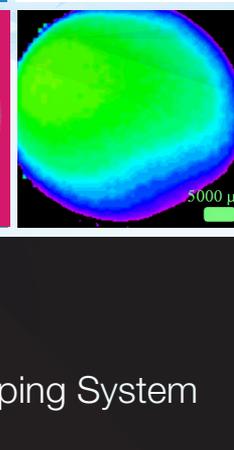
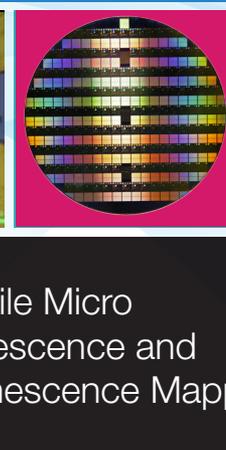
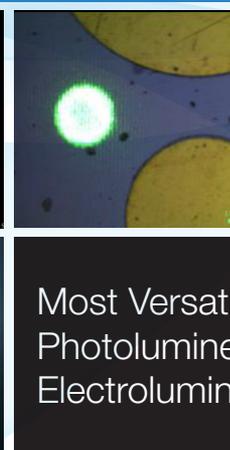
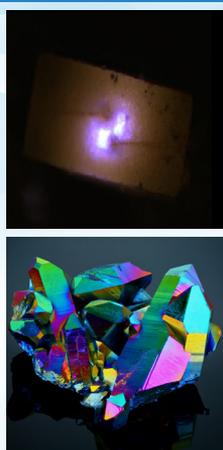
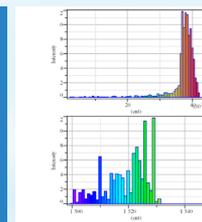


## MiCOS

Modular Microspectroscopy System



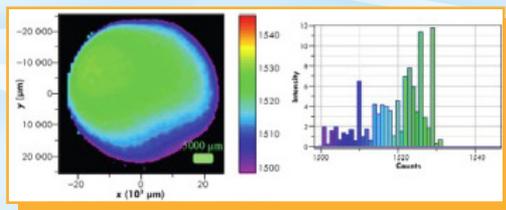
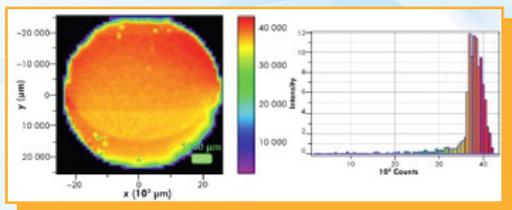
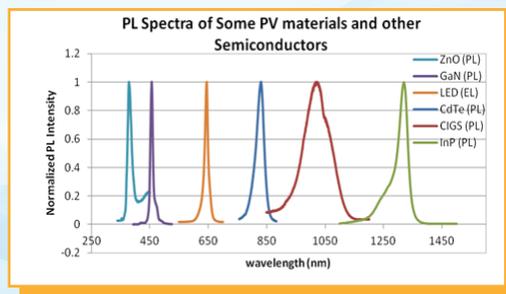
Most Versatile Micro  
Photoluminescence and  
Electroluminescence Mapping System

# Micro Photoluminescence



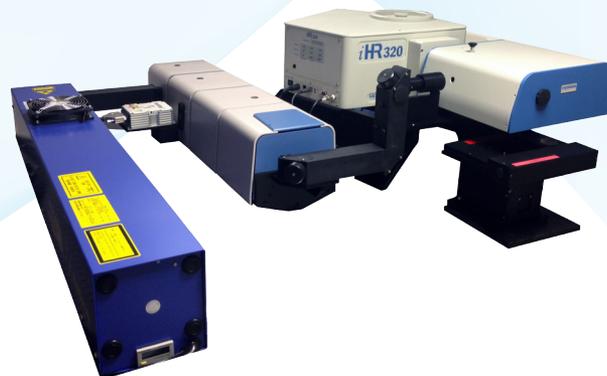
- LEDs
- Photovoltaics
- Nanomaterials
- NIR light sources
- Rare earth doped glasses
- And more!

