Curriculum Vitae (CV): José Miguel López-Higuera

A) BRIEF CV SUMMARY (one page)

José Miguel López-Higuera, (1954), ***Fellow SPIE*** 2012***; Fellow OSA*** 2014*; **Senior** IEEE* 1998. Member of the **Royal Academy** of **Medicine of Cantabria** (2015). Member of **CIBER-BBN** of IS Carlos III, 2016 and also invited to be member of **IDIVAL**, 2017. The last two Spanish institutions encompass R&D Groups selected on the basis of their scientific/technical excellence activity focused on the development of prevention, diagnosis and follow-up systems, the development of technologies related to specific therapies and regenerative medicine and nanotherapies. In our case based on Light Sciences and Technologies.

He is Technical Telecommunications Engineer (1976), Universidad Laboral de Alcalá de Henares (ULAH), in Madrid, Spain. Telecommunication Engineer (1981), Universidad Politécnica de Madrid (UPM, Spain). ***Doctor Engineer with extraordinary PhD award*** (1989), UPM, Spain. ***Technician*** (1976-1979) and later ***Assistant Professor*** (1979-1986) both at the ULAH. ***Assistant Professor*** (1986-1991) at UPM***. Associate Professor*** in Electronics and Photonics (1991) at the University of Cantabria (UC), Spain. ***Full Professor*** in Electronics and Photonics at UC (2001 up today).

R&D LEADER AND ORGANIZER: **Head** of Electronic Technology Department, ULAH, (1981-1984). **Director** of the Technical School of Telecommunications Engineers, ULAH, Madrid, 1984-1985. **Director** of the Centre for Employment Orientation and Information (COIE) of UC, Spain (2001 to 2004). **Founder** of the awards UCEM for promoting the creation of high tech-companies, as spin-offs of the university academic activities. More than 40 new companies emerged from his pioneering initiative. **Founder** of the Photonics Engineering Group, PEG, at the University of Cantabria (1992). **Head** of the PEG R&D Group (1992 up today). Founder of the R&D Photonics Engineering Laboratory (455m^2). **Founder** of the *EWOFS Awards* (2004 up today), *OPTOEL Awards* (2011). OFS *Lifetime Achievements Award* given for the first time at OFS23 (2914) Chaired by Prof. López-Higuera. **Director** of Advanced Course on Light Sciences and Technologies for a new World at Universidad Internacional Ménéndez Pelayo, UIMP, 2015. **Founder and Director** of the International School of Light Sciences and Technologies, ISLIST at UIMP, 2016. ***Member of international Committees*** of Conferences (32), R&D Institutions and Companies in the field of Photonics (mainly in sensing): International Steering's (ISC), Technical Programs (TPC), Scientific SC), Co-chairman and also as General Chairman. **Member** of more than 20 ***Spanish Committees*** in the field of Photonics/optica/fiber Sensing and Instrumentation.

EDUCATOR: ***Teacher*** of *undergraduate* courses: ***40 classes/promotions*** (from 1976) of Telecommunication Engineering have been educated in Spain under his guidance. Author or co-author of more than 25 teaching notebooks. Supervisor of more than 70 Final Degree Projects. More than **25 *postgraduate* courses** (6 of them in quality awarded PhD programmes) focused on photonics and photonic sensing technologies. ***Director* of 17 PhD theses** (8 with extraordinary PhD award) framed inside the Photonics/fiber sensing field.

RESEARCHER AND R&D MANAGER: Firsts lithium niobate integrated optic devices fabricated in Spain (1988). His R&D work focuses on Optical Fibre Sensor Systems and Instrumentations for Civil Engineering, Construction, Electrical Power Generation, Aero-space, Siderurgy, Automotive, Environmental, Medical and Biomedical, Smart Structure applications. ***112 R&D&i projects*** (58 with public and competitive funding) acting on ***93 of they as manager, coordinator or main researcher***). ***R&D stays*** at BT Laboratories in Ipswich (1993); ORC, UK (2005) and at the Center for Optoelectronics and Optical Communications, of the NCC, Charlotte, US, (2005).

PAPERS & PATENTS: ***More than 740 research publications (****including* ***63 invited talks****) and* ***20 patents*** closely related to optical and fiber techniques for sensors and instrumentations. In the ***lasts 15 years*****: *377 international publications*** including 1 books, 6 chapters of books, 342 peer reviewed papers (***125 in JCR regular journals***); 54 invited talks ***(29 international)***. An USA Patent and International patent with the **Dartmouth College**, USA in the field of Cancer detection.

EDITOR: Editor and co-author of four R&D international books. ***Co-Editor*** of several conference proceedings and magazines. ***Guest Editor*** of the Special Issues on Optical Fiber Sensors published on IEEE Sensor Journal (several times), on IEEE/OSA Journal of Lightwave Technology, on Optical Fiber Technology, Elsevier and, very recently, on MDPI.

REFEREE&EVALUATION: Reviewer for a wide range of journals and conferences in the field of Photonics: Nature Materials, Optics Express, Optic Letters, IEEE/OSA Journal of Lightwave Technology, IEEE Sensors Journal, IEEE Photonic Technology Letters, IEEE Transaction on Instrumentation and Measurement, Journal Opy. Soc. Am B, Applied Optics, Optics Communications, Optical Engineering, Sensors, Sensors and Actuators B, Electronic Letters, Measurement Science and Technology, Sensors, among others. **Evaluator for research proposals for Official Public Research Organizations** (Agencies): ERC, EU; EPSRC, UK; Fundazione Cassa di Risparmio di Padova e Rovigo,Italy; ANEP, CICYT, INCITE, ACSUCIL, AVAP among others in Spain.

ENTREPRENEUR: Four new High Tech based companies: **cofounder** of *TELNOS*, (2005), *Empiric Technologies, SL* (2010) and *Sadiq Engineering* (2011). **Enabler** of Edrónica: Technologies for unmanned vehicles (2016).

AWARDS AND RECOGNISHEMENTS: Since 2001, the R&D Photonics Engineering Group has been the recipient of more than 25 Prices. 15 of they have been fruit of R&D&I results of activities in which Prof. López-Higuera have been directly involved: Projects, PhD Thesis, Master Thesis and for new spin-off companies (Sadiq and Empiric). 8 of his 18 thesis has been awarded with extraordinary PhD prizes. Two of the last Awards for his R&D results has been the Board of Trustees of

the University of Cantabria Research Award 2014 and EWOFS Life time Achievement Award, Limerick, Ireland 2016.

