The first International Day of Light in Spain

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Ignacio Moreno, María J. Yzuel, María L. Calvo, "The first International Day of Light in Spain," Proc. SPIE 10741, Optics Education and Outreach V, 1074109 (14 September 2018); doi: 10.1117/12.2320591

SPIE.

Event: SPIE Optical Engineering + Applications, 2018, San Diego, California, United States

The first International Day of Light in Spain

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Abstract

In this work, we review the main activities related to the International Day of Light (IDL) in Spain. We describe the actions of the Spanish Committee for IDL that has been created in Spain, reactivating the Spanish Committee for the International Year of Light created in 2015. The Spanish Committee of the IDL has been very active in promoting the realization of events, and providing tools for the IDL related information dissemination, as the specific related webpage for the IDL in Spain. The Spanish Committee also was the Spanish contact with the International Secretariat of the IDL. We describe the flagship IDL event in Spain that was organized in the Faculty of Physics Sciences of Universidad Complutense de Madrid on May 16th 2018. And we report on many other activities that have been developed in different places in Spain. These activities of the IDL in Spain are intended to make the society aware of the importance of the light and the light based technologies for the progress and well-being of the humankind. They have also been oriented to attract young talent to the studies of science and engineering.

Keywords: International Day of Light, Outreach.

1. INTRODUCTION

After the great success of the International Year of Light (IYL) in Spain, the Spanish related community very well perceived the initiative of the International Day of Light (IDL). In 2014, a Spanish Committee for the International Year of Light (2015) was constituted and was very active and important for the success of the event in Spain. Therefore, right after the initiative of the IDL was announced, the interest of reactivating and renewing the committee and constitute a new Spanish Committee for the International Day of Light was clearly relevant. This new committee was created in 2017, even before the final IDL proclamation by UNESCO, and worked hard to promote the IDL event in Spain.

The Faculty of Physics Sciences of Universidad Complutense de Madrid (UCM) organized the main flagship event of the IDL in Spain. A full day event with two sessions, a morning and afternoon ones, was organized with great success of audience and participation. As a complementary artistic activity, the event finished at evening and night with the realization of a light painting happening.

Many other different activities have been developed in different places in Spain. Next, we describe and review all these activities in Spain related to the IDL. According to the goals of the IDL proclamation [1], these activities are intended to enable global appreciation of the central role that light and light-based technologies play in the lives of the citizens of the world in areas of science, technology, culture, education, and sustainable development. Also, they were intended to emphasize the importance of basic research in the fundamental science of light, the need for investment in light-based technology to develop new applications, and the necessity to promote careers in science and engineering in these fields.

2. THE SPANISH COMMITTEE FOR THE IDL

First contacts and conversations started in June/July 2017, where partial meetings were organized in Barcelona, Madrid, Granada and Santiago de Compostela, in order to directly communicate with the main involved community the idea of the IDL and the necessity to be prepared for the moment when the IDL was officially approved.

During these first meetings, since the very beginning, the Faculty of Physics of UCM offered their facilities to organize a main event in Spain to commemorate the first edition of the IDL.

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Optics Education and Outreach V, edited by G. Groot Gregory, Proc. of SPIE Vol. 10741, 1074109
 · doi: 10.1117/12.2320591

All these first contacts were very successful and, a first official meeting was organized in Madrid, on October 26th, 2017, at the Institute of Optics "Daza de Valdés", at Consejo Superior de Investigaciones Científicas (IO-CSIC), where the Spanish Committee for the IDL was officially created. Following the previous Spanish Committee of the IYL, this committee was intended to join all the different agents in Spain related to light science, to light technologies, and to optics and photonics. This includes scientific societies and organizations, research centers, universities, industrial platforms and professional associations.

Figure 1. Picture at the end of the first meeting of the Spanish Committee of the IDL held at Consejo Superior de Investigaciones Científicas (CSIC), Madrid, on November 2017. From left to right: Juan Diego Ania, Javier Alda, Maria J. Yzuel, Lara Elbaz, Ignacio Moreno, Santiago Vallmitjana, María L. Calvo, and Sergio Sáez. This meeting was also attended on site by Gastón García, Lydia Sanmartin (representing ICFO), Carmen Vázquez, Luis Martín (representing FECYT) and by Enrique Hita, Santiago Royo, Juan Luis Nieves, María Teresa Flores and María Aymerich via teleconference.

