



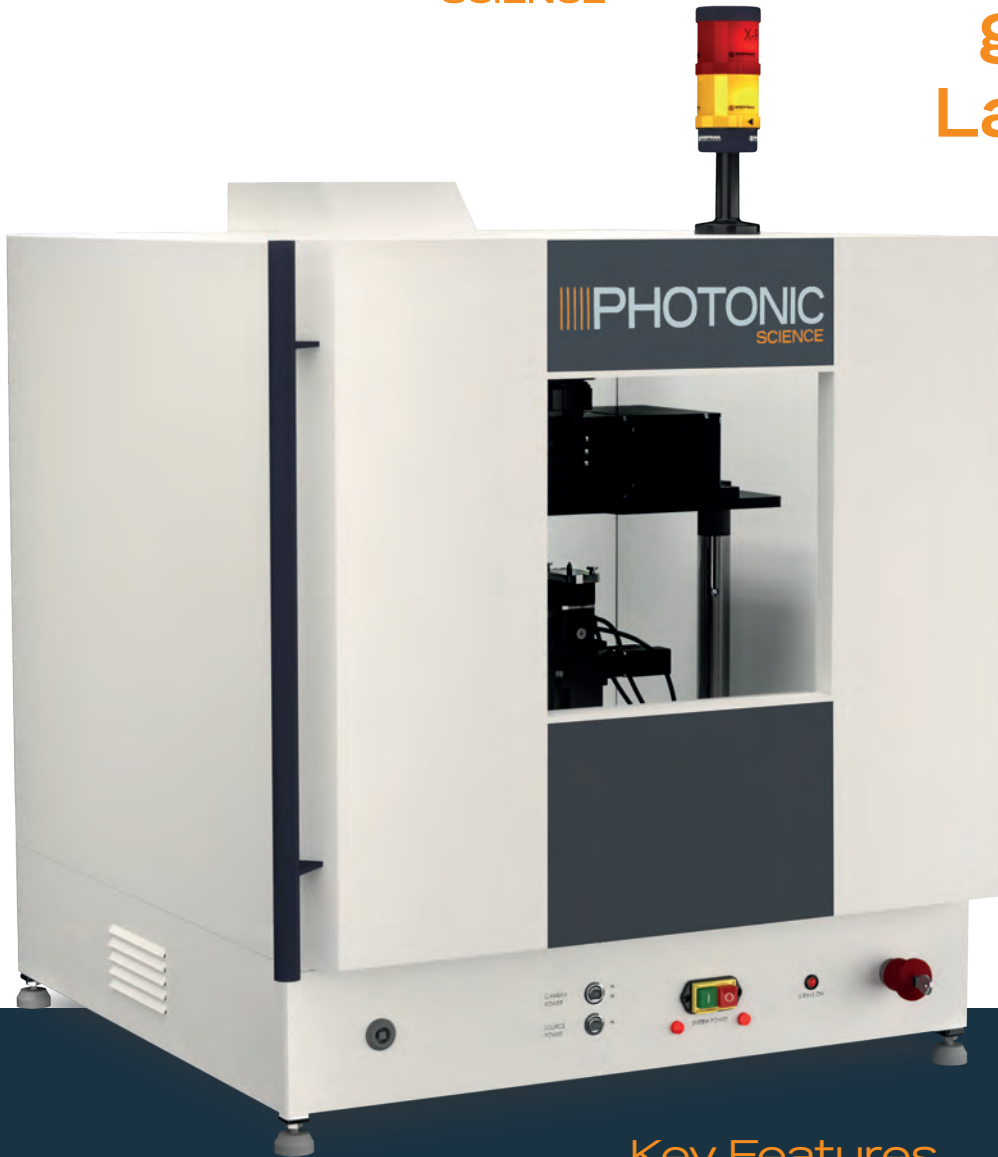
PHOTONIC
SCIENCE

Laue Single Crystal Orientation System

Compact | Motorised | Real-time | Accurate

Industrial
& Scientific
Configurations

The next generation Laue System



Single crystal materials are playing an important role in novel devices, from non-linear optics to jet engine turbine blades and super conducting materials.

