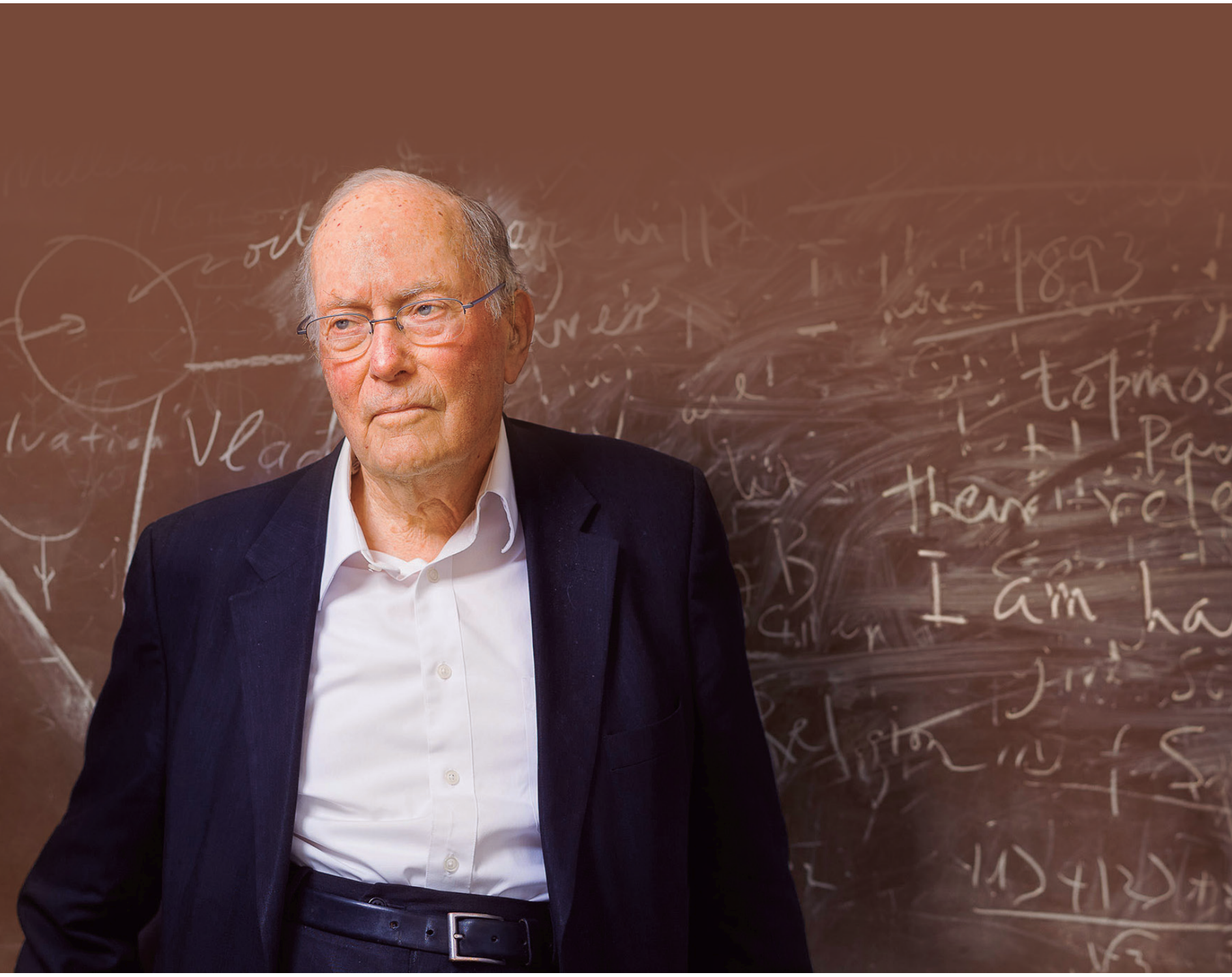
INTERNATIONAL YEAR OF LIGHT 2015

SPRING 2015

ICFONIANS 23

Community News from the Institut de Ciències Fotòniques



"Science is exploration. The fundamental nature of exploration is that we don't know what's there. We can guess and hope and aim to find out certain things, but we have to expect surprises".

CHARLES H. TOWNES, 1915-2015

EDITOR'S CORNER

Leadership Opportunities

Brook Hardwick
Coordinating Editor

No sooner had we begun the New Year than the news arrived of the loss of a great leader in the scientific community- Prof. Charles H. Townes, who died just 6 months short of his 100th birthday. All of those at ICFO who had the honor of meeting Prof. Townes during his visit in 2012 can testify that, even in his late 90's, he lived very intensely his passion for science. Best known for his Nobel Prize winning work towards the invention of the laser, he had a long and productive career in which he made truly landmark discoveries and advances that have changed the way we live today. Prof. Townes was an unquestionable leader who rightly belongs at the head of this issue of ICFOnians that will highlight our own efforts to lead.

