

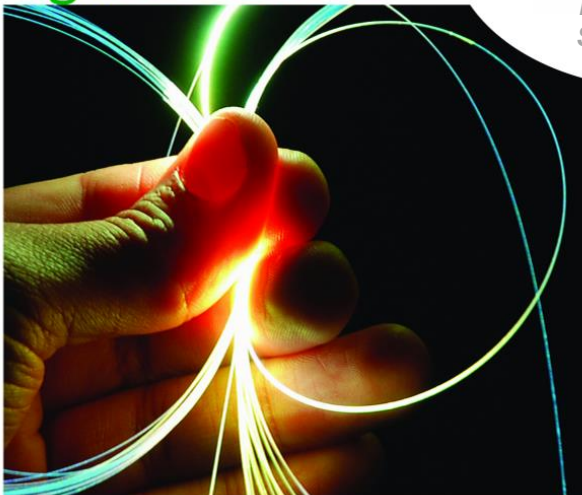
Core 2016:



Light in Life  
Science and  
Health

International  
Light Sciences

School on  
and Technologies



ISLIST

June 20-24, 2016

Santander, Spain

# FINAL REPORT

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## International School on Light Sciences and Technologies (ISLiST)

June 20-24, 2016, Santander, Spain

Core: *Light in Life Science and Health*

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## **International School on Light Sciences and Technologies (ISLIST)**

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### **1.- EXECUTIVE SUMMARY**

This International School has been conceived as a great opportunity to review, actualize and improve the knowledge of *scientists, professionals and technicians*; to contribute to the education and to enhance the motivation of *PhD students*; to offer an ideal frame for *networking* and also to contribute to the education of citizens. It is also a great opportunity to ensure that policymakers, entrepreneurs, and other key “actors” will be aware of the problem-solving potential of Photonics.

**ISLIST** is envisioned to be a worldwide top International forum (every fourth week of June) on *Light Sciences and Technologies* in the framework of a “*special top university*” that is recognized as the “*university of universities*” and in a privileged environment “the Royal Magdalena Palace” in Santander, Cantabria, Spain. Each edition of this international school will have an intensification or main core in a specific application area and additional current hot topics. *Light in Life Science and Health* was the core of this 2016 edition.



Figure 1.- Family photo of the ISLIST-2016 on the Royal Palace of the Magdalena, venue of the event.

85 attendees from 20 different nationalities all around the world received knowledge and shared experiences with the eighteen (18) highly renowned professors (including the Nobel Laureate Andre Geim) and researchers from the most prestigious worldwide institutions of Europe, USA and Japan, and as well, presidents of the most reputed international Photonic Scientific Organizations took place of the school panel of invited speakers.



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Eighteen Invited Talks and two round tables were developed along the week. The First round table was focused on challenges in Light on Life Sciences and Health. The second one was used to discuss the transference of Knowledge and Technique.

In the frame of ISLIST, at the end of the second day, the award ceremony of *Justiniano Casas Prize* for Research in Optical Imaging took place. In this ceremony three recipients were recognized with this Prize of The Spanish Optical Society Committee for Image Techniques is sponsored by INFAIMON S.L.

Sponsored by the Optical Society of America, OSA, which celebrates its 100<sup>th</sup> anniversary in 2016, the ISLIST attendees enjoyed with the OSA100 Reception. This was a great opportunity to shared experiences and also was an optimum time for networking.

In this edition, the UIMP has distinguished *Prof. Philip Russell* with its *Doctor Honoris Causa*. This prestigious honor was given at a solemn ceremony held in the Royal Hall of the Palace of Magdalena at the end of the morning, June 23. It was an unforgettable time to maintain in our “minds” forever: we had the unique opportunity to see in action both a great scientist and a great musician during his acceptance speech! The word yield step to the piano music executed to an unparalleled level of top quality! Thanks Philip for shared with us this unknown facet of your life.

At the end of the closing ceremony, the next edition of this international school was announced. The second edition of ISLIST (June 19-23, 2017) will have the core on Light for Energy and Environment. It will have the participation of the European Commissioner for the Energy and Environment (Mr Arias-Cañete) and the 2017 OSA President (Prof. Mazur).

To be able to reach this 2016 ambitious program this International School of UIMP is supported by several sponsors: Gobierno de Cantabria, Fundación ACS and the Optical Society of America, OSA.

It is also supported by several collaborators such as: SPIE-the International Society for Optics and Photonics; the Official College of Physicians of Cantabria; the Royal Society of Physics of Spain, RSFE; the Spanish Optical Society, SEDOPTICA; AMBAR Telecommunications, OZ Optics, Lasing, INNOVA Scientific, B-Phot Brussels Photonic Team, Hotel Santemar and the Photonics Engineering Group of the University of Cantabria. Without these Sponsors and Collaborators, this top quality school and the grants for international students would not be possible. The UIMP, the direction of this event and the scientific community using Light are grateful with the generosity of all these Organizations and all the Invited Speakers. Thank you so much!

Santander, September 22, 2016.

Prof. José Miguel López-Higuera  
Director ISLIST at UIMP



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### 2.- ISLIST-2016: A SUCCESSFUL AND TRULY INTERNATIONAL SCHOOL

ISLIST at UIMP has been acknowledged as a high standard international meeting by the invited scientist and professionals and as well as by the attendees. It has been considered as an edition with an excellent organization, where high quality services were offered, where cutting-edge ideas and technologies were presented and discussed and where networking and interchange of experiences were also successfully carried out.

