



Company Introduction

2021

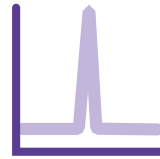
- UniKLasers is based near Edinburgh, Scotland in the UK
- Currently over 20 staff on-site:
 - Laser Development
 - Manufacturing
 - Engineering and Service
 - Software
 - Procurement
 - Marketing
 - Sales



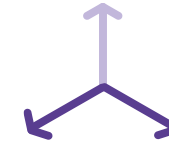
Leading-edge photonics company, specialising in the development and production of CW single frequency DPSS lasers.



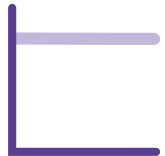
Patented BRaMMS
Technology[®]
platform



Narrow linewidths down
to < 300 kHz at high
output power



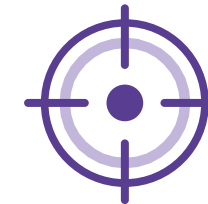
Industry-leading
performance from
a small footprint



Output power
stability within 2%
over 8 hours ± 1.5 °C



Virtually imperceptible
power noise < 0.1% RMS
(10 Hz – 10 MHz)



< 1 picometer of
spectral drift over 8
hours ± 1.5 °C

- Founded in 2013 by Professor Fedor Karpushko
 - Previously Deputy Director for the Academy of Science in Belarus, as well as a leader in numerous laser research departments in both academia and industry.
- Professor Karpushko is cited on over 40 laser patents, including UniKLasers BRaMMS Technology[®]
- Over 150 publications on laser physics, non-linear optics and optical processing
- DPSS CW Laser Systems, using BRaMMS technology to achieve high power output at very low bandwidth