- Direct-coupled microscope for enhanced throughput
- Excitation laser wavelengths from UV to NIR
- Flexible sample handling: Down looking and side looking
- PL emission spectral range from UV to NIR
- Full featured triple grating spectrometer
- Built-in vision camera



## PL Mapping

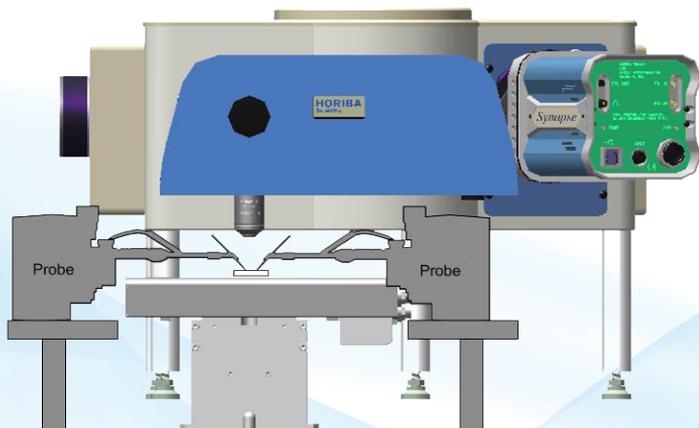
- Fast wafer mapping - collects thousands of spectra in minutes
- Fully automated data acquisition
- Advanced data processing functions
- Hybrid system available



Spectrometers		iHR320 or iHR550		
Spectral range <sup>1</sup>		200 nm to 1600 nm		
Spectral resolution <sup>2</sup>		0.18 nm (iHR320), 0.1 nm (iHR550)		
Detector	Type	CCD Camera <sup>3</sup>	InGaAs Array <sup>3</sup>	Single Channel
	Range	200-1100 nm	800-1600 nm <sup>4</sup>	200-1600 nm <sup>4</sup>
Excitation Laser <sup>5</sup>		266 nm, 325 nm, 405 nm, 532 nm, 633 nm, 785 nm, 980 nm, 1064 nm		
Microscope Objective	Magnification	10 x	50 x	100 x
	Spot size (Fiber-coupled)	100 μm	<20 μm	<10 μm
	Spot size (Free space)	<10 μm	<6 μm	<2 μm
Sample stage		XYZ (manual or motorized options available)		

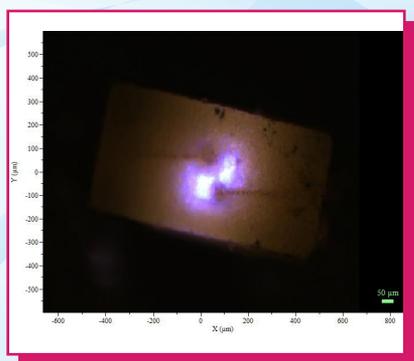
<sup>1</sup> Other spectral ranges available upon request - please contact factory  
<sup>2</sup> Based on 1200g/mm grating at 500 nm and a 26 μm ccd pixel  
<sup>3</sup> Different sensor types available  
<sup>4</sup> Other types of detectors available to go beyond 1600 nm  
<sup>5</sup> Other laser wavelengths available upon request - please contact factory

# Micro Electroluminescence

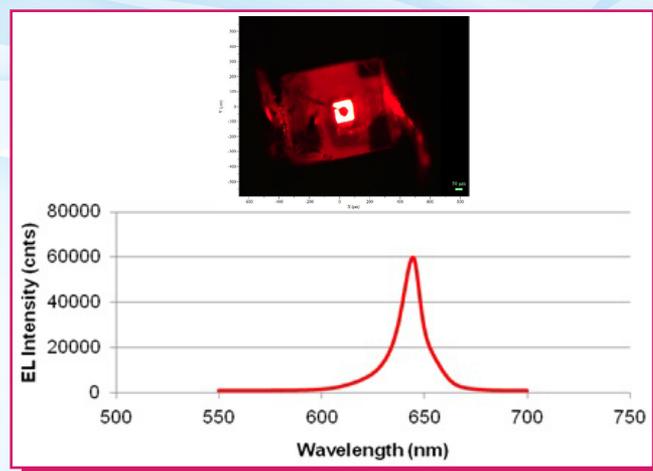


- Wide open area underneath microscope to accommodate a variety of probe stations
- Built-in vision camera for sample and probe identification and positioning
- Ability to perform co-localized PL and EL measurements

## Electroluminescence Pattern



Vision camera displays electroluminescence pattern of red and white InGaN LEDs



Electroluminescence of a red Micro LED

Spectrometers		iHR320 or iHR550			
Spectral range <sup>1</sup>		200 nm to 14 µm			
Sample stage		0.18 nm (iHR320), 0.1 nm (iHR550)			
Detector	Type	CCD Camera <sup>3</sup>	InGaAs Array <sup>3</sup>	Single Channel	
	Range	200-1100 nm	800-1600 nm	190-14 µm	
		Magnification	10 x	50 x	100 x
Sample stage		XYZ (manual or motorized options available)			

