

14 Marie-Curie PhD Positions Available



14 PhD positions are available for highly motivated Early Stage Researchers (ESRs) as part of the new H2020, EU-funded, Marie Skłodowska-Curie Joint Training and Research Programme [“QUANTIMONY: Quantum Semiconductor Technologies exploiting Antimony”](#).

The QUANTIMONY consortium is a European Innovative Training Network (ITN) with a core focus on the field of semiconductor science and technology, **covering all scientific and engineering aspects from modelling through to material growth and characterization, device fabrication and analysis, and industrial exploitation.**

We are looking for 14 young talented ESRs to work towards their PhD in one of these countries: **Germany, Italy, The Netherlands, Spain and UK starting on April/June 2021.**

We offer:

- **Comprehensive, interactive and international research training on semiconductor materials and devices** covering fabrication, characterization, theoretical aspects and their application towards scalable and industrially relevant technologies.
- **Secondments and travel opportunities**, as well as research-specific, complementary and transferrable skills courses and workshops, delivered by academic and industry experts, which are tailor-made to prepare young researchers for their future careers.
- Three or four year contracts with a **highly competitive salary** adapted to the life cost in each host country.
- Family allowances (where applicable) as part of the employment package.¹

Eligibility criteria

- Applicants can be of **any nationality**.
- At the date of recruitment, applicants should hold a **Physics, Chemistry or Engineering Degree**. A separate Master in a scientific field or, an integrated Master (MPhys, MSci, MEng, MChem etc.) is highly recommendable and mandatory in some countries.
- At the date of recruitment, **applicants must be within four years of their first diploma/degree** granting them access to doctorate studies in their country or the country of the recruiting institution (ESR eligibility).²
- In the last 36 months prior to the signing of their contract, **the applicant must not have resided/studied/worked for more than 12 months in the country of the recruiting institution** (Mobility criterion).³
- Applicants should be proficient in **written and spoken English**.
- Applicants have not been awarded yet a doctoral degree.

Selection process

Applicants will be firstly evaluated based on reported academic performance and background, scientific relevance and aptitude to research, and additional data (such as scientific publications, if any). The candidates that pass the initial assessment will be required to send additional documentation and invited for an interview with the recruitment panel via

¹ Additional information about the financial conditions can be found in the [MSCA-ITN guide for applicants](#) (pp 27-28)

² Additional information about the ESR eligibility can be found in the [MSCA-ITN guide for applicants](#) (pp 6)

³ Applicants are required to undertake physical, transnational mobility according to the [MSCA-ITN guide for applicants](#) (pp 20)

internet videoconference. Candidates that are successful in initial interviews will be invited for a final interview with their PhD supervisor.

Application procedure

Applications must be submitted online at <https://quantimony.eu> and include the following documents:

1. An internal application form listing your academic and job records ([.docx template available](#)).
2. A free format CV and official documentation such as degree and grades certificates will be required at a later stage.

The deadline for application is **January 31st, 2021**

Candidates can apply to one or several ESR positions (**up to a maximum of four**) according to his/her preferences and mobility rule restrictions.

Attempts to apply to more than four positions using different registration profiles will invalidate your candidature.

Equal Employment Opportunity Statement

The QUANTIMONY consortium adheres to the European code of conduct for recruitment of researchers and offers and promotes a diverse and inclusive environment.⁴ We welcome applications from people in all diversity groups regardless of age, disability, gender, nationality, race, religion or sexual orientation.

