Annual report

Prepared by Olena Kulyk
St Andrews, 24 October 2014

The chapter was established on 31 January 2006 and revived in 2012.

2014 Chapter Officers
President: Jonathan Nylk
Vice-President: Naomi McReynolds
Secretary: Olena Kulyk
Treasurer: Guy Whitworth
Advisor: Kishan Dholakia

Total members: 22

Current members: 17
Puneet Chhabra
Sayantan Ghosh
Frances Goff
Arko Graf
Maxime Jacquet
Markus Karl
Javid Khan
Olena Kulyk
Douglas Laidlaw
Elliott Levi
Yun Long
Ifeoma Mbomson
Naomi McReynolds
Jonathan Nylk
Maria Laura Staffini
Laura Tropf
Guy Whitworth

Alumni: 11 (*5)
Woei-Ming Lee*
Patience Mthunzi*
Carlos Becerril*
Luis Acevedo*
Damien Kinet*
Helen Rendall
Claire Mitchell
Bavishna (Balagopal) Praveen
Praveen Ashok
Peter Reader-Harris
Blair Kirkpatrik

* - Alumni of the chapter who retain SPIE membership.
Highlights of the social, professional and outreach events

Fireworks and bonfire night,

5 November 2013

Our new committee started the Chapter’s activity with the recruitment event, Fireworks and Bonfire Night at the Castle’s beach organised for new students and postgraduates at the School of Physics at the University. The event attracted more than 30 attendees and raised awareness of the Chapter’s activity. It was very well accepted and we turned it into our annual event.

On the picture (left to right): alumni of the chapter: Claire Mitchell & Helen Rendall

Light for Life Demonstrations at the Science Discovery Day, organised by the University (Usually part of National Science Week),

8 March 2014

Every March, the University of St Andrews takes part in the National Science Week. Our Chapter is always represented at this event as Seeing Life Through a New Light project. We demonstrated fundamental properties of light and a few applications of light in medicine in science.
SPIE Student Chapter at University of St. Andrews hosts Andrew Brown, SPIE Senior Director for Global Business Development

27 May 2014

Brown gave a seminar at the School of Physics on how SPIE helps to make a transition between the photonics research and industrial applications, and how the organization helps young scientists and engineers succeed in their career. His talk also highlighted the U.S. National Photonics Initiative and the International Year of Light 2015.
Lunch BBQ for the Physics department

30 May, 2014

We have organised a social event for the Physics department after the submission of PhDs’ annual reports. The aim was to network across the department, chat about photonics and bring awareness of our activity. The event was heavily attended and very well received.

On the picture (left to right): SPIE Chapter Committee - Jonathan Nylk, Guy Whitworth, Olena Kulyk

Staff and students of the Physics Department, University of St Andrews with the Chapter committee at the Physics’ garden
Committee’s and other attendee’s dinner after attending the Photonex Roadshow, Edinburgh, Scotland

4 June, 2014

On the picture (left to right): Naomi McReynolds, Olena Kulyk, Jonathan Nylk, Guy Whitworth

Kayaking trip for the committee members and other attendees’

2 August, 2014

In order to strengthen our committee team and build up the community we organised one day kayaking trip to a local loch. We discovered more about each other research projects and discussed our future events.
On the picture (left to right): standing: Olena Kulyk, Anja Steude, Guy Whitworth, Maxime Jacquet, Naomi McReynolds, Alex Liles, sitting: Jimmy Said, Arko Graf

Attending the SPIE Leadership workshop in San Diego, California, United States

9 - 13 August 2015

The aim of the workshop was to develop leadership skills of the future leaders of the chapters. After the workshop we have actively started our recruitment campaign and updated our outreach activity.
SPIE Student Chapter - Project Management in the Photonics Industry two days workshop

28-29 August, 2014

SU2P project approached the Chapter advertising its funding for exchange programs and professional development events. Feeling that there was a need to develop skills and awareness in industrial product development and management, we proposed to organise a workshop dedicated to professional development of postgraduate students and early career researchers in the Photonics industry.

