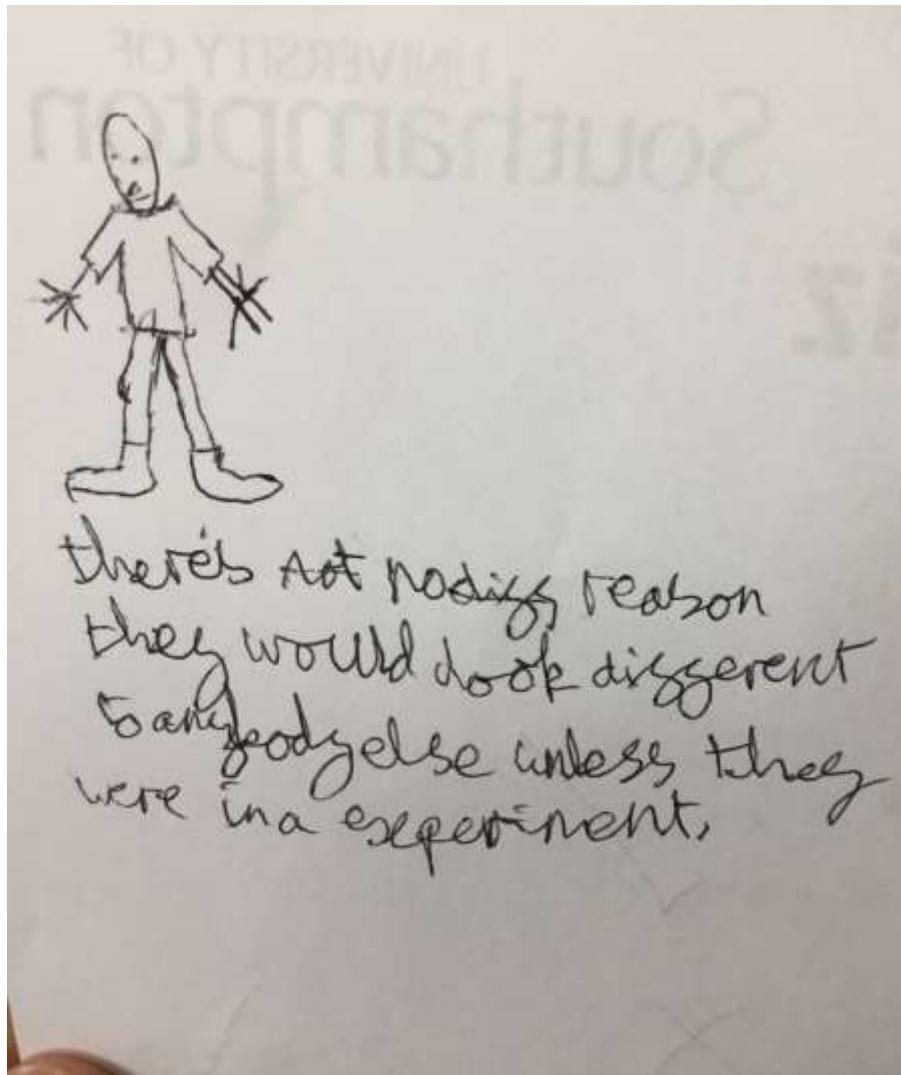
The Lightwave Roadshow is run by PhD students from our student chapter, also known as Lightwave Ambassadors. The activities organised include workshops, demonstration of experiments with increasing complexity, develop and promote the program according to the audience and facilitate in Lightwave's smooth operation. Our team of ambassadors is comprised of students from various backgrounds, with students representing different ethnicities, nationalities, genders, and physical abilities. This remarks how diversity is central to all our activities and our outreach program aims to spread our vision to as many young students as possible. The Lightwave ambassadors increase awareness, knowledge, and general interest in optics by demonstrating and supervising the use of our outreach equipment. Our inventory of equipment includes pieces designed to allow the audience to have a safe hands-on experience of optics and science in general. Some of the topics covered include: communications using light (both optical fibres and free-space), optical illusions, lenses, electromagnetic radiation, and the human eye. The formats of delivery include:

- **Visits to schools**

It is our most traditional format of events. It involves the Outreach officers from the chapter to contact schools which have an interest in Lightwave. Often the most important step consists of making initial contact and providing information about the activities and equipment. For each event, one of the Ambassadors is assigned of the role of director. The director agrees on a date for the shows, finds transportation for equipment and ambassadors, recruits sufficient ambassadors, and leads the event. The director and ambassadors also involve the whole student chapter members in the promotion of our Lightwave program encouraging the participation within PhD students.