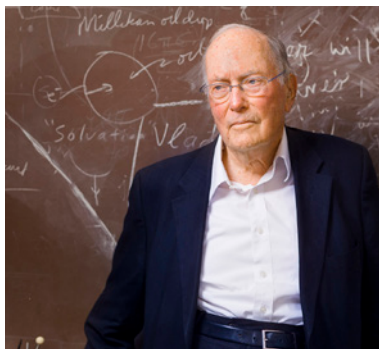
The International Year of Light (IYL 2015) is an enormous opportunity for the entire Photonics community to lead activities that will help to increase the visibility of light based technologies in society. Through ICFO's leadership of the GoPhoton! project, we led an enormous explosion of activity throughout February that aimed at drawing the attention of the general public, students, industries and entrepreneurs to Photonic-based applications and the research which made these possible. The month was packed with activities that were fun (ex. illuminated human towers in Plaça Sant Jaume), informative (ex. Open Day at ICFO; Girls Boys and Photonics) and thought provoking (ex. exhibition "Photonics: the power of light; from fiction to reality" contrasting science fiction illustrations of the 1930's with technologies of today). In addition to what we report in this edition (pg 5), note that there will be more in store throughout 2015! The High Profile interview (pg 8) with CEO of SPIE, Eugene Arthurs also gives an idea of what our colleagues in the Photonics community are leading in this important year.

Clearly young researchers need opportunities to work with leaders and to receive the guidance necessary to go on to become leaders as they advance in their careers. ICFO is committed to providing the necessary support to make these types of opportunities a reality as can be seen with strategic appointments to Academic Programs. Likewise we are grateful to the Cellex Foundation, a true leader in scientific patronage, for making possible new programs like the Cellex ICFO-MPQ fellowship program. (pg 5)

For those who need even more inspiration, don't miss Beyond ICFO (pg 7). Having missed the opportunity to know Armand Niederberger and so many of the earliest ICFOnians, I am still moved by their excitement to belong to the new institute, the projects to be put in motion, the things to learn, the marks to be made. Their early leadership initiatives have had a formative impact on the structure of the ICFO community today. Whether contemplating the leadership example of a giant like Charles Townes or the bold new proposals of Armand and company as well as current ICFOnians, there are so many interesting and worthwhile projects to start, things to share, knowledge to discover…

Happy Reading

COVER



ICFO celebrates the life and contributions to society of Prof. Charles H. Townes, undoubtedly one of the most influential scientists of our time. He won the Nobel Prize in 1964 for his fundamental work that contributed to the invention of the laser. Fascinated by astronomy, he later moved to the field of experimental astrophysics, where he also excelled. His achievements extended beyond purely scientific activities to include important roles such as Provost at MIT, advisor for the US Government and the Vatican, and chairman of the Apollo program's Technical Advisory Committee. He liked to say that his main interest was simply figuring things out. He regarded science, in one way or another, as the study of the universe.

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INTERNATIONAL YEAR OF LIGHT 2015

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ICFO NEWS

RAIS- FASTER THAN SEPSIS

Officially launched on 1 January 2015, the Horizon 2020 project RAIS (Scalable, point-of-care and label free microarray platform for rapid detection of Sepsis) is aimed at developing a new point-of-care label-free microarray platform and validating it for quantifying levels of specific Sepsis' biomarkers. The project will be coordinated by Valerio Pruneri, who will collaborate with fellow ICREA Professor at ICFO, Romain Quidant as well as with companies and institutes from Switzerland, Italy, Spain, Germany, Belgium, and the United Kingdom.

ERC CONSOLIDATOR GRANT

ICREA Professor at ICFO, Romain Quidant, previous awardee of a European Research Council (ERC) Starting Grant and an ERC Proof of Concept Award, has recently been granted the ERC Consolidator Grant to carry out the project entitled "QnanoMECA" (Quantum Optomechanics with a levitating nanoparticle). With this new project, Romain aims at capitalizing on the unique capability of optically levitating nanoparticles to advance the field of optomechanics well beyond the current state-of-the-art.

AAAS SCIENTIFIC FREEDOM AND RESPONSIBILITY AWARD

Former ICFOnian Omid Kokabee, currently imprisoned in Iran, was recently awarded the American Association for the Advancement of Science (AAAS) Scientific Freedom and Responsibility Award. Omid, the first doctoral student to win the award, was also honored in October 2014 with the Andrei Sakharov Prize 2014 from the American Physical Society. On both occasions the awards have been given "for his courage in refusing to use his physics knowledge to work on projects that he deemed harmful to humanity, in the face of extreme physical and psychological pressure."

8000+ CITATIONS IN WOS

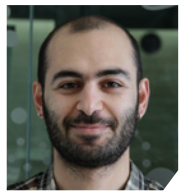
ICFO's growing number of publications in leading journals is a strong indicator of the quality of research that is being conducted at the center. But it is clear that the final gauge of the impact of ICFO's research is measured not by number of publications, but by relevance of our work and its recognition within the scientific community. In 2014, ICFO's citations in the Web of Science (WOS) passed 8000 in the year, an impressive number for a research institute of its size, created from scratch just 12 years ago. ICFO is especially proud of this acknowledgement from the global scientific community for the excellent work and outstanding results that we are accomplishing.