SPIE Workshop was aimed to be an essential guide to product development & project management in the Photonics industry for all graduate students and early career researchers in Physics in Scotland, organized by the SPIE St Andrews Student Chapter, in collaboration with SU2P Project and SUPA. This workshop armed the participants with the essential skills in industrial project planning which they would need when making the transition from academia to industry. The workshop consisted of: an introduction to System Engineering; the theoretical background behind project management; PRINCE2 and software which enables project documentation and tracking.

The second day was a chance to further develop and demonstrate the skills developed during the first day. We were delighted to have local Photonics companies: WideBlue, Optos and M2 Lasers which gave brief overviews of their work and then set project planning tasks.
The participants were divided into groups to develop project plans, use the software to manage their “project” and present their planning at the end of the workshop. The companies’ representatives were available together with the experts in the field to assist and answer any questions. We assessed the project plans and gave feedback on the solutions. In addition to this stimulating and interactive environment attendees had an opportunity to network and learn about potential opportunities for the future employment.

Organisers:
SPIE Chapter, Olena Kulyk, Guy Whitworth, Naomi McReynolds, Jonathan Nylk, Maxime Jacquet
SU2P, Iain Ross | an innovative bridging project connecting Scottish and Stanford Universities
CAPOD, Erwin Lai | Centre for Academic, Professional and Organisational Development
SUPA, Avril Manners | Physics Scotland: is a pooling of physics research and post-graduate education in 8 Scottish universities: Aberdeen, Dundee, Edinburgh, Glasgow, Heriot Watt, St Andrews, Strathclyde and West of Scotland.

Speakers
Sillitto Enterprises | Hillary Sillitto
Centre for Academic, Professional and Organisational Development CAPOD | Erwin Lai, Academic Staff Developer

Industrial Partners:
M2 Lasers | James Bain, Senior R&D Project Manager
Optos | Derek Swan, Senior Research Director
WideBlue | Grant King, Design and Development Director

The workshop banner
On the picture (left to right): Sayantan Gosh, Jonathan Nylk, Olena Kulyk, Erwin Lai (one of the invited speakers)

Registration opening

On the picture: attendees with the SPIE Chapter committee members and the invited speakers, Iain Ross (first left top row) and Hillary Sillitto (third left top row)

Group photo at the end of the first day of the workshop

Information about the event
Attendees: 21
Financial Support
- £163.20 - SPIE Student Chapter - Directly Paid for Accommodation
- £400 – SUPA – Towards Food Costs
- £228 – SU2P – Paid leftover accommodation costs

Total Cost of Event = £791.20

Detailed Costs
- Accommodation was at the St Andrews Hostel and we paid for 12 beds in total (£13.60 per bed)
- Catering was provided by the University of St Andrews Catering Service
  - 3 x £57 = £171 – Coffee & Tea with Biscuits x 30
  - 2 x £37.50 = £75 – Coffee & Tea x 30
  - 2 x £191 = £382 – Std. Buffet x 20, Veg. Buffet x 10, Orange Juice x 20, Apple Juice x 20

Attending IONS-Asia 5 Hokkaido Student conference and networking meeting, Japan

15-16 September, 2014

The conference and the student networking meeting was organised by two SPIE / OSA Student chapters, Osaka University and Hokkaido University. The aim of the event was to develop student networks in the Photonics area in across Asia and Internationally. After the meeting we are planning to continue international networking between the chapters by setting up series of International Web-Seminars across the chapters aimed to encourage networking between the students in the Photonics area. It will also be an opportunity to practice public speaking and develop cultural awareness.
Recruitment event – Wine and Cheese night for new students

18 September, 2014

After the reception we have successfully recruited a few new members.
List of the outreach events

