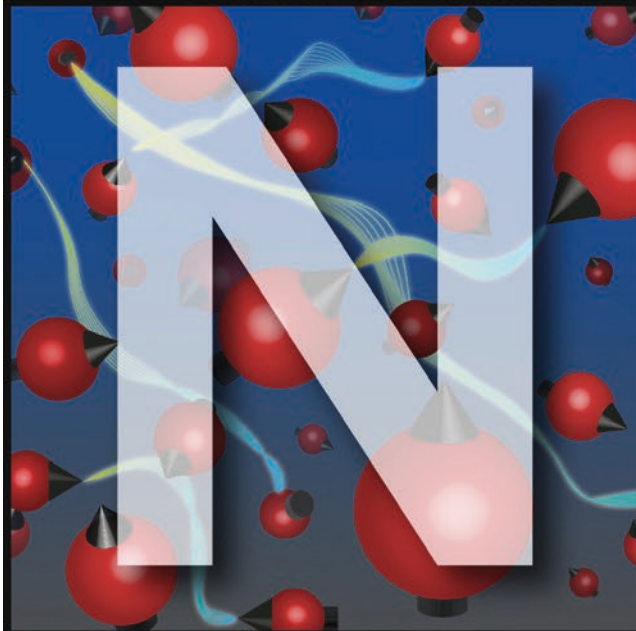


ICFOnians

Community News from the The Institute of Photonic Sciences



EDITOR'S CORNER

The wacky world of ICFO



BROOK HARDWICK
Coordinating Editor



Over the years, ICFO's Outreach Team has embarked on a wide range of activities that aim to awaken scientific curiosity and introduce cutting-edge scientific concepts and advances to the general public. One such initiative, the "Illuminating Curiosity" program, gets celebrities, students and the general public thinking about what makes the physical world behave as it does. Recently celebrating its grand finale, this initiative is a simulation of what happens at ICFO every day as ICFO'ians work towards scientific advances by asking some unique questions about how our world works.

Some of the wackiest scenarios out there belong to the quantum regime which even Einstein had a hard time getting his head around. But as our scientific understanding grows, applications are taking shape that tap into the great potential of quantum mechanics. The inspiration for a quantum focus for this edition of ICFO'ians came from the Quantum Manifesto, an important movement in Europe to form an ambitious roadmap that will allow the continent to lead global advances based on quantum technologies. As the movement starts to pick up speed, it is the perfect moment to give an overview of ICFO's quantum research thrust. We are already making important contributions in this area, with over half of the center's groups participating in research related to quantum technologies. Our theories, discoveries and experiments often represent essential technological elements in today's cutting edge applications and are also setting the theoretical foundations of future quantum solutions. ICFO is therefore paying close attention to the Quantum Manifesto's coordinated effort to usher in what is being referred to as "the second quantum revolution."

ICFO'ians seem happiest when they are delving into challenges that are hard to grasp and even more difficult to resolve. After all, therein lie the opportunities for truly paradigm-changing advances. It is inspiring to be in the middle of where the "Now, Next and Future" of cutting-edge technologies are taking shape - especially when you consider the wide range of scientific focus areas that we have at ICFO! In addition to quantum technologies, in this edition of ICFO'ians, you will see that we have been busy introducing new graphene based prototypes to the Mobile Industry at the Mobile World Congress in Shanghai. Back at ICFO, we welcomed a group of world-leading scientists including experts from the optical nanoscopy field, biophysicists, cell biologists, chemists and statistical physicists for the ICREA Conference on BioNanoVision of cellular architecture: from the nucleus to the cell membrane. (pg. 6) And senior African women scientists have also been collaborating at ICFO for the past several months on projects as diverse as BioSensing and solution-processed solar cells.

Through this quarterly newsletter we continue to strive to bring insights into activities that are happening in our sometimes wacky world. At the same time, we want this to be a place for ICFO'ians to connect (pg. 3 New ICFO'ians, pg. 8 Mystery ICFO'ian) and stay in touch (Beyond ICFO pg. 7). Enjoy your reading!

COVER



The inspiration for a quantum focus for this edition of ICFO'ians came from the Quantum Manifesto, an important movement in Europe to form an ambitious roadmap that will allow the continent to lead global advances based on quantum technologies. As the movement starts to pick up speed, it is the perfect moment to provide an overview of ICFO's quantum research thrust.

