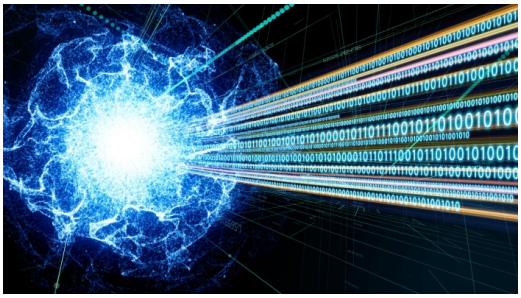
Summer Course on Quantum Technologies



09.Sep - 11.Sep 2024

Cod. Z23-24

Mod.:
Streaming Face-to-face

Edition
2024

Activity type
Summer course

Date
09.Sep - 11.Sep 2024

Location
Miramar Palace

Languages
English Spanish

Academic Validity
30 hours

Organising Committee

Description

The program is designed to provide a comprehensive immersion in the field of Quantum Technologies, specifically addressing its main areas of development: Quantum Computing and Simulation, Quantum Communications, and Quantum Sensing and Metrology.

Through various didactic and participatory sessions, experts in each development field will share their knowledge to provide a comprehensive and rigorous overview of the current state of development of Quantum Technologies and their transformative potential across various sectors.

Throughout the Summer Course, participants will gain a solid understanding of the underlying principles of Quantum Technologies, while examining potential practical applications that could drive significant innovations across multiple domains. From algorithm optimization to applications in information security, the various opportunities offered by these disruptive technologies will be explored.

Objectives

Introducing Quantum Technologies as a new scientific-technological paradigm and presenting its relationship with other emerging technologies.

Present lines of action and general concepts around the main areas of development within Quantum Technologies: Quantum Computing, Quantum Communications, and Quantum Sensing and Metrology.

Organised by

BasQ Basque Quantum

DIPC Donostia International Physics Center

euskampus FUNDAZIOA

In collaboration with

EUSKO JAURLARITZA
GOBIERNO VASCO
HEZKUNTZA SAILA
DEPARTAMENTO DE EDUCACIÓN

Program

09-09-2024

08:45 - 09:00	Registration
09:00 - 09:25	Presentation by the Director of the activity **Javier Aizpurua ---** | BasQ - Director **Igor Campillo ---** | Euskampus Fundazioa - Director
09:30 - 10:45	“Introduction to Quantum Computing“ **Yassine Hamoudi** | Université de Bordeaux - CNRS Researcher in the Quantum Information & Computation group at LaBRI (Université de Bordeaux)
10:45 - 11:15	Pausa-café
11:15 - 12:30	“Quantum computing merges AI efforts“ **Roman Orús** | Donostia International Physics Center (DIPC) - Ikerbasque Research Professor
12:30 - 13:45	“Quantum Computing to solve scientific problems: the spin chain case“ **Nicolás Lorente Palacios** | Centro de Física de Materiales (CFM) - Research Scientist

10-09-2024

08:45 - 08:50	Bienvenida
08:50 - 10:05	“The Era of Quantum Utility“ **Cristina Sanz** | IBM Quantum - IBM Engagement Manager for Quantum Innovation Centers **Joana Fraxanet Morales** | IBM Quantum Education and Workforce Development EMEA Lead
10:05 - 11:20	“Introduction to the Integration of Quantum Solutions in Networks and Communication Services“ **Eduardo Jacob Taquet** | Escuela Ingeniería Bilbao - Professor
11:20 - 11:35	Pausa-café
11:35 - 12:50	“Quantum Communications systems“ **Martha Johanna Sepúlveda Flórez** | Airbus - Senior Expert on Quantum Secured Communications
12:50 - 14:05	“Experimental Implementation of QKD Protocols“ **Verónica Fernández Marmol** | Consejo Superior de Investigaciones Científicas (CSIC) - Tenured Scientist

11-09-2024

09:00 - 09:05	Bienvenida
09:05 - 10:35	“Introduction to Quantum Sensing and Metrology “ **Gabriel Molina Terriza** | Centro de Física de Materiales (CFM) - Research Professor
10:35 - 10:55	Pausa-café
10:55 - 12:25	“Quantum Light Sources“ **Brahim Lounis** | LP2N - Institut d´Optique - Professor
12:25 - 13:55	“New sensing schemes based on quantum optomechanics“ **Daniel Ramos** | Instituto de Ciencia de Materiales de Madrid (ICMM) - Senior Scientist
13:55 - 14:05	Synthesis