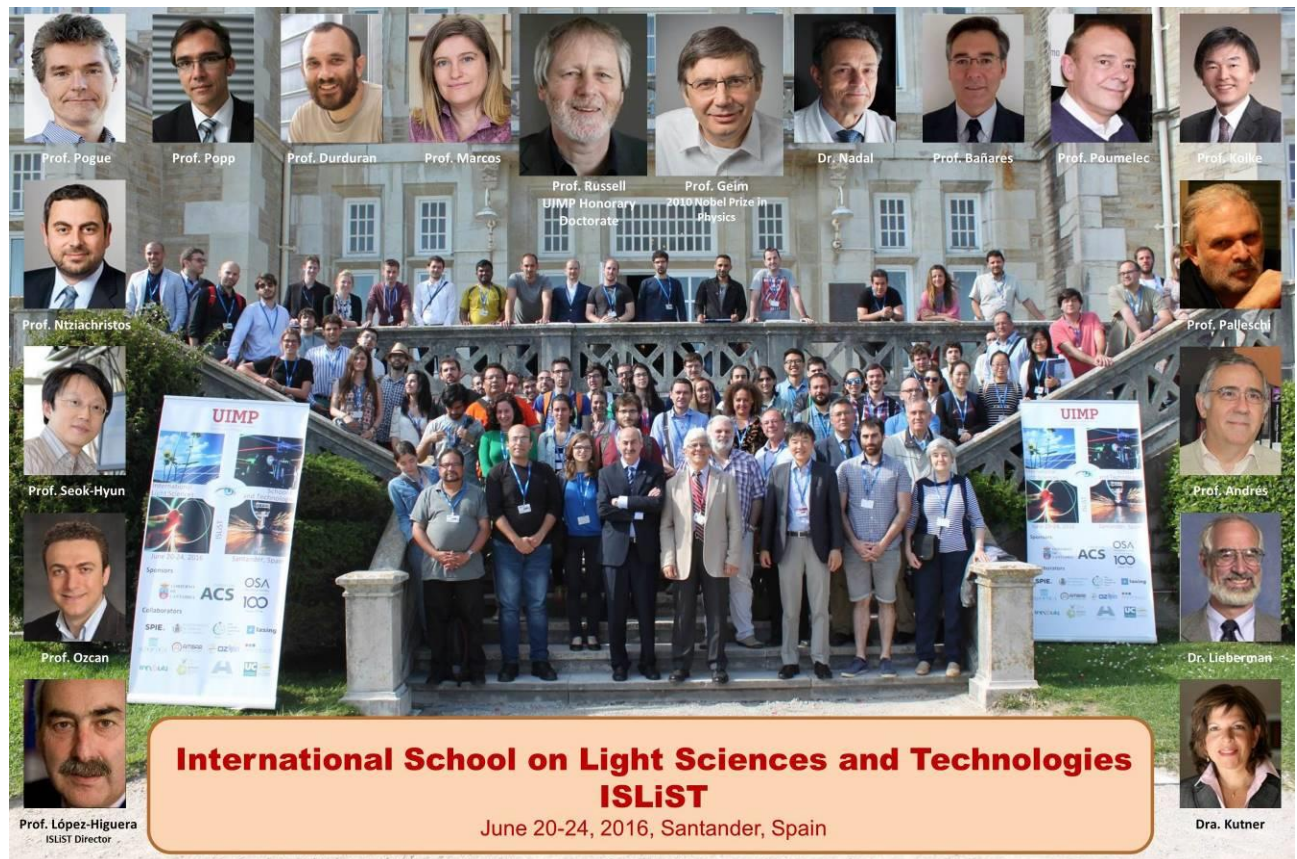


Figure 2. Family photo of the ISLIST-2016 participants. It was taken just before the OSA 100 reception.

The participants of this first edition of the ISLIST at UIMP in Santander, Spain, enjoyed the eighteen (18) invited talks and two round tables by highly renowned professors (including the Nobel Laureate Andre Geim) and researchers from the most prestigious worldwide institutions of Europe, USA, and Japan, and, as well, presidents of the most reputed international Photonic Scientific Organizations.



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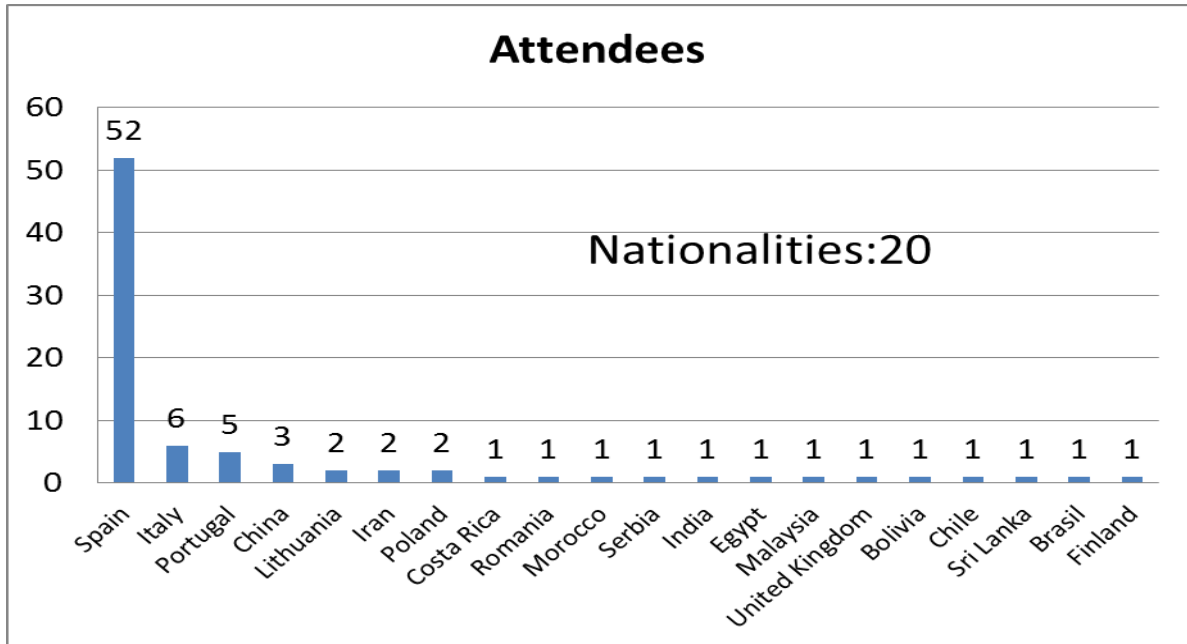


Figure 3.-ISLiST attendees by countries from Europe, Asia, America and Africa.

85 attendees from 20 different nationalities (from over 34 different places) participated in this meeting. As shown in Figure 3, 52 participants came from Spain, 6 from Italy, 5 from Portugal, 3 from China and 2 from Iran and Lithuania and Poland. Other 13 attendees from 13 different countries also participated in the School.

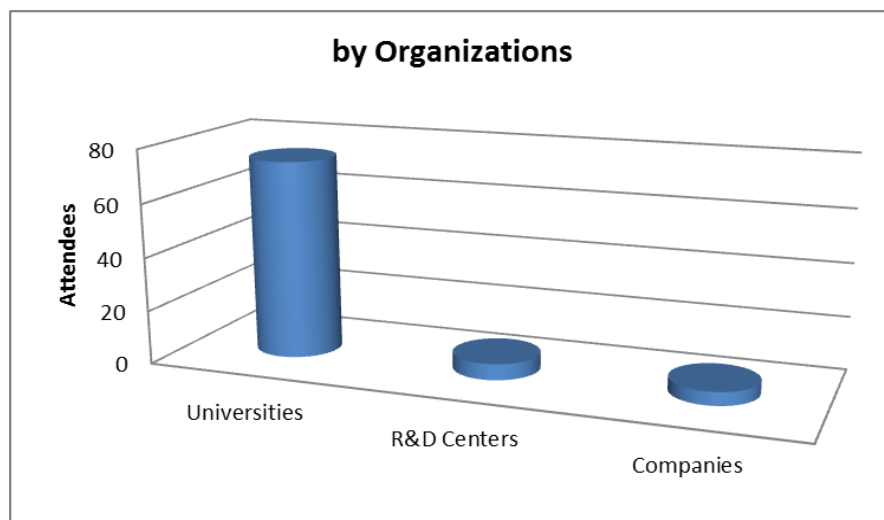


Figure 4.-Attendees by Organizations.

Seventy four (74), six (6) and five (5) participants were from education institutions (Universities), R&D centers and companies, respectively.