HORIZON 2020 MARIE S CURIE ACTIONS

The Marie Sklodowska-Curie actions (MSCA) provide grants for all stages of researchers' careers. In the most recent call, eight ICFOnians have been favorably evaluated and invited to prepare the Grant Agreement for their Marie Curie applications, putting ICFO's success rate in this highly competitive call to over 50%. Congratulations to Jan Kolodynski (Quantum information theory group), Ana Asenjo (Theoretical quantum-nano photonics group), Pierrick Cheiney (Quantum optics theory and Ultracold quantum gases groups), Jason Otterstrom (Advanced fluorescence imaging and biophysics group), Ricardo Jimenez (Quantum information with cold atoms and non-classical light group), David Paredes (Quantum photonics with solids and atoms group) and soon to arrive ICFOnians in the groups led by Professors Gerasimos Konstantatos and Niek van Hulst for their successful applications.

ICFO NEWCOMERS

Lorena Bianchet
PhD Student



Angelo Piga
PhD Student

Flavio Baccari
PhD Student

Ivan Bordacchini
PhD Student

Aleksandar Nesic
PhD Student

Leonardo Guerini
PhD Student

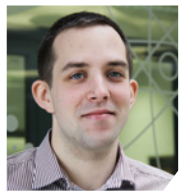
Swapan Rana
Postdoc Researcher

Alexis Chacón
Postdoc Researcher

Iker León Ona
Postdoc Researcher

Erik Woodhead
Postdoc Researcher

Idoia Martí
Postdoc Researcher



Michal Oszmaniec
Postdoc Researcher

Daniel Wegkamp
Postdoc Researcher

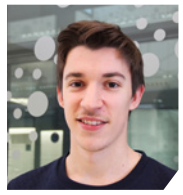
Josselin Pello
Postdoc Researcher

Jorge Vergara
Postgraduate Student

Markus von Rudno
Postgraduate Student

Diana Davydovskaya
Postgraduate Student

Nicolas Perez
Postgraduate Student

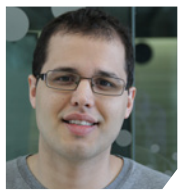


Noah Strobel
Postgraduate Student

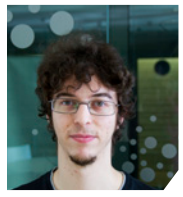
Marc Vidal
Postgraduate Student

Barbara Boccuzzi
Postgraduate Student

Clotilde Prophete
Postgraduate Student



Guillem Xercavins
Research Engineer



Marc Montagut
Undergraduate Student

Irina Suárez
Undergraduate Student

Ingrid Amer Cid
Undergraduate Student

Adrià Escobet
Undergraduate Student

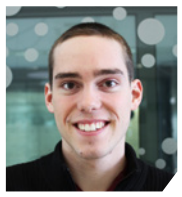
Nicolás Mateos
Undergraduate Student

Jordi Sastre
Undergraduate Student

Joan Sendra
Undergraduate Student

Ismael Benito
Undergraduate Student

Luca Calderaro
Undergraduate Student



Carlos Florensa
Undergraduate Student

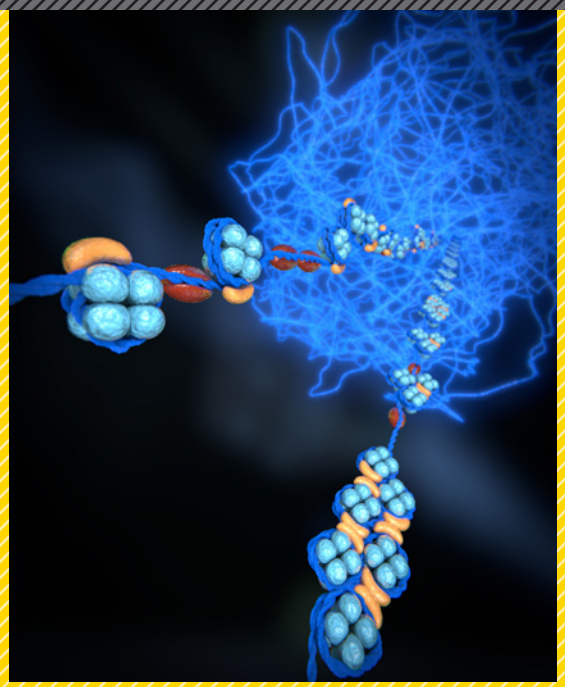
Álvaro Castells
Visiting Scientist

Many of us joined ICFO or took a new position at the Institute between January and March.

Welcome to ICFO!