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ICFO NEWS



ERC ADVANCED GRANT

■ The European Research Council (ERC) has awarded its prestigious Advanced Grant for senior researchers to ICFO Prof. Adrian Bachtold. The grants are awarded under the “excellent science” pillar of Horizon 2020, the EU’s research and innovation program. Prof. Bachtold’s ERC project, “Nanotube Mechanical Resonator, Spin and Superfluidity,” will take advantage of the outstanding sensing capabilities of nanotube mechanical resonators to study various physical phenomena in extreme regimes. Due to the lack of sufficient sensitivity in conventional measurement methods, these physical phenomena have remained largely unexplored to date. These phenomena include measurements of electron spin resonance (ESR) on single molecules, nuclear magnetic resonance (NMR) on single nuclear spins, and helium superfluidity at the nanoscale.

ICFO @ MWC 2016 SHANGHAI

■ Following its debut in the GSMA Mobile World Congress in Barcelona, the Graphene Pavilion made its second successful appearance, this time at the Mobile World Congress 2016 in Shanghai. The Pavilion was curated by ICFO, under the supervision of ICREA Prof. at ICFO Frank Koppens, and the China Innovation Alliance of the Graphene Industry (CGIA), with the support of GSMA. In addition to the Graphene Pavilion exhibition area, ICFO also coordinated the Graphene Summit, a series of high level talks moderated by Prof. Koppens, including a keynote by Prof. Konstantin Novoselov, 2014 Nobel Laureate in Physics. With record attendance of more than 53,000 visitors from 104 countries and territories, the MWCS 2016 was an excellent opportunity to demonstrate to major industry influencers in Asia how graphene is expected to impact the mobile ecosystem.

ANDREU MAS-COLELL NAMED NEW PRESIDENT OF BIST



■ The board of trustees of the Barcelona Institute of Science and Technology (BIST) has nominated Andreu Mas-Colell, Professor of Economics at the Universitat Pompeu Fabra and former Minister of Economy and Knowledge of the government of Catalonia, as its new president. The outgoing president, Rolf Tarrach, is standing down from the position after leading the institute’s first year of promotion, while the vice-president, Jaume Giró, director of the Caixa Foundation, will remain in post. In addition, as part of its commitment to transform the Escola Industrial Campus into a research cluster, the Diputació de Barcelona has announced its agreement to house BIST’s headquarters on the Escola’s campus.

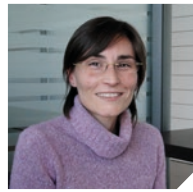
2ND EDITION OF ILLUMINATING CURIOSITY

■ On June 21st, the Mediapro Auditorium *IMAGINA* hosted the final ceremony of the second edition of “Illuminating Curiosity,” an audio-visual contest organized by ICFO’s outreach team which aims to establish a fun and creative encounter between society and photonic sciences. The MC of the ceremony was science writer Marc Boada who was accompanied by the actress Paula Velez from “*Polseres Vermelles*”, and ICFO Director, Prof. Lluís Torner, among others. The “curious” celebrities who inspired video responses and explanations in this edition were doctor and researcher Dr. Bonaventura Clotet, meteorologist Tomàs Molina, the musical group *Els Catarres*, illustrator Pilarín Bayés, actors Miki Esparbé and Paula Velez, and world renown chef Ferran Adrià. More than 100 videos were submitted to the contest, out of which eight received prizes and five were selected as honorable mentions.