A) EXTENDED CV (Ten Pages)

Here more details, briefly commented, about Prof. JM López-Higuera (Prof. LH)

2. ARTICLES IN JCR JOURNALS, H ÍNDEX, THESIS SUPERVISED…

146 JCR articles (**80** Q1 Journals, **30** Q2); **32** international invited talks; Patents: **20**. Quality indicators: **h** index (no auto-cites): **28** (Google Scholar), **20** (Scopus), **20** (ISI Web). RG Index: **39,56**. Total number of citations received (no auto-cites): **3800** (Google Scholar), 2048 (Scopus), 2087 (ResearchGate). Thesis supervised: **17** (8 awarded).

3. MOST DISTINCTIVE CONTRIBUTIONS

Professor López Higuera has made distinctive contributions to the advance of optical science; 2) he is responsible for remarkable advances in optical engineering and knowledge transference; 3) he has contributed substantially to the education and training of optical engineers and optical scientists in Photonics and Optics especially in the sensing and Instrumentation field.

3.1.- Contributions to the advance of optical fiber sensors science and technology

Professor López-Higuera has written (or co-written) more than 740 academic (research) publications in the form of books, chapters of books, papers and conferences, both national (Spain) and international. 99% of these publications on sensing using light sciences and technologies. More than 50 international papers have been published on IEEE JCR Journals.

In the last 15 years, the 377 international publications include 1 books, 6 chapters of books, 342 peer-reviewed papers (125 in JCR regular journals) as well as 29 international invited talks. I would like emphasize the invited tutorial, at the *Optical Fiber Communications Conference sponsored by IEEE&OSA* held in San Diego USA (March 2010) as it is consider a privilege, only conferred to those who are responsible of carrying outstanding research (along the years) in a field within the scope of the conference http://www.opticsinfobase.org/abstract.cfm?uri=OFC-2010-OWL4.

Prof. LH is a regular contributor to the most prestigious Journals with high impact factor and ranked in the first fourth part of their JCR category. It is noticeable that in the last 15 years, 40 journal papers, included in ISI WEB of Knowledge, has been published in IEEE magazines; more than 55 peer reviewed communications has been presented in IEEE sponsored or co-sponsored International meetings. In addition, more than 15 communications were presented in IEEE sponsored or co-sponsored meetings in Spain. In the last 15 years, the 71 % of the IEEE/Journal papers are included in the first quartile (*first fourth part)* of their rank. 15 on IEEE Sensors Journal, 9 papers on IEEE Photonic Technology Letters, 11 on IEEE/OSA Journal of Lightwave Technology, 3 on IEEE Photonic Sensors, 4 on IEEE Selected Topics on Quantum Electronics, 1 IEEE Journal of Quantum Electronics, 1 on IEEE Transactions of Medical Imaging, and 1 IEEE Transaction of Microwave Theory and Techniques are part of the IEEE journals breakdown in the last 15 years.

Must be remarked that the Guest Editors and the Editor-in-Chief of the Journal of Lightwave Technology (OSA/IEEE) invited the nominee to write an Invited Tutorial for a JLT special issue on Fibre Optic Sensors, OFS, paper that is his more cited paper.

Moreover, *Prof. López Higuera* had published two books on OFS technology. The later, published by Willey and Sons, is highly respected, and it has been considered as “one of the reference books, of the last decade on optical fiber sensors”. Indeed, this book is a good example of Prof. López-Higuera dedication to academic activities. It is comprehensive handbook with 36 chapters, which content a wide spectrum of contributions coming from 60 leading experts, working in 15 universities, 9 institutions for R&D, and 10 private companies.

3.2.- Contributions to the optical engineering and to the transfer and exploitation of knowledge

A second aspect of Prof. López-Higuera career that deserves to be outlined as very significant, is the one related to his contributions for generating new technologies, and for transferring to private companies.

From the 119 R&D&I projects, the nominee acted as manager, coordinator or main researcher on more than 100 projects. It is worth mentioning that he led 581 R&D projects for or with industrial companies to enhance their production processes or the quality of their products; or even, to innovate or to develop new products, in all these cases using Optoelectronic Technologies. Lasting impacts on several companies were provoked by the technology and developed instrumentations (high tech) transferred by the nominee team, producing key increases of productivities and product qualities. These differential strengths on some of these mentioned companies in comparison to their international competitors, have contribute to the signature of new and substantial international contracts.

He has collaborated with companies, such as: Ansaldo in Italy; Rolls&Royce in UK; Volvo in Sweden; MTU (Mercedes) in Germany; SNECMA in France; as well as Ibedrola, ITP, ENSA; GSW, Textil Santanderina, AMBAR, APIAXXI, Alcatel Ibérica, Draka Content, Aeroblade, just to mention the ten more significant in Spain.

To enable the exploitation of new knowledge and technology, Prof López-Higuera has co-authored a very important number of patents (20) closely related to his research activity in photonics. Another one in the medial sector will be filled in the next months. In particular, two of them are of a transnational nature, since they were co-authored by researchers of a well-known academic institution of USA.

He has also promoted the creation of three small companies (spin-offs from the Photonic Engineering Group of the University of Cantabria) and acted as enabler to other one very recently. *TELNOS*, Optical and Telecommunications systems (founded on 2005); *Empiric Technologies, SL* (2010), *Sadiq Engineering* (2011) and Edrónica (2016). The first one sold their products to another company and now is no longer operative, while the other two are very actives being several times awarded for their distinctive products and activity.

Empiric Technologies, SL, http://www.empiric.es was founded (January 2010) to exploit the expertise accumulated during 10 years at the Prof. Lopez-Higuera R&D Group on Infrared and high-speed optoelectronics. Empiric Technologies goal is to design and fabricate smart and Low Cost Thermographic based cameras and systems (for the first time in Spain) for industrial and environmental solutions. This technological developed has been awarded with several entrepreneurial prizes.

Another company "Sadiq Engineering" that employs Prof. López-Higuera´s team contributions (on the plasma optical spectroscopy for welding quality monitoring) was created on February of 2011. http://www.sadiq.es. This Company offers optical sensor systems customized for each kind of materials and welding processes (including arc and laser welding). The company has been prized with several awards for entrepreneurs.

Prof. LH have been enabling the creation of the company *Edronica, technology for unmanned aerial vehicles, S.L.* This Photonics Engineering Group´s Spin-off has been created recently (2016) with the aim of developing new technologies based on photonics approaches in the field of unmanned vehicles enabling its use and deployment in advanced applications of interest to the scientific world with research, administration, and various business and industrial sectors. Recently (July of 2016), Edronica has been awarded by the entrepreneurial XIV UCEM Prize to the greater innovation technology project.

