Arphioniq

STUDENT OPPORTUNITY
Internship · MSc Thesis · BSc Project

Optical-carrier microwave interferometric sensor

Develop and characterize a novel optical nano-positioning sensor for precision manufacturing applications

FORMAT *In-person*	**DURATION** *3–6 months*	**LOCATION** *Science Park Amsterdam (HoQ)*
LEVEL *MSc*	**DISCIPLINE** *Physics · Optics*	**START** *Flexible*

ABOUT ARPHIONIQ

Arphioniq is a photonics deep-tech spin-out of the University of Amsterdam, building scalable and field-deployable frequency-stabilised laser infrastructure — the enabling layer that lets photonic-based quantum computing and sensing systems move out of the lab and into the real world. Along with frequency stabilization, our patented platform also powers precision positional measurement for advanced manufacturing. You'd work directly alongside the founding team, contributing hands-on to the journey of transforming an innovative technology into a deep-tech product.

THE PROJECT

Precision dimensional and positional metrology has been constantly gaining more and more importance over the last years driven by ever-increasing demands from high-value industrial areas such as precision manufacturing, industrial automation, semiconductor industry, or photonic integration and packaging. Current metrology solutions, however, struggle to keep up with the tightening tolerances and deployability needs in the high-precision segments.

The users and system integrators in these sectors currently face a dilemma: affordable industrial-grade positioning sensors lack the accuracy they need, while high-performance laser interferometers are too expensive and fragile for real production environments. Arphioniq's proprietary microwave-optical transfer interferometric platform breaks this trade-off by delivering interferometer-class performance at industrial cost and robustness. The system consist of a common opto-electronic read-out unit and multiple interferometric measurement heads bringing and collecting the light signals from the measurement object. In this project, you will work on design and optimization of the measurement head and characterization of positioning performance of the system.

In the initial phase of the project, you will explore and analyse different measurement head architectures, both theoretically and experimentally to compare their relative performance and determine optimal configuration. In the next step, you'll get to design and build a test setup for characterization of distance measurement performance, including active motion control, reference positioning sensor and processing algorithms. Finally, you will use the setup to characterize the measurement accuracy, precision, resolution and repeatability of the entire system with selected measurement head architecture. You will produce a report covering the performance achieved and suggestions for future improvements.

WHAT YOU'LL BRING

- Enrolled in an MSc in physics, optics, electrical engineering or similar
- Relevant background in optics. Prior experience with control electronics and measurement automation.
- Hands-on with a "can-do" mentality, rigorous with data
- Fluent working English
- Able to work independently and in a small team

WHAT WE OFFER

- Real ownership of a problem contributing to an innovative project with real-world application
- Hands-on experience in the field of photonics and quantum technologies
- Close mentorship from founding team experts
- A seat in a fast-moving startup at Science Park Amsterdam
- Monthly stipend to compensate you for your effort

HOW TO APPLY

Send a short CV and a few lines on why this project fits you to **info@arphioniq.com**. Questions? Don't hesitate to reach out at the same address. Applications are reviewed on a rolling basis.