ICFO NEWCOMERS



Jan Gieseler
Postdoc Researcher



Iaria Mannelli
Postdoc Researcher



Martí Perarnau
Postdoc Researcher



Lisa Saemisch
PhD Student



Anna Dawid
Student



Juan Rombaut
PhD Student



Ziad Moubarak
Administration&Manag



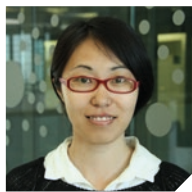
Alberto Ramos
Postdoc Researcher



Mariia Kramarenko
Student



Diego Di Battista
Visiting PhD-student



Yujue Yang
Visiting Scientist



Lluís Danús
Student



Nosipho Moloto
Visiting Scientist



Emre Ozan Polat
Postdoc Researcher



Shreyasi Thakur
Postdoc Researcher



Mathias Charconnet
Student



Nirusanth Vasaspathy
Student



Anita J. Kosmalska
Administration&Manag



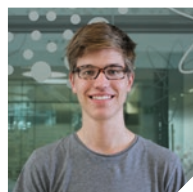
Lenard Vamos
Postdoc Researcher



Raju Regmi
PhD Student



Ingrid Solsona Baya
Administration&Manag



Felix Tebbenjohanns
Student



Inge Groen
Student



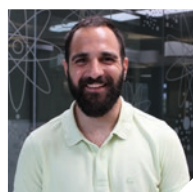
Susanna Tagliabue
PhD Student



María Marsal Terés
Postdoc Researcher



Tymofiy Khodkov
Postdoc Researcher



Sotirios Christodoulou
Postdoc Researcher



Diana Campo Borrás
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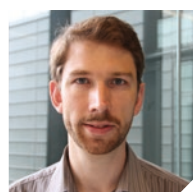
Alexander Powell
Postdoc Researcher



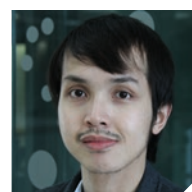
Therese Paoletta
Research Engin (REG)



Elie Calvin
Student



Gregoire de Hemptinne
Student



Veerachart Kajorndejnukul
Postdoc Researcher

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

Welcome to ICFO!

LATEST ADVANCES



SOLAR CELLS FOR GREENER AND SAFER ENERGIES

■ ICFO researchers Dr. Maria Bernechea, Dr. Nicky Miller, Guillem Xercavins, David So, and Dr. Alexandros Stavrinadis, led by ICREA Prof. at ICFO Gerasimos Konstantatos have fabricated a solution-processed, semi-transparent solar cell based on AgBiS₂ nanocrystals, made of non-toxic, earth-abundant elements, produced in ambient conditions at low temperatures. The study, published in *Nature Photonics*, is the first efficient inorganic nanocrystal solid-state solar cell material that simultaneously meets demands for non-toxicity, abundance and low-temperature solution processing.

A LIGHT MICROSCOPE MADE ONLY WITH CONSUMER ELECTRONIC PRODUCTS

■ *Science Advances* has published a study in which ICFO researchers Roland Terborg, Dr. Josselin Pello, Dr. Ilaria Mannelli, UPC Prof. at ICFO Juan P. Torres and ICREA Prof. at ICFO Valerio Pruneri, have built a novel low-cost, compact on-chip microscope, using consumer electronic products, capable of simultaneously measuring nanometer-thick changes over a large volume (0.5cm³) in transparent objects such as glass. The large field-of-view (FOV) interferometric on-chip lens free microscope (LIM) is based on a novel design with a very high axial sensitivity and depth of field (DOF), applying a technique adequate to be used in microarray platforms for the detection of proteins without the need of labels. The device is a major step forward for light microscopy techniques, especially for microarray platforms, since it is low-cost and can be used as a point-of-care tool in the diagnosis and treatment of major diseases such as Sepsis, a critical area where fast and accurate results can translate into life changing health outcomes for individuals.

SPIN GLASS PHYSICS WITH TRAPPED IONS

■ In the recent work published in *Nature Communications*, Dr. Tobias Grass, David Raventos, and Dr. Christian Gogolin, led by ICREA Prof. at ICFO Maciej Lewenstein, in collaboration with Dr. Bruno Julia-Diaz from the UB, lay the theoretical foundations for a quantum simulation of spin glass physics with trapped ions. This study proposes how to tackle the problem of number partitioning by applying a strategy known as “quantum annealing.” The implementation of this approach is possible with state-of-the-art techniques for trapping, cooling, and manipulating ions. These results open a new path and bring us a step closer to the development of a quantum computer.

0.5 keV SOFT X-RAY ATTOSECOND CONTINUA

■ In a recent study published in *Nature Communications*, ICFO researchers Dr. Stephan Teichmann, Dr. Francisco Silva, Seth Cousin and Dr. Michaël Hemmer led by ICREA Prof. at ICFO Jens Biegert, have achieved isolated attosecond pulses covering the carbon, nitrogen and oxygen absorption edges simultaneously in the soft X-ray water window. This study provides site-specific probes for observing electron correlation and many-body effects of core-excited atoms or electron transfer in photo- and electro-chemical processes of organic solar cells and molecular electronics. The work opens new opportunities by bridging the gap between ultrafast time resolution and element specific probing, towards elucidating the entire dynamics of the building blocks of biological life, within organic semiconductors, light harvesting devices and even for molecular electronics.