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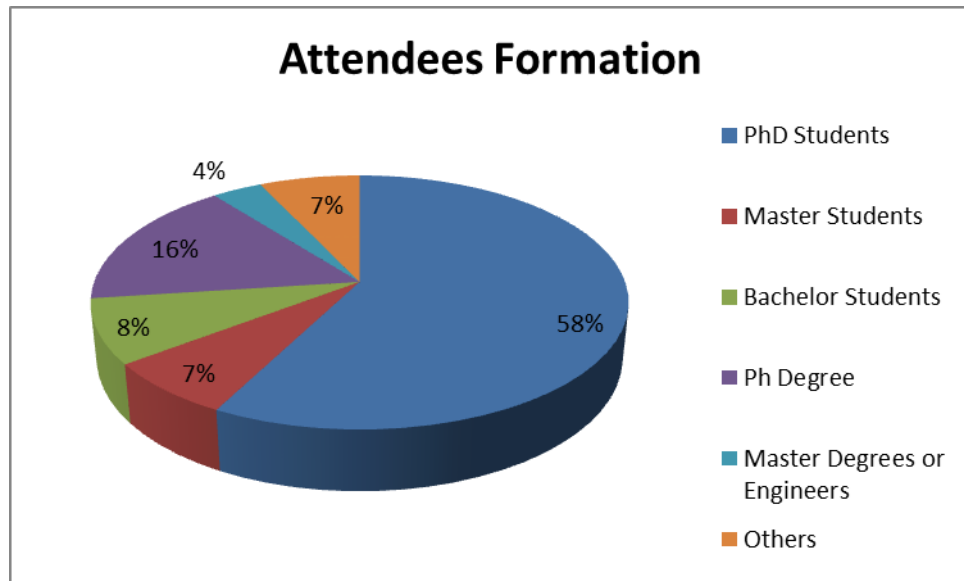


Figure 5.-ISLiST attendees by education

Regarding the previously mentioned students: 49 were PhD students, 14 were PhD (Dr), 7 were Bachelor Students, 6 were Master Students, 3 were Engineers.

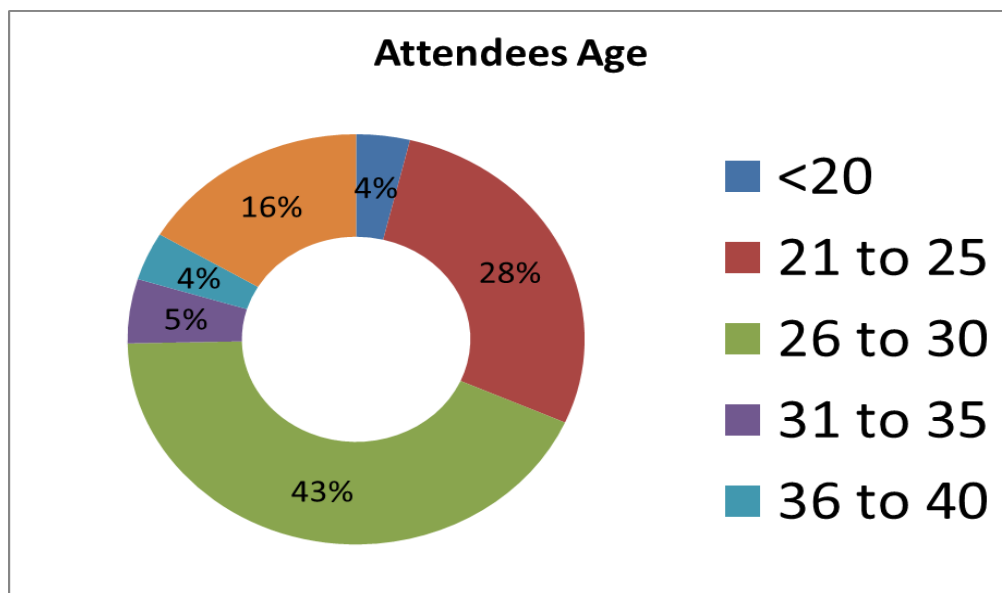


Figure 6.-ISLiST attendees by age.

In terms of the students age: 71% of the attendees were in the range from 20 to 30 years, what is in correlation with the fact of the education period working towards PhD degrees. This fact suggests the very good acceptance of this top quality school and its positive potential impact on the education of very good researchers and professionals in the early stages of their careers.





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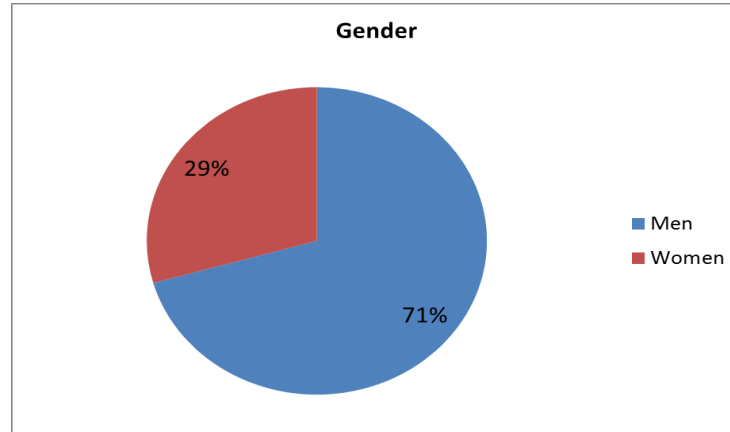


Figure 7.-ISLiST attendees by gender

Analyzing the gender distribution: 60 attendees were men and 25 women. This is in same way in correlation with the real situation in many countries in technical professions. Taking in consideration the high number of women as students in grade levels of the current education institutions, these numbers will be progressively change towards a more homogeneous distribution without the need of any specific policy.

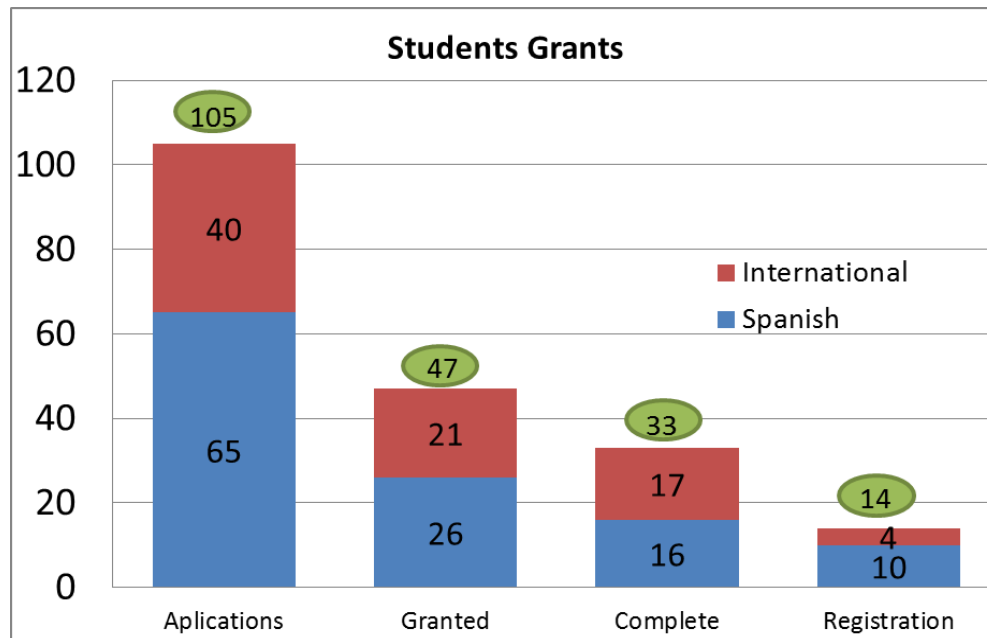


Figure 6.-ISLiST Student Grants statistics. Blue color: For Spanish Students or Students of any nationality but working/studying in Spanish institutions; red color: any other international Students.



