

# ICFONians

Community News from the Institut de Ciències Fotòniques



## EDITOR'S CORNER

### Something in Common



**BROOK HARDWICK**  
Coordinating Editor



Have you ever organized a party, bringing together friends from different areas or moments in your life and been amazed to see how these very different branches are able to find great new connections? At the beginning of the party, maybe YOU were the point that they all had in common, but by the end of the night, new connections, common interests, and stories were taking off. And the best part of this is that these new connections strengthen the original connection- with YOU! If you have already read ahead to page 7 and learned about the new ICFO Alumni Network we are launching, you will immediately grasp this analogy. This Alumni network has been a long time in coming, however now that we are finally launching it, the ideas of shared goals, friendships, concerns, and interests, all of which support the creation of a formal network of ICFOnians, also seem to irradiate into everything else we do. As you read through this newsletter, try to think about things that we have in common and that bring us together. It is clear that shared histories, concerns and/or goals, help to exponentially increase the probabilities of our success in everything we do.

Let's start with a look at all of the Summer Fellows and students who have been part of our institute the last couple of months. Some of these young minds are already pretty sure that they want to work in science and that they will go on towards a PhD. Others are testing the waters. They all become real ICFOnians during the summer months and this requires a lot of work, curiosity as well as a willingness to try new things with new people. In return, it brings new knowledge and experience as well as both professional and personal connections they will carry with them for a very long time, even if they decide in the end to continue their careers in another field. They leave ICFO as ICFOnians with a shared interest in our work and the continued success of the institute.

On this edition's cover (and on page 5) you will read about the community experiment that ICFO's Outreach team has coordinated all over Barcelona. "Barcelona Breathes" (*Barcelona Respira*) has allowed ICFO to establish meaningful collaborations with Barcelona's City government, CosmoCaixa, and researchers at CREAL to measure aerosols in our air. ICFOnians from all different areas of ICFO have gotten to know each other better, collaborating to make this experiment a success. We have met, interacted with and shared our work with the citizens of Barcelona, making them central contributors to an important scientific experiment. All of these contributors have come together with a shared concern for the environment and have worked together using a Photonic enabled technology. And this network of collaborators is contributing to a pan-European experiment coordinated in the Netherlands!

And the possibilities for joining forces to further common interests are endless. Corning has renewed the collaboration for the Corning laboratory at ICFO to pursue common interests. Christoph Rossel, President of the European Physics Society tells us about how EPS is contributing to unite those working with Physics to enable an even larger impact on science, European policy, education and society. If you have read this much, it is because you have a connection and interest in what we are doing at ICFO. Please keep reading, and stay in touch!

## COVER



Barcelona's geography, lay-out and climate allow thousands of people to enjoy the city's outdoor spaces for running, skating, cycling or walking. With so many athletes in Barcelona, the slogan "Do you practice sports?" clearly caught the attention of many, allowing ICFO's Outreach Team to engage citizens, and especially sports fans, in a community experiment to measure the quality of air they breathe. Read more about the Barcelona Breathes Community experiment on page 6.

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Brook Hardwick, Corporate Communications Head

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Institut de Ciències Fotoniques



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INTERNATIONAL YEAR OF LIGHT 2015

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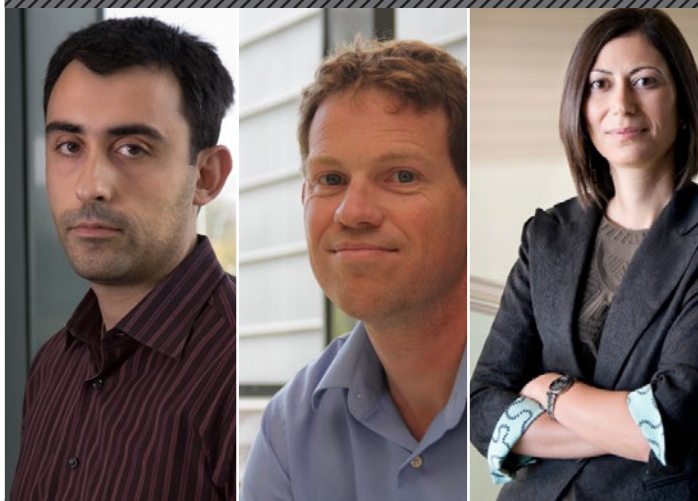
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## ICFO NEWS



### TENURED TRACK

In July, ICFO's Board of Trustees, following the advice of the corresponding ad-hoc committees, has awarded tenure with full honors to ICFO Professors Gerasimos Konstantatos, Frank Koppens and Melike Lakadamyali based on the remarkable progress achieved during their tenure-track periods. All three of these group leaders joined ICFO through the Nest Program, endowed by the Cellex Foundation Barcelona to support outstandingly talented and creative young group leaders.