LIST OF 14 AVAILABLE ESR POSITIONS

Material and Device Fabrication

- **ULANC1:** III-Sb charge-storage devices for non-volatile random access memories
Host Institution: [Physics, Lancaster University](#) (United Kingdom)
Training in: Semiconductor memory device and chip design and modelling, device and chip processing, electrical characterization
- **ULANC2:** Telecoms-wavelength GaSb quantum ring single-photon LEDs
Host Institution: [Physics, Lancaster University](#) (United Kingdom)
Training in: Optical and device design and modelling, epitaxial semiconductor growth, optical and structural materials characterization, device processing, electroluminescence
- **UPM:** Novel III-Sb quantum materials for photovoltaics
Host Institution: [ISOM-UPM, Polytechnic University Madrid](#) (Spain)
Training in: Epitaxial growth of novel semiconductor nanostructures, optical and structural characterization of materials, device processing in clean room and optoelectronic characterization
- **UWUE:** Development of antimony based interband cascade nanostructures and superlattices
Host Institution: [Applied Physics, Julius Maximilians University Würzburg](#) (Germany)
Training in: Epitaxial growth of Sb-based heterostructures, Optical spectroscopy in the mid-infrared wavelength region, electronic and opto-electronic properties of semiconductor materials

Structural and Functional Characterization

- **CSIC1:** III-Sb quantum dots for spin-photon interfaces and quantum communications
Host Institution: [IMN-CSIC, Spanish National Research Council](#) (Madrid, Spain)

⁴ <https://euraxess.ec.europa.eu/jobs charter/code>

Training in: Low temperature optical micro-spectroscopy, magnetic and electronic properties of semiconductors, energy band theory and simulation

- **CSIC2:** Smart synchrotron nanoprobe investigations of III-Sb devices
Host Institution: [ICMM-CSIC](#), [Spanish National Research Council](#) (Madrid, **Spain**)
Training in: Semiconductor physics and materials properties as well as synchrotron radiation microscopy
- **UOW:** Advanced electron microscopy investigations of III-Sb devices
Host Institution: [Physics](#), [The University of Warwick](#) (**United Kingdom**)
Training in: High resolution scanning transmission electron microscopy, atomic resolution X-ray and electron energy-loss spectroscopy, scanning electron microscopy, simulation and image/data analysis
- **TuE1:** Atomic scale characterization of III-Sb quantum materials
Host Institution: [Applied Physics](#), [Eindhoven University of Technology](#) (**The Netherlands**)
Training in: Low temperature and room temperature scanning tunneling microscopy, scanning tunneling induced luminescence

Theory and Simulation

- **TUE2:** Magnetic empirical tight binding methods for III-Sb devices
Host Institution: [Applied Physics](#), [Eindhoven University of Technology](#) (**The Netherlands**)
Training in: Electronic structure simulation techniques including empirical tight-binding, continuum envelope function techniques, pseudopotential, and density functional theory techniques
- **TUB:** Evolutionary inverse design numerical approaches for improved III-Sb devices
Host Institution: [IFKP-TUB Technical University Berlin](#) (**Germany**)
Training in: Electronic structure simulation techniques including continuum envelope function and density functional theory techniques, deep learning, and evolutionary strategies.
- **UNITOV:** Multiscale simulation of novel III-Sb quantum materials and devices
Host Institution: [Electronics Engineering](#), [University of Rome Tor Vergata](#) (**Italy**)
Training in: Development, optimization and use of tight binding based electronic structure codes, multiscale-coupling with continuum model device simulation tools, device modelling and simulation

Scale Up and Road to Market

- **AIXTRON:** Optimization of MOCVD technology and industrial aspects and upscaling of III-Sb MOCVD technology
Host Institution: [AIXTRON SE](#), [RWTH Aachen University](#) (**Germany**)
Training in: Design, carry out and analyzing experiments to find the optimum MOCVD growth conditions for future MOCVD technology up-scale. Use of simulation for advanced reactor design.
- **IQE:** Wafer engineered long wave infrared photodiodes
Host Institution: [IQE plc](#) (**Cardiff, United Kingdom**)
Training in: Growth, optical and structural characterization of InAs/InAsSb photodiodes on different substrates
- **NEXTNANO:** Multiband quantum transport in III-Sb based devices
Host Institution: [nextnano GmbH](#) (München, **Germany**)
Training in: Modeling of quantum transport using the nonequilibrium Green's function (NEGF) method in interband cascade devices, type-II superlattices and memory devices