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For **Spanish Students** or Students of any nationality but working/studying in Spanish institutions, UIMP is able to offer grants using the funds from the Spanish State. However, UIMP is not able to offer grants for **any other international Students**. Thanks to the sponsors and collaborators, ISLiST was able to offer 21 grants for **international** students from non-Spanish institutions: <http://www.teisa.unican.es/ISLiST/index.php/grants>

A call for applications was opened for two kinds of student grants: i) Registration Grants or ii) Full Grants that cover course registration, accommodation and living expenses.

ISLiST at UIMP received a total of 105 applications (65 Spanish... and 40 from any other international students). A total of 47 grants were allocated (26 funded by the public Spanish state funds and 21 using the funds from the sponsors and collaborators. 33 were complete or full grants (17 for international students) and 14 covered only the school registration fee.

As it happened in this first edition of ISLiST, the offer of scholarships to students from any institution around the world, has significantly contributed to the achievement of the recognition of ISLiST as a top international forum, what is "inscribed in the genes" of the University of Universities (the International University Menendez Pelayo).

### 3.- PROGRAM AND ITS DEVELOPMENT

The School Program was designed and published in the meeting web site:

<http://www.teisa.unican.es/ISLiST-2016/>

A School Handbook was printed to be included in the bag of all the ISLiST participants:

<http://www.teisa.unican.es/ISLiST-2016/images/ISLiST-UIMP-LiBRITO.pdf>

#### 3.1 Invited Talks and Round Table in the frame of ISLiST-2016 core

After the Opening Ceremony, from June 20 to June 22, 2016 during the afternoon, 10 invited talks and a Round Table were developed:



Figure 7.-Moment of the Opening Invited Talk by Prof. Philip Russel (Germany)



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Figure 8.- Moments of the invited talks by Prof. López-Higuera (University of Cantabria, Spain), Prof. Ozcan (UCLA, USA) and Prof. Seok-Hyun (University of Harward, USA).



Figure 9.- General view of the ISLiST-room during one of the invited talks.



Figure 10.- Moments of the invited talks by Prof. Ntziarchristos (TUM, Germany), Prof. Pogue (Dartmouth College, USA) and Prof. Pop (University of Friedrich Schiller, Germany).



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Figure 11.- Moments of the invited talks by Prof. Durduran (ICFO, Spain), Prof. Marcos (CSIC, Spain) and Dr. Nadal (Barraquer Ophthalmology Centre, Spain)



Figure 12.- General view of the round table (*Light on medicine and health care challenges*) during the introduction by the moderator (Prof. Lopez-Higuera, ISLiST Director) and four moments of the invited panelists speeches: Prof. Pop (University of Friedrich Schiller, Germany); Prof. Ozcan (UCLA, USA); Prof. Pogue (Dartmouth College, USA) and Prof. Ntziarchristos (TUM, Germany).



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### 3.2 Invited Talks and second Round Table on hot topics

Seven invited talks and the second round table were developed. All were focused on hot topics where light plays a key role: light in Chemistry and Materials processing, Advanced Materials, on Imaging through Turbid media, on Cultural Heritage, concerning the USA National Photonics Initiative and also about the Miracle of the Start-ups in Israel. The second round table was focused on Knowledge and Technique Transference.



Figure 13.-Moments of the invited talks by Prof. Bañares (University Complutense of Madrid, Spain,), Prof. Poumellec (University Paris-sud in Paris-Saclay, France) and Prof. Koike (Keio University, Japan).





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Figure 14.-Moment of the invited talk by the Nobel Laureate 2010 Prof. André Geim (University of Manchester, UK). This Regius and Royal Society Research Professor at the Centre for Mesoscience and Nanotechnology, delivered an memorable talk on *Graphene, other atomically thin crystals and beyond*.



Figure 15.-Moments of the invited talks by Prof. Vincenzo Pallechi (University of Pisa, Italy) and Prof. Andres (University of Valencia, Spain).



Figure 16.-Moments of the invited talks by Dr. Lieberman (2016 SPIE President, USA) and Dra. Kutner (Founder of BioJerusalem, Israel).



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Figure 17.-General View of the round table (Knowledge and Technique Transference) during the introduction by the moderator (Prof. Lopez-Higuera, ISLiST Director).





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Figure 18.-Four moments of the invited panelist speeches: Prof. Koike (Keio University, Japan); Dra. Kutner (Founder of BioJerusalem, Israel); Dr. Lieberman (2016 SPIE President, USA) and Nobel Laureate 2010 Prof. André Geim (University of Manchester, UK)

### 3.3 Special Events

Within the frame of ISLIST two special events were allocated and developed: an Award Ceremony and the OSA 100 reception.

#### 3.3.1 Justiniano Casas Prize Ceremony

To stimulate research activity from its origins, in the framework of doctorate studies, and to foster the incorporation of new researchers in this field, the Spanish Optical Society Committee for Image Techniques has established this Prize sponsored by INFAIMON SL. The call is currently open each two years. [http://www.sedoptica.es/SEDO/Comitelmagen/ficheros/BasesPremioJC\\_5Ed\\_EN.pdf](http://www.sedoptica.es/SEDO/Comitelmagen/ficheros/BasesPremioJC_5Ed_EN.pdf)

As programmed, on June 21 at the end of the afternoon ISLIST session, the award ceremony of Justiniano Casas Prize for Research in Optical Imaging took place.



Figure 19.-Awards Presidential Table: Prof. Inmaculada Pascual and Prof. Jesús Lencís Secretary and President of the Image Techniques Committee of SEDOOPTICA, respectively; Prof. Santiago Vallmitjana, SEDOOPTICA President and Prof. José Miguel López-Higuera, ISLIST Director.

The first prize of this Fifth Edition has been awarded to Dr. Alba Peinado Capdevila, for a work related to his doctoral thesis entitled "Design of polarimeters based on liquid crystals and biaxial crystals for polarization metrology", directed by Dr. Juan Campos Coloma and by Dr. Angel Lizana Tutusaus at the University Autònoma of Barcelona.





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Figure 20.-Some moments of the awarded during the Ceremony.



Figure 21.-Closing words by the Prof. Santiago Vallmitjana, SEDOPTICA President and family Photo including the awarded and the presidential ceremony table.

The second Prize (Accesit) of this Fifth Edition was awarded to the Dr. Alejandro Cámara Iglesias, by the work related to his thesis doctoral entitled "Optical beam characterisation via phase-space tomography", directed by the Dra. Tatiana Aliyeva Krasheninnikova and it Dra. Maria Luisa Calvo Padilla at the University Complutense of Madrid.

### 3.3.2 OSA100 Reception

Since its founding in 1916, The Optical Society has brought together a global community of scientists, engineers, business leaders, and students whose work in Light Sciences and Technologies has transformed the world. A vast body of knowledge the scientific community has generated, the breakthrough technologies that have allowed us to observe our world with ever-greater depth and precision, and the people who have dedicated their lives and careers to expanding knowledge and applications in diverse branches of science.