### NEW PROOF OF CONCEPT

ICREA Prof. at ICFO Romain Quidant (ERC Starting Grant '11, ERC PoC Grant 2011 and ERC Consolidator Grant'15), who leads the Plasmon Nano-Optics research group, has been awarded a second Proof-of-Concept (PoC) study grant from the European Research Council for the project SMARTLENS. SMARTLENS has the objective of exploiting a recently developed technology to create a new paradigm in optical imaging by transforming at low cost any conventional static optical lens into an adaptive lens whose imaging properties can be dynamically shaped almost at will.

### UPC PHD THESIS AWARDS 2015

The UPC has recognized Dr. Daan Brinks and Dr. Alberto González Curto with the 2015 Extraordinary PhD Thesis Award, a prize aimed at recognizing the best doctoral theses which have obtained "cum laude" in their final PhD defence evaluation. Dr. Brinks' research on "Ultrafast dynamics and coherent control of single molecules" and Dr. González Curto's thesis "Optical antennas control light emission", both led by ICREA Prof. at ICFO Niek van Hulst, are among the list of 26 extraordinary doctoral works for the academic period 2012/2013.

### FOUNDATIONAL QUESTIONS INSTITUTE

The Foundational Questions Institute (FQXi) has recently announced the selection of 20 teams around the world who will together receive a total of \$1.85 million in grants for research and outreach projects on the fundamental nature of "Events" in physics. ICREA Prof. at ICFO Antonio Acín, has been chosen from nearly 250 applicants worldwide to receive funding for his project on "Quantum Bayesian networks: the physics of nonlocal events". This foundation is a firm supporter of both foundational (understanding the "ultimate" nature of reality) and unconventional (speculative, non-mainstream, or high-risk nature) research.

### ICFO & CYTO-WATER

Labaqua, ICFO and Cetaqua from Spain, MEMTEQ of the United Kingdom, microTEC from Germany, and Bertin Technologies from France have united their forces and expertise to launch the project CYTO-WATER. Funded by the Horizon 2020 EU Research and Innovation Program and with a duration of over three years, this project has carried out the first market application of a new imaging cytometer platform for the detection of microorganisms, mainly Legionella and Escherichia, in industrial and environmental waters, two areas that play a key role in smart and sustainable growth.

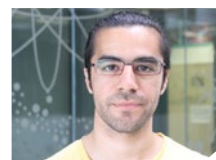
## ICFO NEWCOMERS



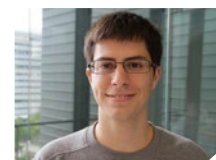
**Rafaël Sibilo**  
PhD Student



**Pamina Winkler**  
PhD Student



**Christos Charalambous**  
PhD Student



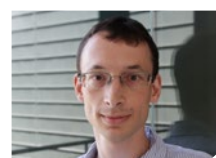
**Gerard Planes**  
PhD Student



**Callum O'Donnell**  
PhD Student



**Michal Kacprzak**  
Postdoc Researcher



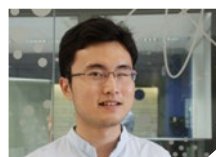
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Postdoc Researcher



**Martijn Jasperse**  
Postdoc Researcher



**Joseph Hollmann**  
Postdoc Researcher



**Shi-Ju Ran**  
Postdoc Researcher



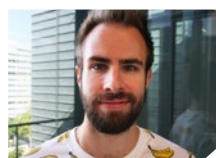
**Sylwester Gawinkowski**  
Postdoc Researcher



**Jaime Ortega**  
Postdoc Researcher



**Mikael Svedendahl**  
Postdoc Researcher



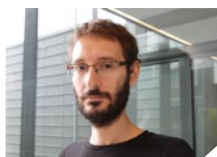
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Postdoc Researcher



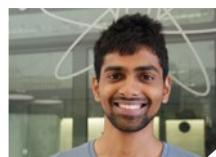
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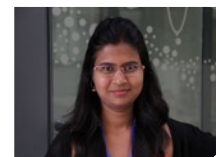
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**Shuchi Gupta**  
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**Laurent Philippet**  
Research Engineer