LATEST ADVANCES

ICFO IN CELL



Cell has recently published a study in which ICFO researchers Dr. Carlo Manzo, ICFO Prof. Melike Lakadamyali and ICREA Prof. at ICFO María García-Parajo, in collaboration with researchers Maria Aurelia Ricci and Prof. Pia Cosma from CRG- Centre for Genomic Regulation, have been able to use super-resolution microscopy to visualize and count the smallest units which, packaged together, form our genome. In combination with innovative quantitative approaches and numerical simulations, they were also able to define the genome architecture at the nano-scale. They have seen that the nucleosomes are assembled in irregular groups ("nucleosome clutches") across the chromatin and that nucleosome-free-DNA regions separate these groups. They found that clutch size is related to the pluripotency potential of stem cells- the more pluripotent a cell is, the less nucleosomes are included in its clutches.

GRAPHENE ENABLES ALL-ELECTRICAL CONTROL OF ENERGY FLOW FROM LIGHT EMITTERS

Scientists from ICFO, MIT, CNRS, CNISM and Graphenea have demonstrated active, in-situ electrical control of the energy flow from erbium ions into photons and plasmons. The experiment was implemented by placing the erbium emitters a few tens of nanometers away from the graphene sheet, whose carrier density (Fermi energy) is electrically controlled. Partially funded by the EC Graphene Flagship, this study, which offers new possibilities for data storage and manipulation through active plasmonic networks, has been published in *Nature Physics*.

SINGLE ATTOSECOND PULSE GENERATION AT THE CARBON K-EDGE

Francisco Silva, Stephan Teichmann, Seth Cousin, and Michael Hemmer led by ICREA Prof. at ICFO Jens Biegert, have obtained, for the first time, the generation of isolated attosecond pulses at the carbon K-edge at 284 eV, within the water window range. The study was published in *Nature Communications*. With their experimental setup, they were able to create ultra-short pulses with pulse duration below 400as and a bandwidth supporting a 30-as pulse duration. The availability of attosecond duration ($1as=10^{-18}s$) soft X-ray pulses permits imaging the triggering events behind bond formation and breaking, the flow of energy in organic solar cells or energy storage devices, or the inner workings of ultrafast magnetic devices or superconductors.

PARTICLE ENTANGLEMENT IN A BEAM OF SQUEEZED LIGHT

In a recent study published in *Physical Review Letters*, researchers Federica Beduini, Joanna Zielinska, Vito Lucivero, and Yannick de Icaza Astiz, led by ICREA Prof. at ICFO Morgan Mitchell, have detected, for the first time entanglement among individual photon pairs in a beam of squeezed light. The experiment consisted in fabricating a beam of squeezed light, predicted to consist almost entirely of entangled photons. Then they extracted a small number of photons at random and measured their quantum state, in particular the joint polarization state of photon pairs, and they found, in agreement with theoretical predictions, that any two photons near each other are entangled. By changing the density of the beam, they also observed effects of entanglement monogamy, where particles can be strongly entangled only if they have few entanglement partners. The results of this study show promising advances in the field of superconductivity and superfluidity, optical communications, or the research and development of qubits for quantum computing.

BUSINESS NEWS

2015 ICFO-Corporate Liaison Day

The 6th edition of the CLP Day was dedicated to Wearable Technologies

ICFO's Corporate Liaison Day which took place on Tuesday, 3 February, is a one-day program where ICFOnians, representatives of international platforms, multinational corporations, local business representatives and researchers of other institutions have the opportunity to interact with world renowned experts to review the latest advances and issues related to photonic technologies while focusing on the generation of joint research projects.

The theme of each edition of the CLP Day changes in order to highlight topics of interest and relevance to ICFO's corporate partners and collaborators. This year's focus was on Wearable Technologies.

The day started with Prof. Koen Kas, Founder & CEO of InBioVeritas, who gave a fantastic overview on the available wearable technologies for consumer markets, emphasizing the opportunities they offer to turn the concept of sickcare into healthcare. Dr. Ruben de Francisco, Program Manager on Wearable Health at IMEC, went deeper into the wearable healthcare opportunities and the impact on having medical quality within everyone's reach. Dr. Manish Gupta, Founding Director of the Center for Advanced Athletic Engineering (USA), overviewed the large number of possibilities arising in the field of sports, including sports medicine, improving performance or recovery, all enabled by the dynamic monitoring of the human body. The morning session was completed with a talk by Dr. Marc Bailey, Product Manager for Sensor Systems which forms part of the Nokia Technologies Business, who summarized flexible sensing technologies for wellness and mobile health applications of mobile communications devices.

The program also featured an ICFO Award ceremony to congratulate ICFOnians who received prestigious awards and prizes during 2014, followed by the Graphene Connect Industrial Workshop that took place after the CLP program.

Now in its sixth year, the 2015 ICFO-Corporate Liaison Day attracted around 150 attendees, including industry representatives from more than 50 companies. To date, ICFO has more than 30 members in its CLP Program. The ICFO CLP program is dedicated to generating shared knowledge, mutual trust, and common benefits with corporations of all kinds.

Graphene Connect Industrial workshop

On the afternoon of 3 February and throughout 4 February, ICFO hosted the industrial workshop on photonics and electronics, part of the workshop series *Graphene Connect*, within the Graphene Flagship program.