Furthermore, Prof. López-Higuera was one of the four scientist of **the international scientific advisor committee**, for the high-tech company FiberSensing, which has been a leading company in the market of optical fiber sensors. Now it is **HBM FiberSensing SA** a world leader in the development and production of advanced monitoring systems based on optical Fiber Bragg Grating Technology. http://www.fibersensing.com .

15 years ago, Prof. López-Higuera created the awards UCEM for promoting spin-off companies, within the university community (mainly from the Cantabria University). Since then, there are more than 40 new companies, which have a high survival rate. I would like also to outline that Prof. López-Higuera is responsible for suggesting and for co-editing an international book, which promotes high-tech entrepreneurial activities on photonics.

It must be highlighted that very recently Prof. Lopez-Higuera R&D Group has been selected to be part of the Spanish Biomedical Research Centre (**CIBER-BBN)** of the Carlos III Health Institute in a highly competitive public call www.**ciber-bbn**.es . It must be remarked that this institution encompass only R&D Groups selected on the basis of their scientific/technical excellence activity. This important fact in conjunction to Reference Hospital Marques Valdecilla, and two R&D institutes in Medicine in the Santander, Spain, has driven to the nominee to decide to focus the main workforce, of his R&D Group to develop solutions to real problems (using Light Sciences and Technologies) on prevention, diagnosis on specific therapies and regenerative medicine and nanotherapies. In addition, Prof. Lopez-Higuera group has been also invited to ingress also in the Valdecilla Health Research Institute IDIVAL https://www.**idival**.org . The later invitation has been due, in part, to the demonstrated capacity of prof. Lopez-Higuera´s group on transference of their R&D results.

3.3.- Education and training of optical engineers and optical scientists

A third aspect of Prof. López-Higuera is his very significant contributions to the education/training of new knowledge and technique-based Engineers and researchers mainly in the ICT and Photonics/Optics fields.

Since 1986 Prof. López-Higuera has taught to over 40-promotions of the Telecommunication Engineers in Spain (9 in the University Laboral of Alcalá of Henares, 5 in the UPM and 26 in University of Cantabria). In undergraduate courses he has taught engineering subjects such as: Electronic Instrumentation, Technology, Electronic and Photonic Components, Photonics, and Optical Communications subjects. Since 1991 he has taught more than 25 postgraduate courses (6 of them in quality-awarded PhD programs) mainly focused on photonics

(including optical communications and optical networks advanced devices and systems) and photonic/optic sensing technologies. He has also written or cooperated in writing more than 20 teaching note-books (for teaching purposes) and supervised more than 70 Final Degree Projects or Master Thesis.

In the last 15 years he has directed 16 PhD thesis, several of them with European Mention, being seven awarded with the the "Board of Trustees of the University of Cantabria Extraordinary Award" to the best thesis in the area of ICT (information technology) engineering. All of them were inside the photonic field: 14 belonging to the fiber sensing area and two to the infrared thermo graphic field. Six of the mentioned PhD.´s (educated by Prof. López-Higuera) are nowadays managers or heads of R&D departments of important companies; 5 are working in education and R&D activities in the field of the Photonics and Electronics engineering in the University of Cantabria; and 2 are working at very renowned R&D European institutions.

Prof. López-Higuera **founded and Directed** the "*Advanced Course on Light Sciences and Technologies for a new World (LiST)*" framed on the IYL2015 at the International University Menendez Pelayo (UIMP) in Santander, Spain. This very successful event, conducted Prof. Lopez-Higuera to the **creation** of the *International School of Light Sciences and Technologies, ISLIST, at* UIMP in Santander, Spain, 2016. This new International School (Directed by Prof. López Higuera) is envisioned to be (every fourth week of June) a worldwide top International forum on *Light Sciences and Technologies* 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. The core of the ISLIST first edition (June 2016) was on ***Light in Life Science and Health*** being the core of this second edition (June 2017) on ***Light in Energy and Environment.*** ***http://www.teisa.unican.es/ISLiST/index.php/invited-speakers.*** The core of the third ISLIST edition (under the direction of the mentioned prof. on 2018) is planned to be on ***light in Sensing and Communications.*** These two significant contributions on education and training (at the highest level) have the objectives 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,*** to contribute to the education of the **citizens** and also to ensure that **policymakers, entrepreneurs**, and other key "actors" will be aware of the problem-solving potential of Photonics,

In the currents, Prof. López-Higuera is **co-promotor** of a new Master Degree entitled ***Science and Engineering of Light*** that is planned to start at the 2017-2018 course in the University of Cantabria. This new Master intends to form professionals and researchers capable of facing the challenges posed by the society and the industry of the 21st century. Specifically, it is focused in training for face one of the three socio-economic and industrial challenges: i) on Sensing and Communications; ii) on Life Science and Health and iii) on Industrial Manufacturing and Quality. Despite it is conceived to contribute on the training and formation of international students, it will significantly contribute to the education and training on photonics of professionals and scientists from South America, Spain and with high impact in the North Spain area.

4. EVIDENCES

It must be mentioned that (excluding self citations) the nominee publications have been cited more than 2390 times (Google Schollar), 1773 times (ResearchGate), 1390 times (Scopus) being cited more than 150 times per year in the last five years. Some samples of tangible and verifiable evidences of Prof. Dr. Lopez-Higuera´s most significant contributions related to optical science in education of human resources, in engineering, and on its transference and exploitation by the productive sector are given below. First a book, a paper, a patent and several invited talks are mentioned. Second ten additional papers on IEEE Journals and finally, several additional evidences of the nominee contributions to the Optics and Photonics field are addressed.

4.1 Four first evidences

4.1.1.-**BOOK:** **JM López-Higuera**, *Handbook of Optical Fibre Sensing Technology*. John Wiley & Sons Ltd, ISBN 84-8102-197-0, Published on 18/03/2002.

http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0471820539.html.

The nominee is Editor and co-author of this **book** as the *first comprehensive* text that covers the core topics concerning OFS technology. This book bridges the gap between the previous research texts written that only covers parts of the involved knowledge and techniques. Written with the collaborations of 60 leading international experts from 15 universities, 9 R&D institutions and 10 companies, offers a clear understanding of the theory as well as focussing on the many successful applications. The 35 chapters are organised in four main parts: *Preliminary, Fundamentals, Principles and Applications.*

The book not only facilitates engineering research, education and training on fiber optic sensing but also opens several research topics and challenges. It is consider a very valuable reference in this key technology with high rates of growths for this decade. *More than 550 cites*.

4.1.2.- **PAPER (INVITED): J. M. López-Higuera**, L. Rodriguez, A. Quintela, and A. Cobo. *Fiber Optic Sensors in Structural Health Monitoring*, IEEE/OSA Journal of Lightwave Technology, pp. 587-608, 15/02/2011.