**Bryce Kobrin**  
Research Engineer



**Gregory Burwell**  
Research Engineer



**Santanu Pradhan**  
Research Engineer



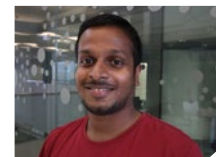
**Claudia Valdés**  
Visiting Scientist



**Emilia M. Méndez**  
Visiting Scientist



**Francesco Chiavaioli**  
Visiting Scientist



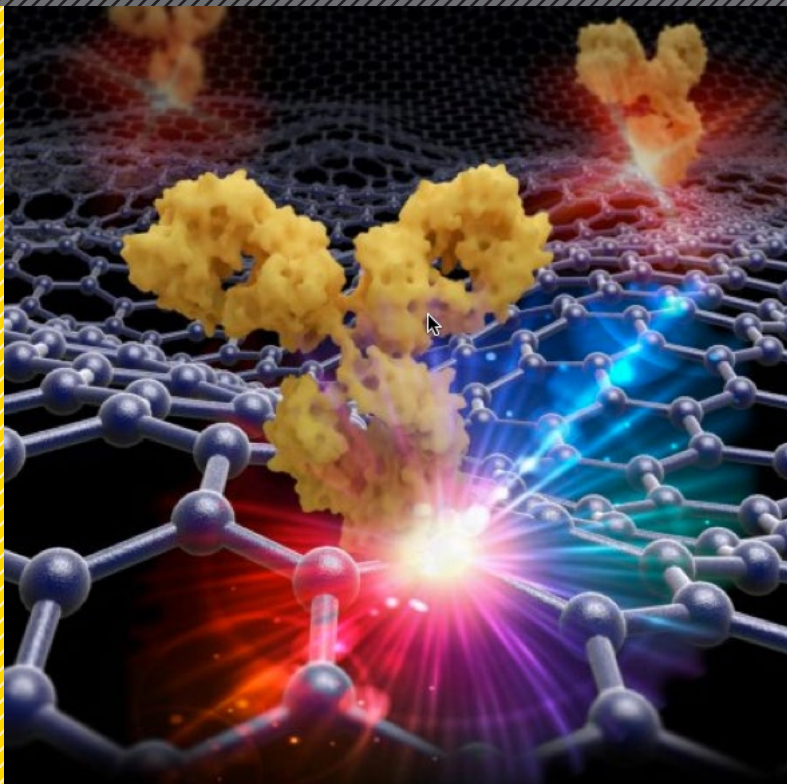
**Apurv Chaitanya**  
Visiting Scientist

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

*Welcome to ICFO!*



## LATEST ADVANCES



## ICFO IN SCIENCE

■ *Science* has recently published a study in which ICFO and EPFL developed a tunable, highly sensitive graphene-based infrared sensor that improves molecule-detection through infrared absorption spectroscopy, a technique that has important limitations when applied to molecules at the nano-scale. By giving a specific geometry to graphene, this material is capable of focusing light on a precise spot on its surface and “hearing” the vibration of a nanometric molecule that is attached to it. Researchers “tuned” the graphene to different frequencies by applying voltage, which is not possible with current sensors. Making graphene’s electrons oscillate in different ways makes it possible to “read” all the vibrations of the molecule on its surface.

## TRACKING SLOW NANOLIGHT IN NATURE PHOTONICS

■ In a recent paper published in *Nature Photonics*, researchers from ICFO and nanoGUNE have collaborated in a study aimed at using a nano-imaging technique to observe the ways in which light moves inside an exotic class of matter known as hyperbolic materials: solids that behave like both a metal and an insulator. For the first time, they have seen ultraslow pulse propagation and backward propagating waves in deep subwavelength-scale thick slabs of boron nitride – a natural hyperbolic material for infrared light. These results lay the foundations for studying the way in which light travels through complex optical systems at the subwavelength scale in extremely high levels of detail, vital for understanding how nanophotonic devices work such as those used in biosensing or optical computing applications.

## CONTROLLING MATERIAL PROPERTIES

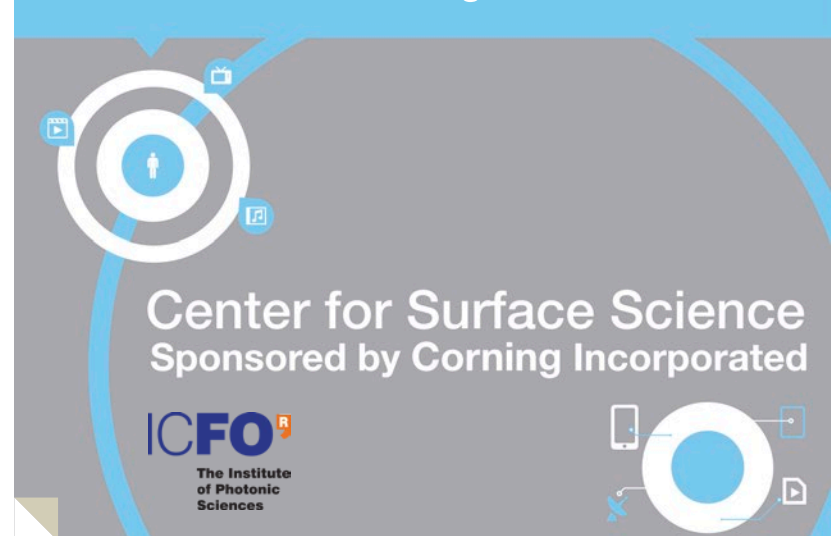
■ In a recent issue of *Nature Communications*, a team of researchers from ICFO and HZDR shared their discovery of a new way to control domains utilizing THz radiation from Europe’s only quasi-cw THz free electron laser FELBE. The researchers utilized the unique tunable narrow-band THz radiation from the FEL to align a novel type of domain consisting of electronic order as opposed to magnetic order found in hard drives. Future studies aim at utilizing the high-field high repetition rate THz pulses to reveal details of the ultra-fast dynamics of the alignment mechanism.

