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# Quantum-Safe Internet (QSI)

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## Outreach Day 1: Local Public-Science Events.

### Deliverable D7.1

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<b>Deliverable:</b>	D7.1
<b>Deliverable Name:</b>	Outreach Day 1: Local Public-Science Events.
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## 1. Index of Abbreviations and Acronyms.

<b>QSI:</b>	Quantum-Safe Internet
<b>D:</b>	Deliverable.
<b>WP:</b>	Work Package.
<b>DC:</b>	Doctoral Candidate.
<b>UVIGO:</b>	Universidad de Vigo.
<b>SU:</b>	Sorbonne Universite.
<b>UNIPD:</b>	Universita Degli Studi Di Padova.
<b>RUB:</b>	Ruhr-Universitaet Bochum.
<b>UvA:</b>	Universiteit Van Amsterdam.
<b>TU/e:</b>	Technische Universiteit Eindhoven.
<b>DTU:</b>	Danmarks Tekniske Universitet.
<b>UNIGE:</b>	Universite de Geneve.
<b>ULEEDS:</b>	University of Leeds.
<b>TOSHEU:</b>	Toshiba Europe Limited.
<b>ID QUANTIQUE SA:</b>	Id Quantique SA.



## 2. Doctoral Candidates and their Outreach Activity 1.

DC	Name	Institution	Outreach Activity 1	Date
DC1	Alessandro Marcomini	UVIGO	Participation in “Conecta con atlantTic”, University of Vigo, Spain.	October, 2023.
			Participation in an outreach activity within the “XXXIX Reunión bienal de la Real Sociedad Española de Física”, San Sebastian, Spain.	July, 2024.
DC2	Silvia Ritsch	TU/e	Participation in the “Soapbox Science” event in Cologne, Germany.	June, 2024.
DC3	Álvaro Yángüez Bachiller	SU	Participation in an outreach activity within the Colegio de España, Paris, France.	April-June, 2024.
DC4	Gina Muuss	UvA	Participation in the “CreativeMinds Workshop” in Bochum, Germany.	March, 2024.
DC5	Massimo Ostuzzi	RUB	<u>Pending</u>	<u>Pending</u>
DC6	Sergio Juárez	TOSHIBA/UVIGO	The DC joined the QSI project recently (January, 2024) and, he will do his Outreach Activity 1 at the UK National Quantum Technologies Showcase 2024 in London this November.	November, 2024.
DC7	Shanshank Kumar	UNIGE	The DC has started on August 2024. He will do his Outreach Activity 1 in the next few months.	Soon 2024-2025.
DC8	Matías Rubén Bolaños	UNIPD	Public talk at the University of La Plata, Argentina.	October, 2023.
DC9	Javier Rey Domínguez	ULEEDS	Participation in the “Be Curious Live event”, University of Leeds.	May, 2024.
DC10	Loïc Millet	IDQUANTIQUE/UNIGE	Participation in the “Nuit de la Science 2024” in Geneva, Switzerland.	July, 2024.
DC11	Vaisakh Mannalath	UVIGO	Participation in the “Conecta con atlantTic”, University of Vigo, Spain.	October, 2023.
			Participation in the “A CUP OT TTIC”, University of Vigo, Spain.	April, 2024.
DC12	Fabrizio Sisinni	DTU	Participation in the “Training session at the Danish Cyber Championships”.	February, 2024.