The 2018 Spanish Committee for the International Day of Light has been composed by the following members:

- **María Josefa Yzuel**, President of the Spanish Committee for the IDL, Professor Emeritus at Universitat Autònoma de Barcelona, and Academic Member of RACAB - Reial Acadèmia de Ciències i Arts de Barcelona.
- **Ignacio Moreno**, Vice-President of the Spanish Committee for the IDL, Professor at University Miguel Hernández of Elche, President of SEDOPTICA – Spanish Society of Optics.
- **María Luisa Calvo**, Vice-President of the Spanish Committee for the IDL, Professor Emeritus at Universidad Complutense de Madrid, Representative of RSEF - Real Sociedad Española de Física.
- **Javier Alda**, Professor at Universidad Complutense de Madrid, Director of the Deparrtment of Optics, UCM.
- **Juan Diego Ania**, Director of the Instituto de Óptica "Daza de Valdés", Consejo Superior de Investigaciones Científicas, Madrid (IO-CSIC).
- **Caterina Biscari**, Director of ALBA Synchrotron Facility, Barcelona.
- **Carmen Carreras**, Honorific Professor at UNED – Universidad Nacional de Educación a Distancia, and representive of RSEF - Real Sociedad Española de Física.
- **Antonio Corrons**, Vice-President of CEI - Comité Español de Iluminación (Spanish Committee for Lighting).
- **Paloma Domingo**, General Director of FECYT – Fundación Española de Ciencia y Tecnología (Spanish Foundation for Science and Technology).
- **Lara Elbaz**, representative of APDI - Asociación de Profesionales del Diseño de la Iluminación (Association of Lighting Design Professionals)
- **Gastón García**, Adjunt Director of ALBA Synchrotron Facility, Barcelona.
- **Enrique Hita**, Professor Emeritus at University of Granada, and President of the Academy of Exact, Physical, Chemical and Natural Sciences of Granada.

- **Humberto Michinel**, Professor at Universidade de Vigo, President Elect of the European Optical Society – EOS, and Secretary General of the International Commission for Optics – ICO.
- **Beatriz de Munck**, Director of the Presidency Cabinet and Institutional Relations of Red Eléctrica de España.
- **Luis Roso**, Professor at University of Salamanca, Director of CLPU - Centro de Láseres Pulsados de Salamanca.
- **Santiago Royo**, Director of CD6-UPC – Center for Development of Sensors, Instrumentation and Systems, Universitat Politècnica de Catalunya, and representative of FOTÓNICA21.
- **Sergio Sáez**, Manager of SECPhO – Southern European Cluster in Photonics.
- **Joan Sarroca**, Vice-Presidente of CEI - Comité Español de Iluminación.
- **Lluis Torner**, Professor at Universitat Politècnica de Catalunya, Director of ICFO - Institut de Ciències Fotòniques, Barcelona.
- **Santiago Vallmitjana**, Professor at Universitat de Barcelona, Past President of SEDOPTICA.

Prof. María Yzuel and Fernando Crespo (in representation of Red Eléctrica de España) were the members in representation of the Spanish Committee of the IDL at the International event of the IDL held in Paris on May 16th. Other Spanish representation in the event were Prof. Humberto Michinel, who attended as representative of ICO and EOS, Lydia Sanmartin from ICFO, and Prof. Augusto Beléndez and Prof. Inmaculada Pascual, from University of Alicante, invited by the IDL International Steering Committee.

Figure 2. Pictures of the Spanish representation at the IDL event in Paris. On the left: Humberto Michinel, María J. Yzuel and Fernando Crespo. On the right: Augusto Beléndez, John Dudley (IDL 2018 Steering Committee Chair), María J. Yzuel, Inmaculada Pascual and Fernando Crespo.

3. RESOURCES

The main goal of the Spanish Committee for the IDL was to disseminate and announce the IDL to all the related community. For that purpose, articles and notes with information about the IDL were published in some of the Spanish related journals, like those published in Optica Pura y Aplicada [2], the journal edited by SEDOPTICA, in Luces [3], the journal edited by CEI, or in Revista Española de Física [4], the journal edited by RSEF.