Chapter members were actively involved in various optics outreach activities, especially a project “Seeing Life through a New Light”. Chapter members actively participated in introducing school students to the world of photonics. Jonathan Nylk and Naomi McReynolds coordinated the events. Details of the outreach events the Chapter was involved in this year are listed in the table below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Volunteers</th>
<th>Type of Attendee</th>
<th>Number of Attendees</th>
<th>Other Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>31/10/2013</td>
<td>Girls into Physics &amp; Engineering, George Watson's College (Edinburgh)</td>
<td>Claire Mitchell, Helen Rendall, Jonathan Nylk</td>
<td>High School Students</td>
<td>150</td>
<td>A day of science and engineering demonstrations to encourage girls into physics and engineering</td>
</tr>
<tr>
<td>20/01/2014</td>
<td>Girls into Physics &amp; Engineering, The James Young High School (Livingston), Demonstrations</td>
<td>Claire Mitchell, Naomi McReynolds, Guy Whitworth</td>
<td>High School Students</td>
<td>100</td>
<td>A day of science and engineering demonstrations to encourage girls into physics and engineering</td>
</tr>
<tr>
<td>08/03/2014</td>
<td>Science Discovery Day, Demonstrations</td>
<td>Jonathan Nylk, Naomi McReynolds, Claire Mitchell, Helen Rendall, Guy Whitworth, Olena Kulyk, Sayantan Ghosh, Josep Mas</td>
<td>Family Groups</td>
<td>400</td>
<td>A science fair organised by the University (Usually part of National Science Week), All day</td>
</tr>
<tr>
<td>13/03/2014</td>
<td>Girls into Physics &amp; Engineering, Prenston Lodge High School (East Lothian), Demonstrations</td>
<td>Jonathan Nylk, Naomi McReynolds</td>
<td>High School Students</td>
<td>70</td>
<td>A day of science and engineering demonstrations to encourage girls into physics and engineering</td>
</tr>
<tr>
<td>21/03/2014</td>
<td>Melrose Primary School (Scottish Borders), Seeing Life Talk and Demonstrations</td>
<td>Jonathan Nylk, Maxime Jacquet</td>
<td>Primary School Students</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Event Description</td>
<td>Participants</td>
<td>Audience</td>
<td>Attendance</td>
<td></td>
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<tr>
<td>------------</td>
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<td></td>
</tr>
<tr>
<td>04/04/2014</td>
<td>Student personal visit to group</td>
<td>Prof. Kishan Dholakia, Jonathan Nylk, Derek Craig, Elaine Campbell</td>
<td>Primary School Students</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>09/05/2014</td>
<td>Scottish Crucible Interdisciplinary Event</td>
<td>Prof. Kishan Dholakia, Prof. Frank Gunn-Moore, Jonathan Nylk, Naomi McReynolds, Derek Craig, Alison McDonald, Elaine Campbell</td>
<td>Postdoctoral researchers</td>
<td>40</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30/06/2014</td>
<td>Sutton Trust Summer School, Seeing Life Talk and Demonstrations</td>
<td>Jonathan Nylk, Maxime Jacquet, Naomi McReynolds, Alex Qiu</td>
<td>High School Students</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>15/07/2014</td>
<td>Internation Science Summer School, Seeing Life Talk and Demonstritions</td>
<td>Jonathan Nylk, Maxime Jacquet, Naomi McReynolds, Alex Qiu</td>
<td>High School Students</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>21/07/2014</td>
<td>English Language Teaching Scence Summer School, Seeing Life Talk and Demonstrations</td>
<td>Jonathan Nylk, Maxime Jacquet, Naomi McReynolds, Alex Qiu</td>
<td>High School Students</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

**EPSRC / SPIE Summer outreach project**

Summer student: Alex Qiu  
Supervisor: Jonathan Nylk  
Advisor: Kishan Dholakia

**Funding: 04 April, 2014**

**Project duration: 02 June – 08 August, 2014**

After receiving an Education outreach Grant from SPIE to upgrade the outreach programme, Seeing Life Through a New Light, it was decided that it would be beneficial for this work to be undertaken as a summer internship by an undergraduate student interested in public engagement. The student, Alex Qiu, secured an internship award from EPSRC for £2400 to
cover living costs and an additional £300 towards equipment for the project. The duration of the project was 10 weeks, and in this time Alex repaired and improved exhibits and updated educational materials to supplement these.