### 3. Outreach activity 1: DC1. Alessandro Marcomini.

The DC has carried out two outreach activities:

1. **Participation in the Outreach activity dedicated to the general public within the event:**

[Home | XXXIX BIENNIAL OF THE ROYAL SPANISH PHYSICS SOCIETY \(bienalfisica.org\)](https://bienalfisica.org)

On July 16th, 2024 the Doctoral Candidate Alessandro Marcomini took part in an outreach activity dedicated to the general public within the national conference “XXXIX Reunión bienal de la Real Sociedad Española de Física”, which was organised by the Spanish Royal Society of Physics in Donostia-San Sebastián (Spain). In an open-air setting located in the heart of the city, researchers from around the country illustrated the most interesting phenomena of Physics in an engaging and playful way. Alessandro, as the only representative of the quantum technology community, had the chance to teach the fundamental properties of quantum mechanics adopting a daily-life based approach. Moreover, he could raise awareness about the security threats that modern cryptographic schemes are suffering, thus underlying the importance of quantum key distribution and quantum-safe technologies in providing a new, fully safe solution. His exposition has been greatly appreciated by the public, with people of different ages showing great interest and asking questions, with conversations going on well beyond the official ending time of the event.



**Photo 1.**

**Photo 1:** Website of the XXXIX Reunión Bienal de la Real Sociedad Española de Física.



**Photo 2.**

**Photo 2:** Alessandro Marcomini during his outreach activity at the conference.



## 2. Participation in the Atlanttic Open Day, 2023.

### [Open Days: Atlanttic](#)

On October 20th, 2023 the Doctoral Candidates Alessandro Marcomini and Vaisakh Mannalath took part in the outreach activity “**Conecta con AtlanTTic**” held at the Telecommunications Engineering faculty of the University of Vigo. This yearly event, organised by the [AtlanTTic research center](#) for telecommunications technologies, has the goal of sharing results and ideas streaming from the research of the various groups within the center with the general public of the city of Vigo.

The Doctoral Candidates held a morning session with high school students and an afternoon session dedicated to families and enthusiasts, introducing them to the principles of quantum mechanics and their applications to communication engineering in a lively and engaging way. Their activities included hands-on games to raise awareness in kids about the threats of new technologies to current cryptographic schemes and the promised security enabled by quantum communication, as well as more technical discussions about the properties of quantum mechanics that allow for it, such as quantum superposition and quantum entanglement. Eventually, they could also introduce the more expert audience to their own work and results, highlighting the potential of their current research in addressing practical limitations of these technologies.

Their presentation was welcomed with excitement as both youngsters and adults engaged in active discussion with them, asking questions and showing great interest in the promises of the important new technologies that our team is developing.



**Photo 3.**

**Photo 3:** Illustration of the hall of the Telecommunications Engineering Faculty at the University of Vigo.



**Photo 4.**

**Photo 4:** Alessandro Marcomini and Vaisakh Mannalath engaging with the public who attended the event.



**Photo 5.**

**Photo 5:** Illustration of the screen used during their presentation.



#### 4. Outreach activity 1: DC2. Silvia Ritsch.

The Doctoral Candidate Silvia Ritsch took part in the [Soapbox science](#) event in Cologne, Germany, June 29, 2024.

Soapbox Science is an innovative event format in the field of science communication, which increases the visibility of women and non-binary scientists and their research work. It is a local event



in the Rhineland that has been celebrated since 2020, and it has been organized by the Universities of Bonn, Cologne and Düsseldorf. The event transforms public places in environments for learning and scientific discussion. During the celebration of this event there were twelve talks by women scientists. Silvia Ritsch gave the lecture entitled: "Securing our data in the age of quantum computers". This outreach activity had two principal goals: on the one hand, to use this opportunity to train scientists in an unobstructed context and to interact with them, and on the other hand, to increase the visibility of female and non-binary scientists.

**Photo 6:** Illustration of the program of the Soapbox science event in Cologne, Germany.





**Photo 7.**

**Photo 7:** Researchers that participated in the Soapbox science event in Cologne.



**Photo 8.**

**Photo 8:** Sivia Ritsch during her presentation in the event.



## 5. Outreach activity 1: DC3. Álvaro Yángüez.



The Doctoral Candidate Álvaro Yángüez took part twice in the outreach activities organized at the [Colegio de España](#) in Paris, France. Every Monday, a resident gives an outreach talk about their research field in Les rendez-vous du Comité. Álvaro Yángüez gave two introductory talks to quantum cryptography and quantum information.