BUSINESS NEWS

New ERC Proof-of-Concept Project

The European Research Council, in its efforts to help ERC grant holders to bridge the gap between their research and the earliest stage of a marketable innovation, created the Proof of Concept (PoC) funding scheme. Not only does this program help ERC grantees to explore the innovation potential of their research and/or commercialize the results of their ERC-funded research, the program complements the efforts of ICFO's Knowledge and Technology Transfer Unit (KTT) which proactively searches for ways to translate newly generated knowledge into new technologies.

ICREA Professors at ICFO Morgan Mitchell and Valerio Pruneri have recently been awarded a PoC for the *ERIDIAN* project. This is ICFO's sixth successful PoC application in five years.

The main goal of *ERIDIAN* is to develop a market-ready quantum random number generator for Device Independent (DI) Quantum Cryptography (QKD), which offers the best possible security guarantees. The prototype developed in *ERIDIAN* will enable major industrial players to make DI QKD a commercial reality. The first loophole-free BIVs were demonstrated in 2015, using laboratory-grade random number generators developed in Prof. Mitchell's ERC starting grant AQUMET. *ERIDIAN* will advance to the prototype stage this randomness generation technology, a critical element of the “loophole-free Bell Inequality Violation” (BIV) and thus a requirement for the DI approach. The availability of a commercial-grade randomness source suitable for BIVs will allow industrial actors such as telecommunications providers to enter the DI field and offer solutions to a broad range of customers.

ERIDIAN is the second PoC project for both Professors Mitchell and Pruneri, who in 2012 received a PoC in collaboration with ICREA Professor at ICFO Antonio Acín for the *MAMBO* project.

Retos 2016



■ ICFO has recently been awarded a RETOS grant, allowing the institute to team up with the company GRAPHENEA and carry out a joint R+D+i project entitled “*Detectores infrarrojos híbridos basados en grafeno y puntos cuánticos para seguridad alimentaria fabricados a escala de oblea*” (Hybrid infrared detectors based on graphene and quantum dots for food control applications).

The RETOS program is a call sponsored by the Ministry of Industry and Competitiveness providing incentives for public-private collaborations, facilitating the creation of joint R&D+i projects between research organizations and companies. These joint projects help to promote innovation, the development of new technologies, the application of new ideas and techniques as well as the creation of new products and services by attracting private investment, generating employment and improving the technology base in the country.

The new project named *GRAQDOBLEA* will be coordinated by Graphenea, one of Europe's main producers of graphene, in collaboration with the Functional Optoelectronic Nanomaterials research group led by the ICREA Prof. at ICFO Gerasimos Konstantatos and Nano-Optoelectronics research group led by ICREA Prof. at ICFO Frank Koppens. Together, they will coordinate efforts towards the development of image sensor arrays based on graphene and quantum dots.

+ INFO ► www.graphenea.com

RESEARCH EXCELLENCE

Quantum at ICFO

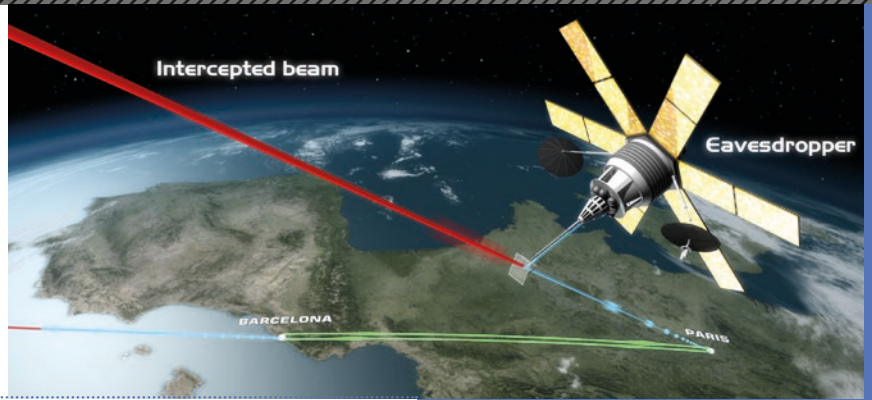
ICFO researchers are at the forefront of a growing scientific community working to understand and harness the power of quantum phenomena in order to usher in revolutionary new technologies and applications.

