



# Product Line Card Quantum Applications

**2026 V1**

For customized projects please Contact us:

[info@simtrum.com](mailto:info@simtrum.com)

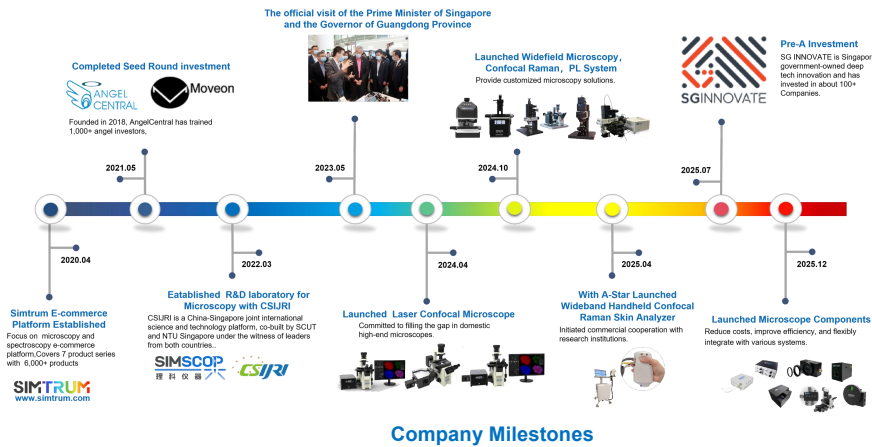
## Company Profile

Established in Singapore in 2019, SIMTRUM Group specializes in innovation and applications within microscopy and spectroscopy. Its core team brings decades of optical technology expertise. In 2022, the company partnered with the CSIJRI in Guangzhou to establish a joint R&D laboratory for microscopy with independent research capabilities. The team now includes multiple Ph.D. graduates from the National University of Singapore (NUS), and has grown to dozens of members.

SIMTRUM has collaborated with leading institutions such as Nanyang Technological University (NTU), NUS, A-Star, and Xiamen University to develop high-end microscopy systems. In March 2023, the company's Guangzhou R&D center was visited by former Singapore Prime Minister Lee Hsien Loong and the Governor of Guangdong Province. Later that year, SIMTRUM won first prize in the startup category of the Guangzhou Technology Innovation and Entrepreneurship Competition and secured multiple technology patents.

**Vision:** To be a leading photonics technology company that truly understands and adds value to our customers.

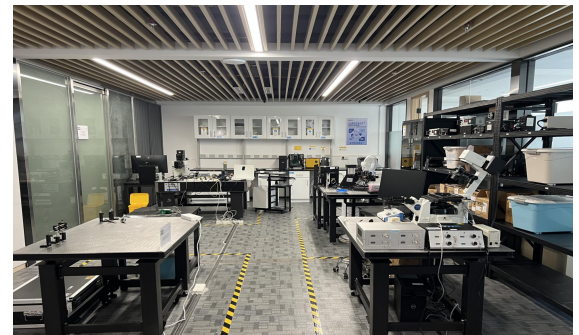
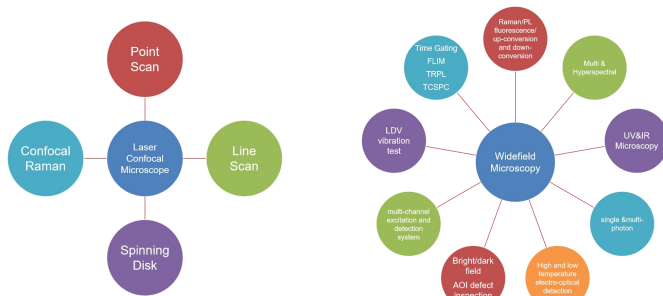
**Mission:** Driven by innovation, we deliver exceptional services and precise products to global photonics users, empowering customer success and advancing industry transformation.