Tutorial written by invitation to the nominee of the Guest Editors and the Editor-in-Chief of the IEEE JLT. The nominee is co-author and writer (more than 65%) of this comprehensive paper. The basic SHM concepts are introduced, the main OFS techniques available for this application are reviewed and discussed. Several examples of the use of OFS in real structures are also addressed, including those from the renewable energy, transportation, civil engineering and the oil and gas industry sectors. The papers conclude with the identifications of the most relevant current technical challenges and the key sector markets.

This tutorial provides a comprehensive background on this subject and also a forecast of OFS for the SHM emerging technology. *Current valuable reference for the OFS community and, especially, for researchers and engineers working on SHM field*. 2,784 *impact-index; position 5 among 79 Journals in the Optics Rank. More than 150 cites (Scopus).*

4.1.3.- **PATENT:** Pogue, B; Krishnaswamy, V; Paulsen, K; Allende,P; Portilla, O.; Lopez-Higuera, JM. *Apparatus and method for surgical instrument with integral automated tissue classifier.* **International Patent** *WO 2010/080611A3; 110 countries covered. Priority date: December-19, 2008.*

This instrument is able to work in the intraoperative domain and automatically discriminates between benign and malignant tissue. The apparatus optically scans a field of view (part of an organ during surgery) and obtains spectra that correlates with to the spectra database of healthy and normal tissue types of the organ of interest (previously classified by a pathologist) being able to display as a colour-encoded map of tissue types to the surgeon. Then instrument come from a fruitful collaboration with the **Dartmouth College,** USA who realized the experimental works. All concerning with the critical optical signal data processing for the tumor identification, classification (in 5 different subtypes of tumors) and their visual presentation was done by the team directed by the nominee.

The ability to deliver superior performance (automatically and in quasi-real time) with the commonly used (direct view of an organ and the surgeon experience), will play a key roll to enhance patient survival by simultaneously ensuring complete tumor removal by minimizing damage to normal tissue.

4.1.4.- **INVITED TALKS:** From the 63 invited talks (30 international) here, a **sample** of six presented in international meetings during the last 3 years.

1. **José Miguel López-Higuera**, Luis Rodriguez Cobo and Mauro Lomer, ***Photonic Sensing in Diagnostic and Health Care***, Workshop on Photonics Polymer for Innovation (IWPPI), **Nasu** Highlands, Japan, October 11-14, 2016.
2. **José Miguel López-Higuera**; ***'Biomedical Optical Sensors: Currents and Trends'***; Optical Sensors 2016, **Vancouver** Canada, pp. 1-5; ISBN: 978-1-943580-14-9; 18/07/2016.
3. **José Miguel López-Higuera**; ***'Light based Biomedical Sensors'***; EMN Meeting on Optoelectronics, **Phuket**, Thailand, 12/04/2016.
4. **José Miguel López-Higuera**, Luis Rodríguez-Cobo and Adolfo Cobo; ***'Optical Sensors: a comprehensive approach***'; Advanced Photonics, **Boston**, Massachusetts, USA, pp. 1-6; ISSN: 978-15572520005; 27/06/2015.
5. **José Miguel López-Higuera**; ***'Photonic Sensors: Sensing using Light Technologies***, 5th OMGS-2014 (5th International Forum on Opto-electronic Sensor-based Monitoring in Geo-engineering), **Nanjing**, China, pp. 46-50; 12/10/2014.
6. **José Miguel López-Higuera**; '***Fiber Bragg grating sensors for Structural Health Monitoring in civil Engineering and Composites***'; European Workshop on Fibre Optic Sensors for Industrial Applications, **Toulouse**, France; 30/09/2014

4.2.- Additional ten papers on IEEE Journals (one per year).

From the 136 ISI web Journal papers, 51 has been on IEEE Journals. Here it is a selection of ten:

1. Arturo Pardo, Eusebio Real, Venkat Krishnaswamy, **José Miguel López-Higuera**, Brian W. Pogue, Olga. M. Conde; 'Directional Kernel Density Estimation for Classification of Breast Tissue Spectra'; **IEEE Transactions on Medical Imaging**, 21/07/**2016**. Impact Factor (IF): 3,756, rank 13 of 255 on Electric Engineering and Electronics; **Quartile (Q):1, Decile (D):1.**

2. Luis Rodriguez-Cobo, Mauro Lomer and **Jose-Miguel Lopez-Higuera**; 'Fiber Specklegram Multiplexed Sensor'; Journal of Lightwave Technology, Vol.33, Nº 12, pp. 2591-2597; 15/06/**2015.** IF: 2,965, rank 5 of 77 on Telecommunication, D: 1

3. Sergio Rota-Rodrigo, Luis Rodríguez-Cobo, María Ángeles Quintela**, José Miguel López-Higuera**, Manuel López-Amo; 'Dual-Wavelength Single-Longitudinal Mode Fiber Laser Using Phase-Shift Bragg Gratings'; **IEEE Journal of**

Selected Topics in Quantum Electronics, Vol.20, Nº 5; 01/10/**2014,** IF: 2,828, rank 25 of 249 Electric Engineering and Electronics; Q: 1.

4. C.A. Galindez, **J.M. Lopez-Higuera**; 'Pulsed Wavelength-Tunable Brillouin Fiber Laser Based on a Fourier-Domain Mode-Locking Source'; **IEEE Photonics Jou**rnal, Vol.5, Nº 4, 01/08/**2013**. IF: 2,33, rank 45 of 247 on Electric Engineering and Electronics; Q:1.

5. R. A. Perez-Herrera, A. Ullan, D. Leandro, M. Fernandez-Vallejo, M. A. Quintela, A. Loayssa, **J. M. Lopez-Higuera**, and M. Lopez-Amo; 'L-Band Multiwavelength Single-Longitudinal Mode Fiber Laser for Sensing Applications (**Invited Paper**)'; **IEEE/OSA Journal of Lightwave Technology**, Vol.30, Nº 8, pp. 1173-1177; 15/04/**2012**. IF: 2,555, rank 6 of 77 on Telecommunications, D: 1.

6. D. Leandro, A. Ullan, A. Loayssa, **J.M. Lopez-Higuera**, M. Lopez-Amo; 'Remote (155 km) Fiber Bragg Grating Interrogation Technique Combining Raman, Brillouin and Erbium Gain in a Fiber Laser'; **IEEE Photonics Technology Letters**, Vol.23, Nº 10, pp. 621-623; 15/05/**2011**. IF: 2,191, rank 42 of 245 on Electric Engineering and Electronics; Q:1.