*Professor Karpushko with Professor Prokhorov
and Professor Stepanov*

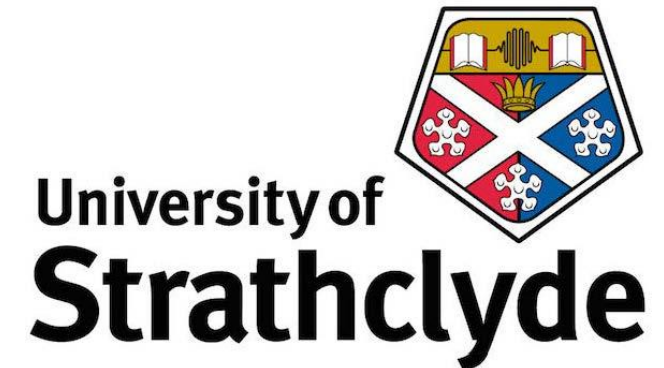


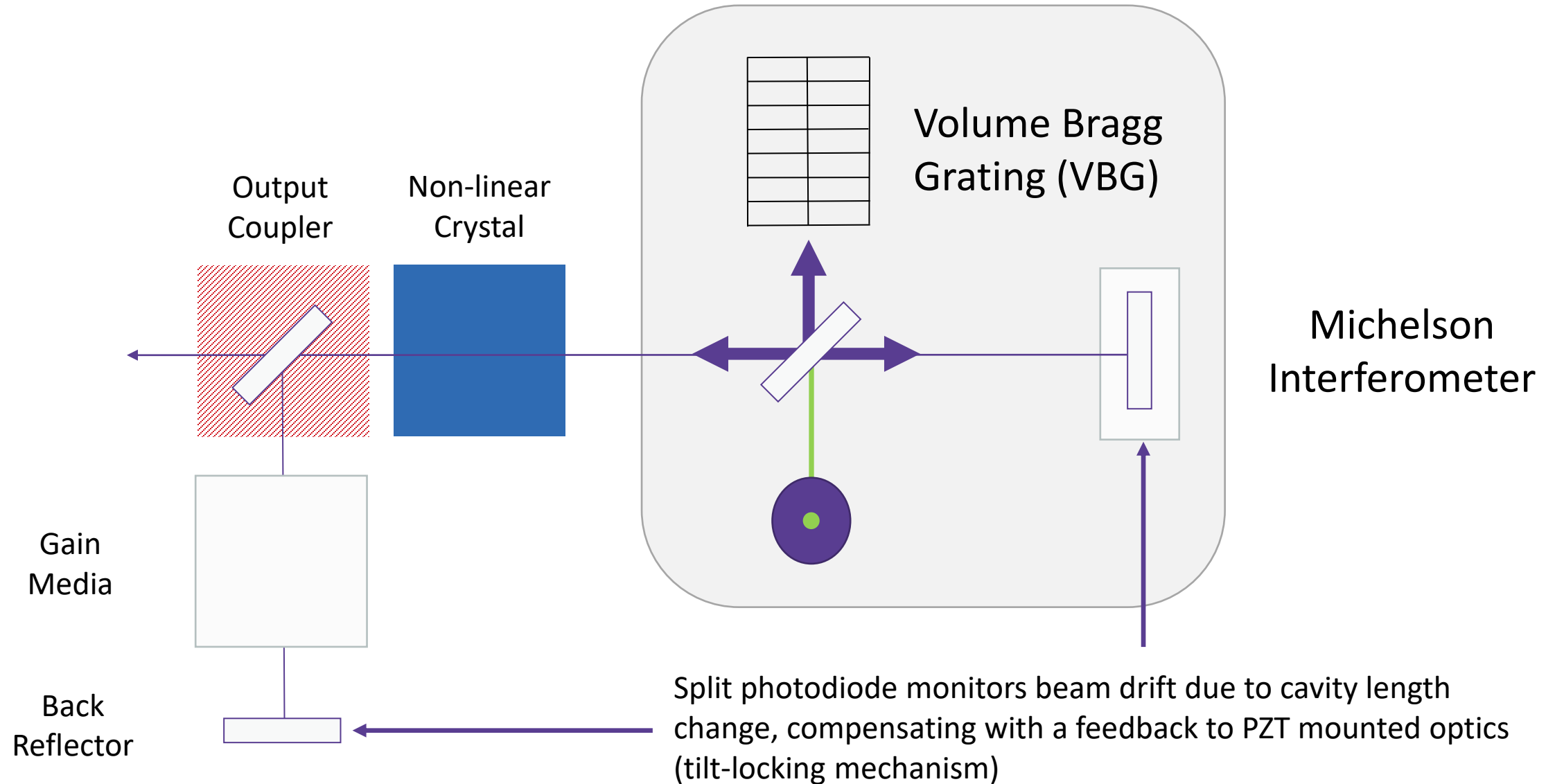


UNIVERSITY OF
BIRMINGHAM

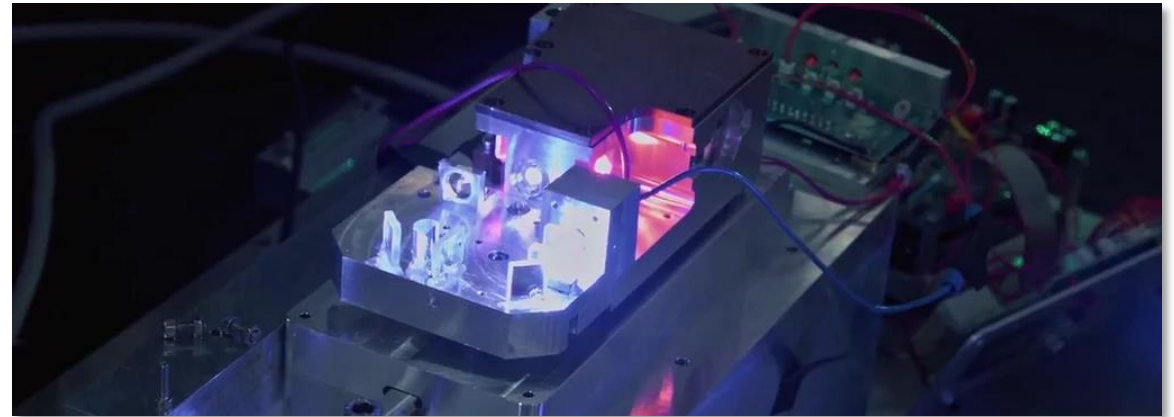


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Southampton





- Unique method of single frequency generation
 - High efficiency
 - High power
 - Compact design
 - Ultra-narrow linewidths
- High stability
 - No mode hopping
 - High wavelength stability
 - Long coherence lengths
- High robustness
 - Able to use different gain media to create fundamental wavelength outputs (more efficient than SHG) e.g. 523 versus 532 nm.