We have collaborated with partners internal and external to the University to increase the reach of our program. The University's central Outreach office helps us to get in touch with schools and other institutions to reach a wider range of ages within and outside the University of Southampton. They also help us coordinated our visits, leaving our ambassadors time to focus on the planning, delivery and evaluation of the activity. This format has been revealed very successful over the last

few years increasing the reach and gain more experience of teaching. The impact of our activities is obtained from short surveys given to the students on what they enjoyed and what could be improved.



Feedback from a young student

- **On-campus classes and tours**

It is often possible to invite pupils to visit the university, our laboratories and other facilities within the ORC and the whole faculty. These visits are combined with classes on the model of schools visit described before. For small groups we can organise classes inside the cleanroom where the students had a hands-on demonstration of the process of photolithography. This format is well used to engage also adults during open days.

- **Open Days, fairs and festivals**

The Lightwave program also supports university open day events and other fairs by participating as an exhibitor. One of the biggest annual events is the University of

Southampton’s annual Science and Engineering Day, which is open to the public. During the open day we have the chance to carry out exhibitions and demonstrations widely appreciated by both children, parents and older visitors. Open days highlights how the public can be intrigued by science and is eager to learn something new about photonics due to the impact this field of research has in everyday technologies.

The Lightwave Roadshow has been very active this year, reaching out to **over a thousand people** over the events listed below.

Date	Event	Location	Attendance
11/03/17	International Womens Day	West Quay	151
11/03/17	SPIE Women in science: Women in Science debate panel	Art House Southampton	21
18/03/17	Science and Engineering Day	Highfield campus	445
04/05/17	Thomas Hardy School Bringing Science to Life	Thomas Hardy School	327
08/06/17	Year 6 WP class	Highfield campus	90
13/06/17	Year 6 WP class	Highfield campus	51
16/06/17	Cantell School Year 8 Communicating with Light	Cantell school	94
20/06/17	Year 6 WP class	Highfield campus	89
22/06/17	Year 6 WP class	Highfield campus	87
23/06/17	NWED celebration	Portswood elementary school	60
28/06/17	Year 6 WP class	Highfield campus	64
30/06/17	Year 8 WP class	Highfield campus	42
05/07/17	INSPIRE	Highfield campus	40
11/07/17	Year 6 WP class	Highfield campus	49
12/07/17	Year 6 WP class	Highfield campus	61
29/07/17	Winchester Science Festival Day 1	Winchester	79
30/07/17	Winchester Science Festival Day 2	Winchester	62
		Total	1812

The results of our activities allowed a representative of our program to attend the conference SPIE Education and Training in Optics and Photonics (ETOP) in Hangzhou (China). We proudly submitted two papers describing two formats of our outreach activities and their outcome.

M. T. Posner, A. Jantzen, L. D. van Putten, A. Ravagli, A. L. Donko, N. Soper, N. H. L. Wong, and

P. V. John, *“Cathedral outreach: student-led workshops for school curriculum enhancement in non-traditional environments”*, ETOP 2017, Hangzhou, China.

N. H. L. Wong, A. S. K. Tong, M. T. Posner, and A. Ravagli, *“Modular and extensible lesson on fiber optics for youths”*, ETOP 2017, Hangzhou, China.