7. Jose M. Lazaro, Antonio Quintela, Waclaw Urbancyzyk, Jan Wojcik, **Jose M. Lopez-Higuera**; 'Bragg grating written in Tapered Solid-Core Photonic Crystal Fibers'; **IEEE Photonics Technology Letters**, Vol.22, Nº 14, pp. 1048-1050; 15/07/**2010**. IF: 1,987, rank 43 de 247 Electric Engineering and Electronics; Q:1.

8. Montserrat Fernandez-Vallejo, Silvia Diaz, Rosa Ana Perez-Herrera, Ruth Unzu, Maria Angeles Quintela, **José Miguel López-Higuera**, Manuel López-Amo; 'Comparison of the stability of ring resonator structures for multiwavelength fiber lasers using Raman or Er-doped fiber amplification'; **IEEE Journal of Quantum Electronics**, Vol.45, Nº 12, pp. 1551-1557; ISSN: 0018-9197; 01/12/**2009**. IF: 1,968, rank 44 of 245 on Electric Engineering and Electronics; Q:1.

9. Carlos Galindez, Francisco J. Madruga, **Jose M. Lopez-Higuera**; 'Influence of Humidity on the Measurement of Brillouin Frequency Shift'; **IEEE Photonics Technology Letters**, Vol.20, Nº 23, pp. 1959-1961; 01/12/**2008**. IF: 2,173, rank 12 of 64 on Optics; Q:1.

10. A. Quintela, M.A. Quintela, C. Jauregui, **J.M. Lopez-Higuera**; 'Optically Tunable Long-Period Fiber Grating on an Er3+ Fiber'**; IEEE Photonics Technology Letters**, Vol.19, Nº 10, pp. 732-734; 15/05/**2007.** IF: 2,015, rank 26 de 227 on Electric Engineering and Electronics; Q:1

4.3.- Additional ten papers on other International Journals

4.3.1. Eusebio Real, José Fernando Val-Bernal; José M. Revuelta; Alejandro Pontón; Marta Calvo Díez; Marta Mayorga; José M. López-Higuera; Olga M. Conde; 'Hessian analysis for the delineation of amorphous anomalies in optical coherence tomography images of the aortic wall'; **Biomedical Optics Express**, Vol., Nº , pp. 1415-1429; 21/03/**2016**. IF: 3,648, rank 8 of 86 on Optics; D:1.

4.3.2. Luis Rodriguez-Cobo, Jesus Mirapeix, Ruben Ruiz-Lombera, Adolfo Cobo, Jose-Miguel Lopez-Higuera; 'Fiber Bragg Grating sensor for on-line welding diagnostics'; **Journal of Materials Processing Technology**, Vol.214, Nº , pp. 839-843; 11/04/**2014**. IF: 2,236, rank 5 of 43 on Industrial Engineering; Q:1.

4.3.3 L. Rodríguez-Cobo, M.A. Quintela, S. Rota-Rodrígo, M. López-Amo, **J.M. López-Higuera**; 'Single-longitudinal mode laser structure based on a very narrow filtering technique'; **Optics Express**, Vol., Nº 18/03/***2013*****.** *D: 1.*

4.3.4.- L. Rodriguez-Cobo, A. Cobo, **J.M. López-Higuera**; 'Sample Fiber Bragg Grating Spectral synthesis'; **Optics Express**, Vol.20, Nº 20, pp. 22429-22441;17/09/***2012***. *Impact Factor (IF): 3,587, Position 6 of 79 on Optics, Quartile Q: 1.*

4.3.5. P. Beatriz Garcia-Allende, Olga M. Conde, Jesus Mirapeix, Adolfo Cobo, **Jose M. López-Higuera**; 'Quality control of industrial process by combining a hyperspectral sensor and Fishers's linear discriminant analysis'; **Sensors and Actuators B Chemical**, Vol.129, Nº 2, pp. 977-984; ISSN: 0925-4005; 22/02/**2008**. IF: 3,122, rank 5 of 56 on Instrumentation; D:1. More than 30 citations.

4.3.6.-A.M. Cubillas, M. Silva-Lopez, J.M. Lázaro, O.M. Conde, M.N. Petrovich, **J.M. Lopez-Higuera**; 'Methane detection at 1670-nm band using a hollow-core photonic bandgap fiber and a multiline algorithm'; **Optics Express,** Vol.15, Nº 26, pp. 17570-17576; 24/12/***2007***. *IF: 3,7009, Rank 2 of 64 on Optics, D: 1; More than 50 citations.*

4.3.7.- J. Mirapeix, P.B. Garcia-Allende, A. Cobo, O.M. Conde, **J.M. López-Higuera**, "Real-time arc welding defect detection and classification with Principal Component Analysis and Artificial Neural Networks"; **NDT&E International Journal**, Vol 40, Nº 4, pp, 315-323,01/06/**2007**, Elsevier Science Bv. I*mpact Factor: 1,131, Rank 3 of 29 in Materials Science, Characterization & Testing, Quartile: 1; more than 80 citations.*

4.3.8.M. Lomer, A. Quintela, M. López-Amo, J. Zubía, J**.M. López-Higuera**; 'A quasi-Distributed Level Sensor Based on Bend Side-Polished Plastic Optical Fibre Cable'; **Measurement Science and Technology**, Vol.18, Nº 7, pp. 2261-2267; 19/06/**2007**. IF: 1,297, rank 10 of 67 on *Multidisciplinary Engineering; Q: 1; more than 50 citations.*

4.3.9.-Imran M. Ishaq, Antonio Quintela, Stephin W. James, Geoffrey J. Ashwell, **José M. López- Higuera**, Ralph Tatam, "Modification of the refractive index response of long period gratings using thin film overlays", **Sensors and Actuators B Chemical Journal**, Vol. 107, Nº 2; pp.738-741, 29/06/**2005**, Elsevier Science Bv. *IF: 2,646, Rank 1 of 52 in Instruments and Instrumentation; Q: 1; more than 80 citations.*

4.3.10.- César Jáuregui, Antonio Quintela, **José Miguel López-Higuera**; 'Interrogation unit for fiber Bragg grating sensors that uses a slanted fiber grating'; **Optics Letters**, Vol.29, Nº 7, pp. 676-678; 01/04/***2004***. *Impact factor: 3,882, Rank 3 of 54 on Optics; Quartile: 1; more than 30 citations.*

4.4 Additional evidences.

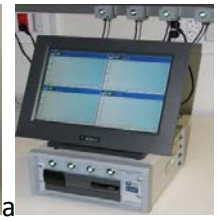
4.4.1.-JM López-Higuera and Brian Culshaw, Editors, "*Engineering a High-Tech Business: Entrepreneurial Experiences and Insights"*, SPIE Press Book, ISBN: 9780819471802, Published 21/03/2008, www.amazon.co.uk.