## ULTRAHIGH MOLECULAR SENSITIVITY

■ In a recent study in *Nature Photonics*, ICFO, MPQ and LMU researchers discuss the development of a unique broadband and coherent infrared light source with unprecedented sensitivity, that detects the molecular fingerprints of cancer cells. Its characteristics make it an ideal device to detect minute changes in the spectral features from cells or tissue which are tell-tale signs of DNA mutation or the presence of cellular malfunctions such as cancer. ICREA Prof. at ICFO Jens Biegert and his group are currently researching molecular sensitivity for the identification of cancer biomarkers on the single cell level using all optical techniques in the mid-wave infrared wavelength range.

## BUSINESS NEWS

## ICFO - Corning Alliance



## Renewed Support for the Corning Center for Surface Science at ICFO

Corning Inc. and ICFO sign a renewal agreement for the Corning Laboratory at ICFO

Corning Incorporated, a world leader in specialty glass and ceramics, and ICFO announce a four-year renewal agreement for the Corning Laboratory at ICFO. Since 2010, the collaboration has been the basis for numerous successful projects in the areas of photonics and surface technologies and has subsequently helped enable Corning and ICFO to secure their leading positions in surface science and technology.

The Corning-ICFO collaboration, which will now extend through 2019, includes sponsorship of a chaired faculty professorship, the Corning Surfaces Laboratory and sponsored research projects of mutual interest. Professor Valerio Pruneri holds the chaired faculty professorship. The Knowledge and Technology Transfer unit at ICFO and the University Collaborations department at Corning are playing a key role in maintaining and fostering this joint effort.

“Professor Pruneri and his group at ICFO are at the leading edge of research in optical physics and materials and surface sciences,” said Aleksandra Boskovic, director, Optics and Surface Technologies, Corning Science and Technology. “This collaboration enables Corning to innovate with ICFO by exploring optoelectronic properties and applications for its unique materials.”

ICFO Director Lluís Torner said, “The special relationship that ICFO shares with Corning through this partnership enables us to join forces to tackle truly relevant problems facing companies and society today. The innovative spirit and world-leading capabilities of the Corning team have already yielded great results. We are thrilled to continue working on projects that promise to greatly benefit both organizations.”

“My group is looking forward to continuing the collaboration with highly qualified research scientists and leaders,” declared ICREA Professor at ICFO Valerio Pruneri. “The results we have achieved to date demonstrate that this is a win-win for both teams. We are producing very exciting advances and are committed to continue working on projects relevant to the industry.”

Salient examples of the important technological breakthroughs achieved so far include antireflection glass surfaces with almost zero reflection up to very large viewing angles. These surfaces have been combined with antiglare properties to achieve a display screen that is free of interference from ambient light. Other advances include a super-omniphobic glass window repelling water and oil and a flexible glass substrate whose surface is electrically conductive, allowing low cost manufacturing of consumable electronic devices. All of these advances have been enabled by new designs involving ultrathin materials and micro-nano-structuring technologies, patented under the collaboration framework.



YOUNG TALENT

Summer Opportunities for Students at ICFO

Undergraduate and high school students take advantage of the summer break to have a truly unique research experience

Throughout the year, ICFO welcomes a steady stream of high school and undergraduate students as part of the center's mission to have a formative influence on the next generation of scientists. Thanks to a wide range of outreach activities as well as an active internship program, young minds gain exposure to the work carried out at ICFO.

In July, August and September, these special visitors have a much more visible presence in our corridors and labs. Undergraduate student participants in the ICFO Summer

Fellows program and high schoolers in the CiMs+Cellex program, the CTM program, ACER program and the Fundació Catalunya-la Pedrera's E<sup>2</sup>C<sup>3</sup>-Centre Recerca program, take advantage of the summer break to have a truly unique research experience. ICFO puts into motion a full series of Summer Lectures, designed to introduce newcomers to the many different lines of research at ICFO. A series of lab tours as well as special projects conducted within ICFO's research groups provide the framework for these young scientists (and scientists-to be) to experience ICFO as a researcher, not just a visitor.