The theory of quantum mechanics was developed at the beginning of the XX century. Since then, it has radically changed our understanding of nature, forcing scientists to adopt a new approach to describe the physical world at a more fundamental level, changing our vision of the world. Its principles seem weird and paradoxical at first sight – terms like superposition and entanglement are

certainly not part of day-to-day lexicon – yet they promise revolutionary advances for new quantum industries. Today, ICFO researchers are at the forefront of a growing scientific community that is working to understand and harness the power of these paradoxes to transform them into new quantum technologies and applications with far-reaching benefits for society.

Some of ICFO's landmark discoveries form part of today's cutting edge applications in fields as diverse as secure communications, high performance/cloud computing and personal devices. The institute is at the forefront of advances that will bring Next-Generation applications, such as hacker proof communication and data storage, more powerful simulations devices and big data analysis, and ultra-sensitive sensors to society. The disruptive technologies of the future remain to be fully conceptualized. No doubt, however, they will be built upon some of ICFO researchers' groundbreaking advances in quantum theory and quantum protocols.

The ongoing research in quantum technologies provides society with key ideas and results that are contributing to building safer, faster, more sensitive and smarter devices, products and protocols.



As in the timeline outlined in the Quantum Manifesto, we classify ICFO's research in three stages, according to where current work stands in terms of time to market when it is expected to provide solutions for many of today's societal challenges:

- **NOW** *Application-ready technologies (<5 years from now).*
For high performance/cloud computer simulations, data center security, q-encryption for secure point to point classical links, high-end quantum experiments, QKD in point to point links...
- **NEXT** *Technological breakthroughs for the next generation quantum applications (5-10 years from now).*
For mobile security, DI-QKD systems, quantum sensors, q-secure links between distant cities, development and design of new complex materials...
- **FUTURE** *Foundations and building blocks of the future quantum solutions. (> 10 years from now).*
For simulators of real life challenges in quantum dynamics or drug design, quantum internet, universal quantum computers...

ICFO^R The Institute of Photonic Sciences

*ICFO's research is presented here in relation to the moment in time where the related applications are expected to reach society.

	APPLICATIONS		
	NOW	NEXT	FUTURE
Application-ready technologies	Ultrafast QRNG modules	●	●
	Ultra Low Latency QRNG modules	●	●
	Entangled photon sources	●	●
Technological breakthroughs for the next generation quantum applications	Sub-shot noise atomic sensors	●	●
	Nano-optoelectronic systems	●	●
	Nano-optomechanical systems	●	●
	Nano-photonics for future quantum devices	●	●
	DI protocols	●	●
	q-memories	●	●
	q-Frequency converters	●	●
Foundations and building blocks of the future quantum solutions	Theory and Experiment of Simulators	●	●
	Foundations of quantum computing	●	●

The Quantum Manifesto

■ **The Quantum Manifesto**, officially presented to the Dutch Minister of Economic Affairs Henk Kamp and European Commissioner of Digital Economy and Society Günther H. Oettinger in May 2016 at the Quantum Europe Conference in Amsterdam, is an ambitious roadmap that sets out a common strategy for Europe to capitalize on its outstanding and rapidly advancing quantum capabilities, positioning the continent to build and lead the future Quantum Industry on a global scale. By assuming leadership of what is being referred to as "the second quantum revolution", Europe aims to usher in transformative technologies that will create "a lucrative knowledge-based industry, leading to long-term economic, scientific and societal benefits."

The Manifesto was supported by more than 3,400 representatives from academia, industry and governmental and funding institutions. It plants the seeds for a €1 billion flagship-scale initiative in quantum technology which will start in 2018 within the European H2020 research and innovation framework program.

