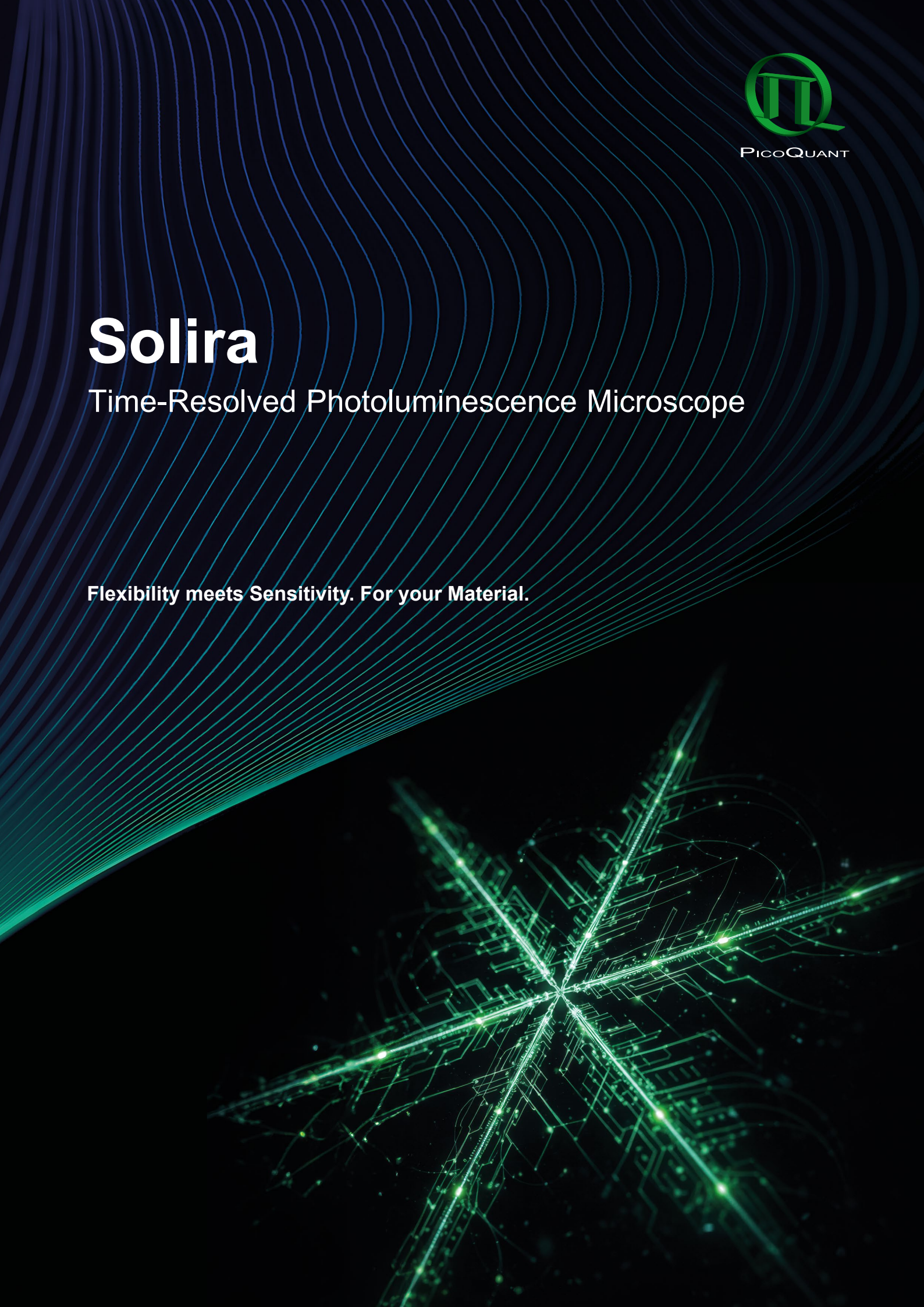
PicoQuant

Solira

Time-Resolved Photoluminescence Microscope

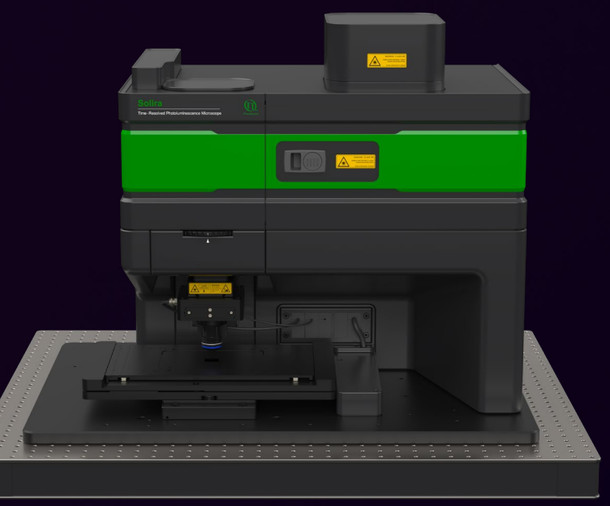
Flexibility meets Sensitivity. For your Material.