One major task was to provide our community with a website where all the related information could be available. For that purpose a new website (www.diadelaluz.es) was programmed [5], specifically developed to collect all the information related to the IDL in Spain and to provide resources to people interested in organizing new activities. The webpage was arranged in various sections: news, resources, conferences, workshops, educational, industrial, awards, publications, and media. Social networks like Facebook, Twitter and Instagram related to the IDL in Spain were also opened and maintained. Figure 3 illustrates the main page of this website. The webpage was also connected to the international webpage [6], where the Spanish Committee was indicated as the national node in Spain.

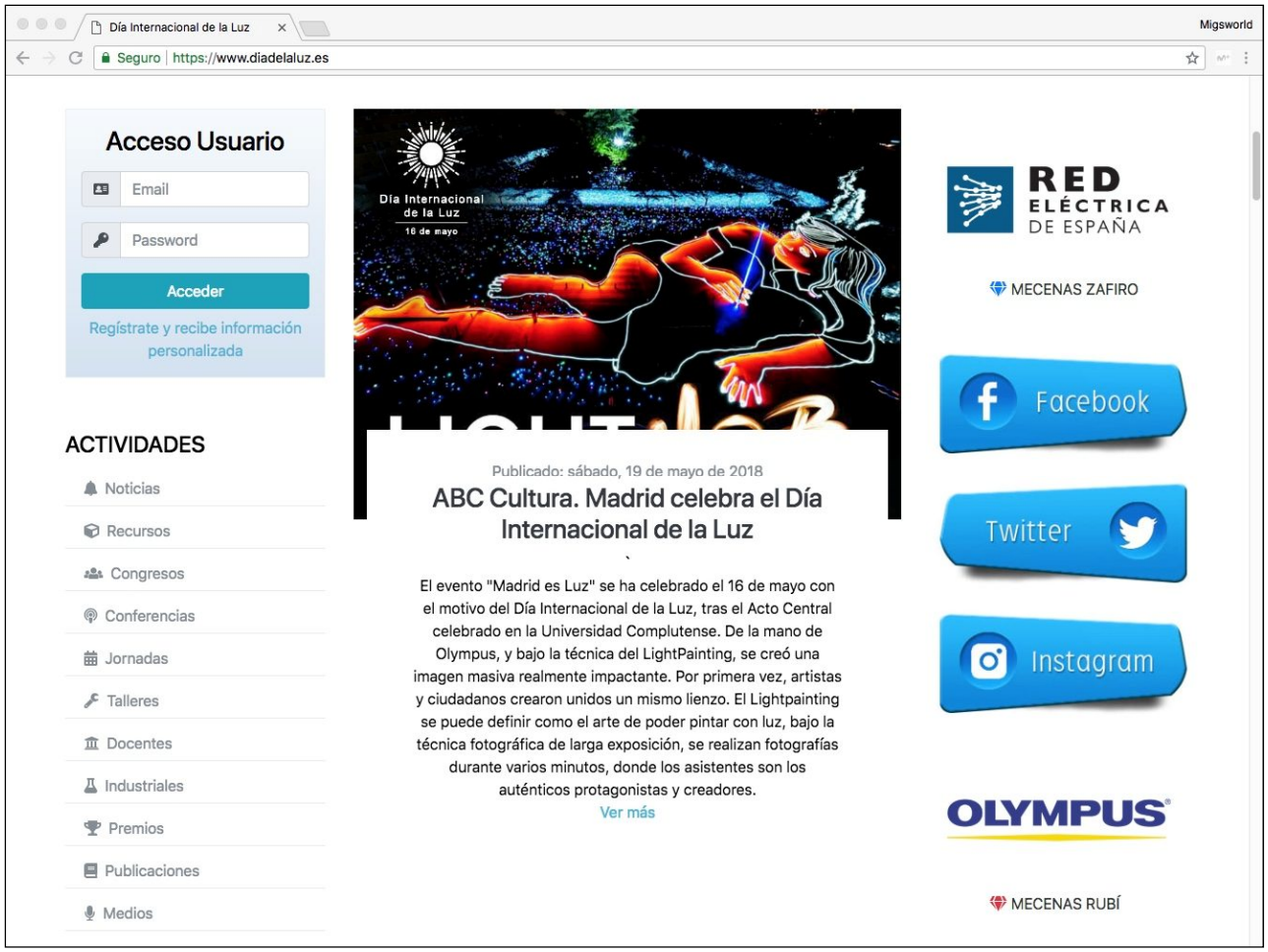

Figure 3. Main window of the Spanish website for the IDL.