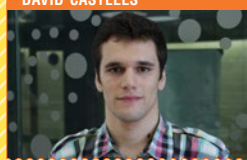





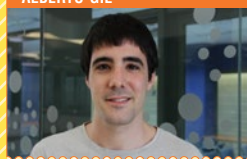





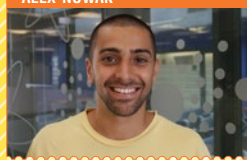




SUMMER FELLOWS ICFO<sup>®</sup> 2015



Now in its 9th edition, the Summer Fellows program welcomed 17 undergraduate and Master's students to ICFO to carry out challenging research projects under the supervision of a Group Leader and with the assistance of Postdocs or PhD students.

This program is part of ICFO's efforts to attract young top talent at an early academic career stage. It represents a unique opportunity for the fellows to collaborate in frontier research projects, to learn how these projects are conducted and to gain research experience.

<p><b>LAURA ALBERO</b></p>  <p>-Age 21, Alicante -Autonomous University of Barcelona -ICFO Group: Organic Nanostructured Photovoltaics</p>	<p><b>JAVIER ARGUELLO</b></p>  <p>-Age 22, Santander -Complutense University of Madrid -ICFO Group: Theoretical Quantum-Nano Photonics</p>	<p><b>DAVID CASTELLS</b></p>  <p>-Age 20, Terrassa -Autonomous University of Barcelona -ICFO Group: Nanophotonics Theory</p>	<p><b>MARIONA CASTREJON</b></p>  <p>-Age 21, Barcelona -Pompeu Fabra University -ICFO Group: Optoelectronics</p>	<p><b>MARC DE CEA</b></p>  <p>-Age 20, Barcelona -Polytechnic University of Catalonia -ICFO Group: Molecular Nanophotonics</p>	
<p><b>ESTEFANIA FERNANDEZ</b></p>  <p>-Age 24, Montornès del Vallès -University of Barcelona -ICFO Group: SLN Facility</p>	<p><b>JULIA FERRER</b></p>  <p>-Age 22, Mallorca -University of Barcelona -ICFO Group: Plasmon Nano-optics</p>	<p><b>XIMO GALLUD</b></p>  <p>-Age 22, Valencia -Polytechnic University of Catalonia -ICFO Group: Plasmon Nano-optics</p>	<p><b>ALBERTO GIL</b></p>  <p>-Age 22, L'Hospitalet del Llobregat -Autonomous University of Barcelona -ICFO Group: Attoscience and Ultrafast Optics</p>	<p><b>MARIA BELEN MARTINEZ</b></p>  <p>-Age 23, Parla (Madrid) -Rey Juan Carlos University -ICFO Group: Organic Nanostructured Photovoltaics</p>	<p><b>CATALINA MARTINEZ</b></p>  <p>-Age 23, Puig-reig -Pompeu Fabra University -ICFO Group: Single Molecule Biophotonics</p>
<p><b>LUIS MARTINEZ</b></p>  <p>-Age 23, Murcia -Polytechnic University of Catalonia -ICFO Group: Quantum Photonics with Solids and Atoms</p>	<p><b>AXEL MASO</b></p>  <p>-Age 21, Viladomus -Autonomous University of Barcelona -ICFO Group: Quantum Information Theory</p>	<p><b>JUAN CARLOS MORALES</b></p>  <p>-Age 21, Granada -Polytechnic University of Catalonia -ICFO Group: Functional Optoelectronic Nanomaterials</p>	<p><b>ALEX NOWAK</b></p>  <p>-Age 21, Badalona -Polytechnic University of Catalonia -ICFO Group: Quantum NanoMechanics</p>	<p><b>GERARD PELEGRI</b></p>  <p>-Age 23, Barcelona -University of Barcelona -ICFO Group: Quantum Optics Theory</p>	<p><b>MARC SANTIGOSA</b></p>  <p>-Age 20, Barcelona -Polytechnic University of Catalonia -ICFO Group: Nano-Optoelectronics</p>

E<sup>2</sup>C<sup>3</sup> @ ICFO

ICFO hosted 6 high school students for a 2 to 5 week stay within the E<sup>2</sup>C<sup>3</sup>-Centre Recerca program, supported by Fundació Catalunya-la Pedrera. Students worked on the following projects: "Image Compression" within the Theoretical quantum-nano photonics group, "Quantum information applied to secured communications" within the Quantum information theory group, and "See molecules and brighten up molecules" within the Molecular Nanophotonics group.