A high-resolution Crystal Orientation System is the ideal tool to capture and analyse the Laue diffraction pattern from a wide range of crystalline materials. With dedicated software, the orientation of single crystals can be measured quickly with excellent accuracy.

Key Features

Large Active Area

155 mm x 105 mm

High Resolution

2,500 x 1,650 pixels

Input Pixel Size

60 μm x 60 μm

Spot Size

Down to 200 μm

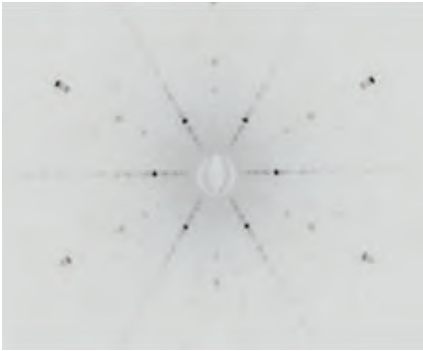
Energy Range

5 to 50 keV

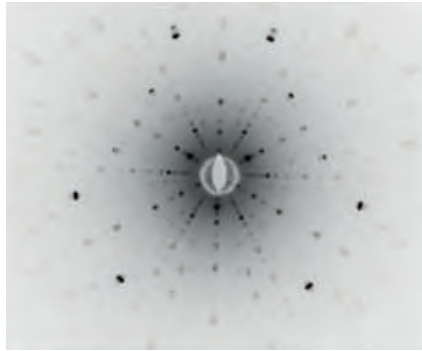
Source

50W

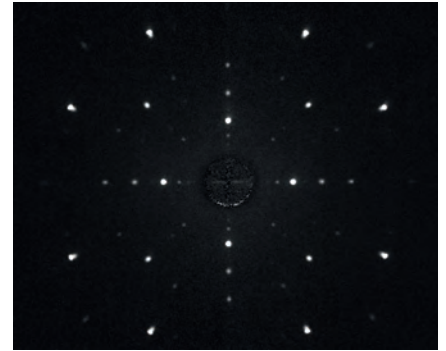
- | **Vertical, Horizontal, and Grain Map configurations**
- | **Plug-n-Play compact cabinet system**
no customised bench or additional services required
- | **Fully automated and motorised XYZ Stages and Goniometer**
with manual options available
- | **CCD back reflection, high-resolution, high-sensitivity x-ray detector**
- | **High-throughput sample screening options**
- | **Proprietary focussing optics**
giving a small collimated beam size
- | **Fast and precise alignment of small crystals**
with on-board high-resolution viewing camera
- | **Distance measurement tool**
for precise and reproducible sample positioning
- | **Dedicated Laue Software**
for full control, data acquisition, processing and analysis



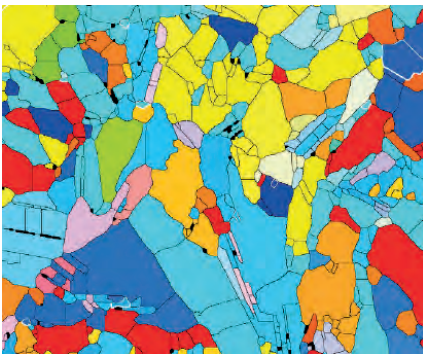
Sapphire C-axis aligned



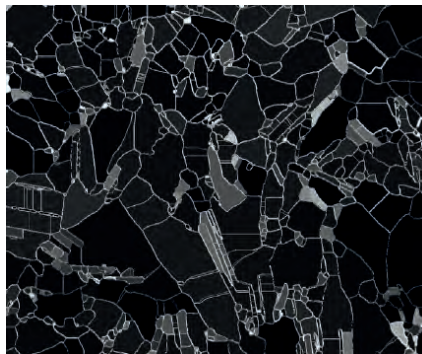
SiC Hex aligned



Silicon alignment to better than 0.1 degree accuracy



Two dimensional orientation map



Poly crystalline Si Wafer



Extraction of contours and centroids for x-ray analysis

Applications

Crystal Growth

Real Time Crystal Orientation

Crystal Characterisation

Crystal Cutting

Photovoltaic Inspection

Gem Inspection

Two-Dimensional orientation mapping of polycrystalline silicon wafers

Semiconductor Crystals

Wafer Inspection

“ The Photonic Science Laue is our system of choice as we have found it very dependable.

