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Planning

Purchase of maskless laser lithography system

Cardiff University

UK2: Preliminary market engagement notice - Procurement Act 2023 - [view information about notice types](#)

Notice identifier: 2026/S 000-007806

Procurement identifier (OCID): ocds-h6vhtk-061176 ([view related notices](#))

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Scope

Description

The Institute for Compound Semiconductors (ICS) intends to procure a maskless laser lithography system to support essential expansion of its hybrid electro-optical lithography capability. The system will enable processing in which wafers are exposed using both electron-beam lithography and optical radiation within the same resist layer(s), or across multiple aligned resist layers.

ICS has previously invested €2.5 M in a state-of-the-art electron beam lithography platform capable of patterning nanoscale features down to 10 nm. To fully realise the benefits of hybrid lithography workflows, ICS requires a complementary optical lithography system capable of producing large-area exposures (several millimetres) with feature sizes down to approximately 300 nm, while maintaining extremely high positioning and overlay accuracy with respect to electron-beam-defined structures.

The required system must incorporate:

a high-resolution optically encoded stage with positioning fidelity on the order of 1 nm;

the capability for stitch-free patterning across full wafers up to 200 mm in diameter;

demonstrated overlay accuracy of approximately 15 nm (optical?to?electron?beam alignment);

software and workflow compatibility to support integrated hybrid lithography between electron?beam and optical exposures.

ICS has undertaken a technical review of the market and believes that only one supplier Raith can provide a maskless laser lithography system meeting these combined requirements for stage precision, stitch?free wafer?scale patterning, and proven sub?20 nm optical?to?electron?beam overlay accuracy. No other commercially available maskless optical system is known to provide these capabilities.

This capability is essential for ICS's academic and commercial programmes. For example, in photonic integrated circuit fabrication, nanoscale waveguides must be aligned to larger optical structures with tolerances under 50 nm. Currently, such structures must be written entirely using electron?beam lithography, which is time?intensive and financially prohibitive for large?wafer platforms. A high?precision maskless laser lithography system would enable rapid exposure of larger structures without compromising alignment accuracy, significantly reducing process time and costs—an important benefit for ICS's commercial partners. Further strategic application areas include quantum photonics and RF power electronics, where precise overlay between high?resolution and low?resolution structures is equally critical.

The required system must also include dedicated micro?optics generation software capable of real?time algorithmic creation of complex greyscale structures (e.g., microlenses, diffraction gratings, Fresnel zone plates) during exposure, thereby eliminating the need for extremely large pattern files and reducing data?processing overheads.

Total value (estimated)

- £415,000 excluding VAT
- £498,000 including VAT

Above the relevant threshold

Contract dates (estimated)

- 27 February 2026 to 26 February 2027
- 1 year

Main procurement category

Goods

CPV classifications

- 31600000 - Electrical equipment and apparatus

Contract locations

- UK - United Kingdom

Engagement

Engagement deadline

11 February 2026

Engagement process description

Please email: Rogalaa@cardiff.ac.uk by 10th of February 2026

Submission

Publication date of tender notice (estimated)

23 February 2026

Contracting authority

Cardiff University

- Public Procurement Organisation Number: PHVT-4343-HWYR

Procurement Services

Cardiff

CF24 4HQ

United Kingdom

Email: rogalaa@cardiff.ac.uk

Website: <http://www.cardiff.ac.uk/business/why-work-with-us/for-suppliers>

Region: UKL22 - Cardiff and Vale of Glamorgan

Organisation type: Public authority - sub-central government

Devolved regulations that apply: Wales