**Participating students:** Jordi Montañà, Gerard Castro, Paula Muñoz, Glòria Boqué, Eduard Prujà and Clara Roig.



PROGRAMA JOVES I CIÈNCIA

CiMs-CELLEX @ ICFO

As part of the CiMs+Cellex program, this year ICFO welcomed two CiMs+Cellex students, Albert Puntí and Pau Matarrodona. Both have spent the month of July in different projects, Albert collaborating with the project "Mechanical resonators based on graphene and carbon nanotubes" within the Quantum NanoMechanics group and Pau with the project "Laser light" within the Quantum optics theory group.



ACER

This year the Catalan Association of Research Centers (Associació Catalana d'Entitats de Recerca - ACER) awarded, through the 1<sup>st</sup> Edition of the Extraordinary High School Prizes, a scholarship to Gerard Orriols, who worked on the project "Disorder in atom-nanophotonics interfaces" within the Theoretical Quantum-Nano Photonics theory group.



CTM

In the 1<sup>st</sup> Edition of this program, the Generalitat's Education Department, through the Science, Technology and Mathematics (CTM) program, awarded a scholarship to Marc Fuster, who worked on the project "Mechanical resonators based on graphene and carbon nanotubes" within the Quantum NanoMechanics Group.



Generalitat de Catalunya



## OUTREACH

# BCN Breathes

ICFO coordinates a citizen's experiment to measure aerosol pollution in Barcelona



From September 15<sup>th</sup> thru October 15<sup>th</sup>, and as part of the LIGHT 2015 European project coordinated EPS, ICFO organized a city-wide citizen's science experiment in Barcelona with three main objectives: to offer citizens the opportunity to participate in a scientific experiment, to promote the understanding of the properties of aerosols and their effects on the environment, and last but not least, to raise awareness that Photonics is omnipresent in our everyday lives. The first learning point for many was the discovery that the smartphone, a technology that almost everyone carries in their pocket, is capable of using photonics to carry out complex measurements such as that of aerosols in the air.

Barcelona's geography, lay-out and climate offer great places for thousands of people to enjoy the city's outdoor spaces for running, skating, cycling or walking. With so many athletes in Barcelona, the slogan "Do you practice sports?" clearly caught the attention of many, allowing ICFO's Outreach Team to engage sports fans, regular citizens and many schools based on a concern and curiosity for the quality of air they breathe.

With this in mind and in collaboration with CREAL (Centre for Research in Environmental Epidemiology) and the Citizen's Science Office of BCNLab Science, ICFO organized the citizen experiment campaign for one full month. The campaign staked

ICFO volunteers in specific areas of the city that are well known as "healthy spots", frequented for practicing sports. Every Wednesday afternoon and Sunday morning during the month-long period, ICFO volunteers gathered at stands in the four strategically chosen observation points of the city: Barceloneta, Collserola, Montjuïc and Diagonal. From these locations, they invited passers-by to take part in an experiment consisting of taking measurements of the air. In parallel, ICFO worked with several schools to take daily measurements which provided a significant amount of data. Teachers were able to use this experiment as an education tool to talk about important concepts in physics, biology, and chemistry, to name but a few related subjects.

Those who participated simply had to use their iPhone 4 or 5, a scientific add-on called "iSPEX" provided by ICFO, and download a free App developed specifically for this experiment. These basic ingredients, mixed with natural light from the sun, allowed for the measurement of concentration of aerosols in the air. The measurement process is as easy as pointing the phone to the horizon, and initiating the App. Volunteers swept a path from the horizon to the zenith, throughout which time the App was programmed to take pictures of the sky through the special iSPEX lens. Photonic technology allowed the camera to capture images based on

the spectrum and polarization of the light, providing information about the identity and quantity of aerosol particles in the air.

The measurements taken in every location, by every participant in Barcelona, were then compressed into a file and sent in-situ to headquarters in Leiden University (NL). As a pan-European experiment taking place in parallel in nine other cities around Europe, a considerable amount of data was gathered and sent to headquarters in the Netherlands during the campaign, all of which will be used to create a map of aerosol concentrations in Europe. The map will be published by the end of 2015, allowing all those concerned for the quality of air in their city to see the final results.

On behalf of ICFO, we would like to thank all the participants, students, teachers, and also volunteers who helped to make this experiment a success. Thank you!

## LIGHT 2015 EXPERIMENT

■ This initiative is part of the **LIGHT2015** project which coordinates the implementation of the experiment in ten major European cities in parallel: London, Manchester, Milan, Rome, Berlin, Copenhagen, Belgrade, Toulouse, Athens and Barcelona.