## Optical R&D Laboratory

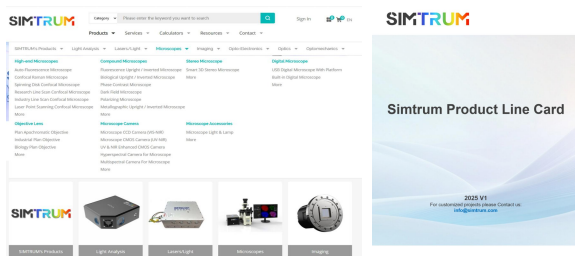
We have established a fully-owned optical laboratory in Guangzhou operating as a subsidiary of Simscop Instruments. This facility specializes in the R&D and manufacturing of high-end microscope systems and critical equipment components.

Our proprietary microscope systems include confocal laser microscopes and wide-field microscopes, along with core components such as detection modules, photomultiplier tubes (PMTs), silicon photomultipliers (SiPMs), multi-channel lasers, and motorized filter wheels. Additional products are currently under development.



Real scene of optical R&D laboratory

## Focus on microscopy and spectroscopy e-commerce platform



E-commerce platform website: [www.simtrum.com](http://www.simtrum.com)

Simtrum is a specialized e-commerce platform dedicated to microscopy and spectroscopy, serving scientific research, industrial, and healthcare fields with high-quality products and aiming to be a trusted partner in the sector.

The platform features seven major product categories: Microscopes, Light Analysis, Lasers/Light sources, Imaging, Opto-Electronics, Optomechanics, and Optic, offering over 4,000 products in total. Each category is equipped with a product line card to facilitate efficient selection.

As a supply chain-integrated systems provider, Simtrum employs a rigorous testing system where every product undergoes professional inspection and performance verification before launch. This ensures reliability and delivers a ready-to-use, worry-free experience for customers.

### Optical Frequency Comb



#### Standardized Repetition Locking Optical Combs

Operating Wavelength (Customizable) 1560 nm  
 Spectral Bandwidth (Customizable) >20 nm  
 Output Power (Customizable) 100 mW



#### Fully Locked Optical Frequency Combs

Operating Wavelength (Customizable) 1560 nm  
 3dB Spectral Bandwidth (Customizable) >30 nm  
 Output Power (Customizable) 30-100 mW



#### Asynchronous Optical Sampling Light Source

Wavelength  $1560 \pm 10$  nm  
 3dB Spectral Bandwidth 20 nm  
 Output Power 50 mW



#### Optical Frequency Comb Accessories

Wavelength  $1560 \pm 10$  nm  
 Input Pulse Repetition Rate 100-250 MHz  
 Input Pulse Energy 2 nJ

### Laser Frequency Locking



#### Saturated Absorption Spectroscopy Frequency Stabilization Module

Frequency Stability < 10MHz(12h)  
 Operating Wavelength Range 400-1600 nm  
 Modulation Frequency 0-100kHz



#### Active Power Stabilization Module (QTM-APS)

Operating Wavelength 780-950 nm  
 Max. Output Efficiency 1.5 dB  
 Power Stability 0.1%@8hrs



#### High-Finesse Cavity for Laser Stabilization

Finesse Option 10k-400k  
 Wavelength 500-3000nm  
 Multiple Wavelength Available  
 Cavity Linewidth < 100kHz  
 Typical Cavity Vacuum Level <  $1E-5$  Pa  
 Temperature Stability < 0.001 C



#### Laser Diode Controller

Temperature Stability < 5mK  
 Locking Period > 1 month  
 Current Range 0-200mA  
 Current Noise < 1uA  
 Pzt Tuning Voltage 0-150V



#### Automatic Laser Locking System

Frequency Stability <  $3.5E-13/1s$   
 Laser Linewidth < 100kHz  
 Operating Wavelength Range Li, Na, K, Rb, Cs, Sr, Yb, ...  
 Auto-relock speed within 10s