To celebrate its centennial, The Optical Society of America, OSA, was very pleased to offer to ISLiST attendees the OSA100 Celebration Reception. It was a great opportunity to chat, to networking, to interchange experiences, enjoying with snacks and drinks inside an incredible nice environment in the Royal Dining Room of the Magdalena Palace (June 22, 2016).



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Figure22.-Prof.Rodríguez Val, UIMP Vice-chancellor, welcoming the ISLIST attendees to the OSA100 Celebration Reception.



Figure23.-Four moments of the introduction and welcome speeches to the participants by Prof. López-Higuera, Prof. Russel, and Prof. Marcos, ISLIST Director, 2015 OSA President and OSA Director at Large respectively.



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Figure24.-Several moments along the OSA reception.



Figure25. Prof. López-Higuera with Prof. André Geim Nobel Laureate 2010 during the OSA100 Reception.

### 3.3.3 Press Conference

Andre Geim , Nobel Laureate on physics 2010 and professor of the University of Manchester, UK and Philip Russell, director of the Max Planck Institute for the Science of Light, University Erlangen-Nuremberg, Germany, offered a press conference accompanied by the rector of the UIMP, César Nombela and Professor of Electronics and Photonics of the University of Cantabria Jose Miguel Lopez-higuera. They outlined the latest developments in their fields of research, within the activities of the International School on the UIMP Light Sciences and Technologies (ISLiST).



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*Figure25. Prof. Philip Russell, UIMP DHC, Prof. André Geim, Nobel Laureate 2010; Prof. César Nombela, Rector of UIMP and Prof. José Miguel López-Higuera, ISLiST Director; before and during the round press.*



*Figure26.- A moment of the Press Conference.*

Philip Russell works in new optical materials and explained that the main finding of his research, glass fibers Photonic (PCF, its acronym in English), allows "control light" and "handle it". "It looks like magic", he assured. In addition, he highlighted the range of possibilities offered by this discovery in areas such as medicine, science and technology.

On the other hand, Andre Geim, Nobel of Physics Laureate, has praised the academic level of the

UIMP and acknowledged the "high quality" of the content of the course.

Geim pointed out that in the last fifteen years he has been working with "new materials that were not previously available to us". "Our era is the Silicon", he said, but is it being already surpassed by the era of Graphene, the two-dimensional material that managed to develop and which was awarded the Nobel Prize in Physics in 2010. In this regard, he explained that it is a useful material, among many other things, the development of "electronic devices more flexible and resistant and efficient", such as computers, touch screens or solar panels. He also pointed out



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that it takes "between twenty and forty years for a newly discovered material ends up using as a consumer product".

In addition, the Russian teacher has highlighted the importance of "curiosity" in the development of a research.

### 3.4 Exceptional Event: Doctor Honoris Causa Ceremony

To recognize seminal results during three decades of research, traveling all the way from the sketched idea to the development of its applications in many real-world devices and especially for the invention of the Photonic Crystal Fibers (PCFs), which are already widely used both in the academic and industrial arenas, the Menendez Pelayo International University, UIMP, vested *Doctor Honoris Causa* (DHC) to Prof. Philip Russell. The current Director of the Max Planck Institute for the Science of Light, Germany, received this prestigious distinction in a solemn ceremony held in the Hall Real of the end of the morning of the fourth day (June 23, 2016) of the International School on Light Sciences and Technologies. Nominated by the ISLiST's director, this International prestigious institution (university of universities) conferred this honorary doctorate to Prof. Philip Russell by unanimous agreement of its Governing Council.



Figure27. UIMP Governing Council and the godfather moments before the DHC Ceremony



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Figure28. Moment of the *entrée* in the Hall Real of the honored (accompanied by his godfather) with UIMP Governing Council members and the ceremony attendees included the Nobel Laureate Prof. Geim) standing.



Figure29. Three moments of the Godfather (“*padrino*”) *laudatio* speech.

In his “*laudatio*” speech, entitled *When Light and Sound work together*, Prof. Lopez-Higuera, Philip’s Godfather at the Ceremony, made a flight for the scientific, entrepreneurial and as a musician profiles of the honored and concluded:

*“Our honored is a reputed scientist fascinated by sound and light. This world citizen, is an uncommon human being who is always keen on taking nothing for granted, to remove misconceptions going back to the basics, encouraging people to work it out for themselves and*



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*developing their own intuition. He is someone, in which mind there is always something going on, someone, whose mind is always at work even if he is not aware.*

*Philip is a deep thinker, a genius certainly on a mental plane far above most people. He is capable of generating theoretical ideas, solving complex theories and transposing them to a level that can be understood by "mere mortals" and then implemented by high powered experimental scientists. He is well known and respected throughout the field of Light Sciences and Technologies, recipient of many prestigious awards, because of his world-renowned research that in addition has driven the scientific community to elect him as OSA President 2015.*

*Así pues Rector, dignísimas autoridades y claustrales, agradezco a esta universidad de universidades, que en base a sus relevantes méritos haya otorgado al Profesor Philip St John Russell, el Supremo Grado de Doctor Honoris Causa y se honre incorporarle hoy a su claustro de doctores”.*



Figure30. Five moments of the ceremony in which the Rector of the UIMP Prof. César Nombela, in presence of the Godfather invested Philip St John Russell as Doctor Honoris Causa (DHC).



Figure31. The honored (three moments) during his acceptance speech (part A:discourse).

...in his acceptance speech the Honored started:

*“I am deeply honoured and grateful to be awarded an Honorary Doctorate from the Universidad Internacional Menéndez Pelayo. I would like to thank in particular Professor Cesar Nombela, Rector of the University, for supporting my nomination, and Professor José Miguel López-Higuera for his great generosity in nominating me”.*

....and followed:



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*"This, the award of my first honorary degree, is the kind of rare occasion when I believe it's considered OK to reflect on one's career, which in my case means the random sequence of serendipitous events and often undeserved strokes of luck that have propelled me to the position of standing here and speaking to you today on this very happy occasion".*

.....and concluded:

*"In closing, I'd like to thank the many friends and colleagues who have worked with me over the years for their great support. Actually Jose Miguel asked me if I would be willing to play the piano for you. I have been a keen pianist from age 5, and in fact used to practice 3-4 hours per day as a teenager and into my late 20s, and even toyed seriously with becoming a professional (classical) pianist at age 28.*

*So instead of a concluding statement, here are some jazz tunes..."*



Figure32.-The honored (two moments) during his acceptance speech (part B: playing piano).



Figure33.-The honored (two moments) being recognized and enthusiastically applauded by the audience.





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.. and then Philip's fingers worked on the UIMP piano... and the Royal Hall was flooded by the sounds of music of the highest quality ....and the ceremony attendees were all... mesmerized!



Figure34.-The honored with Prof. Marcos, Prof. Andres, JM López-Higuera and his wife Rosie after closed the Solemn DHC ceremony.