+ INFO ► [www.light2015.org](http://www.light2015.org)

*"The iSPEX lens, a Photonic technology, allows the camera to capture the spectrum and polarization of light, providing information about the identity and quantity of aerosol particles in the air."*



BEYOND ICFO

# ICFO Alumni Network

A new network to keep ICFONIANS connected



Do you remember when ICFO was still a “BIG IDEA”? Would you like to connect with people from your days at ICFO where everyone knew everyone’s name? Are you about to defend your thesis and preparing to head out to expand your career in science at a different institution? Are you looking to move from science into industry? Are you already immersed in the world “outside ICFO” and feeling nostalgic about the four o’clock futbolin match or the annual *Calçotada*? As you advance in your career, can you also see reasons for maintaining close ties with ICFO as it also grows and increasingly reaches new heights of international recognition for its research output?

If any of these questions have struck a chord with you, you will be happy to hear that at long last, ICFO is launching its very own alumni network. This network aims to connect all *ICFOnians* who have at one point in their career

called ICFO home. The goals of the ICFO Alumni Network are numerous: it aims to recognize the contribution that each *ICFOnian* makes to the institution during her/his time here, and at the same time ensure that the important ties from the shared experience and credential help to make a stronger research institute. ICFO experiences are very strong professional platforms, but they also represent lasting friendships that go far beyond the science and knowledge that is shared and created in ICFO’s labs.

We are now starting to roll out this new network, which will have several different components:

**ALUMNI DIRECTORY:** Find your friends; find an ICFO contact in a new city or industry. We will soon be asking you to take a few moments to give us information on where you are and what you are doing. Not only will this infor-

mation help us to keep you up-to-date on things that are going on at ICFO, it will help you connect with friends and colleagues. When you receive an email from us with a personalized link to your profile, please take a moment to log-in and give us your update. It should only take a few minutes and you can choose which information you want to share with you former colleagues in the directory.

**ALUMNI PLATFORM:** *ICFOnians* leave to continue their careers around the globe, so we need a “home” that all alumni can access, no matter where they may be. The ICFO Directory will be “live” on this alumni platform and will give us a virtual “home” for posting news on current happenings at ICFO, YOUR news that you wish to share with the community, and details on how to meet up. This platform is currently under construction but will be available soon!

■ If you have not heard from us in a while and have been moving around a lot, it is possible that we do not have your correct contact details. Please send us a mail at [alumni@icfo.eu](mailto:alumni@icfo.eu) to let us know how best to contact you.

We will be sending out information to Alumni on how to stay connected and get involved with the network and want to make sure you are in the loop.

And this is just the beginning. The alumni network aims to be a dynamic resource and “home” for *ICFOnians*, offering opportunities to stay in touch both professionally and personally. We have already started to talk with members of the alumni community to help us roll out this new initiative and hope to hear from you all. Two ICFO PhD graduates, Armand Niederberger and Clara Osorio, will act as our first honorary alumni representatives, adding to the contributions that they made to help build the institute during their time inside ICFO.

ARMAND NIEDERBERGER (@ ICFO 2005-2010)



\*Now the Director of Data Science and Algorithms at LEIA Inc. in Menlo Park, California (USA)

■ “Most of the friends I made as a PhD student at ICFO and through ICONS are now scattered around the world, working in academia, industry, or consulting in other areas.. This is not only enriching my life, but also enhancing my professional network. With the alumni network, upcoming generations of ICFOnians can directly connect to those who have come before them. This will bring people from around the world with ties to ICFO closer together, making all of us stronger and more effective.”

CLARA OSORIO (@ ICFO 2003-2010)



\*Now a postdoctoral researcher at the FOM Institute AMOLF in Amsterdam (NL)

■ “Many happy memories of my time in Barcelona involve discussing science (and life in general) with friends and colleagues in ICFO. Not only did I learn a lot about physics and other cultures, but the social interaction with other ICFOnians was a great support during my PhD. Unfortunately, due to the nature of our profession, we are now all scattered around the world and with time it has been difficult to stay in touch. I see this network as an opportunity to keep in touch and to keep on learning and supporting each other personally and professionally.”

GO & FLY



**101** 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.



**99**  
July 20  
2015

JORDI TURA

*Characterizing Entanglement and Quantum Correlations Constrained by Symmetry*  
TD: ICREA Prof. at ICFO Dr. Maciej Lewenstein; Co-Advisor Dr. Remigiusz Augusiak



**100**  
July 24  
2015

STEPHAN TEICHMANN

*Ponderomotively Scaled High Harmonics Generation for Attoscience in the Water Window*  
TD: ICREA Prof. at ICFO Prof. Jens Biegert



**101**  
September 23  
2015

GONZALO DE LA TORRE

*From Quantum Foundations to Quantum Information Protocols and back*  
TD: ICREA Prof. at ICFO Dr. Antonio Acín



## HIGH PROFILE



### Christophe Rossel:

*“I am very happy about our EPS Young Minds which aims to increase the visibility of EPS among university physics students and also help young scientists to engage in outreach activity in their community.”*

Retired but still emeritus member at IBM, Christophe Rossel brings his vast experience as an Industrial Physicist to the European Physics Society (EPS). He shares his vision for EPS and reflections on opportunities for the EPS Young Minds initiative on outreach and education as well as the role of physics in industry and society.