Co-promoted and co-edited by the nominee. This book provides actual entrepreneurial stories (mainly placed in photonic sensing instrumentation) giving insight into the pitfalls and successes for what one might find in starting or even continuing with a small high-tech business. Along the 25 chapters, this later book contains 33 contributions from distinguished optical engineers from USA, UK, Germany, Switzerland, Denmark, Russia, India, Portugal, and Spain. The book describes successful photonic entrepreneurial cases worldwide. Hence, the book has found avid lectors in under-graduate and post-graduate courses for promoting the entrepreneurial spirit among the university students. The book is being used in courses to promote the entrepreneurship in several research institutions (include the University of Cantabria) being recommended to entrepreneurs in all high-tech disciplines and in particular for students and early career professionals. *Valuable Book to help and promote the High-Tech entrepreneurship.*

4.4.2.- A very remarkable contribution to the development of new and advanced sensing optoelectronic instrumentation for companies.

It must be mentioned that he did R&D&I for companies such: Ansaldo, Italy; Rolls-Royce (UK); Volvo (Sweden); MTU-Mercedes (Germany); SNECMA (France) on the international arena. Three examples of optoelectronic developments for companies carried out under his direction are given below:


a


b

c

Figure 1.- Three photos of optoelectronic instrument-tation developed for industrial companies: a) for Rolls-Royce consortia, *b) for ENSA and c) for SETELSA.*

a.- The Optoelectronic Unit of an advanced sensor for laser welding quality control of specific materials in the aero-space field (photo 1.a). In the framework of a European MMFSC consortium (for Rolls-Royce, Volvo, MTU, SNECMA and ITP).

b.-The optoelectronic sensor instrumentation for the welding process quality control on nuclear steam generators fabricated by ENSA company (photo 1.b). These two technologies were the core of the Photonics Engineering Group spin-off company Sadiq Engineering.

c.- The smart thermographic based camera for the fully automated on-line control of ceramic ovens that is controlling the ovens production quality on the company EIKA. Fully developed by the Prof. Lopez-Higuera's team for the company SETELSA (photo 1.c). This technology was the core of the nominee-group spin-off company Empiric Technologies, SL.

4.4.3.- Official recognition of the outstanding transference to the productive industrial sector of optical technologies developed by the Prof. López-Higuera R&D Photonics Laboratory.

On 29th November of 2011, the continuous R&D focused on specific process topics to improve the production efficiency on companies was, officially, recognized by the President of the Cantabria Government Ignacio Diego Palacios.

In this regard, he visited the R&D photonics Laboratory of the University of Cantabria to preside the official delivery to the Company ENSA of one of the last laser based equipment developed to monitoring one of their key welding processes. It was carried out in the presence of the Rector of the University and the President of the mentioned company.

4.4.4.-A significant contribution as author and co-author of industrial publications (patents)

Prof. López-Higuera has obtained or has filled 19 industrial publications (patents) closely related to optical topics. Another is nowadays in process. It must be mentioned that two of the last co-authored patents were presented in collaboration with researchers of the Photonics Engineering Group and from the **Dartmouth College**, USA. One of the last 3 filled patents (result of a collaborative R&D project with the company **Aeroblade**) is an optical fiber transducer to be integrated inside the new generation of smart blades of new wind power turbines designed and constructed by the mentioned company. Two patents one in the medical sector (concerning the monitoring of chronic aged people) and another in the very high temperature monitoring of industrial processes are filled along 2016.

4.4.5.-Very significant contributions to the education/training of new knowledge and technique-based Engineers and researchers.

Teacher of *undergraduate* courses: ***40 classes/promotions*** of Telecommunication Engineers educated in Spain under his guidance. Author or co-author of more than 25 teaching notebooks. Supervisor of more than 70 Final Degree-and-master projects. More than **25 *postgraduate* courses** (6 of them in quality awarded PhD programmes) focused on photonics and photonic sensing technologies. ***Director* of 17 PhD theses** (several ongoing) framed inside the Photonics/fiber sensing field.

4.4.6.-*A very active role on Optical/Fiber Sensor international community acting as member of committees of international conferences being many of them sponsored or co-sponsored by IEEE.*

Acting as a Technical Program Committee , or as a Co-Chairman Technical Program Committee or as a Scientific Committee, or member or as Co-Chairman or Chairman of international meetings, Prof López Higuera had or is working for 50 committees (more than 33 in international meetings) mainly focused into the optical sensing area.

International Technical Program Committees, TPC´s, and Scientific Committee, SC (18):
Optical Sensors (SENSORS). **OSA**. **New Orleans**, USA, July 24-27, 2017. www.osa.org/en-us/meetings.
Optical Sensors (SENSORS). **OSA**. **Vancouver**, Canadá, 18-20 July 2016
WSOF 2015. **OSA Hong Kong**, China**,** November 4-6**,** 2015**.**
Optical Sensors (SENSORS). **OSA**. **Boston**, 27 June–01 July, 2015**.**
Optical Sensors (SENSORS). **OSA**. **Barcelona**, Spain July 27-31,2014**.**
WSOF 2013. **Sigtuna,** Stockholm**, Sweden,** A**ugust 28-30, 2013. OSA**. http://www.wsof2013.org.
Optical Sensors (SENSORS). **OSA**. **Puerto Rico**, 14 July - 19 July 2013**.**
Optical Sensors (SENSORS), **OSA** organizer; **Monterey**, California, United States, June, 24-28, 2012.
WSOF 2010. **OSA/IEEE**. **Oaxaca** City, México, October 13-15, 2010. http://www.wsof2010.org
Photonics Asia 2010. **SPIE**, China National Convention Center **Beijing**, China, 18 - 20 October 2010.
First Mediterranean Photonics Conference 2008. **Ischia**, Italy, June 25-28, 2008.
BGPP '07, (Bragg Gratings, Photosensitivity and Poling**), OSA**. **Quebec**, Canada, September 2007.
ODIMAP V. **IEEE, Madrid**, Spain, October 2-4, 2006. www.unipv.it
WFOPC 2005. IEEE, Modella, Italy, June 22-24, 2005
ODIMAP IV. IEEE, Oulu, Finland, June 16-18, 2004. http://www.ee.oulu.fi/
OFS´15 ***(15th International Conference on Optical Fiber Sensors),*** **IEEE**. **Portland,** USA, May 6-10, 2002.