<sup>1</sup> Maximum wavelength limited if PL included

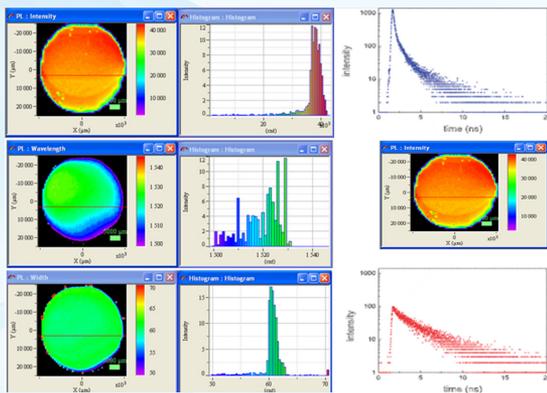
<sup>2</sup> Based on 1200g/mm grating at 500 nm and a 26 µm ccd pixel

<sup>3</sup> Other types of CCDs and InGaAs arrays available

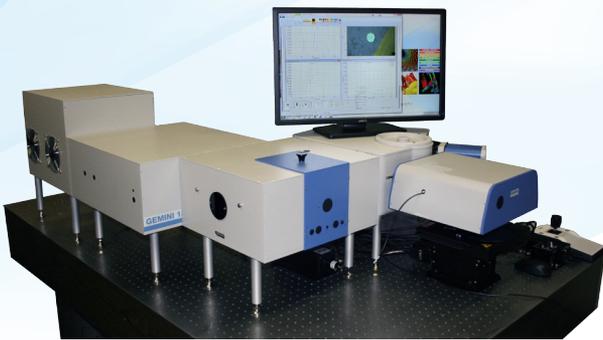
# Specialty and Hybrid Systems

## Steady State and Time-Resolved Photoluminescence

- Complementary steady state and time-resolved PL from the same spot
- Lifetimes (TCSPC) from 100 ps to 1 s
- Lifetime emission from 250 nm to 900 nm
- Interchangeable UV-NIR pulsed sources



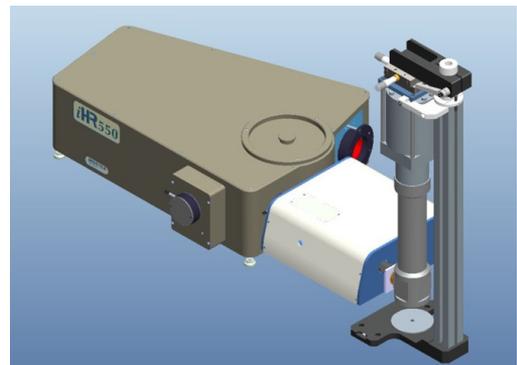
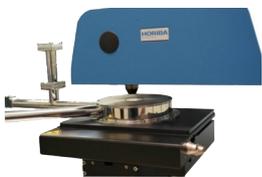
## Macro and Micro Photoluminescence



- Macro Fluorescence system and micro PL system in one
- Great for cuvette-based fluorescence measurements using a tunable excitation source
- Laser-based micro PL measurements including mapping
- General purpose photoluminescence platform

## Low Temperature Micro Photoluminescence

- Cool sample down to 4K for micro PL measurements
- Different cryostat configurations
- Includes probes for voltage and current measurements



**Spectrometer**

iHR320  
iHR500

**Gratings**

Grating 1  
Gratings 2  
Gratings 3

**Detectors**

Synapse CCD (250-1050 nm)  
IGA Array (800-1600 nm)  
Syncerity CCD (affordability)  
Single-channel Detector

**Side & Down Objectives**

10 x  
50 x  
100 x  
Custom

Focusing Stage  
Mounting Platform

**Lasers**

266 nm  
325 nm  
405 nm  
532 nm  
633 nm  
785 nm  
880 nm  
1064 nm  
Custom

**Optional Manual/  
Motorized Stages**

Mapping Stage  
Focusing Stage  
Mounting Platform



# Custom Spectroscopy Solutions

## Light Sources

- Continuous or pulsed broadband illuminators
- Continuous or pulsed tunable illuminators
- Millisecond tunable illuminators
- Fiber or Light Guide illuminators
- Nanosecond pulsed lasers
- Broadband metal halide illuminators



## Detectors

- PMT
- Single Channel
- Solid state
- Ambient/TE/LN-cooled



## Cameras

- Front and back illuminated
- UV-Vis-NIR
- Scientific
- Deep cooled
- Low light imaging



## Optical Accessories

- Filter wheels
- Sample compartments
- Optical fibers
- Collimators
- Laser diodes
- Timing electronics
- Light guides



## Spectrometers

- Small, mid-range and long focal lengths
- Miniature fiber spectrometers
- Research-grade grating spectrometers
- CCD and PDA USB spectrometers



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