**Photo 9:** Announcement of the Artificial Intelligence outreach seminar held at Colegio de España in Paris where Álvaro Yángüez participated.

On Monday, June 17, 2024, he gave the talk entitled "*Asegurando el futuro: una breve introducción a la encriptación cuántica*". The goal of this talk was to provide a broad introduction to the field of cryptography for a general audience, with a special focus on its impact on our daily life. After introducing the field of cryptography, Álvaro discussed the problems and solutions that quantum physics offers.





On April 20, 2024, Álvaro Yángüez gave the talk entitled "*Mirando hacia el futuro: Información Cuántica*", about quantum computing within the Artificial Intelligence (AI) Outreach seminar. The talk, intended for a general audience, covered topics such as the theoretical foundations of AI and its practical applications. Álvaro introduced the audience to quantum information, discussing quantum computing and concluding with a brief overview of its intersection with machine learning.



**Photo 10:** Álvaro Yángüez during one of his presentations at the Colegio de España in Paris.



## 6. Outreach activity 1: DC4. Gina Muuss.

The Doctoral Candidate Gina Muuss co-organized the second iteration of the [CreativeMinds Workshop in Bochum](#), in cooperation with CASA, the Max-Planck Institute, FluxFingers (a local computer-security student group), and several corporate sponsors. The workshop revolves around



getting more women interested in Cyber Security and helping them get a start in the field. For this, in this new edition, it was offered an introduction to Web Exploitation to 24 women aged 16 to 25, who qualified to be invited through a series of challenges.

**Photo 11:** Website of the Creative Minds Workshop 2024 event.

During the event, Gina Muuss gave lectures on the basics of the Internet, Cross-Site scripting and several injection vulnerabilities. She also gave a brief overview of her ongoing PhD research. The workshop gave the women a platform to form communities with the aim to alleviate the ongoing issue of gender imbalance in the field of IT-security.



**Photo 12:** Gina Muuss during one of her lectures in the Creative Minds 2024 event.



## 7. Outreach activity 1: DC5. Massimo Ostuzzi.

Pending

## 8. Outreach activity 1: DC6. Sergio Juárez.

The Doctoral Candidate Sergio Juárez joined the QSI project recently (January 2024) and will do his first outreach activity at the UK National Quantum Technologies Showcase 2024. The event will be held at The Business Design Centre, 52 Upper Street, London, on 8 November 2024.

He will be presenting the threat of quantum computers breaking current encryption methods is real, and adversaries are already employing "store now, decrypt later" strategies, where they capture encrypted data today with the intent of decrypting it when quantum capabilities are fully realised. A key take-home message of this activity will be that Quantum key distribution (QKD) offers a proven, already available solution. Grounded in the principles of quantum mechanics, QKD is fundamentally secure, enabling real-time detection of any attempts to intercept encryption keys. By adopting QKD now, we can protect our most sensitive information from future quantum threats and ensure long-term data security.

Please see below the photo of the UK National Quantum Technologies Showcase 2023 at the Business Design Centre in London:





## 9. Outreach activity 1: DC7. Shashank Kumar.

The Doctoral Candidate Shashank Kumar joined the QSI project very recently (August 2024) and he has not yet carried out his first outreach activity. As planned, he will do it within the next year.

## 10. Outreach activity 1: DC8. Matías Rubén Bolaños.

In October 2023, the Doctoral Candidate Matías R. Bolaños gave a public talk at the [Universidad Nacional de La Plata | UNLP](#), Argentina, entitled: *"Advances in quantum key distribution, quantum generation of random numbers and their participation within the QSI project"*.