Beyond the accuracy and reliability, the major feature is the convenience and speed of the system... it runs off a normal wall plug and quickly boots up to check your crystals immediately.

It really is the best value that I have found on the market, with the complete kit delivered onsite with an installation video - you set it up and, in an hour or two, you are ready to go. ”

Gavin Hester, PhD

Assistant Professor, Dept. of Physics, Brock University

Laue System Configurations

Vertical Laue System

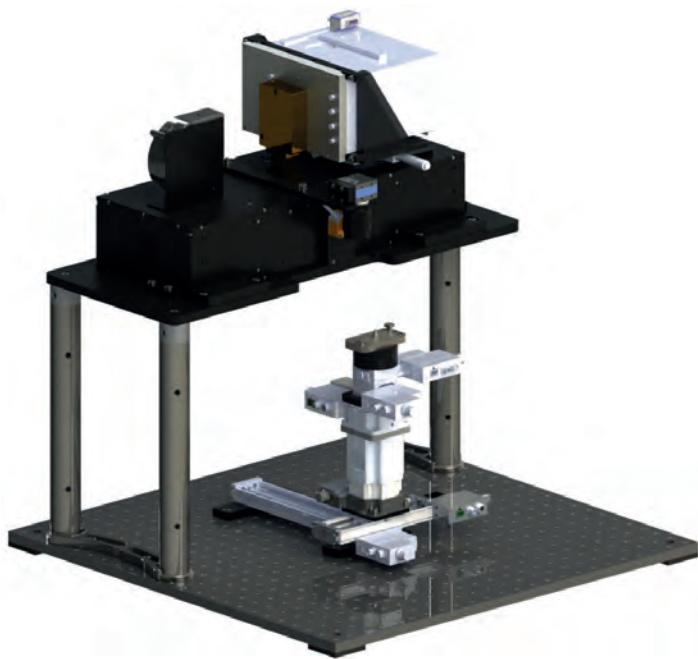
The most flexible configuration, the Vertical Laue System uses a vertical beam path for high throughput scanning of multiple crystals in isolation, or multiple areas of interest.

Using gravity, samples do not need to be adhered to the platform, allowing for easier mounting and orienting of crystals.

A vertical system also enables an upgrade, from the horizontal beam mechanical pointer, to a laser-guided distance sensor to optimise sample-to-detector distance and correct Laue pattern simulation for indexing crystals.

With a $<200\ \mu\text{m}$ beam size both sub-millimetric range samples and larger components like turbine alloys are accommodated.

See below for the wide ranging benefits of a vertical system...



Above: Vertical system with fully motorised XYZ stage and goniometer

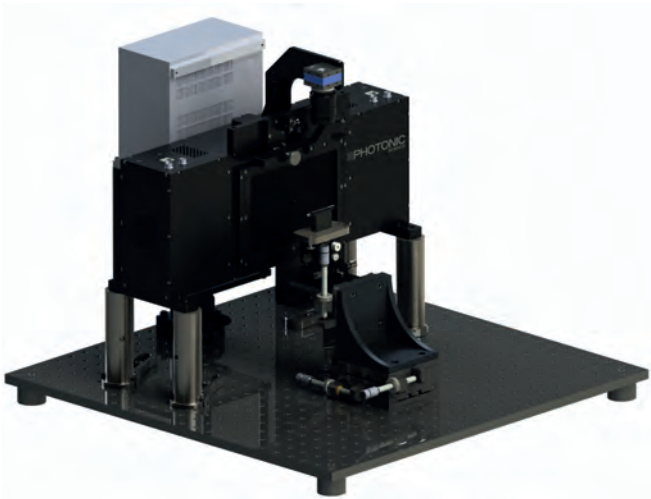
“ The Laue System has the most versatile configuration, and the backscatter geometry is the most intuitive for non-crystallographic experts.