Figure 4. Sponsors (left) and patrons (right) of the IDL in Spain.

The realization of this website was possible thanks to the initial sponsorship of the Spanish Committee for the IDL provided by the following sponsor institutions: SEDOPTICA, IO-CSIC, ALBA, ICFO, CD6, FOTONICA21, SECPHO, APDI and CEI. These funds were essential to start to move on the IDL in Spain.

The Spanish Committee for the IDL defined four different levels of patronage of the event in Spain, which received the names of Sapphire, Garnet, Ruby and Quartz, thus relating them to gemstones used in lasers and optics. Seven different companies became patrons of the IDL in Spain: Red Eléctrica de España – REE, that became sapphire patron, and other six companies that became ruby patrons: Indizen Optical Technologies (IOT), Philips, Valeo-UCM, Lasing, MTB and Olympus.

4. THE FLAGSHIP EVENT AT UNIVERSIDAD COMPLUTENSE DE MADRID

The main flagship event of the IDL in Spain was held at Universidad Complutense de Madrid (UCM). It consisted in two sessions held at the Faculty of Physics of UCM. All the local organization was supported by the Dean of the Faculty, Prof. María Luisa Lucía, who conducted many of the internal activities needed to assure a correct development. Moreover, the Local Organizing Committee was very active in all the programmed activities. This Local Organizing Committee was presided by María L. Calvo in coordination with the Dean and Vice-Dean, Julio Serna, as well as the Director of the Optics Department, Javier Alda, and professors Rosa Weigand, Carmen Carreras and Pablo Nacenta. Also the Director of the Institute of Optics CSIC, Juan Diego Ania, and Lara Elbaz from the Association of Professional Lighting Designer (ADPI) had active participation. The Committee had regular meetings starting October 2017.

The complete event at UCM can be viewed at the following links:

Morning Session: https://www.youtube.com/watch?v=9pFtjYzjlaQ

Afternoon Session: https://www.youtube.com/watch?v=PdVIvkKYEaw

The morning session consisted in a first conference delivered by Rosa Weigand on the history of lasers and three key talks on the ALBA Sincrotrón, by Gastón García, on virtual reality by Rubén Mohedano and on gravitational waves by Alicia Sintes. The session ended with a round table on the projection of optics and photonics in our daily life, and connections with the industry and educational programs with participation of various professionals of the relevant sectors.

A special guest for the IDL Flagship event in Madrid was Prof. Glenn Boreman, 2017 SPIE President. The funds to cover the trip of Prof. Boreman to Spain were provided by SPIE, RSEF via its agreement with Fundación Ramón Areces, and by a Travelling Lecturer of ICO. On May 16th, Prof. Boreman participated at the IDL event in Spain where he delivered a Plenary Talk in the afternoon session entitled "Photonics in our World".

Figure 5. Left: Prof. Glenn Boreman with Prof. Carlos Andradas, Rector of UCM. Right: Prof. Boreman with some members of the Spanish Committee of the IDL and Local Organizing Committee. From left to right Javier Alda, María L. Calvo, Glenn Boreman, María Luisa Lucía, Dean of the Faculty of Physics of UCM, Ignacio Moreno, Lara Elbaz, Pablo Nacenta, professor at IES "Alameda de Osuna", and Carmen Carreras from RSEF.

4.1 The Photon Awards

The afternoon session also included the ceremony of delivery of a new award initiative of the Institute of Optics "Daza de Valdés" of CSIC. This award received the name of *Premio Fotón* (Photon Award), and it had two categories: *Emitted Photon*, and *Absorbed Photon*. The *Emitted Photon* Award intends to recognize and promote the works on scientific communication and dissemination related to light, optics and photonics. The *Absorbed Photon* Award is intended to recognize educational works and projects related to light science and technology.

Two prizes were delivered for the *Emitted Photon* Award. The first prize was delivered to Fernando Gomollón, for a work entitled "Yo, fotón" (I, photon) published in the *Principia Magazine* [7]. The second prize was delivered to Patricia Luna, for the article "Fotónica. El genio (invisible) de la luz" (Photonics. The (invisible) genius of light), published the supplement of the journal Heraldo de Aragón [8]. The *Absorbed Photon* Award was delivered to the project "Grupo Gusto y Pasión por investigar", from the IES "El Cairat", from Esparreguera (Barcelona).