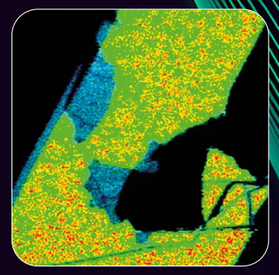
For Your Material

Time-Resolved Insights Across Advanced Materials

Solira is a time-resolved photoluminescence (TRPL) microscope for analyzing a wide range of materials, from semiconductors and nanostructures to solar cells and quantum sensing. Its upright design enables the investigation of both transparent and non-transparent samples, supporting flexible characterization across diverse material systems.

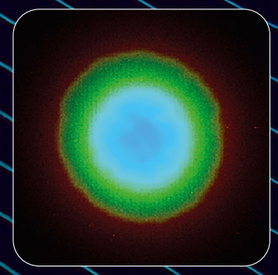


Get More Info



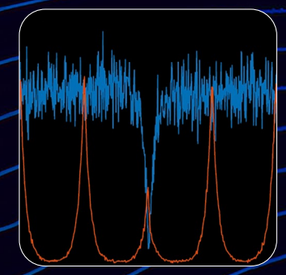
TRPL Insights into Nanomaterials

Optical characterization with Solira reveals the photophysical properties of nanomaterials such as quantum dots, carbon dots, and TMDs. These insights support the integration of nano-structures into displays, catalysts, and energy-related materials such as solar cells and batteries.



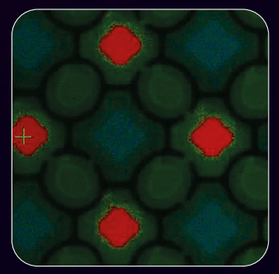
Carrier Diffusion in Semiconductors

Carrier diffusion mapping with Solira enables investigation of charge carrier recombination processes beyond the excitation spot. These measurements reveal defects, trap states, and material homogeneity, helping to improve semiconductor performance and long-term device stability.



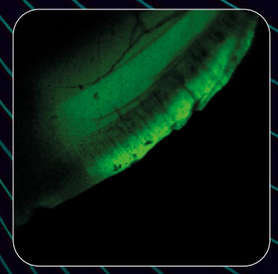
Single-Emitter Correlation Studies

Solira enables correlation measurements of single emitters such as NV centers and nanostructures. g(2) analysis provides insight into antibunching behavior in nanoparticles and TMDs.



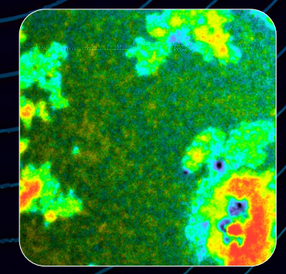
TRPL Imaging of LED Materials

Solira enables TRPL imaging of LED materials such as OLEDs, PeLEDs, and MicroLEDs to reveal charge carrier dynamics and emission behavior, helping to improve efficiency, brightness, and reduce energy losses.



Photocatalysis Monitoring

Time-resolved measurements with Solira monitor photocatalytic materials such as TiO_2 and ZnO under light-driven reactions. Tracking charge carrier dynamics helps improve efficiency and selectivity for environmental and synthesis applications.



TRPL Imaging of Perovskites

Solira provides non-destructive characterization methods such as time-resolved photoluminescence (TRPL) imaging and carrier diffusion mapping to study excited-state dynamics in perovskite solar cells, helping to improve electronic and optical performance.

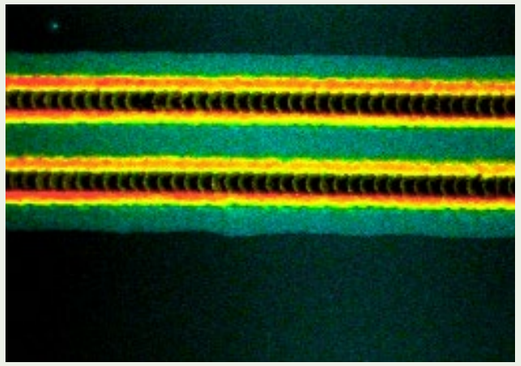
Solira in Materials Science

Time-Resolved Photoluminescence Microscope

Solira combines flexible excitation, sensitive detection, and time-resolved analysis to support advanced characterization across diverse material systems.