A new type of format was introduced this year in occasion of IWD. As part of the SPIE Women in science grant, we held a discussion panel comprised of women in science at different stages of their careers. Apart from emphasising the role of gender equality in our workplace, the goal of the event was to develop a stronger awareness about how the needs of researchers change according to the stage of their career. Hence, the panel included a young researcher (PhD student), a PhD student mother of two children, a PhD student with over 10 years of experience in industry and a senior researcher. The event was hold in a local café, attracting people from the University and from all over the city. We believe that giving a voice to unexpressed issues within our community is very important and we intend to propose this format again in future events.



2017 International women's day discussion panel

4. Finance

OPENING BALANCE	5075.18	
Description	Paid IN (Credit)	Paid OUT (Debit)
SPIE 2016 Activity Grant	1015.63	
Grant from UoS Students' Union	112.25	
SPIE Women in Optics Grant 2017	392.43	
OSA Maintenance Grant	538.43	
Food for IWD networking lunch (prepaid for WPN)	74.00	
SPIE Educational Outreach Grant	2871.58	
IEEE award for largest membership increase	145.07	
IEEE PS Seed Grant 2017	1890.82	
Refunded fuel cost to Fianium	20.00	
SPIE 2017 Activities Grant	848.63	
Charity cake sale donations	139.62	
Old committee gifts		134.40
Arctic BBQ food and misc		149.22
OPSoc hoodies payment		474.84
Oxford minibus hire		80.00
Christmas Coffee and Cake and mince pies for Matt's talk		15.04
Total Outreach		3899.85
Ursula Gibson seminar		21.42
Trampolining event		138.00
Minibus Hire for Fianium Company visit		83.28
Bus, Food and drinks for International Women Day Networking Lunch		190.12
Coffee and cake ingredients		22.60
Board games night		53.91
Prize for 2nd year talks - wireless presentation clicker		24.35
OPSoc banner		25.08
Movie night		109.00
Poster for IONS Paris		52.74
Bletchley Park tickets 14 @ £14, 1 free, bus, fuel		279.00
Travel lecture "Vendu Dinner"		136.25

Poster SPIE Officer travel grant		31.00
Lightwave equipment		32.99
INTERACT Coach		380.00
Bowling Night		119.84
Total	8048.46	6513.27
NET BALANCE	6610.37	

Notes:

- 1- The currency of the figures Great Britain Pounds (GBP). Please consider the variability of the exchange rate over the last year.
- 2- The outreach invoice includes maintenance of the equipment, purchase of new equipment, transportation, fuel and food (only when included in the grant awarded).
- 3- The outreach invoice includes residual payments due from activities of the previous committee.

5. Awards

- Angeles Camacho was awarded of the 2017 University of Southampton Women in Science, Engineering and Technology (WiSET) award, for her contribution to increase the awareness in diversity and gender equality.
- Alex Jantzen was awarded of the People's Choice Award at the FPSE 3-minute thesis final, and was also runner-up in this competition.
- OPSoc was awarded of the IEEE Photonics Society Largest Membership Increase Award, a global award, for setting up an IEEE Photonics Society student branch and enhancing IEEE Photonics' visibility in our local region, through innovative programming.
- The OPSoc was shortlisted for the Student Union's 2017 Award in the Category "Best extra-curricular activity/programme".

6. Future activities and outlook

Two activities are yet outstanding for later this year and these are; our charity run for "Action for Blind People" as well as our Lapel Pin purchase for recruitment.

The University of Southampton SPIE Student Chapter and the whole student body of the Optics and Photonics Society, will continue to remain an active society. We will invest our future efforts to increase the impact of our academic, professional and outreach activities in

optics and photonics. Our annual events will be kept as a backbone tradition of our society over the next year including the popular social and networking events such as the Arctic BBQ, Pub Quiz, International Food Festival and the Chinese new year celebration. We will propose the activities we organised for IWD taking into account the outcome and the feedback from this year. These events act as a complementary part of our student experience and represent the traditions of the photonics student and staff community. We believe they were successful at bringing researchers together in formal and informal environments.

We are extremely grateful to SPIE for its excellent support to our chapter, both financially and administratively. We are looking forward to the next year and are confident it will be another successful one for the University of Southampton Optics and Photonics Society.