Product Range

2021

Power Specifications	
High Output Power	Up to 2 W
High Power Stability	< 2% over 8 hrs
Low Noise	< 0.1% RMS
Spectral Specifications	
Narrow Linewidth	< 500 kHz
High Spectral Stability	± 1 pm over 8 hrs
High Coherence Length	> 100 m
Beam Specifications	
Small Beam Diameter	0.8 – 1.2 mm
Low Beam Divergence	< 1 mrad *diff ltd
High Pointing Stability	< 5 μ rad/°C



Flow Cytometry

Raman

Brillouin

Interferometry

Optical Manipulation

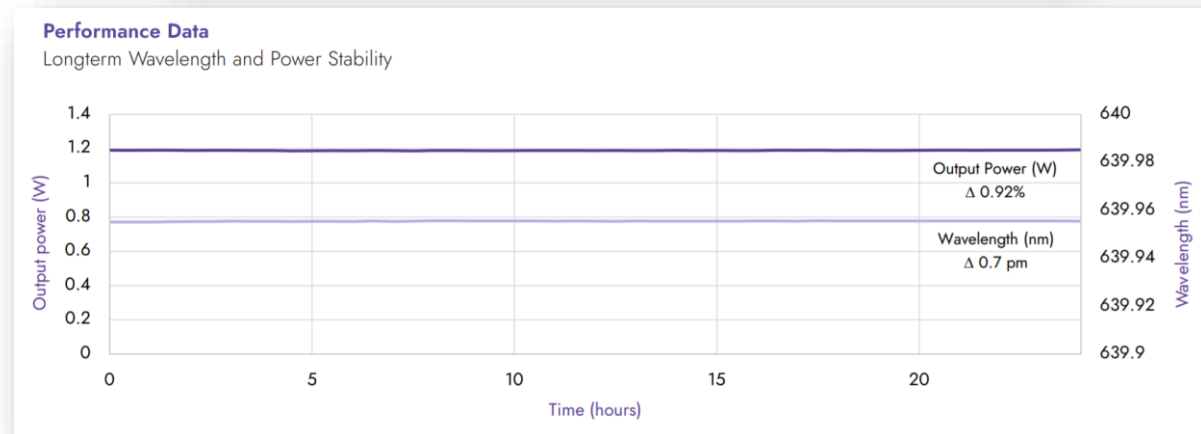
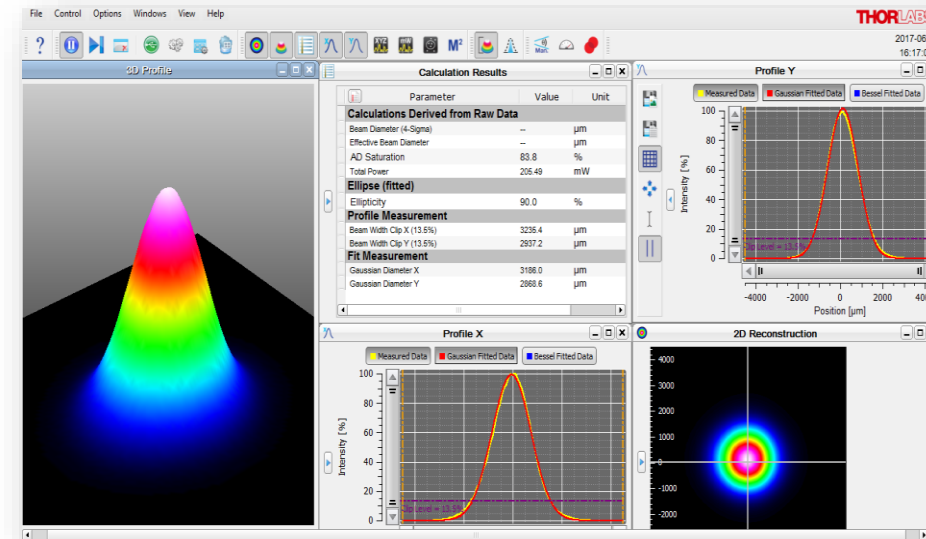
Heterodyning

Microscopy

Power Specifications	
High Output Power	Up to 1 W
High Power Stability	< 2% over 8 hrs
Low Noise	< 0.1% RMS

Spectral Specifications	
Narrow Linewidth	< 500 kHz
High Spectral Stability	± 1 pm over 8 hrs
High Coherence Length	> 100 m

Beam Specifications	
Small Beam Diameter	0.8 – 1.2 mm
Low Beam Divergence	< 1 mrad *diff ltd
High Pointing Stability	< 5 μ rad/ $^{\circ}$ C