The ultimate objective of the workshop was to plan for actions to create collaborative innovation projects within the flagship or other platforms. The program included popular presentations on state-of-the art research by the work package leaders, industry perspectives by four industry representatives, as well as group discussions and matchmaking. Building on the presentations, moderated group discussions were organized, offering representatives across industry sectors the opportunity to interact with each other as well as with researchers, with the ultimate goal of initiating future collaborative innovation projects within the flagship framework.

GRAPHENE FLAGSHIP
GRAPHENE CONNECT – PHOTONICS AND ELECTRONICS

TRAINING

Academic Programs

New appointments strengthen program structure

One of ICFO's central founding missions was and remains the training of the next generation of scientists and technologists. To date, the young women and men who have successfully completed ICFO's PhD program have gone on to have successful careers in science, industry and business around the world, outlining the strength and relevance of the scientific program at the institute.

As ICFO grows, it is clear that the training programs it offers also need to develop to meet the institutes expanding needs. Key appointments in Academic Programs confirm ICFO's commitment to frontier research.

PROF. NIEK VAN HULST has been appointed Head of Academic Programs.

"The ICFO academic program reflects our most concrete contribution to the world: shaping PhD students into top-level independent scientists, with critical character, originality, intellect, assertiveness and persistence to face the challenges of the future."

DR. ROB SEWELL, former postdoctoral researcher in the Quantum information with cold atoms and non-classical light group at ICFO assumes the role of Coordinator of Academic Programs.

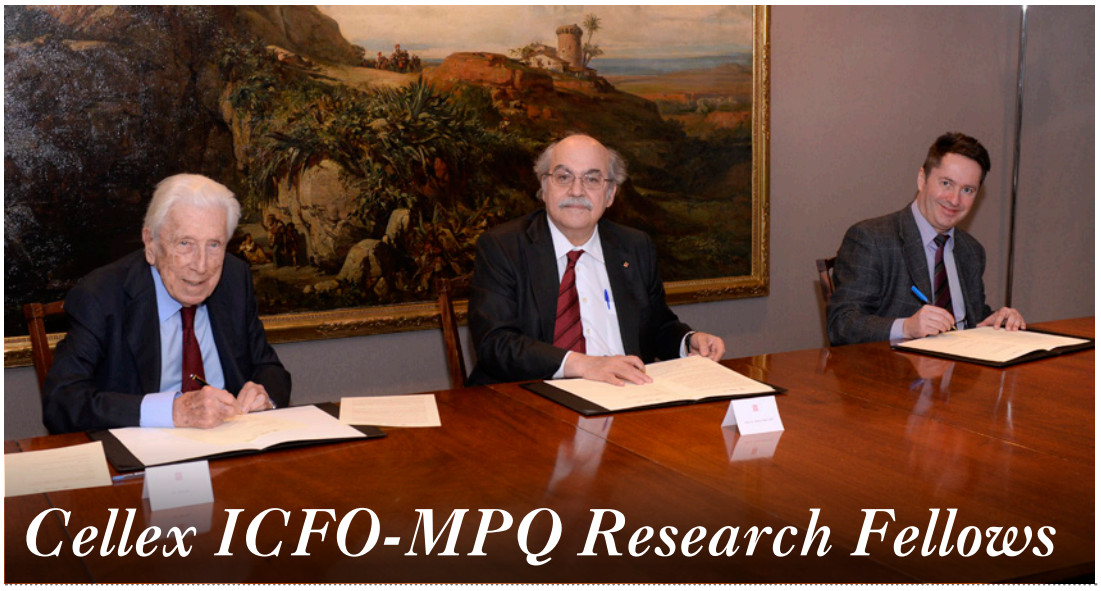
"I am very excited to take up this new position, and look forward to working with Niek, David, and everyone at ICFO, to grow and improve our academic programs and educational activities."

PROF. DAVID ARTIGAS assumes the appointment as Head of Academic Liaisons, leveraging his experience in the Catalan University system.

"I look forward to focusing on liaisons with academic institutions in Barcelona. My parallel appointment as Deputy Head of the UPC Doctoral School will naturally ensure smooth relations between these institutes."

JIPI Awards

In early February, ICFO students participated in the third *"Interdisciplinary Conference for Predoctoral Researchers" (JIPI),* held in the beautiful Paranimf Auditorium at the University of Barcelona. This interdisciplinary meeting brought together predoctoral researchers from throughout Catalonia to meet one another, give 5 minute flash talks about their research, and participate in round table discussions on scientific transparency and entrepreneurship. Several ICFO students (pictured below) won prizes for best talk: Bárbara Buades Sabater for her talk on Discovering the ultrafast world; Peter Schmidt and Achim Woessner for discussing Optoelectronics with 2D materials; and Alexia Salavrakos, Florian Curchod and Paul Erker for asking *Can we predict everything?*



Cellex ICFO-MPQ Research Fellows

A 6-year program agreement for cutting edge research collaboration between the Max Planck Institute for Quantum Optics and ICFO

ICFO announces the signature of a new and important collaboration agreement between ICFO and the Max Planck Institute for Quantum Optics (Germany), facilitating collaboration on topics of common interests between both institutes. This landmark agreement is a testament to how far ICFO has come since its founding 12 years ago, illustrating the fact that the institute is now in a position to enter into an agreement in which the results of collaborative research in terms of knowledge sharing and intellectual property can be fully expected to be on par with that of an established giant on the global scene of frontier research such as the Max Planck institute.