Figure 6. Winners of the Photon Awards together with Prof. Victor Velasco, Vice-President of CSIC, and Prof. Juan Diego Ania, Director of IO-CSIC.

Figure 7. Announcement of the Light MOB event and some pictures. Images courtesy of Children of Dark Light: https://childrenofdarklight.com/2018/05/20/hydra-olympus-lightmob-madrid-es-luz-2018/.

Figure 8. Final result of the Light MOB event. Image courtesy of Children of Dark Light: https://childrenofdarklight.com/2018/05/20/hydra-olympus-lightmob-madrid-es-luz-2018/.

4.2 The light painting happening

The day ended with a magnificent happening organized by the group Children of Dark Light dedicated to organize shows of light painting. This happening and light painting activity was financed by Olympus Co. Children of Dark Light already participated at the International Year of Light with a happening with light design of the IYL logo at the Oviedo Cathedral. This time, the UCM happening took place at the gardens of the Moncloa Campus in front of Faculty of Physical Sciences, and it was named as "Light MOB, Madrid es Luz". A great number of participants collaborated on the formation of the lighting art representation. Figure 7 shows an announcement of the event, people preparing to participate, and a view from the top of the roof of the Faculty of Physical Sciences, the place from where the image was taken. The final result is shown in Fig. 8. This was publicized and commented on many Madrid newspapers enhancing the nice initiatives of the IDL.

5. OTHER ACTIVITIES

Many other activities were developed in different cities in Spain. In this section, we briefly describe some of them. A more complete detail of all the activities can be found at the web page: www.diadelaluz.es.

5.1 Activities in Barcelona

In the area of Barcelona different activities were organized at different universities and research centers in the area. The common title "La llum ens parla / La luz nos habla" (Light talks to us) joined the different activities developed at the major universities: the University of Barcelona (UB), the Autonomous University of Barcelona (UAB), the Polytechnical University of Catalonia (UPC), as well as at the Institut d'Estudis Catalans (IEC), and coordinated by the Academia Europaea-Barcelona Knowledge Hub and the Catalan Society of Physics (SCF). Each university designed an individual program developed in May 16th and 17th, adapted to their students at the Faculties of Physics and at the Engineering Schools. Other relevant research centers in the area like ICFO and ALBA provided speakers to these events. Other activities and demonstrations for secondary schools were also developed at the School of Optics and Optometry of Terrassa.

5.2 Activities in Andalucía: Granada and Malaga

At the University of Granada, Prof. Enrique Hita delivered a conference entitled "Natural Light Phenomena", and a new set of experiments named "Kit de Optica" with demonstrations in optics intended for primary and secondary schools, and developed by José A. García, Francisco J. Perales and Javier Romero were presented and illustrated. A tutorial for this kit is freely available as a resource provided by FECYT and the University of Granada [9].

In Málaga, different astronomical observations were organized around the IDL by AstroLab.

5.3 Activities in northern Spain: Salamanca, Santander, Bask Country and Galicia

In northern Spain, the University of Salamanca, the University of Cantabria and the University of Santiago de Compostela organized different conferences, workshops and activities. The "I Encontro da Noite" organized at the Agrupación Astronómica Coruñesa was a workshop devoted to light pollution and obscurity preservation. In the Bask Country, the Faculty of Science and Technology of the UPV/EHU, elaborated a program that included a divulgation talk on short laser pulses and the Sgiker Laser Facility opened its doors in a guided visit to the lab.

In the city of Vigo, the exhibition "A Luz e a lente: Historia do microscopio a través da colección Camacho y Pallas" was organized. This exhibition collects a selection of historical microscope pieces, property Dr Tomás Camacho and Dr. Estrella Pallas. Two emblematic pieces of this exhibition are one Leeuwenhoek microscope, built in 1680, and one original edition of the book "Micrographia: or some Physiological Descriptions of Minute Bodies Made by Magnifying Glasses", published by Robert Hooke in 1665. This exhibition stated in May 16th, and will be opened until September 23th at the Museum of Contemporary Art of Vigo.