MADE @ ICFO

IN FOCUS



WOMEN FOR AFRICA FOUNDATION @ ICFO



The Women for Africa Foundation's (*Fundación Mujeres por África*), mission is to contribute to sustainable development in Africa through the drive of female scientists like Professors Mangaka Matoetoe and Nosipho Moloto. Thanks to the foundation's fellowship program, ICFO has the privilege of welcoming these South African scientists to

our institute for a six-month sabbatical. While ICFO will enjoy the benefits of their expertise, the foundation also hopes to make their achievements in the international scientific community more visible, and thus, promote African women's access to research activities. In this interview, we learn more about what motivates them in their work.



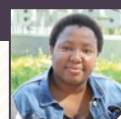
Prof. MANGAKA MATOETOE

Chemistry Associate Professor and Founder of the Electroanalytical Research Group at Cape Peninsula University of Technology.

- **Research interests:** Electrochemical sensors and characterisation of nanomaterials and their composites. This involves synthesis and sensor (chemical and biochemical) fabrication for pharmaceuticals and pollutants as well as their potential application in dye sensitised solar cells with a combination of natural dyes.
- **Other interests and awards:** She is involved in the Lesotho government representation in environmental bodies

and other tertiary institution boards. She has received funding for various activities from the World Bank, OPCW and DAAD.

■ **Work at ICFO:** Prof. Matoetoe is working with the research group led by ICREA Prof. at ICFO Romain Quidant, concentrating on the investigation of Au NPS functionalization with chemicals and biological materials for the development of an optical Nevirapine sensor.



PROF. NOSIPHO MOLOTO

Associate Professor at Wits University South Africa in the School of Chemistry.

- **Research interests:** The synthesis of nanostructures using various solution-based chemical methods for application in chemical sensors, solar cells and SERS.
- **Other interests and awards:** She is the recipient of the 2014 South African Young Woman in Science award for leading research work in the physical and engineering sciences as well as the 2016 National Research Foundation Emerging Researcher award.

■ **Work at ICFO:** Prof. Moloto is collaborating with the research group led by ICREA Prof. at ICFO Gerasimos Konstantatos, focusing on the intricacies of making solution-processed solar cells. She hopes to see a long-term collaboration between ICFO and her group in South Africa using synthetic skills in providing materials for optoelectronic applications.

■ *What are your goals while at ICFO:*

Prof. Matoetoe: I hope to find ideas for transforming my laboratory-based electrochemical sensor devices into tools which can be used at point for drug screen or patient adherence monitoring. This would ensure proper dosage and eliminate high rate of nevirapine resistance, which forces patient to use expensive, higher-end anti-viral drugs. Hopefully miniaturization or an alternative detection mode can assist in achieving this. Developing an optical biosensor for nevirapine is a step towards my goal.

Prof. Moloto: From a personal perspective, it is always good to see what other people are doing and how they are do things differently and possibly better and one can take those things and implement them in their own environment.

■ *What are the pressing issues for women scientists in South Africa & how can programs like this help:*

Prof. Matoetoe: I would like to see future young women researchers unburdened from "burning the candle at both ends" so they do not have to forfeit opportunities to strengthen their research in order to maintain families.

Prof. Moloto: Africa is a continent that has deep imprinted cultural beliefs that women are inferior to men and this is the sentiment from Cape to Cairo. We need a paradigm shift in our thinking and practices beginning with what we teach our children. So for us to see more women scientists, I think we should purposefully empower more women into these positions whether by quotas or whatever strategy until it becomes a norm.

■ *What has been your most positive take away from ICFO so far:*

Prof. Matoetoe: I have already communicated to my students to start applying the micro systems used in the lab, which minimizes chemical losses.

Prof. Moloto: I have done more work that I could possibly do in a year, so it has been quite productive. I admire the different approaches that people have in running successful research groups.



COMMUNITY PICTURE Sant Jordi



CONFERENCE



ICREA
Int'l Symposium:
BioNano Vision of
cellular architecture

ICREA Professor María García-Parajo and Professor Melike Lakadamyali at ICFO in collaboration with ICREA Professor Pia Cosma at CRG were given the ICREA Conference award in 2015 to host the International Symposium on *BioNanoVision of cellular architecture: from the nucleus to the cell membrane*, which took place on May 25-27 at ICFO.