### 3.5.-Opening, Closing remarks and Diploma Delivery

The opening ceremony was presided by the Vice-Chancellor of the UIMP Prof. Martinez del Val Peñalosa who welcomed all participants to the event and stated that ISLIST international School is envisioned to be a worldwide top International forum (**every fourth week of June**) on *Light Sciences and Technologies* in Santander, Spain.



Figure35.-The UIMP Vice-chancellor and ISLIST Director during the Opening Ceremony

He also added that ISLIST has been conceived as a great opportunity to review and actualize knowledge in this Key or Essential science and technology for the development of the nations. It



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offers a great opportunity to contribute to the education of citizens and to ensure also that policymakers are made aware of the problem-solving potential of Photonics.

The ISLiST director explained how the School was planned to be developed along the week including the special and exceptional events included in the programme. He presented also the statistics concerning the participants on the school and concluded with acknowledgement words for the Sponsors and Collaborators with Special thanks, to all the 18 Invited Speakers selected among the world-wide leader authorities in their respective matters. He added special mentions to the secretary of the course Jesús and to his secretary Maria, both at University and to Margarita Montes, to the Vicerrector Rodrigo Martinez and the Rector César Nombela at the UIMP for their understanding, support and facilities offered during the organization of the event.

During the week the Rector of the UIMP offered a salutation brief speech and also attended several talks.



Figure36.-Prof Nombela,UIMP Rector and ISLiST Director during his salutation speech



Figure37.-Several moments of the Diploma delivery to the ISLiST participants

Before the closing ceremony a personalized Official Diploma was delivered to the participants that participated in the school.



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The Closing ceremony was presided by the Vice-Chancellor of the UIMP Prof. Vázquez de Castro who remarked that the UIMP satisfaction for the high quality of the ISLiST international school and its splendid development, concluding his Closing Speech with the **confirmation of the continuation of this international School in next years.**

Prof. López-Higuera, announced that the **Second International School on Light Sciences and Technologies** next year will have the **Main Core on Light on Energy and Environment.** It will be developed during the week of **June 19-23, 2017.** The ISLiST director announced also that several invitations were submitted (include to two Nobel Laureates) and that, at that time, it was confirmed the participation of the European Commissioner for the Energy and Environment (Mr. Arias-Cañete) and Eric Mazur, Professor at Harward University, USA, and also the 2017 OSA President.



Figure38.-The UIMP Vice-chancellor and School Director during the concluding Remark and announcement of the ISLiST 2017.

### 4.- QUALITY: SATISFACTION SURVEY

To have objective index of quality, after closing the ISLiST international School a brief and anonymous survey was carried out among the participants. The questions asked were:

Q1-Please indicate your overall opinion regarding the quality of the invited speakers

- |               |                |
|---------------|----------------|
| 0 - Very Poor | 3 - Good       |
| 1 - Poor      | 4 - Very good  |
| 2 - Average   | 5 - Excellent! |

Q2-Please indicate your overall opinion regarding the topics of the talks

- |                             |                                    |
|-----------------------------|------------------------------------|
| 0 - Extremely uninteresting | 3 - Interesting                    |
| 1 - Not very interesting    | 4 - Very Interesting               |
| 2 - Average                 | 5 - Really what I was looking for! |

Q3-Please indicate your overall opinion regarding the ORGANIZATION of the school

- |              |                |
|--------------|----------------|
| Final Report | 3 - Good       |
|              | 4 - Very good  |
|              | 5 - Excellent! |



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- 0 - Very Poor
- 1 - Poor
- 2 - Average

**Q4-Please indicate your overall opinion regarding the INFORMATION that you received before attending the school**

- 0 - Very Poor
- 1 - Poor
- 2 - Average
- 3 - Good
- 4 - Very good
- 5 - Excellent!

**Q5-Would you attend future editions if possible?**

- 0 - Not at all
- 1 - Not very likely
- 2 - Maybe
- 3 - If the main core suits me
- 4 - Probably
- 5 - I would love to come again to Santander and attend ISLiST-XX

**Q6-Would you recommend ISLiST to other colleagues?**

- 0 - Not at all
- 1 - Not very likely
- 2 - Maybe
- 3 - If the main core suits him/her
- 4 - Probably
- 5 - Absolutely!

**Q7-Finally, did the school meet your expectations?**

- 0 - No, it was a complete disappointment
- 1 - Not really
- 2 - Only partially
- 3 - Yes, but it might have been better
- 4 - Yes, absolutely
- 5 - It was even better than I expected!

**Q8-Please, tell us about the best things of the school (what we should go on considering in future editions)**

**Q9-Please, tell us about the worst things of the school (what we should NOT consider in future editions)**

**Q10-Do you have any suggestions, comments ...?**

After processing the responses, the overall result of the survey is graphically summarized as follows:

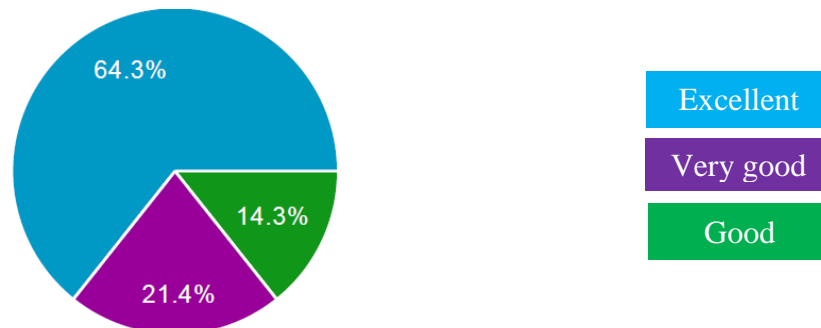


Figure 39.-Regarding the **quality of the invited speakers** (Q1), the 64.3 %, the 21.4 % and the 14,3 % of the participants considered that they were *excellent*, *very good* and *good* respectively. There were no answers qualified as average, poor or very poor.



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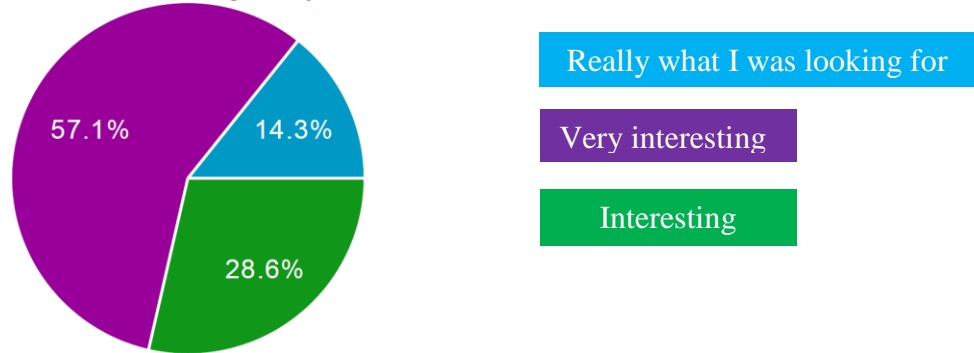


Figure 40.- Regarding the **topics of the talks** (Q2), the 14.3 %, the 57.1 % and the 28.6 % of the participants considered that they were *Really it was what I was lloking for*, *very interesting* and *interesting* respectively. There were no answers qualified in the other possibilities.