5.4 Activities in the Mediterranean area: Castellón – Valencia – Alicante – Elche – Murcia

In the Valencian region, the University Jaume I of Castellón (UJI), the University of Valencia, the University of Alicante and the University Miguel Hernandez of Elche (UMH), they all organized different activities. Also, at the University of Murcia some activities related to secondary schools were developed.

Prof. Glenn Boreman visited the University Miguel Hernandez of Elche (UMH), invited by the Alicante local section of the RSEF, and he delivered the talk "How Photonics Lights the World" on May 21st, at the Polytechnic School of Elche, with great success of students and professors.

5.5 The role of the industry

The participation and involvement of the industry in these events is also very important. The participation in the Spanish Committee of the IDL of members of Fotónica21 and SECPhO, the two industrial platforms in Photonics in Spain, allowed us to have access to the local industry.

Different activities were developed by different companies. Some of the companies patrons of the IDL, like for instance the company MTB, included their activities around May 16th in the activities announced in the ILD webpage. Other workshops and conferences organized by Fotonica21 and SECPhO in these dates were also part of the information provided to all people registered in the IDL webpage.

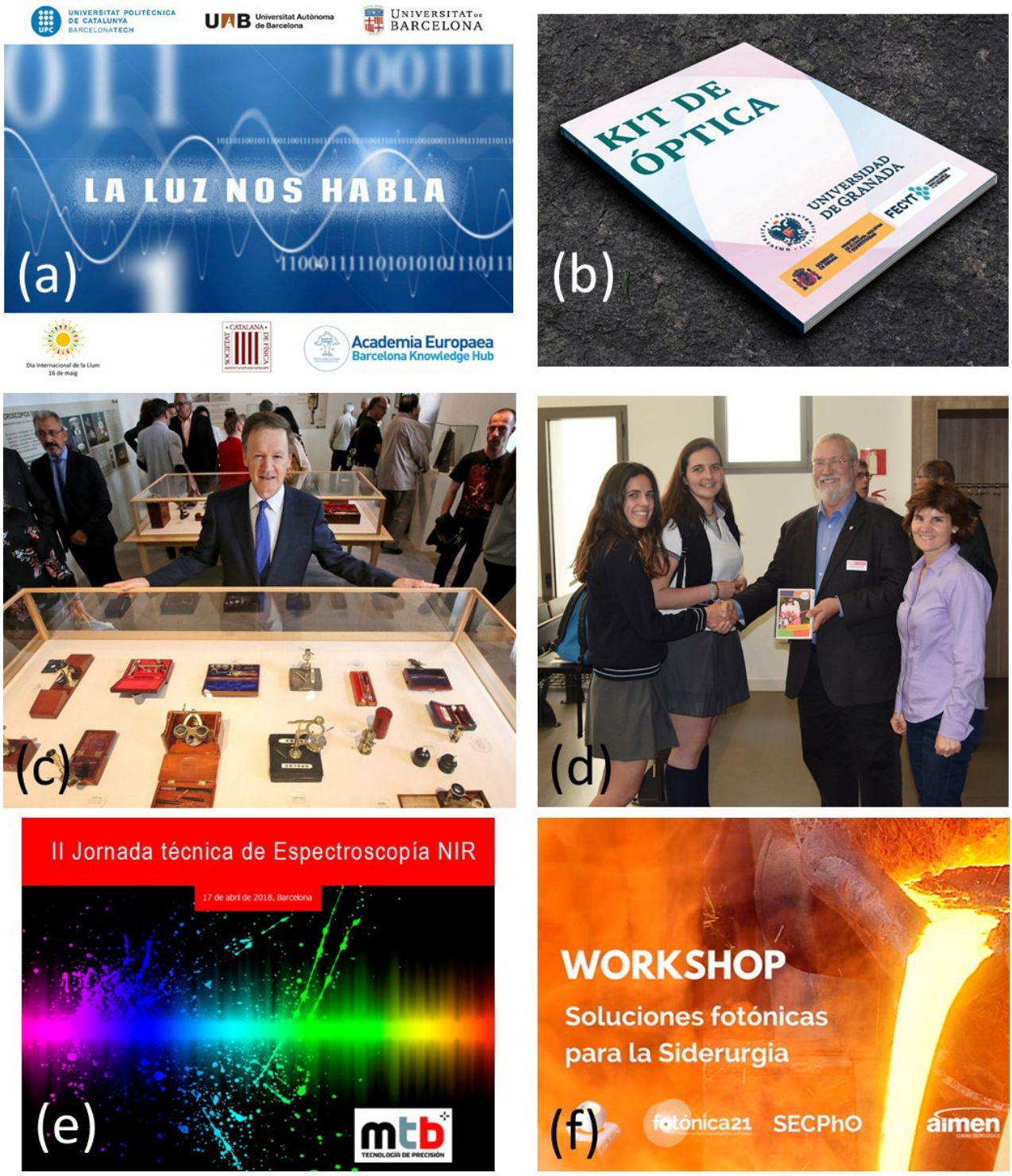

Figure 9. Some examples of activities developed at different cities in Spain: (a) Common program of activities "La luz nos habla" organized in the area of Barcelona by UB. UAB and UPC. (b) Optics Kit Tutorial for primary and secondary schools developed at the University of Granada; (c) Dr. Tomás Camacho at the opening of the exhibition on microscopy "A luz e a lente", organized at Vigo; (d) Glenn Boreman with María M. Sánchez, President of the Alicante Local Section of RSEF, giving the SPIE Women in Optics Planner to young students from Newton College, after the talk of Prof. Boreman at UMH. (e) Announcement of a Workshop on Spectroscopy by the company MTB, patron of the IDL in Spain, and (f) announcement of the Workshop on Photonics for Steelmaking organized by Fotonica21 and SECPhO with AIMEN.

6. CONCLUSIONS AND FUTURE PERSPECTIVES

The success of the IDL event in Spain allows us to be optimistic about the continuity of this activity. The academic, research and industrial community related to Optics & Photonics is growing importance in Spain. It is the important task of all of us to be able to align efforts of the different related institutions and companies for the mutual benefit.