This program is made possible by Fundació Privada Cellex, the private foundation of Dr. Pere Mir i Puig, which has a long tradition and interest in promoting research in medicine, physics, mathematics and education. Through a generous endowment in 2010, ICFO was able to make an important leap forward in terms of size, world-class facilities and top global talent attraction. Dr. Mir has been noted to comment that "research is what makes a country advance. Scientific careers in general, and physics in particular, are beneficial for companies and the healthy functioning of the economy". Cellex now agrees to fully finance this new program between ICFO and MPQ for the duration of 6 years, creating 4 postdoctoral positions who will jointly work at ICFO and MPQ as "Cellex ICFO-MPQ Research Fellows". The institutes will have the freedom to define cutting edge research projects between at least one ICFO research group and one MPQ research division.

ICFO's Director, Lluís Torner emphasizes, "We are fully committed to offering opportunities to young scientists in early stages of their careers, who can benefit from the unique training that they will receive within the joint ICFO-MPQ cutting-edge projects. This is a very exciting opportunity for us all".

PHOTO:
Dr. Pere Mir i Puig: Fundació Privada Cellex
Hon. Andreu Mas Colell: Minister of Economy and Knowledge, Generalitat & Chairman of ICFO's Board of Trustees
Prof. Ignacio Cirac: Director of the Max Planck Institute for Quantum Optics

OUTREACH

GoPhoton! creates a Photonic Splash of outreach activities

ICFO draws the attention of thousands of Barcelonians to the power of Photonics

One of the structural propositions of the GoPhoton! project coordinated by ICFO in the framework of the International Year of Light, was to organize explosions ("Photonic Splashes") of outreach activities throughout Europe designed to make Photonics a household word. From the 3rd – 16th of February, ICFO's Photonic Splash took place in Barcelona with an agenda full of high profile and high impact activities, drawing the attention of industry, students, entrepreneurs and the general public to the amazing powers of Photonics.

Barcelona's Splash began with the co-located inauguration of Barcelona's light festival- LlumBCN. In a reception at the Town Hall presided over by Mayor Xavier Trias, ICFO's director Lluis Torner introduced the inaugural speech by renowned architect Bendetta Tagliabue, paying tribute to Photonics and the power of light in art and architecture. Other personalities such as Catalan Minister of Economy and Knowledge, Andreu Mas-Colell and Chairman of Abertis, Salvador Alemany, also took part. The event was followed by the spectacular construction of illuminated human towers (Castellers) just outside in Plaça Sant Jaume, for the enjoyment of over 4,000 people on site and many more via video streaming.

"GoPhoton! activities aim to make PHOTONICS a household word"

Also coinciding with LlumBCN, ICFO inaugurated the photonics exhibition "Photonics: the power of light; from fiction to reality" at the Palau Robert, one of Barcelona's most prestigious exhibition centers. After a 4 week showing there, the exhibition began a tour that will continue throughout 2015 to maximize its dissemination. The exhibit from Palau Robert will circulate in museums and exhibition halls- next stop Espai Cultura in Sabadell (16 April to 26 July). A more mobile replica of the exhibit will travel to universities across Catalonia and has already been shown in the Physics and the Engineering halls of the UAB. It is currently being showcased in the UPC campus in Terrassa and will next move to the North Campus of the UPC in Barcelona where it will coincide with the *LIGHTtalk: Careers in Photonics* that will take place on the 21st April.

The Photonic Splash also included a number of events that were tailor made for more specific audiences. A number of talks and round-table discussions for industry and entrepreneurs took place at ICFO in which invited speakers shared their expertise with 150 attendees. Likewise, ICFO reached out to younger audiences with a special event geared just for them. The Girls Boys and Photonics event, in which 90 high school students visited ICFO, included a day packed with activities such as talks and workshops, among many others. The general public was given the opportunity to visit ICFO on Open Day, offering all audiences the chance to tour laboratories and the ICFOseum, as well as to take part in didactic activities.

The Photonic Splash occasion was the perfect opportunity to launch three big outreach activities in ICFO which will take place during this year: the contests Light on the Waves and Illuminating Curiosity, as well as the first Photonics Congress for young people, which will take place on the 20th of November.

The Splash culminated in the official Inauguration of the International Year of Light in Spain, which ICFO organized as member of the Spanish Committee in coordination with other members; the Synchrotron ALBA, SEDOPTICA and the RACAB. 700 people were present at the Poliorama Theatre in central Barcelona to hear key note speakers Ignacio Cirac, Director of the Max-Planck Institute of Quantum optics; Caterina Bisari, Director of ALBA; and Jeroni Nadal, ophthalmologist in the Barraquer Clinic. All three gave very different perspectives on the power of light. The audience was rewarded with the musical performance by world-renowned cellist Lluís Claret.