The symposium brought together a multidisciplinary group of world-leading scientists including experts from the optical nanoscopy field, biophysicists, cell biologists, chemists and statistical physicists. More than 100 researchers participated in the meeting, with 14 talks from invited speakers, 12 shorts selected from contributed abstracts and more than 35 posters.

The first day of the meeting concentrated on new technological advances in super-resolution & single molecule imaging, followed by the second and third days that focused on applications of novel techniques in the fields of cell membrane biology and trafficking and nuclear architecture. The meeting closed with a talk from Kyle Legate, Senior Editor from Nature Communications providing guidelines on Nature policies for publishing in this burgeoning research field. Ione Verdeny (ICFO) received the award for the best short talk of the event and Franziska Fricke (Goethe University) received the best poster award.

BEYOND ICFO



Felix Rohde:

“As a product manager I have access to nearly 20 years of TOPTICA’s experience of taking technology from science to the market.”

ICFO began as a long sought-after personal adventure. As a freshly graduated physicist, the big world was calling me when Jürgen Eschner proposed that I join his new group in Barcelona. I saw the chance to do cutting edge research while satisfying my thirst for a different cultural experience. We took the challenge to set up a new experimental apparatus from scratch to study quantum technology using trapped ions. In this case “from scratch” literally meant starting from a hole in the ground next to the Canal Olympic in Castelldefels in 2004. After a long journey that led us through many ups and downs, our team set up an internationally competitive experiment which today, seven years after I left the group and thanks to the efforts of our successors, still produces top-notch results.

When I finished my PhD I was faced with the question - what comes next? - which was also linked to my personal life. You may be familiar with the riddle: How can I find a new challenge in line with my interests and talents which is compatible with the ambition and plans of my partner? This riddle became even more difficult to solve because we decided to start a family while hunting for our dream jobs in our dream city. We approached this challenge by trying a step-by-step approach.

For me, that meant leaving ICFO officially but not physically. I joined

the small company COSINGO to work on a prototype of a device for plasmonic cancer detection as part of a European project. It was very refreshing to change focus and get insight into plasmonics, microfluidics and bio-chemistry. It was also interesting to see a technology transfer project from the perspective of a company and to think and work towards a future product. Those were happy times during which my daughter Zoé was born.

In 2012 I moved with my small family to Braunschweig in northern Germany. There, I had the opportunity to work with Harald Telle, one of the fathers of the frequency comb technology, at the German National Metrology Institute PTB. The task was to develop a continuous wave optical synthesizer based on a frequency comb in collaboration with TOPTICA Photonics. I was convinced that frequency combs would play an important role in many applications in the future and liked the idea of getting more involved with industry. During that time, I learned a great deal about combs and frequency metrology from Harald and his coworker Erik Benkler, but I also strengthened my connections with TOPTICA.

Towards the end of the PTB project, TOPTICA was seeking a product manager for its emerging “Laser Reference” activities. I got the job and we



moved south to Munich. Since a new job, a new house and a new town - all at once - seemed to be too easy to handle, we added a new kid as well, little Oscar.

I like my job as product manager a lot because it gives me insight into almost all processes within the company. I have access to nearly 20 years of TOPTICA’s experience of taking technology from science to the market. Serving the scientific market with a product like our recently released offset-free frequency comb means that I am still in touch with many scientists. I organize collaborations, discuss technical issues of applications, get to know new technologies, and analyze market opportunities. The big challenge is to balance the different interests of the R&D, production, and sales departments. For the moment it feels like I am in the right place.

While I write these lines my son has grown enough to dare to seriously fight with his older sister, and my partner has found an interesting new job in Munich. Might the riddle be solved at last?

GO & FLY

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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 ICFOmians have recently succeeded in defending their PhD Theses. Honoring ICFO’s tradition, ICFOmians 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.



IVAN SILVEIRO

‘Plasmonic Response of Graphene Nanostructures’

TD: Prof. Dr. Javier García de Abajo

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ELSA PASSARO

‘Impact of Imperfections on Correlation-Based Quantum Information Protocols’

TD: Prof. Dr. Antonio Acín

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MARTÍ PERARNAU

‘Thermodynamics and Quantum Correlations’

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DOMINIK KUFER

‘Photodetectors Based on Low-dimensional Materials and Hybrid Systems’

TD: Prof. Dr. Gerasimos Konstantatos

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NICOLÒ ACCANTO

‘Coherent Control of Nonlinear Optical Processes in Individual Nanoparticles’

TD: Prof. Dr. Niek F van Hulst

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MUSSIE BEIAN

‘Spectral Evidence for a Condensate of Dark Excitons in a trap’

TD: Prof. Dr. Maciej Lewenstein

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June 22nd 2016

HIGH PROFILE



Francesc Subirada i Curcó:

“As General Director of Research, and as a board member of a CERCA center, there is an additional emotional component: a commitment to a specific model with a set of research policies that we all strive to safeguard.”