The audience were students from Physics and various Engineering degrees at the University of La Plata. In addition, he gave the same presentation a second time in the framework of the CIOp 2023 Seminar Series: [Seminario: Avances en distribución cuántica de claves, generaci](#) ([conicet.gov.ar](https://conicet.gov.ar))

**Photo 13:** Illustration of the announcement of the talk of Matías R. Bolaños at the CIOp 2023 Seminar Series.

The University of La Plata is a national public research university located in the city of La Plata, capital of Buenos Aires Province, Argentina. It has over 90,000 regular students, 10,000 teaching staff, 17 departments and 106 available degrees. CIOp is an Institute in Buenos Aires (Argentina), belonging to the University of La Plata, which for more than 30 years has been dedicated to scientific and technological research in the area of photonics, optics and light technology.



**Photo 14:** The Doctoral Candidate Matías R. Bolaños giving his outreach talk for University students from the University of La Plata, Argentina.



**Photo 15:** Illustration of a slide from the talk of the Doctoral Candidate Matías R. Bolaños.





## 11. Outreach activity 1: DC9. Javier Rey Domínguez.

The Doctoral Candidate Javier Rey Dominguez took part in the [BeCurious Live 2024](#) event, hosted by the University of Leeds.



**Photo 16.**



**Photo 17.**

**Photo 16:** The computer of the Doctoral Candidate Javier Rey prepared for Quantum Videogames.

**Photo 17:** Illustration of different games designed by the Doctoral Candidate Javier Rey.

The BeCurious event in Leeds, is an annual event organized by the University of Leeds where families and members of the Leeds community visit the campus and participate in fun activities while they learn about the research that takes place in the University. This year, the event was held on May 18th with a record number of visitors and Javier Rey and his colleagues participated with their own stall, *"How do we go into the Quantum Realm?"*. For this stall, they prepared an attractive poster and handed out informative leaflets about core concepts of quantum technologies.

Moreover, they prepared several activities including a card game, a guided play through of an online video game and an encryption/decryption game, as well as a quiz about the participant's knowledge of quantum mechanics, in order to promote interest in the field and educate the visitors about these topics.





**Photo 18.**



**Photo 19.**

**Photo 18 and Photo 19:** The Doctoral Candidate Javier Rey with the attendees of BeCurious Live 2024.

## 12.Outreach activity 1: DC10. Loïc Millet.

The Doctoral Candidate Loïc Millet took part in the [Nuit de la Science 2024](#) in Geneva, Switzerland.

The Nuit de la Science 2024 took place on July 6th and 7th in Geneva. This event brought together Swiss universities to engage the public with hands-on experiments and interactive demonstrations.





Loïc Millet, along with lab members from the Group of Applied Physics at the University of Geneva, participated in the event. They provided explanations on the concept of quantum random

number generators and showcased various classical optics phenomena.

**Photo 20 and photo 21:** These photos show the location of Nuit de la Science 2024 event.

### 13.Outreach activity 1: DC11. Vaisakh Mannalath.

The Doctoral Candidate has carried out two outreach activities:

1. [Open Days: AtlanttTic.](#)

On October 20th, 2023 the Doctoral Candidate Vaisakh Mannalath (along with Alessandro Marcomini as mentioned above) took part in the outreach activity “**Conecta con atlantTic**” held at the Telecommunications Engineering faculty of University of Vigo. This yearly event, organised by the [AtlantTic research center](#) for telecommunications technologies, has the goal of sharing results and ideas streaming from the research of the various group in the field with the community of the city of Vigo.

The Doctoral Candidates held a morning session with high school students and an afternoon session where they opened their stand to families and enthusiasts, introducing them all to the principles of quantum mechanics and their applications to communication engineering in a playful and engaging way. Their activities included hands-on games to raise awareness in kids about the threats of new technologies to current cryptographic schemes and the promised security enabled by Quantum Key Distribution, as well as more technical discussion about the properties of quantum mechanics that allow for it, such as quantum superposition and quantum entanglement. Eventually, they could also introduce the more expert audience to their own work and results, highlighting the potential of their current research in addressing practical issues.



Their presentation has been welcomed with excitement as both youngsters and adults engaged in active discussion with them, asking questions and showing great interest in the promises of the important new technologies that our team is developing.