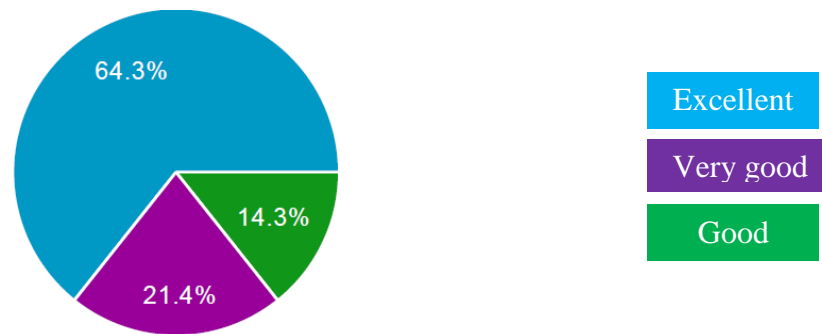


Figure 41.-Regarding the **organization of the School** (Q3), the 64.3 %, the 21.4 % and the 14,3 % of the participants considered that they were *excellent*, *very good* and *good* respectively. There were no answers qualified as average, poor or very poor.



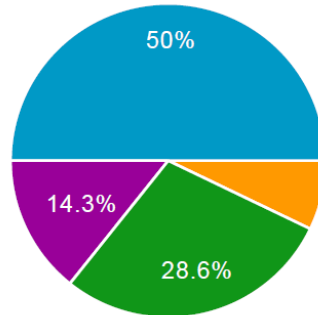
Figure 42.- Regarding the **information received before attending the School** (Q4), the 28.6 %, the 28.6 % the 35.7 % and the 7.1% of the participants considered that they were *excellent*, *very good*, *good* and *average* respectively. There were no answers qualified as poor or very poor.



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Core: *Light in Life Science and Health*



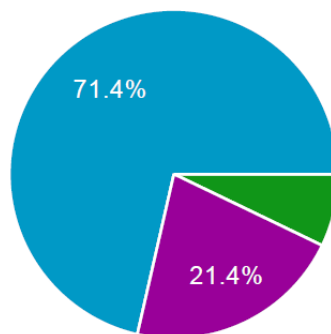
I would love to come again..

If the main core suit me

Probably

Maybe

Figure 43.-Regarding the **possibility of attending the next edition of the School (Q5)**, the 50 %, the 14.3 % the 28.6 % and the 7.1% of the participants considered that they were *that they would love to come again, If the main core suit they, probably, and maybe* respectively.

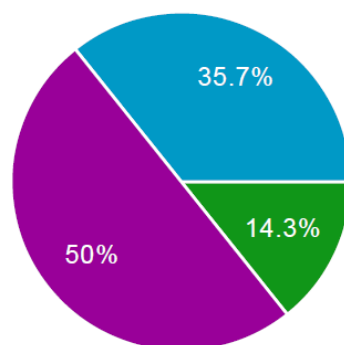


Absolutely

If the main core suit they

Probably

Figure 44.-Concerning **if they would recommend ISLIST to other colleagues (Q6)**, the 71.4 %, the 21.4 % and the 7.1 % of the participants considered that they will *absolutely, If the main core suit they, and probably* respectively will recommend the school to other colleagues.



Yes, absolutely

It was even better than I expected

Yes, but it might have been better

Figure 45.-Concerning **if the ISLIST meet your expectations (Q7)**, the 50 %, the 35.7 %, and the 14.3 % of the participants considered that: *yes absolutely, it was even better than they expected and yes, but it might have been better* respectively the school meet their expectations.



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Concerning the three additional questions, we have received the following (they are as they have been received):

*Q8-Please, tell us about the best things of the school (what we should go on considering in future editions)*

*bus to Magdalena*

*Location, time, world class speakers, cutting edge science, ability to read/watch presentations/videos after the school*

*You help me accommodate a perfect roommate. It's really wonderful.*

*The panel discussions! It is a great way to discuss the lectures more casually, and to engage the students in the challenges faced by scientists in the real world.*

*Everything was great for me! Quality of the speakers were amazing. Location breathtaking.*

*Food was exquisite and everyone was so helpful.*

*Location, Organization, Quality of the talks,*

*Q9-Please, tell us about the worst things of the school (what we should NOT consider in future editions)*

*the lunch very expensive*

*Everything is great. If there must be one, I would like to say that coffee break without coffee and biscuit.*

*The lecture on the start up culture in Israel was interesting, but perhaps not factual or concise at all.*

*Every aspect exceeded my expectation so I am not sure what was bad*

*Q10-Do you have any suggestions, comments ...?*

*nada*

*Thanks a million for everything. Have a lovely summer time.*

*Students found it challenging to build a network in between*

*the lectures during the day. My suggestion is that it would benefit the students and the professors both if there were to be a social event planned during the course, as networking is important motivation for students and a way to meet possible future collaborators.*

*No comments*

## **5.- CONCLUSIONS**

Eighty five (85) people from 20 different nationalities from all around the world participated on ISLiST 2016. During the development of the whole programme, they received knowledge and shared experiences with eighteen (18) highly renowned professors (including the Nobel Laureate Andre Geim) and researchers from the most prestigious worldwide institutions of Europe, USA. They also enjoyed the special events along what they have great opportunities to do networking on matters of their interest.

Very special moments were lived during several talks with special emphasis on the Prof. André Geim and also it was and memorable the solemn ceremony investing Doctor Honoris Causa to the Prof. Philip Russell. Unforgettable was their DHC acceptance response by playing several concatenated pieces of music on the piano.



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According with post-ISLIST survey, the quality of the program, of the speakers, of the complementary events the facilities offered, can be considered at the top level worldwide. ISLIST has met their expectations, being over the 70% of the attendees very happy to recommend ISLIST to other colleagues and about the 50% indicating their interesting in participating again *in next editions of the ISLIST School*.





## **International School on Light Sciences and Technologies (ISLiST)**

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### **ANEX: ISLIST-2016 PROGRAMME**

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#### **Monday, 20**

##### **Why Light matters for Medicine and Health?**

10:15 h

##### **Opening Ceremony**

10:40 h / **Break**

11:00 h / **Opening Talk**

##### **The Multi-Faceted World of Photonic Crystal Fibres**

**Prof. Philip Russell,**

OSA Past President, **Director** of Max Planck Institute for the Science of Light, University Erlangen-Nuremberg, Germany

12:10 h

##### **Light in Life Sciences and Health**

**Prof. José Miguel López-Higuera,**

**Head** of Photonic Engineering Group, Universidad de Cantabria, Spain.

13:30-15:00 h / **Lunch Time**

Afternoon: **Light in Medicine and Health Care**

15:30 h / **Keynote**

##### **Democratization of Next-Generation Imaging, Sensing and Diagnostics Tools through Computational Photonics**

**Prof. Aydogan Ozcan,**

**Director** Bio&Nano-Photonics Laboratory, Chancellor's Professor, of California, Los Angeles, USA.

16:40 h / **Keynote**

##### **Biological and Intracellular microlasers and their applications in medicine**

**Prof. Seok-Hyun,**

**Director** of The Bio-Optics Lab. **Harvard** Medical School and faculty member at **MIT**, MA, Boston, USA.

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Core: *Light in Life Science and Health*

### **Tuesday, 21**

Morning: **Light in Medicine and Health Care**

9:30 h / Keynote

#### **Clinical Optoacoustic and Fluorescent Imaging**

**Prof. Vasilis Ntziachristos,**

**Director** of Institute for Biological and Medical Imaging at the Helmholtz Zentrum München, Munich, Germany.

10:40 h / Break

11:00 h / Keynote

#### **Light in cancer management: Surgery, Medicine & Radiation Oncology**

**Prof. Brian Pogue**

**Director** of Center for Integrating Innovations in Imaging for Intervention (I4) Medicine, Dartmouth, USA.

12:10 h / Keynote

#### **Biophotonics – a powerful tool for clinical diagnostics**

**Prof. Jüergen Popp**

**Director** of Leibniz Institute of Photonic Technology; Institute of Physical Chemistry & Abbe-Center of Photonics, Friedrich Schiller University, Jena, Germany.