Directed by

Javier Aizpurua ---

Ikerbasque, Profesor

Ikerbasque Research Professor at Donostia International Physics Center, DIPC, and distinguished researcher at the University of the Basque Country, where he leads the Nanophotonics Theory Group. Javier Aizpurua gained his doctorate in Physics at the University of the Basque Country (UPV/EHU) in 1998 for work on the interaction of rapid electrons and nanostructures. After his pre-doctoral stage, he spent two periods as a post-doctoral researcher, one at Chalmers Technology University in Gothenburg, Sweden, and the other at the US National Institute of Standards and Technology (NIST). In 2004, Aizpurua joined DIPC, the Donostia International Physics Center, as a research fellow, starting to train a nanophotonics group. In 2008 he was awarded a permanent scientific place at the CSIC, taking responsibility for the photonics line of research at CFM, the Materials Physics Centre in San Sebastián, where he worked until 2023. From this year on, he joined Ikerbasque. He obtained the Euskadi Research award 2022, and is currently the director of the strategy Basque Quantum.

Igor Campillo ---

Euskampus Fundazioa, Director

He is director of Euskampus Fundazioa, founded in 2011 by the University of the Basque Country (UPV-EHU), Tecnalia Corporation and the Donostia International Physics Center (DIPC). He worked as assistant professor in the Faculty of Sciences of the UPV/EHU, international projects manager in Gamesa Energy, researcher and project manager at LABEIN- Tecnalia, project and outreach manager in the Nanoscience Cooperative Research Center- nanoGUNE, manager of the nanoBasque Strategy in the Basque Business Development Agency- SPRI, and director of DeustoTech. He holds a PhD in Physics from UPV/EHU, and a master degree in journalism and science communication from the Spanish Open University. He is the author of more than 70 international scientific publications indexed in the Web of knowledge,and author of 3 international patents. He has been awarded as one of the word-leading “Boundary Spanners” for University Business Cooperation by the University Industry Innovation Network.

Teachers

Javier Aizpurua ---

Ikerbasque, Profesor

Ikerbasque Research Professor at Donostia International Physics Center, DIPC, and distinguished researcher at the University of the Basque Country, where he leads the Nanophotonics Theory Group. Javier Aizpurua gained his doctorate in Physics at the University of the Basque Country (UPV/EHU) in 1998 for work on the interaction of rapid electrons and nanostructures. After his pre-doctoral stage, he spent two periods as a post-doctoral researcher, one at Chalmers Technology University in Gothenburg, Sweden, and the other at the US National Institute of Standards and Technology (NIST). In 2004, Aizpurua joined DIPC, the Donostia International Physics Center, as a research fellow, starting to train a nanophotonics group. In 2008 he was awarded a permanent scientific place at the CSIC, taking responsibility for the photonics line of research at CFM, the Materials Physics Centre in San Sebastián, where he worked until 2023. From this year on, he joined Ikerbasque. He obtained the Euskadi Research award 2022, and is currently the director of the strategy Basque Quantum.

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Verónica Fernández Marmol

Joana Fraxanet Morales

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Yassine Hamoudi

Eduardo Jacob Taquet

Universidad del País Vasco (UPV/EHU), Catedrático de Universidad

Eduardo Jacob holds a PhD in Industrial Engineering and is Full Professor of Telematics Engineering at Communications Engineering Department of the UPV/EHU. He also leads a Basque Government grade "A" consolidated Research Group. He has been working on 5G/6G, cybersecurity, and research infrastructures. The last one, named SmartNetworks for Everything", is part of the European ESFRI infrastructure, SLICES. This infrastructure is becoming a Quantum Communication Infrastructure with 4 different QKD technologies. As a result of the IKUR funded projet SareQuant he is currently carrying out the redesign of the Basque National Research and Education Network (i2Basque). He is also leading the design of the future Province of Bizkay Quantum Communication Infrastructure. Additionally we works on the use of quantum technologies like QKD to secure telecommunication networks.

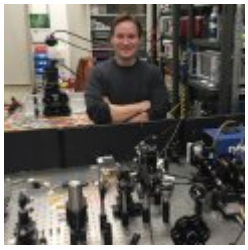
Nicolás Lorente Palacios

Brahim Lounis

Gabriel Molina Terriza

Roman Orús

Donostia International Physics Center



Daniel Ramos

Cristina Sanz

Martha Johanna Sepúlveda Flórez

Registration fees

FACE-TO-FACE	UNTIL 09-09-2024
Free registration	0 EUR

LIVE ONLINE	UNTIL 09-09-2024
Free registration	0 EUR

Place

Miramar Palace

Pº de Miraconcha nº 48. Donostia / San Sebastián

Gipuzkoa