Application Note

Spatially Resolved TRPL Imaging of Laser-Patterned Perovskite Solar Mini Modules



Laser-patterned perovskite solar mini modules were characterized using steady-state spectroscopy, TRPL, and spatially resolved lifetime imaging. Differences in photoluminescence decay behavior between structured and unmodified regions revealed local variations in charge carrier dynamics.

By combining sample localization, emission spectroscopy, and TRPL imaging within one system, Solira enables efficient analysis

Download the Full Application Note

Flexible Excitation

A flexible selection of picosecond excitation sources supports time-resolved photoluminescence measurements across diverse material systems. Configurations with up to 8 laser channels cover excitation wavelengths from 355 nm to 1064 nm, enabling optimized characterization across different sample types and measurement conditions.

Single Photon Sensitivity

Highly sensitive photon detection enables reliable measurements of weak emission signals and subtle photophysical processes.
Solira supports flexible detector configurations with up to 12 detection channels and spectral sensitivity from 400 nm to 1550 nm, enabling precise characterization across demanding material systems.

Picosecond Timing Resolution

Time-resolved measurements are powered by PicoQuant's proven time tagging and TCSPC electronics, delivering picosecond timing precision for studying carrier dynamics, recombination processes, and excited-state behavior across a broad temporal range.

- Ready for spectral and spectroscopic extensions
- High-sensitivity detection for weak emission signals
- Lifetime analysis from picoseconds to milliseconds
- Adaptable sample handling across scales and geometries
- Flexible excitation from UV to NIR

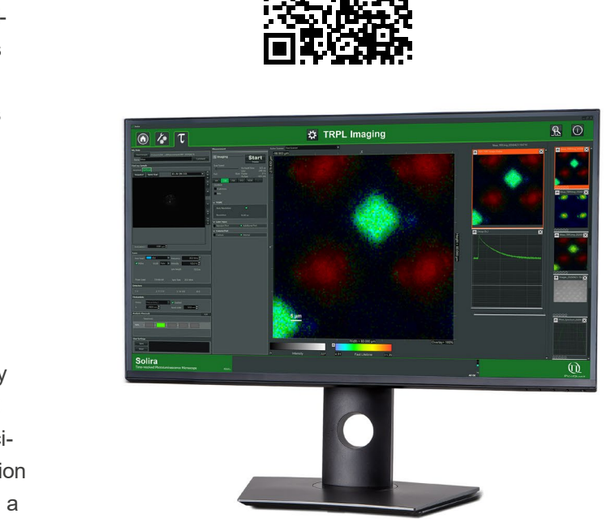
Context-Based Software Workflows

Solira's dedicated software environment provides context-based workflows for streamlined acquisition and analysis across different measurement modes. Designed for materials characterization, it supports steady-state PL, TRPL point measurements, imaging, carrier diffusion mapping, TRES, time-trace analysis, and g(2) experiments within a unified interface.

Flexible Sample Access

The upright microscope design provides easy access to a broad range of sample geometries and sizes while supporting multiple characterization methods. Configurable sample stages and scanning options, including motorized and piezo-based solutions, enable measurements from the nanometer to millimeter scale.