13:30-15:00 h / Lunch Time

Afternoon: **Light in Medicine and Health Care**

15:30 h

#### **Using diffuse light and speckle statistics to non-invasively measure blood flow; from theoretical foundations to clinical applications**

**Prof. Turgut Durduran,**

**Head** of the Medical Optics Group, Instituto de Ciencias Fotónicas, ICFO, Barcelona, Spain.

16:40 h

#### **Understanding, diagnosis and corrections of the eye using Light**

**Prof. Susana Marcos**

**Director** of Visual Optics and Biophotonics Lab, Instituto de Optica, Professor of Research, CSIC, Madrid, Spain

17:55 h Special Event

#### **Justiniano Casas Prize Ceremony**

The prize tries to stimulate research activity from its origins, in the framework of doctorate studies, and to foster the incorporation of new researchers in this field. This Prize of the Spanish Optical Society Committee for Image Techniques is Sponsored by INFAIMON SL.



## International School on Light Sciences and Technologies (ISLiST)

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Core: *Light in Life Science and Health*

### Wednesday, 22

Morning: **Light in Medicine and Health Care**

9:30 h

#### **And the blind went back to see the light!**

**Dr. Jeroni Nadal**

**Director of** Department of Vitreo-Retina and Macula unit of the Barraquer Ophthalmology Centre, Barcelona, Spain.

10:40 h / Break

11:00 h

#### **Round Table I: Light on life Sciences and health Challenges**

**Prof. Aydogan Ozcan, Director** Bio&Nano-Photonics Laboratory, Chancellor's Professor University of California, Los Angeles, USA

*Challenges on photonics based telemedicine technologies toward next generation smart global health systems*

**Prof. Vasilis Ntziachristos, Director** Institute for Biological and Medical Imaging at the Helmholtz Zentrum München, Munich, Germany

*Challenges on Drug-Based Optical Agents: Infiltrating Clinics at Lower Risk*

**Prof. Brian Pogue, Director** of Center for Integrating Innovations in Imaging for Intervention (I4) Medicine, Dartmouth, USA

*Challenges on Light in neuro surgery and Photodynamic therapy to go to the real world*

**Prof. Jürgen Popp, Director** Leibniz Institute of Photonic Technology; Inst. of Physical Chemistry, Friedrich Schiller University, Jena, Germany

*Challenges on Endoscopic techniques for efficient and safe use into the clinical environment*

**Prof. JM López-Higuera, Director ISLiST, Moderator**

13:30-15:00 h / Lunch Time

Afternoon: **Light in Chemistry and Materials Processing**

15:30 h

#### **Dynamic Monitoring of the Chemical Bond using Ultrafast Lasers**

**Prof. Luis Bañares**

**Director of** Center for Ultrafast Lasers University Complutense of Madrid, Spain

16:40 h

#### **Three Dimensional Writing and Material Functionalization by laser: Science and Technology**

**Prof. Bertrand Pommellec**

**Director of** Research ICMMO, University Paris-sud in University Paris-Saclay, France.

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17:55 h Special Event

#### **OSA100 Celebration Reception**

The Optical Society of America, OSA, which celebrates its 100th anniversary in 2016, will offer to ISLiST attendees the OSA100 Reception. This OSA Happy Hour will be an optimum time to networking.



## **International School on Light Sciences and Technologies (ISLiST)**

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Core: *Light in Life Science and Health*

### **Thursday, 23**

Morning: **Light in Advanced Materials**

9:30 h Keynote



#### **Graphene, other atomically thin crystals and beyond**

**Prof. Andre Geim**

2010 Nobel Prize

Regius and Royal Society Research Professor, Centre for Mesoscience and Nanotechnology, University of Manchester, UK.

10:35 h / **Break**

10:50 h

#### **Plastic Optical Fibers in Medicine and Communications: New generation and trends**

**Prof. Yasuhiro Koike**

Director of Keio Photonics Research Institute, Keio University, Japan.

12:00 h / **Exceptional Event**



#### **Philip Russell Doctor Honoris Causa Solemn Ceremony**

UIMP will confer the Doctor Honoris Causa distinction to Prof. Philip Russell by unanimous agreement of its Governing Council, which wants to recognize his relevant contributions to the Sciences and Technologies of Light.

13:30-15:00 h / **Lunch Time**

Afternoon: **Light in Turbid Media and Cultural Heritage**

15:30 h

#### **Imaging through turbid media by single-pixel detection**

**Prof. Pedro Andrés**

Head of the Imaging and Photonics Group, Universidad de Valencia, Spain.

16:40 h

#### **Light in Cultural Heritage**

**Prof. Vincenzo Palleschi**

Head of the Laboratory of Applied and Laser Spectroscopy of the Institute of Chemistry of Organometallic Compounds, National Research Council and Professor at University of Pisa, Italy.



## **International School on Light Sciences and Technologies (ISLiST)**

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### **Friday, 24**

#### **Knowledge and Technique Transference**

9:30 h

#### **The National Photonics Initiative**

**Dr. R. Lieberman**

**2016 SPIE President** President of Lumoptics LLC, California, USA

10:00 h

#### **The Miracle of the Start-up Nation**

**Dra. Shirley Kutner**

**Founder of BioJerusalem**, Senior Strategic Consultant, Biotech/Biomed, Israel.

10:30 h / Break

10:45 h

#### **Round Table II: Knowledge and Technique Transference**

**Prof. Andre Geim, 2010 Nobel Prize**, Regius and Royal Society Research Professor, University of Manchester, UK.

*From the groundbreaking works to the real world applications*

**Dr. R. Lieberman, 2016 SPIE President, President of Lumoptics LLC, California, United States**

*SPIE actions to promote and to the Transference and exploitation of Knowledge&Technology*

**Prof. Yasuhiro Koike, Director**, Keio Photonics Research Institute, **Keio University, Japan**

*Insights for the success gained from Koike start-ups.*

**Dr. Shirley Kutner, Founder** of BioJerusalem Senior Strategic Consultant, Biotech/Biomed, **Israel**

*Insights from the success gained from BioJerusalem adventure*

**Prof. JM López-Higuera, Director ISLiST, Moderator**

12: 45 h

#### **Diploma Delivery**

13: 00 h

#### **Closing Remarks and Announcement of ISLiST 2017**