We refer to the pictures illustrated in the outreach activity of Alessandro Marcomini.

2. On April 11, 2024, he attended [“A Cup of TTic”](#), a breakfast-outreach event organized by the Telecommunications Technology Research Center, AtlanTTic, at University of Vigo.



Vaisakh Mannalath

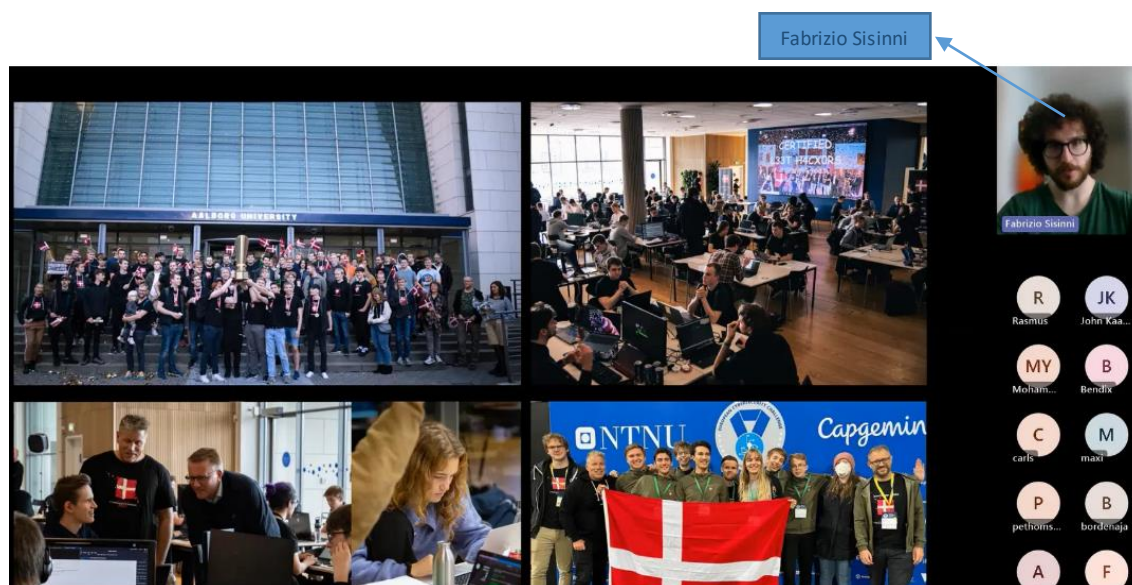
**Photo 22:** This photo shows the participants of “A Cup of TTic”.

This relaxed, inspiring, and dynamic meeting point aims to provide research staff with an opportunity to present and publicize their research, share concerns, and explore potential collaborations. Open to all research staff upon registration, the morning session includes open presentations of projects or lines of research, followed by breakfast and conversation. During the event, the Doctoral Candidate had the opportunity to showcase his work and engage in insightful discussions with fellow researchers over coffee and snacks, fostering a relaxed networking space that encouraged the exchange of ideas and potential collaborations within the AtlanTTic community.



#### 14.Outreach activity 1: DC12. Fabrizio Sisinni.

The Doctoral Candidate Fabrizio Sisinni participated in the [Danish Cyber Championships \(DDC, De Danske Cybermesterskabe\)](#), is a national crypto challenge where people from 15 to 25 years old compete as groups by solving tasks from different areas of cybersecurity and cryptography. Before the qualification to the national challenge they have one month to prepare themselves by attending an online training that is public (also person older than 25 can attend these sessions). The winners of the national challenge then participate to an European challenge. This year Fabrizio Sisinni was asked to provide the crypto training session together with another professor. He prepared two sessions about historical ciphers, stream cipher and block ciphers. He taught 4 sessions in total, on February 24th and 25th, and on March 10th and 11th and prepared and solved exercises by showing different techniques.



**Photo 23:** Fabrizio Sisinni during his sessions within the Danish Cyber Championships.