### Acousto-Optic Device

### Multi-wavelength/Multi-aperture/ Multi-frequency



**Free Space Acousto-Optic Modulators(AOM)**

Wavelength 266-10640 nm  
Aperture 0.5-8 mm  
Frequency 40-200 MHz



**Fiber Coupled Acousto-Optic Modulators**

Wavelength 780-940 nm  
Loss < 3 dB  
Frequency 40-300 MHz



**Fiber-coupled Acousto-optic Tunable Filter**

Wavelength 800-1700 nm  
Loss < 3 dB  
Frequency 60-100 MHz



**Free Space Acousto-Optic Tunable Filter**

Wavelength 200-4500 nm  
Aperture 3-20 mm  
Frequency 18-135 MHz



**Acousto-Optic Q-switch (AOQ)**

Wavelength 1064-10600 nm  
Aperture 1-11 mm  
Frequency 20-80 MHz



**Acousto-Optic Frequency Shift (AOFS)**

Wavelength 633-1064 nm  
Aperture 1-3 mm  
Frequency 20-115 MHz



**Phase Modulators**

Wavelength 280-960 nm  
Aperture 2-3 mm  
Frequency 25MHz-1 GHz



**Acousto-Optic Deflector (AODF)**

Wavelength 266-1083 nm  
Aperture 1-26 mm  
Frequency 70-230 MHz

### AOM Driver/RF Low-Noise Signal Source



**Flexible Multi-Channel Phase-Coherent Radio Frequency Source WL-FlexDDS**

RF generators 8  
Output frequency (sine wave)  
0.3 MHz-400 MHz  
DDS (direct digital synthesis) 1GSpS



**Flexible Multi-Channel Phase-Coherent Radio Frequency Source WL-FlexDDS-NG**

RF generators 12  
slots(dual RF generator module) 6  
data streaming capability > 30MBytes/s



**Dual-Channel 400 MHz Agile Waveform Generator WL-FlexDDS-NG-DUAL**

sampling rate 1 GS/s  
resolution 14 bit  
frequency range 0.3-400 MHz

### Electro-Optic Modulators/Spatial Light Modulator



**Electro-optical Amplitude Modulator**

Wavelength 780-1550 nm  
Bandwidth 10-40 GHz  
Loss < 5 dB



**Electro-optic Phase Modulator**

Wavelength 780-1550 nm  
Bandwidth 300 MHz - 40 GHz  
Loss < 3 dB



**Phase Spatial Light Modulator**

Wavelength 400 - 1700 nm  
Resolution 1920 × 1080  
Response Time 16-600 ms



**Digital Micromirror SLM**

Wavelength 350-2500 nm  
Resolution 1920 × 1080  
Real-time transmission rate 30-120 Hz

### Laser Modulation Detector: Photodiode



**Silicon photomultiplier (SIPM)(300-950nm)**

Spectral Range 300 - 950 nm  
Dark Voltage 2 mV  
Peak Wavelength 420 nm



**Single Photon Detector (SPD)(200-1700nm)**

Spectral Range 200 - 1700 nm  
Timing Resolution/Jitter < 40 ps  
QE 25% - 35%



**Photomultiplier Tubes (PMT)(160-900nm)**

Spectral Range 160 - 900 nm  
Peak Wavelength 380 - 500nm



**Photodiode Detector (PD)**

Spectral Range 200 nm-12 μm  
Bandwidth 0 -70 GHz



**Pyroelectric Infrared Detectors (2-12μm)**

Spectral Range 2 - 12 μm  
Size/Pixel 1 mm × 1 mm - 3 mm × 3 mm



**Single-Photon Avalanche Diode Array**

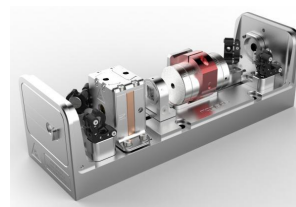
Array configuration 512 × 512  
Spectral Range 400 - 900 nm