An undergraduate student Alex Qiu worked to upgrade the outreach kit: the optical tweezers; the light guide exhibit; the lecture materials, 3D animations. The main changes to the optical tweezers were: realignment of the trapping and imaging arms to optimize trap strength (enabling strong Z-trapping); replacing the optical fibre illumination with a mains-powered LED, and replacing the manually actuated XY stages with a piezoelectrically driven XYZ setup. The work on the light guide exhibit was an attempt to increase the range of the stream of water which guided the laser light; a water reservoir to be installed in the top of the tank that would supplement the stream using gravity was designed and built, but the project remains unfinished. The lecture materials were edited for delivery to a non-fluently English-speaking audience and modularised into self-contained sections so that future presentations can be built quickly by selecting the desired topics to cover. The animations give a basic demonstration of the schematic differences between confocal laser scanning and light sheet microscopy.

Some examples of the work completed during the internship are shown below.

Drawings for fabrication of the components for the upgraded optical tweezers kit and graphical user interface for easy operation
Chapter activities for the next year

Social event:
1. New committees’ handover and welcome social in a pub after the AGM, 30 October, 2014.
2. Fireworks and Bonfire night for the Physics Department of the University, 5 November, 2014

Outreach events:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Attendees</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17/11/2014</td>
<td>Dundee Science Festival, Demonstrations</td>
<td>Family Groups</td>
<td>40</td>
<td>A scientific presentation on using photonic technologies to analyse whisky, followed by a whisky tasting</td>
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<tr>
<td>17/11/2014</td>
<td>Seeing whisky in a new light</td>
<td>Adults</td>
<td>200</td>
<td>Demonstrations of properties of light and application for medicine and sensing</td>
</tr>
<tr>
<td>02/2015</td>
<td>International Year of Light – Royal Society of Edinburgh</td>
<td>Mixed</td>
<td>200</td>
<td>All day</td>
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## Financial report

<table>
<thead>
<tr>
<th>Description</th>
<th>Credit</th>
<th>Total</th>
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<tr>
<td><strong>Starting balance</strong></td>
<td></td>
<td><strong>£235.13</strong></td>
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<tr>
<td>Movie night snacks</td>
<td>£-29.94</td>
<td>£205.19</td>
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<tr>
<td>BBQ food</td>
<td>£-123.43</td>
<td>£81.76</td>
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<tr>
<td>Cashbox</td>
<td>£-8.09</td>
<td>£73.67</td>
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<tr>
<td>BBQ takings</td>
<td>£136.00</td>
<td>£209.67</td>
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<tr>
<td>SPIE activity grant</td>
<td>£401.08</td>
<td>£610.75</td>
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<td>Photonex committee dinner</td>
<td>£-47.50</td>
<td>£563.25</td>
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<td>Kayaking activity</td>
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<td>£463.25</td>
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<td>Kayaking car travel</td>
<td>£-36.50</td>
<td>£426.75</td>
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<td>PM workshop accommodation</td>
<td>£-163.20</td>
<td>£263.55</td>
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<tr>
<td>Cheese &amp; Wine</td>
<td>£-104.94</td>
<td>£158.61</td>
</tr>
</tbody>
</table>

**End of the year balance**  

**£158.61**

## Awards

April 2004  
Chapter Members have been awarded a $3529 SPIE Education Outreach Grant for the outreach programme, Seeing Life Through a New Light  
http://www.st-andrews.ac.uk/seeinglife/index.html