Founder and former Associate Director of the Barcelona Supercomputing Centre (2005-2016), Francesc Subirada has devoted much of his career to collaborating with research & development centers and managing university-industry partnerships. He now takes over the role of General Director of Research for the Government of Catalonia.



How did your experience launching BSC prepare you for the Directorate General for Research (DGR)?

Being part of the launch and growth of a prestigious entity within our research system gave me first-hand and in depth knowledge of the R&D+i system in Catalonia, as well as the tools for identifying and prioritizing the policies that have allowed it to excel. It allowed me to play an active role in the system’s institutional governance, gaining direct experience and insights into both the Spanish and Catalan research models. In addition, the experience allowed me to manage public and private financial sustainability while boosting growth and consolidating the center’s international reputation.

What role does the DGR play in driving research excellence in Catalonia?

The system has its own unique model, devised by Minister Mas-Colell 20 years ago. It establishes a framework for prioritizing talent and infrastructure related to research, dedicating the necessary resources and tools to allow them to become competitive, and amplifying the government’s invest-

ment by procurement of additional public and private funding. The model must continue to evolve to remain relevant. While we now need to further expand the flexibility and capabilities of the system, to transform knowledge into economic and social value, we also need to protect the system from the bureaucratic interference that detracts from its competitiveness. Our challenge is to guide government activity relating to R&D+i where it has the greatest impact: Industrial PhDs, the knowledge industry, and HR policies in general are a few cases in point.

What are the biggest challenges facing the (DGR) right now?

I have set goals that will work towards making research part of Catalonia’s backbone. These call for improving and protecting the excellence of our existing research system, achieving greater economic and societal impact from innovation, conveying the value of research to society, and attracting private funding so that we solidify our objectives and achieve knowledge generated growth - easier said than done! One of our main challenges now is to raise awareness.

Our model represents Catalonia’s potential, and it should become our international calling card. As President Puigdemont recently said “We either join the countries that are helping to change the world... or we join the countries condemned to follow the changes that others make for us.” We choose the former, but society needs to take ownership of this system’s success and contribute to its growth with funding, sponsorship and investment.

What role does DGR play in ICFO’s Board of Trustees?

As board members, it is our job to ensure that the foundation’s objectives are fulfilled; to protect the foundation’s assets and guarantee productivity, according to the established financial criteria. But apart from the legal responsibilities, as Director General of Research, and as a board member of a CERCA center, there is an additional emotional component: a commitment to a specific model with a set of research policies that we all strive to safeguard. I confess to an element of pride in the efficiency of these centers. ICFO in particular is one of the clear success stories of the Catalan research system.

CHALLENGE

SUDOKU

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	1	2		3				5
			8					1

MYSTERY ICFONIAN

How much do you know about the people you work with? ICFOnians are a fascinating group, with hobbies, interests and talents that may surprise you. Have a look around and see if you can guess who this edition’s **Mystery ICFOnians** is! Look for the answer in next edition’s Challenge section!



1. He is a comic book fanatic.
2. He has directed 18 short films with disabled youngsters.
3. He has been strongly committed to human rights issues in Palestine and Nicaragua.
4. He is not a scientist but knows his way around all the labs.
5. He never strays from his standard style: trousers and checkered shirts.
6. You may catch him listening to Indie Rock music.

Ed. #27 (Spring) solution: 1. Lorena Blanchet | 2. Maria Garcia Matos

SAVE THE DATE:
FRIDAY SEPTEMBER 23, 2016

ICFO
Alumni
Network

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1st Alumni
Reunion Event

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- Poster sessions
- Keynote speakers: Núria Sebastian (Vice President ERC) and Lita Nelsen (Retired Director MIT Technology Licensing Office)

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