## Quantum Cascade Lasers (MIR)



### MIR Multi-Channel Widely Tunable External Cavity QCL-Glider

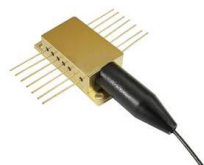
Spectral Linewidth 1-2  $\text{cm}^{-1}$   
 Tuning Range 50-300  $\text{cm}^{-1}$   
 Grating Period 100-450 gr/mm



### Tapered Amplifier

Operating Wavelength (Customizable) 630-671nm  
 Tuning Range 1 nm  
 Output Power 250-4000 mW

## CW Narrow Linewidth Laser and Low Noise Amplifiers



### Narrow Linewidth Package Modules (532-1064 nm)

Wavelength 532-1064 nm  
 Output Power 100-800 mW (Multimode)



### Narrow Linewidth Laser Diodes (1530-1625nm)

Center Wavelength C/L-band (1525-1625 nm)  
 Output Power 10-20 mW  
 Linewidth ~ 1kHz



### 1/1.5 $\mu\text{m}$ High Power Narrow Linewidth Fiber Lasers

Center Wavelength 1020-1080nm  
 Output Power 10-40 W  
 Linewidth 20 kHz



### Erbium Doped Fiber Amplifier

Wavelength 1530-1565 nm  
 Output Power 13-45 dBm



### Ytterbium Doped Fiber Amplifier

Wavelength 1030-1100 nm  
 Output Power 17-40 dBm



### Thulium-Doped Fiber Amplifier

Wavelength 1920-2020 nm  
 Output Power 20-30 dBm



### High Power SOA Butterfly Devices (1060-1560 nm)

Wavelength 1060-1650 nm  
 Output Power 8-25 dBm



### Fiber Raman Amplifier

Wavelength 1425-1465 nm / 1528-1565 nm  
 Raman Gain 10/20 dB



### Narrow Linewidth, High Power Laser

Wavelength 177 - 5000 nm  
 Linewidth < 10kHz  
 Typical Power > 1W (max 200W)

## CW Multiple Wavelength Laser



**Multichannel CW Multimode Lasers**

Wavelength 405/450/488/520/532/561/  
589/637/685/755/780/....  
Output Power > 500mW  
Power Adjust Accuracy 1%  
Software and Manual Control  
Analog and Digital Modulation Available  
Stability < 1/2/3% Available



**Multichannel CW Single-mode Lasers**

Wavelength 405/450/488/520/532/561/  
589/637/685/755/780/....  
Output Power > 20/50mW  
Power Adjust Accuracy 1% (continuous adjust available)  
Software and Manual Control  
Analog and Digital Modulation Available  
Stability < 1/2/3% Available

## Broadband and Tunable Laser



**External-Cavity Diode Laser**

Wavelength 394-2000nm  
Output Power (depend on wavelength)  
Linewidth < 100kHz  
Continuous Tuning Range > 20GHz  
Isolator, TEC, LDC, and Fiberization are Available



**C/L-band Tunable Laser**

Wavelength 1529-1567nm and 1554-1607nm  
Output Power upto 300mW  
Up to 64/96/128 Channels ITU-T  
Continuous Tuning Range > 20GHz



**Supercontinuum Fiber Laser**

Wavelength 375-2400nm  
Power > 3W  
Fiber Coupled Output



**ASE Light Source**

Wavelength 973-1940nm  
Output Power 10-400mW  
Dual-band Supercontinuum Available

### Light Analysis



**Linewidth Analyzer**

Wavelength 450 - 1625 nm  
Effective linewidth range 1 kHz - 100 MHz



**Wavemeters**

Wavelength 380 nm - 2600 nm  
Measurement Speed 76 kHz  
Absolute Accuracy 200 MHz