#### In your new role as President of EPS, how will you combine your science with EPS?

This is going to be two wonderful years! Since my early retirement, I have more time to share between my EPS duties and further research activities at IBM. I now have many new opportunities and more freedom in organizing my work. I do not know how my predecessor John Dudley did it with teaching, research and family!

#### Taking over at the helm as IYL 2015 is nearing an end, where do you hope to lead the society?

In my term as president, I will work for the visibility of EPS and there is a lot for us to do! My large network will help me to work on one of the priorities for EPS: to establish itself as a major science organization in Europe and provide expert advice to policy makers. EPS's strength is to federate all stakeholders in physics, from academia, research and industry, promoting scientific excellence. Outreach is another important focus. In addition to the IYL2015 and LIGHT2015 programs, we are working with Initiative for Science, are planning exhibits in Brussels and are working through our Equal Opportunity Committee to act against the under-representation of women in physics. I am in the process of creating an EPS foundation to support specific projects in outreach, education and development in countries in need... all this and a lot more. And I am

very happy about our EPS Young Minds which aims to increase the visibility of EPS among university physics students and also help young scientists to engage in outreach activity in their community.

#### What role do Young Minds (YM) play at EPS?

They are the future of our society; many of today's students will be the professors of tomorrow and hopefully members of EPS! The networking that we can offer them is very important via workshops or conferences where they can meet senior scientists, and also learn to share their ideas and communicate. The YMs Program is a great opportunity for developing teamwork, creativity and technical skills, communication, and research management. Today there are 34 sections in 19 countries with over 500 members. The role of the EPS YMs is clearly outreach. Young people find it easier to listen to other young people with similar concerns and to share their knowledge with family, friends and kids at school. YM helps to advise and search for young talents.

#### What can young scientists expect if they choose to work in Industrial Physics?

At IBM we were always reminded that the impact of our research, except for long-term science, is measured by the success in delivering technology to IBM's customers and bringing added value to the company. When Alex Müller, a Nobel Prize recipient for his work in high tem-

perature conductivity, hired me to join the IBM Zurich laboratory at the end of the eighties, just after he received the prize, this place was one of the best in the world to conduct basic research. You had more freedom to work on topics outside the main lines of IBM, but it had to result in outstanding contributions to science. Nowadays, due to globalization and the business constraints in delivering always better and faster, the rules of the game have changed a lot. But there are still plenty of great reasons to work in an industrial research laboratory, forming part of a large trend-making effort. The most important thing is to enjoy your job as a physicist, wherever you work, and have also some fun in what you are doing.

#### So is this the end of basic research in industry?

Not really! At IBM like in other industrial R&D laboratories, the publication and dissemination of scientific results remains very important. Especially in industry, there is a strong need to secure original ideas or prototypes with patent applications, an important barometer of innovation activity. A company's patent portfolio contributes to a non-negligible part of the company's revenue. The long-term strategic commitment to innovation is also a prerequisite to help scientific discovery to find its way into the market. Since scientific research is becoming more and more interdisciplinary and connected, the distinction between basic and applied science is not always straightforward.

## STAY TUNED...

### ACADEMIC PROGRAMS

► 6 Nov | **PhD Open Day**

### OUTREACH

► 27 Oct | **Bill Phillips:** "Time, Einstein and the coolest stuff in the universe". La Pedrera, Barcelona

► 3 Nov | **Exploradors de la Llum** – CosmoCaixa – Barcelona

► 11 Nov | **Exploradors de la Llum** – Caixa Forum – Tarragona

► 16 Nov | **Inauguration Science Week 2015 – FCRI**  
Romain Quidant – "Nanofotònica i salut: obrint noves perspectives en la diagnosi precoç i tractaments menys invasius" IEC

► 20 Nov | **Young Photonics Conference**

► 15 Dec | **Exploradors de la Llum** – Caixa Forum – Lleida

► Through 7 April 2016 | participate in the **illuminating Curiosity contest**. More info at: <http://illuminatingcuriosity.icfo.cat>

### CONFERENCE

► 22-23 Oct | **Frontiers of Quantum Physics 2015.**  
Celebrating landmark birthdays of Maciej Lewenstein and Roy Glauber

### INSTITUTIONAL

► 27 Nov | **ICFO Day.** Organized by ICFOnians for ICFOnians. See and share your work with colleagues

### SCIENTIFIC EVENTS

► 11 Dec | **Colloquium:** John Pendry "Transformation Optics: A Universal Design Tool".



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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