COMMUNITY PICTURES solar eclipse

BEYOND ICFO

Armand Niederberger:

"While my research has certainly been quite removed from direct commercial applications, I now know how easily the skills I learned were transferrable."

PHOTO:
Armand Niederberger at ICFO with Sonny Vo, colleague at Leia Inc, a start-up based in Silicon Valley that manufactures the world's first holographic 3D displays for mobile applications.

"How about we invite some students to ICFO? We show them what we work on, learn about their projects, visit the city and get to know cool people." Ten years ago, when ICFO was a much smaller place and we all knew each other, a group of students had just submitted an application to become the ICFO-OSA Student Chapter. I joined Giovanni, Gajendra, Iván, Osamu, Xavi, and several others that were full of energy and crazy ideas and we all worked together to make our dream come true: advance our research, build a strong student community, and have fun doing it.

Meanwhile, my thesis advisor, Maciek, enabled me to work with top groups from around the world and made sure I learned the relevant aspects of ultra-cold atoms, to study disorder-induced order in them for my PhD. "There are no stupid questions" he told me when we first met in Hannover. I learned about the intricacies of quantum optics, discovered advanced mathematical tools to tackle complex problems, and developed computer programs to simulate disorder effects numerically. And when I wanted to work with a fellow student from Germany, or with a professor from Poland, I received all the support to do it.

A pattern emerged: get a few enthusiastic and hard-working people, let them work for their project, and serve as a catalyst for their efforts – this is how Maciek led me, and how ICFO supported our efforts at the Chapter.

At the chapter, we first established our seminar series, which taught us how food encourages attendance. Then, we drafted and implemented our two-hour-long outreach program for high schools called *"El día de la luz"* I still remember our excitement during that first "Day of Light" in May 2006, and how proud we were that this program became a regular ICFO activity for many years to come.

These achievements gave us the credibility to finally realize our goal of inviting fellow students in other center to visit ICFO. Originally called "the ICFO OSA Student Chapter Exchange initiative" it was soon shortened to "IONS - The International OSA Network of Students". We met great people from all over Europe and were invited to Southampton soon after, then to Munich, and then to Naples. IONS won awards, grew into a household name, and taught all of us valuable lessons in project management, people skills, presentation, and implementation of a crazy idea.

The hardest thing during my PhD was facing the limits of my own understanding and capabilities. Being stuck, feeling stupid, and simply being lost were difficult to deal with. However, in retrospect, it is clear that the ability to work your way through obstacles is what it's all about.

Towards the end of my PhD, I met Tom Baer when he visited us during IONS-5, and finally ended up working at Stanford University as a SU2P Entrepreneurial Fellow after my PhD. There, we developed tools for nanophotonic simulations. Still quantum optics, but with a stronger focus on applications. The scientific freedom I had at Stanford allowed me to further explore methods of optimizing complex circuits. And since math is math, I ended up applying this method to classical nanophotonics: high-contrast gratings while working at HP Labs. Here, I met a group of people who fabricate a special backlight to create a glasses-free 3D screen based on standard LCD technology. Today, I lead the software and algorithms effort at LEIA Inc — the HP Labs spin-off that commercializes this nano technology.

Interestingly, I find that my quantum background really provides me with a reliable intuition when it comes to advanced math problems, and numerical simulations – math is math: we often find astonishing mathematical parallels in vastly different fields of study. For example, I learned how to deal with n-dimensional Hilbert spaces during my PhD. Today, we are working with 4-dimensional vector spaces for computer graphics; and we routinely deal with 4-dimensional Fourier transforms to describe our light-fields. Thus, a solid mathematical understanding is, indeed, transferrable from quantum theory to light-field display algorithms. And the same goes for experience in numerical simulation and data visualization.

I was lucky: I had great mentors, met fantastic friends and even my wife at ICFO. The different facets of my student experience at ICFO – my research using advanced mathematical methods, my simulations using a variety of computational platforms, the collaborative student chapter – all contribute to my highly gratifying experience in R&D at this startup.

"My thesis advisor, Maciek, enabled me to work with top groups from around the world."

GO & FLY

95 women and men have successfully defended their theses at ICFO since its founding in 2002 and have helped us to measure what we have learned, how far we have come, and how much we have yet to learn. These ICFOnians have recently succeeded in defending their PhD Theses. Honoring ICFO's tradition, ICFOnians gather together to celebrate your accomplishments and encourage you to Go & Fly! Remember that wherever you go, you will always be a part of the ICFO community.

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January 27 2015

YANNICK ALAN DE ICAZA

Optimal Signal Recovery for Pulsed Balanced Detection
TD: ICREA Prof. at ICFO Dr. **Morgan Mitchell**

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January 30 2015

IGOR DIEGO BLANCO NÚÑEZ

Diffuse optical monitoring of cerebral hemodynamics in experimental and clinical neurology
TD: Prof. Dr. **Turgut Durduran**

95
February 18 2015

FRANCISCO P. GARCÍA DE ARQUER

Plasmonic Hot-Carrier Optoelectronics
TD: Prof. Dr. **Gerasimos Konstantos**

HIGH PROFILE

Eugene Arthurs:

"I have a sound and informed faith in the potential for photonics for the coming decades."