Get More Info About Solira



Micro-Photoluminescence

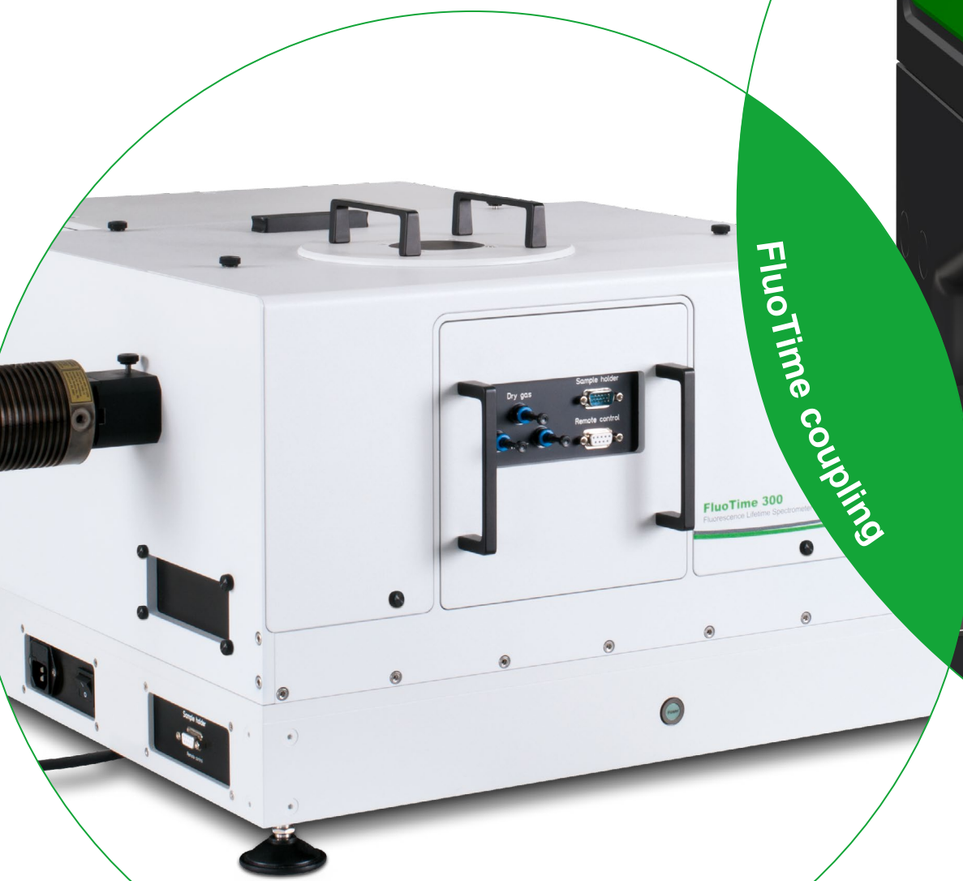
Expanding the Power of Time-Resolved Microscopy

Combining Solira with spectral extensions expands time-resolved photoluminescence into a more comprehensive characterization workflow. Whether precise spectral acquisition or fast wavelength selection is required, coupling with FluoTime 300 or FlexLambda provides tailored solutions for different research needs.

Get More Info

FluoTime Coupling – Spectral and Temporal Precision

FluoTime 300 extends Solira with steady-state and time-resolved spectroscopy in a single workflow. Researchers can analyze fluorescence lifetimes, phosphorescence decays, and time-resolved emission spectra (TRES) with high temporal and spectral resolution. Covering a broad UV to IR range, it supports detailed analysis of materials such as solar cells, LEDs, and quantum dots, all within a fully automated and software-controlled system.



FluoTime coupling

FlexLambda coupling

FlexLambda Coupling – High-sensitive and Tunable Wavelength Selection

For applications requiring dynamic spectral selection, FlexLambda provides tunable wavelength control for wavelength-dependent and spectrally resolved measurements without mechanical filter exchange. Combined with Solira, it enables time-resolved and steady-state luminescence measurements across the visible to NIR range. The system supports analysis of semiconductors, perovskites, single emitters, and other advanced materials with full software control for streamlined experiments.

What‘s useful for…

Methods:	Coupled with FlexLambda	Coupled with FluoTime 300/250
Photoluminescence (PL) at points of interest	●	●
Time-resolved PL (TRPL) at points of interest	●	●
TRPL imaging (FLIM & PLIM)	FLIM + PLIM	FLIM + PLIM
Time-resolved emission spectra (TRES) at points of interest	●	●
Time-resolved emission microscopy (TREM)	●	●
Carrier diffusion mapping	●	●
Electroluminescence (EL) at points of interest	Electrodes available	Electrodes available
Excitation power/intensity-dependent measurements	●	●
Polarization angle-dependent in emission	●	●
Two-Photon excitation microscopy (TPE)	●	●
Antibunching	●	●
Single molecule detection	●	
Excitation:		
Range	355 – 1064 nm	355 – 1064 nm
Type	Pulsed, burst, CW	Pulsed, burst, CW
Detection:		
Range	400 – 1550 nm	400 – 1550 nm
Number of detectors	1 – 4	1 – 2
Detection type	Hybrid, SPAD, NIR-PMT, SNSPD	PMT, Hybrid, NIR-PMT
Scanners:		
XYZ-Piezo objective scanner	●	●
XY-Piezo wide-range sample scanner	●	●
XY-Piezo carrier diffusion scanner	●	●
Add-Ons:		
Sample probing stage	●	●
Cryostat (LN2 or He)	●	●
Second excitation and/or second emission port	●	●
Transmission illumination	●	●
Coupling with wavelength selection unit or spectrometer	●	●
Electrical excitation/biasing capability	●	●

More Info About Solira

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