**Fiber Spectrometers (200nm-5um)**

Wavelength 200 nm - 5 um  
Detector Model Hamamatsu  
Resolution < 1nm



**VIS-NIR Beam Profiler(350-1750nm)**

Wavelength 350 - 1750 nm  
Resolution 4096\*3072  
Sensor pixel size 3.45 - 17 um



**Scientific VIS-NIR CMOS Camera**

Wavelength 200 nm – 1100nm, 900-2200nm  
Resolution 640x512, ..., 2048x2048  
QE typical 95%



**VIS CCD Camera**

Wavelength 160 nm – 1100nm  
Resolution 1024x1024, 2048x2048, 4096x4096  
Applicable for Spectroscopy and Imaging

### Optical System – Vacuum System



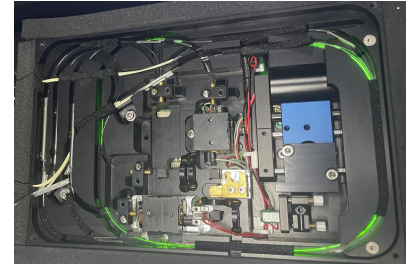
**Ultra-high Vacuum Atomic Glass Cell**

Vacuum < 1E-8 Torr  
Non-magnetic Mounting  
All-glass Construction (no epoxy/frits)



**Vacuum Chamber**

With Ion Pump and Differential Pumping Tube



**Compact Laser System**

Compact Quantum Optics  
Compact Bioimaging Optics  
Compact Material Science Optics  
Compact Ultrafast Spectroscopy Optics  
You sketch it, we make it!

### Fiber Optics



**Pump Combiner/MFA/CPS**

Pump Wavelength 800 - 1000 nm  
Signal Wavelength 1030 - 1080/1450 - 1600 nm



**Filter Coupler**

Center Wavelength 780 - 1550 nm  
Optical Power 500mW - 20 W



**532nm/633nm In-line Isolator**

Wavelength 532/633 nm  
Isolation 28-45 dB  
Insertion Loss 1.8-3.2 dB



**532nm/633nm Polarization Beam Splitter/Combiner**

Wavelength 532/633 nm  
Insertion Loss 1.5-1.8 dB  
Return Loss 50 dB

### Optical Components

*Custom Multi-Wavelength, Multi-Layer Coating - Low Volume*



**Spatial Optical Isolator**



**Waveplates**

Wavelength 355 - 10640 nm



**Dichroic Mirror**

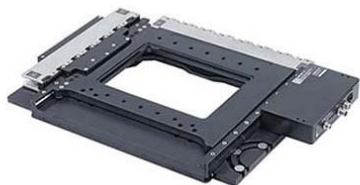
Thickness 3.5 mm  
Diameter 25.4 mm



**Filters**

Wavelength 200 - 3000 nm  
Transmittance 93% - 99%

## Optomechanics



### Motor Stages

Built-in Controller  
Minimum Incremental Move 50 nm  
Accuracy 5  $\mu$ m



### Galvo Mirror Systems

Max Beam Diameter 5 mm  
2-Axis System Beam Offset 10 mm



### Motorized Mirror Mount

Piezoelectric Linear Stroke  
0.7  $\mu$ m@150V  
For Rapid-Stepping Phase-Shifting  
Applications



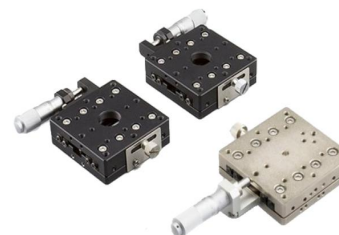
### Rotation Stages

Rotation Angle 3 mrad



### Motorized Precision Rotation Mount

Bidirectional Repeatability  $\pm 0.1^\circ$   
Backlash  $\pm 0.3^\circ$   
Max Rotation Velocity 25 deg/s



### 13mm Linear Stages

Minimum reading 10  $\mu$ m  
Drive Direction Center/Right  
Platform dimensions 40  $\times$  40  
mm