Having led companies in the optics and photonics industry, EUGENE ARTHURS now supports the entire Photonics community as CEO of SPIE- the International Society of Optics and Photonics

What is SPIE doing to celebrate IYL2015?

SPIE supported the concept of the IYL throughout the multiple steps toward final endorsement by the UN and is taking a leadership role to maximize the IYL impact. Aside from continuing to highlight the IYL at all SPIE meetings, we have a comprehensive range of activities to take the message beyond the science and engineering communities. For example, we ran a photography contest to attract ideas from different communities on how people saw light. The contest drew 800+ submissions and had meaningful results on many different levels. We have printed and freely distributed to the public about 25,000 copies of a coffee table book, "Celebrating Light". We are making IYL graphics and posters available and are supporting local exhibits in public thoroughfares, airports, museums, etc. to draw attention to the different communities working with light. In addition, we have opened new competitive calls for student chapters to finance outreach activities related to the IYL. The students' ideas and energy are an inspirational confirmation of a truly bright future for our fields.

What do you anticipate will be the major takeaway of IYL 2015 for industries in this field?

For companies, improved recognition of the technology of light at the political level should result in more support for related research, another cornerstone of the innovation infrastructure. Companies benefit eventually from the advances in knowledge that come with research. IYL is a unique opportunity to make funding decision makers and investors more aware of the leverage of light-based science and technologies, encouraging them to increase their support which will in turn help companies, the research community, and all of humanity. Awareness at the highest levels in government of the economic and social impact of what we do should also positively influence the regulatory climate.

In order to meet its potential, the field of photonics needs….

To realize the obvious-only-to-insiders potential for light-based technologies we need an ongoing supply of bright, industrious people. Some of our IYL efforts will be directed at raising awareness at the parent and student level. Inspiring young people to enter the field is important to companies to sustain their innovation and to expand their customer base.

How can PhD and postdoctoral students at ICFO get involved in SPIE?

SPIE is a society of members working to improve our world. It thrives because it is blessed with many who simply step forward, take the initiative, make suggestions, and follow through. Staff support these energy sources. We encourage you to believe that SPIE is your Society and take the initiative. Student chapter participation is a good route to get to know SPIE. We have an "early career infrastructure" as a transition from student to full member, and there are leadership opportunities for people early in their careers. People often find they like one activity more than others, and by assertive participation, they can rise rapidly in visibility and reputation.

What issues concern today's SPIE leadership?

Two substantive examples from our long list are the disruption of the traditional scientific publishing model, and a growing trend summarized in this month's *National Geographic* cover "The War on Science", coupled with what we see as a stubborn refusal by the scientific community to communicate its value to the public, the people who pay to sustain science. SPIE will proactively continue to adapt to new publishing models to better serve the science and engineering communities of the future. We will also do more than our part to communicate the value of what our community does- IYL 2015 is a great opportunity. I have a sound and informed faith in the potential for photonics for the coming decades. SPIE's intent is that this great potential boon for humanity be realized.

STAY TUNED...

ACADEMIC PROGRAMS

- 12 Apr | **Deadline for application** to the **ICFO Summer Fellows Program**
- 06 May | Stand at the *"Fira d'Empreses"* at Universitat de Barcelona promoting opportunities at ICFO
- 01 July | Start of the **ICFO Summer Fellows Program**- a unique training opportunity for undergraduate and masters students
- 15 June | **Science by Woman Fellowships** application deadline- through the *Women for Africa Foundation*

OUTREACH:

- 9 Apr | **Toca la llum Outreach Activity** Launch at Cosmocaixa- Science Museum of Barcelona
- 15 Apr | **LIGHTtalk** *"Lighting the Future"* debating innovative ideas and entrepreneurial opportunities based on Photonics- HUB Barcelona Center, Plaza Les Glòries
- 16 Apr | **Exhibition Pull&Push: a world moved by light**- Espai Cultura Sabadell, Sabadell
- 21 Apr | **LIGHTtalk** *"Careers in Photonics"* focussed towards university students and aimed at showing the broad range of professional opportunities in Photonics
- 15 May | Deadline to submit texts for the *La Llum a les Ones* contest. More info at: http://lallumalesones.icfo.eu

CONFERENCE

- May 4-8 | **Conference** | *"Randomness in Quantum Physics and Beyond"*

COLLOQUIUM SERIES

- 10 Apr | Paul Dumas *"Infrared Synchrotrons and Lasers for Biomedical-Related Applications"*
- 8 May | Adam E. Cohen | *"Bringing Bioelectricity to Light"*
- 5 June | Orazio Svelto |"*The Laser: a Bright Solution Looking for a Problem"*

INTERNATIONAL YEAR OF LIGHT 2015

KEEP YOUR EYE on the events section of the web. There is always something interesting happening at ICFO.

SUDOKU

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