It allows easy sample loading and inspection with a high-resolution camera and automatic transfer under the x-ray beam for automatic Laue pattern acquisition routines.

The motorised XYZ stage allows you to position samples down to 200 microns accuracy, and manual or motorised goniometers allow for flexibility for real-time sample orientation. ”

Vertical System Benefits

- ✓ A vertical beam path takes up less room in the cabinet, leaving more space for experiments
- ✓ Allows scanning experiments with wafers, rods, and multiple samples, for example diamonds on trays up to 30x 30 cm
- ✓ Compatible with additional optics or inspection modalities
- ✓ Laser-guided distance sensor for more accurate and repeatable sample positioning
- ✓ Safer mounting of samples away from the detector
- ✓ More loading space makes sample setup easier and faster
- ✓ Allows motorised goniometers to operate at larger tilt and rotation degrees compared to horizontal systems
- ✓ Software supports automated macro routines



Horizontal Laue System

The Laue System is also available with a traditional horizontal geometry.

A horizontal beam system is well suited to orient the crystal for cutting or to quickly scan the crystal to identify reflections.

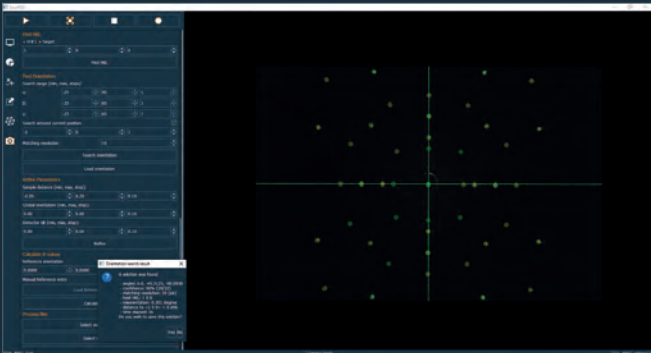
Speak with our expert team to help determine which configuration option best suits your requirements.



Grain Map System

Vertical system featuring a special camera, lens, illumination, and mapping software to measure the orientation of each grain.

Grain Map includes a fully motorised XYZ stage and goniometer as standard. It is ideal for grain mapping Silicon Wafers.



Alignment Software

Automatically detects diffraction spots and calculates spot position against reference crystal

Automatically calculates mis orientation against goniometer and crystallographic axis (no manual fit or distorted patterns)

Intuitive workflow for multiuser operation and non-expert crystallography users

Saves angular measurements in CSV format for Quality Assurance traceability

Built-in Macro interface for automating repetitive routines

Compatible with CFL data files

Remote access control for ongoing service support, minimising downtime

System Options

- | **MANUAL** XYZ Stage and Goniometer
- | **MOTORISED** XYZ Stage and Goniometer
- | **NO GONIOMETER** - Motorised XYZ Stage
- | **FINE FOCUS** - Vertical Configuration only
- | Fully customisable solutions available

Installation

Video Installation

As a plug-n-play system, with no specialist requirements, the Laue is easy to install and setup. Each Laue is delivered pre-configured with an installation video that takes you through the complete process step-by-step.

Our support team are available by phone or email to answer any questions you may have.

In-person Installation

Should a system require an in-person install, our service team will deliver and setup the Laue at your facility.

After Sales Services

Training

Laue systems come with a comprehensive User Manual to guide users, both new and experienced, through all the features and how to setup and run your Laue experiments. Training videos are also available.

A training session, via Teams or on site (location dependant), can be arranged.

Remote support

Our support team are on hand to help diagnose and troubleshoot problems to get your experiment back on-track.

Quality Assurance

Quality and continuous improvement is at the heart of everything we do at Photonic Science, to ensure we deliver on-spec systems every time.

Photonic Science is an ISO9001:2015 qualified company and as standard we provide a 12 month warranty on all our products; with warranty extensions available on request.

Photonic Science also provide after sales support for the lifetime of our products, and we can provide maintenance and repairs for all Photonic Science systems.

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