A major goal of our community should be let the society be aware of the importance of the field and how relevant is for our country to invest in science and development in general, and in Optics and Photonics in particular. The IDL represents a unique opportunity for this goal and we consider the number of activities and success of participation in this first edition as an excellent sign for the subsequent impact in the next years.

We intend to arrive to the students in primary and secondary schools and also to the professors at those levels of education. The resources are open for them. They are also invited to the talks given at the IDL activities and there are open doors visits for students at the universities, research institutes, and museums. The involvement of the Photonics industry should be also of great importance for the success of the activities in future.

We plan to continue and start to prepare the 2019IDL!

ACKNOWLEDGEMENTS

The authors of this paper acknowledge the members of the Spanish Committee of the International Day of Light, and the support of the different organizations and companies that were sponsors and patrons of the IDL in Spain: SEDOPTICA, RSEF, Fundación Ramón Areces, Universidad Complutense de Madrid, ICO, SPIE; IO-CSIC, ICFO, ALBA CD6, CEI, Fotónica21, SECPhO, APDI, Red Eléctrica de España, IOT, Philips Lasing, UCM-Valeo, MTB and Olympus.

REFERENCES

[1] https://www.lightday.org/unesco-proclamation.
[2] I. Moreno, M. J. Yzuel, "El Día Internacional de la Luz," Opt. Pura Apl. **51** (2), i-iii (2018). http://doi.org/10.7149/OPA.51.1.i.
[3] M. J. Yzuel, I. Moreno, "Día Internacional de la Luz," Luces CEI, No. 64, pp 13/14 (May 2018).
[4] J. Dudley, J. Rivero González, "Día Internacional de la Luz, 16 de mayo: una celebración anual", Revista Española de Física 32 (2), (2018). http://revistadefisica.es/index.php/ref/article/view/2437.
[5] http://www.diadelaluz.es.
[6] http://www.lightday.org.
[7] F. Mogollón, "Yo fotón," Principia Magazine, 27/Dec/2017 https://principia.io/2017/12/27/yo-foton.IjczOCI/
[8] P. Luna, "Fotónica. El genio (invisible) de la luz," III Milenio, Heraldo de Aragón (18/Apr/2017). http://www.idibell.cat/sites/idibellpt.dd/files/DWebRevistatemp20170418%20%20000178244063008079%20%20Heraldo%20de%20Aragn%20III%20Milenio.pdf.
[9] J. A. García, F. J. Perales and J. Romero, "Kit de experiencias de Óptica para primaria y ESO", FECYT, Universidad de Granada (2017). https://educa.ugr.es/wp-content/uploads/2018/04/cuaderno-kit-optica.pdf.