ODIMAP III. **IEEE. Pavia**, Italy, September 20-22, 2001. www.unipv.it
ODIMAP II. **IEEE**. **Pavia**, Italy, May 20-22, 1999. www.unipv.it

International Steering Committees, ISC´s (13):
OFS´25, co-sponsored **IEEE**, **Jeju**, Korea**,** , April 24-28**,** 2017. **IEEE/OSA JLT special Issue**. http://ofs-25.org
OFSIS 2017, IEEE, **Brisbane**, Australia, January 8-10, 2017. http://www.mechmining.uq.edu.au/OFSIS2017
OFS´24. **Curitiva**, Brasil**,** September **28, 2015. IEEE/OSA JLT special Issue**.
EWOFS'2016. ***Limerick****, Ireland , May 31-June3, 2016*, www.ewofs2016.org
OFS´23, **IEEE, Santande**r, Spain**,** June 2-6, 2014. **IEEE/OSA JLT special Issue** http://teisa.unican.es/OFS23.
5th OSMG, **Nanjing**, China Oct 12-14, 2014. http://www.osmg2014.com
OFS´22, **IEEE**, **Beijing,** China**, 15 -19 October 15-19, 2012.** www.**ofs-22**.org .
OFS´21, **IEEE**, **Ottawa**, Canada, May 15-19 May 2011. **2017. IEEE/OSA JLT special Issue**
OFS´20, **Edinburgh**, Scotland, UK / October 5-9, 2009. http://www.ofs20.org
OFS´19, **Perth**, Western Australia, April 14-18, 2008. http://obel.ee.uwa.edu.au/OFS-19
OFS´18, Cancún, México, October 23-27, 2006. http://congresos.cio.mx/WEB-OFS18/INDEX.html
OFS´17, **IEEE**, **Bruges**, Belgium, May 23-27, 2005. http://www.ofs17-Bruges2005.be
OFS´16, **IEEE**, **Nara**, Japan, October 14-77, 2003. http://www.ee.t.u-tokyo.ac.jp/OFS-16/

International Organizing Committees, IOC´s (4).
POF2011, Bilbao, Spain*,* September, 14-16, 2011. http://www.ppof2011.org
WSOF 2010. **OSA/IEEE**. **Sao Pedro**, Brasil, August 20-22, 2008. http://www.wsof2008.org
EUROPTRODE VII. ***Madrid****, Spain, April 4-7, 2004.*
EWOFS'1998. ***Peebles****, Scotland, July 8-10, 1998.*

Co-Chairman of Technical Programs Committees (*3)*
EWOFS'2013. ***Kraków****, Poland , May 19-22, 2013.* http://www.5ewofs.eu/
EWOFS'2010. OSA. ***Porto****, Portugal, September 8-10, 2010.* http://www.ewofs.org/; **IEEE sensors special Issue.**
EWOFS'2007. *Napoly**, Italy, July 4-6, 2007.* http://www.ewofs.org/. **IEEE sensors special Issue.**

Chairman (3)
23rd International Conference on Optical Fibre Sensors, **OFS´23**, **IEEE/OSA. Santander, Spain,** June **2-6, 2014.** http://teisa.unican.es/OFS23. General Chairman.

OFS´20. **OSA**. **Edinburgh**, Scotland, UK, October 5-9, 2009. Co-Chairman.

EWOFS'2004 (2nd European Workshop on Optical Fibre Sensors), **IEEE/OSA** .Santander, Spain, June 9-11, 2004. **IEEE sensors special Issue**, http://grupos.unican.es/GIF/EWOFS04. General Chairman.

5.- Likewise, it must also be considered other contributions that Prof. Lopez-Higuera has carried out.

5.1.- A very active role as editor or co-editor of engineering/scientific papers

He has also worked as co-editor of several conference proceedings and magazines: Proceedings of Second European Workshop on Optical Fibre Sensors, SPIE Volume 5502 (co-edited with Prof. B. Culshaw); Proceedings of third European Workshop on Optical Fibre Sensors, SPIE Volume 6619 (co-edited with Profs. A. Cutolo and B. Culshaw); Proceedings of fourth European Workshop on Optical Fibre Sensors, SPIE Volume 7653 (co-edited with Profs. JL Santos, B. Culshaw and W.N MacPherson); Proceedings of the 20th International Conference on Optical Fibre Sensors, SPIE Volume 7503 (co-edited with Profs. Julian Jones, B. Culshaw, W. Ecke and R. Willsch). Proceedings of the 23rd International Conference on Optical Fibre Sensors, SPIE Volume 9157 (co-edited with Profs. Julian Jones, JL Santos and M. López-Amo).

Prof. López-Higuera was the Guest Editor of the Special Issue on Optical Fiber Sensors published on IEEE Sensor Journal, Vol.8, No. 7, July of 2008 and he has also served as Guest Editor of the Third Special Issue on Optical Fiber Sensors published on IEEE Sensor Journal published on January of 2012. He was also Guest Editor of the Special Issue on Optical Fiber Sensors published on IEEE/OSA Journal of Lightwave Technology Vol.34, No. 17-20, October15,2016. He is also Guest Editor of the Special Issue on Optical Fiber Sensors that will be published MDPI in the next moths (2017).

In addition, he is also member of the Consultant Committee of “Mundo Electrónico” Journal widely extended in Spain and Latin-America.

5.2.- A very significant contribution to maintain the Quality of the Scientific Community Activity acting as referee of papers and R&D Proposals in the ICT and Optics/Photonics field.

Prof. JM López-Higuera acts as current referee of a very wide set of current well known journals such as Nature Materials, Optics Express, IEEE Journal of Lightwave Technology, IEEE Sensors Journal, IEEE Photonic Technology Letters, IEEE Transaction on Instrumentation and Measurement, Journal Opy. Soc. Am B, Applied Optics, Optics Communications, Optical Engineering, Sensors, Sensors and Actuators B, Electronic Letters, Measurement Science and Technology, among others.

Prof. JM López-Higuera has also acted as technical referee for research proposals for Official Public Research Organizations such as The European Research Council European Commission, FP7, Programme IDEAS; for the EPSRC, Engineering and Physical Sciences research Council, UK and for Scientiphic Foundations such Fundazione Cassa di Risparmio di Padova e Rovigo, Italy, among others at international level. He acts currently as technical referee for research proposals for the Spanish Evaluation and Prospective Agency (ANEP) and several times for the Spanish Commission of Science and Technology (CICYT) in its ad-hoc Committees; and for regional R&D agencies such as the INCITE of the Xunta de Galicia, Spain and the AVAP of Valencia, Spain http://www.avap.es, Castilla y León-ACSUCYL,Spain, www.**acsucyl**.es, among others.

