

On the silicon road: from Trento to Taiwan

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The story of Leonardo Limongi, a doctoral student at FBK's Center for Sensors & Devices who spent a training period at the National Applied Research Laboratories

Taiwan is a world leader in the production and export of **silicon technologies**, and there **Leonardo Limongi**, a Ph.D. student in Materials, Mechatronics and Systems Engineering at **FBK's Integrated and Quantum Optics (I&QO) Unit** and the Department of Industrial



*Suit Design and
ories – NAR Labs.*

Specifically, the **course**

was held at the **Taiwan Semiconductor Research Institute (TSRI)** and focused on learning more about the latest innovations in **silicon technologies** through lectures given by university

professors and experts in the field coupled with hands-on laboratory sessions and company visits. The sessions covered both theory and software application for the simulation and design of **electronic integrated circuits (EICs)** and **photonic integrated circuits (PICs)**.

Through this experience, I learned how to design and simulate an integrated chip that combines electronic and photonic functionalities. I am excited to have learned about the design and simulation software required in the field of microfabrication. I will definitely apply what I learned in Taiwan to my doctoral project, which focuses on the fabrication of a PIC (Photonic Integrated Circuit) using lithium niobate technology,”
Leonardo Limongi said.

The title of Leonardo’s **research project** is “**Development of a Platform for Integrated Quantum Photonics based on Lithium Niobate**”. The main goal of the project is to make an **integrated photonic device** capable of manipulating and detecting quantum states of light, taking full advantage of the nonlinear and electro-optical properties of lithium niobate by combining them with mature silicon chip fabrication techniques.

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