5.3.- Significant contributions as academic organizer and R&D leader

During the first 5 years of the eighties, he was the Head of the Components and Technology Department, and Director of the Technical School of Telecommunications Engineers, in the Universidad Laboral de Alcalá de Henares (Madrid). He also was the Director of the Centre for Employment Orientation and Information (COIE) of the University of Cantabria from 2001 to 2004, where he created the awards UCEM to promote the creation of new tech-based companies promoted by people from the university (mainly from the Cantabria University). Since then more than 25 new companies have been created with a high survival rate.

As R&D leader, he founded the Photonics Engineering Group (on 1991) acting as its Director since them up to now. He also led the building of the new R&D Photonics Engineering Laboratory at the University of Cantabria (455 m^2 fully equipped with state of the art electronics and photonics experimental facilities). Nowadays it employs 26 researchers including 2 professors, 5 associate professors, 1 lecturers.

5.4.- Very active role promoting the research on Optical/Fiber Sensor field within Spain.

Pioneering and seminal works on fiber and optical sensing in Spain and also, active role promoting research has led the country to relevant positions in the contributions to the International Optical Fiber Sensors Conference, OFS, (co-sponsored in many editions by IEEE). From the OFS9, 1993, in which the only Spanish researcher was the nominee, the Spain-paper-contributions growth from 0% to 5-7% of the accepted papers (from OFS15, 2002 to OFS22, 2012, period in which the nominee acted as TPC or as ISC member).

Acting as the General Chairman OFS23, 2014 in Santander was de more successful edition of OFS series up to Now (2016). OFS23 exceeded the figures of all editions in terms of received submissions and participation. 524 scientists, researchers, PhD students, engineers and entrepreneurs from more than 42 different countries around the world took part in the conference. More than 600 people, including accompanying people, participated in the conference. China (15%), Spain (12%) and UK (8%) were the more active countries in terms of the scientific contributions and their active participation.

Spain is now currently classified between the 4^{th} to 6^{Th} place of OFS conference (accepted papers geographic breakdown). The paper quality (awarded with best paper prizes) also growth significantly. All the mentioned are evidences of the lasting impact of the nominee's contributions (using Photonics) to society and industry.

It must also be remarkable the nominee participation on **Committees in Spanish Meetings acting** as:

General Chairman: Séptima Reunión Nacional de Optoelectrónica, OPTOEL'11, Technically Co-sponsored by IEEE Spanish Section; OSA; SPIE Europe; SEDOOPTICA, *Santander, Spain / 29 June to 1 July, 2011.* www.teisa.unican.es/optoel2011/

***As Technical Program Committee member*:** Simposium National of the International Union of Radio Science Union, URSI: URSI'2011, Leganés, Spain/September, 2011. URSI'2010, Bilbao, Spain/September, 2010. URSI'2006, Oviedo, Spain/September, 2006. URSI'2003, A Coruña, Spain/September, 2003. URSI'2002, Alcalá de Henares, Spain/September,2002. URSI'1998, Pamplona, Spain/September,1998. Primera Reunión Nacional de Optoelectrónica y Óptica Integrada, OPTOEL'1999; Sociedad Española de Óptica (SEO), SEDOOPTICA; *Teruel, Spain/July 17-19, 1999.* OPTOEL'2001; SEO, SEDOOPTICA; *Barcelona, Spain / July 17-19, 2001.* OPTOEL'03; SEO, SEDOOPTICA; Madrid*, Spain / July 14-16, 2003.* OPTOEL'05; SPIE; European Optical Society (EOS), SEDOOPTICA. Elche*, Spain / July 13-15, 2005.* OPTOEL'07; SEO, SEDOOPTICA; *Bilbao, Spain / July 11-13, 2007.* OPTOEL'09; SEO, SEDOOPTICA; *Málaga, Spain / July, 2009.* OPTOEL'13; MiNeCo, European Union, SEDOOPTICA;

Alcalá de Henares, Spain / July 10-12, 2013. www.optoel2013*;* . OPTOEL'14, Salamanca 2015, OPTOEL'17, Santiago de Compostela, 2017, Spain.

And also in other ***R&D Committees such as:*** External-Scientific-Committee of Institute for Systems based on Optoelectronics and Microtechnology,ISOM, UPM-*Madrid, Spain/2002 up 2013.* Experts committee of the ICT of the R&D National Program-CYCYT-Council, in 1997 and several times.

5.5.- Likewise, it must also be mentioned that Prof. Lopez-Higuera´s Photonics Engineering Group was awarded with more than ***25 prizes and honors****. 15 of they in R&D activities in what the nominee was directly involved. Can be mentioned:*

He is the recipient of the *Salvá i Campillo Prize (2001)* to 'The Most Original R&D Project for the 'SISFOCDETIC', co-funded by the European Union and the Spanish Government. It is worth noting that 'SISFOCDETIC' project was designed, coordinated and directed by Professor López-Higuera. A consortium integrated by ALCATEL Ibérica, APIA XXI and the University of Cantabria carried out the associated activities. The system is installed, at the Las Navas viaduct (A8 highway) in Cantabria, Spain.

With Seven (8) extraordinary Prices to the best PhD Thesis were awarded the seventeen (17) thesis directed by Prof. López-Higuera, all in the optical sensing field.

Both spin-off companies promoted by Prof. López-Higuera Sadiq Enginnering and Empiric Technologies have benn recipient of several prices. In competence with 50 new technology based Spanish *companies, Empiric Technologies was* distinguish with the *Joung New Innovative Company Price* on *December of 2012*. It is a well known Spanish Price given by the Foundation "Zaragoza Ciudad del Conocimiento". The new Spin-off in which Prof.Lopez Higuera acted as enabler have received also a recent award.

Fellowship **of The International Society for Optical Engineering (*SPIE*)** for his contributions to the education, the R&D and dissemination on optics and photonics (2012).

Fellowship **of The Optical Society of America (*OSA*)** for his contributions to optical sensing and contributions promoting Photonics in Spain (2014).

Elected **Member of the Royal Academy of Medicine** of Cantabria (2015).

Board of Trustees of University of Cantabria Research Award XIV, for the best work in R&D&I, 2015.

EWOFS 2016 Lifetime Achievements Award, Limerick. Ireland, http://ewofs2016.org/content/press-release

Elected **Member of the CIBER-BBN** what is a public research consortium set up at the initiative of the Instituto de Salud Carlos III (ISCIII) to carry out excellence research in Biomedicine and Health Sciences in the National Health System and in the Science and Technology System in Spain (2017).

Invited to be member of Health Research Institute, **IDIVAL**, Institution awarded by the Spanish Institute of Health Carlos III as one of the reference Institutes for Health Research in Spain. http://www.idival.org/en

More information on:

http://teisa.unican.es.
or http://www.teisa.unican.es/ofs23/index.php?option=com_content&view=article&id=49&Itemid=55

Fdo. José Miguel López-Higuera