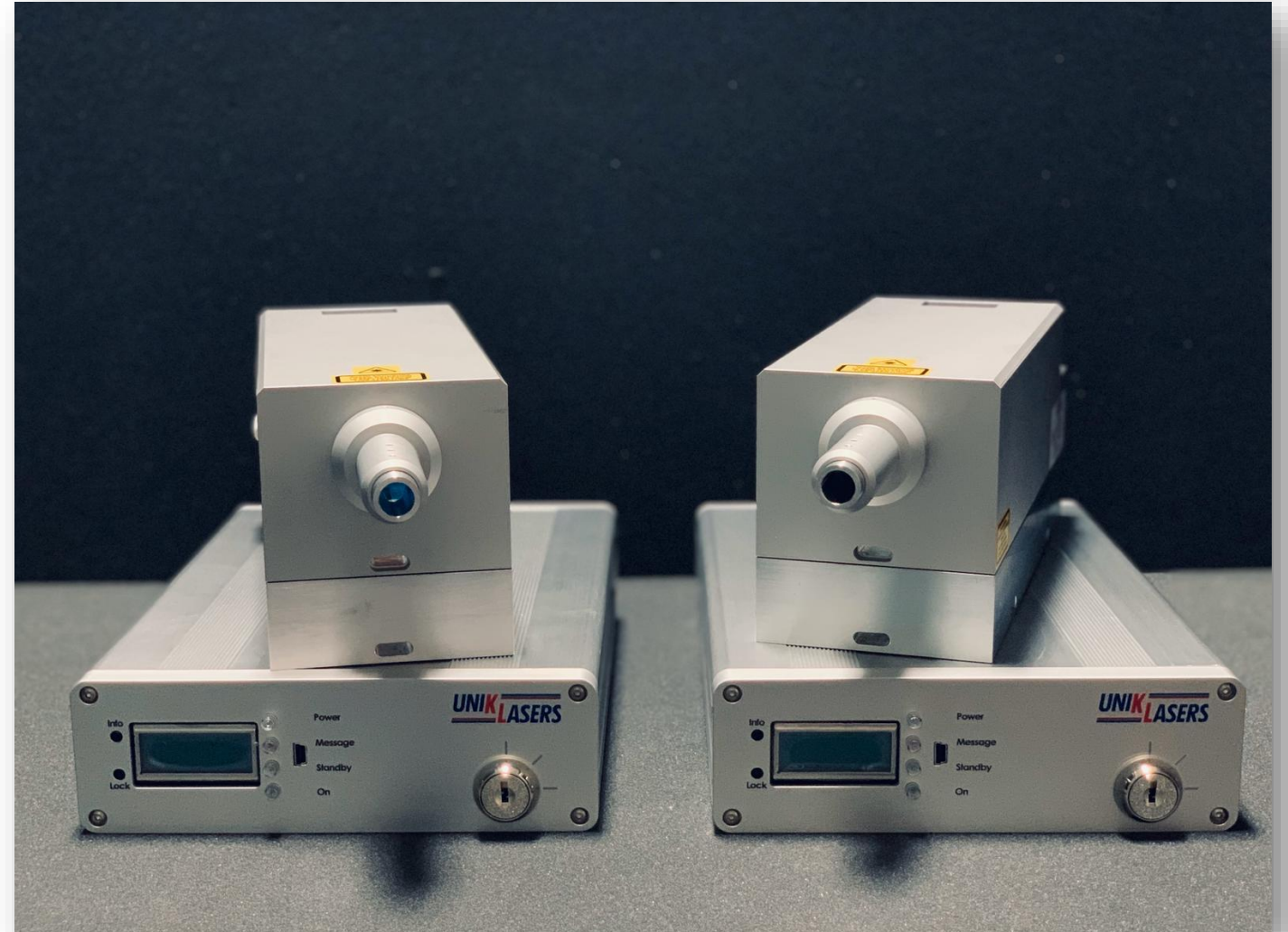


Holography Raman Brillouin Interferometry Photoluminescence Microscopy

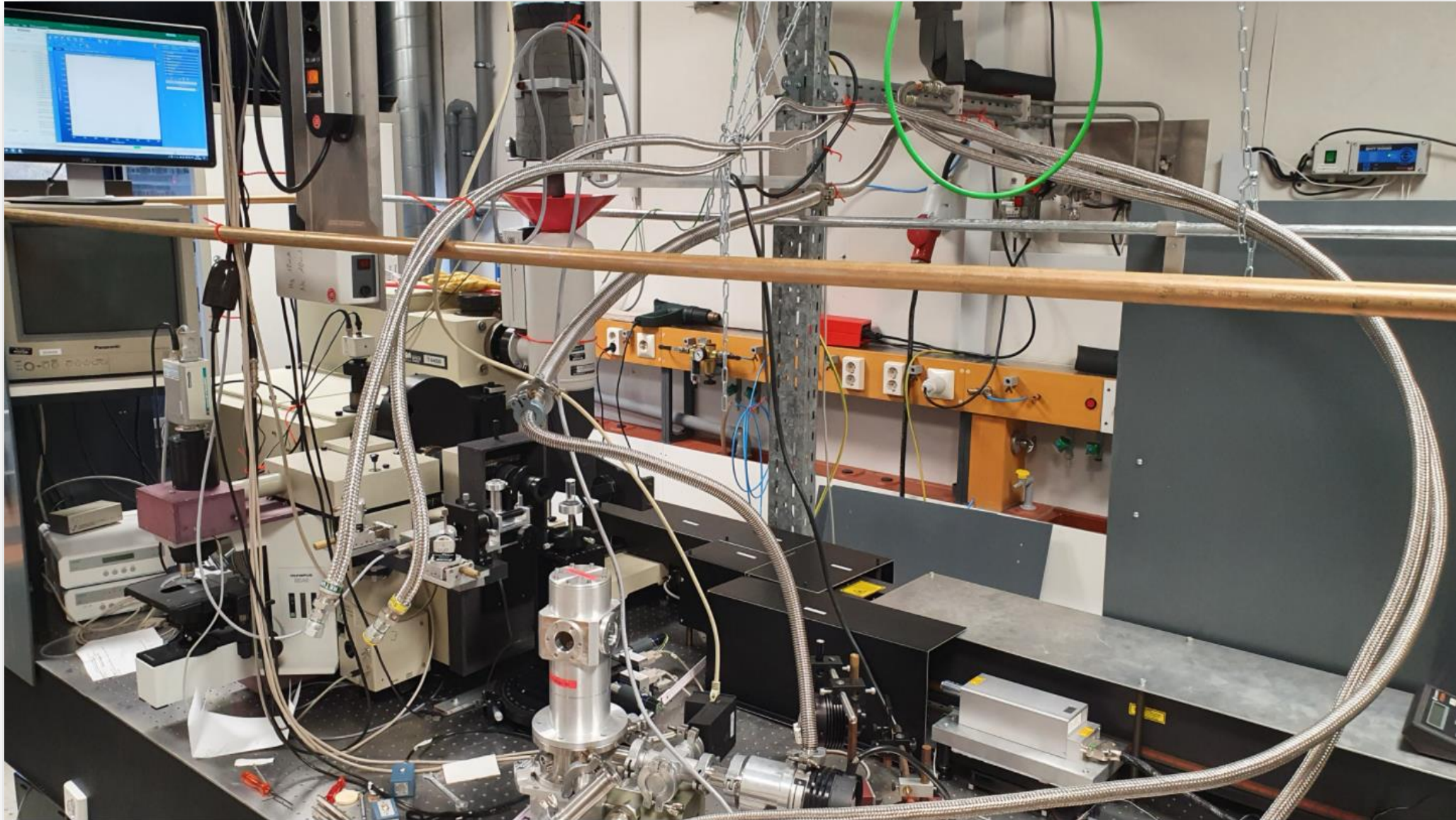
Power Specifications	
High Output Power	Up to 1 W
High Power Stability	< 2% over 8 hrs
Low Noise	< 0.1% RMS

Spectral Specifications	
Narrow Linewidth	< 500 kHz
High Spectral Stability	± 1 pm over 8 hrs
High Coherence Length	> 100 m

Beam Specifications	
Small Beam Diameter	0.7 – 1.2 mm
Low Beam Divergence	< 1 mrad *diff ltd
High Pointing Stability	< 5 μ rad/°C



Holography Raman Brillouin Interferometry Photoluminescence Microscopy



UniKLasers supplies ultra-narrow linewidth lasers (< 300 kHz) from our QT series to our partners in quantum sensing, metrology and other technologies at the specific wavelengths related to the exact atomic transitions they wish to target.

Our QT laser series includes:

- Solo 813.42 QT and Solo 780.24 QT for **Rubidium**
- Solo 698.4 QT and Solo 689.4 QT for **Strontium**

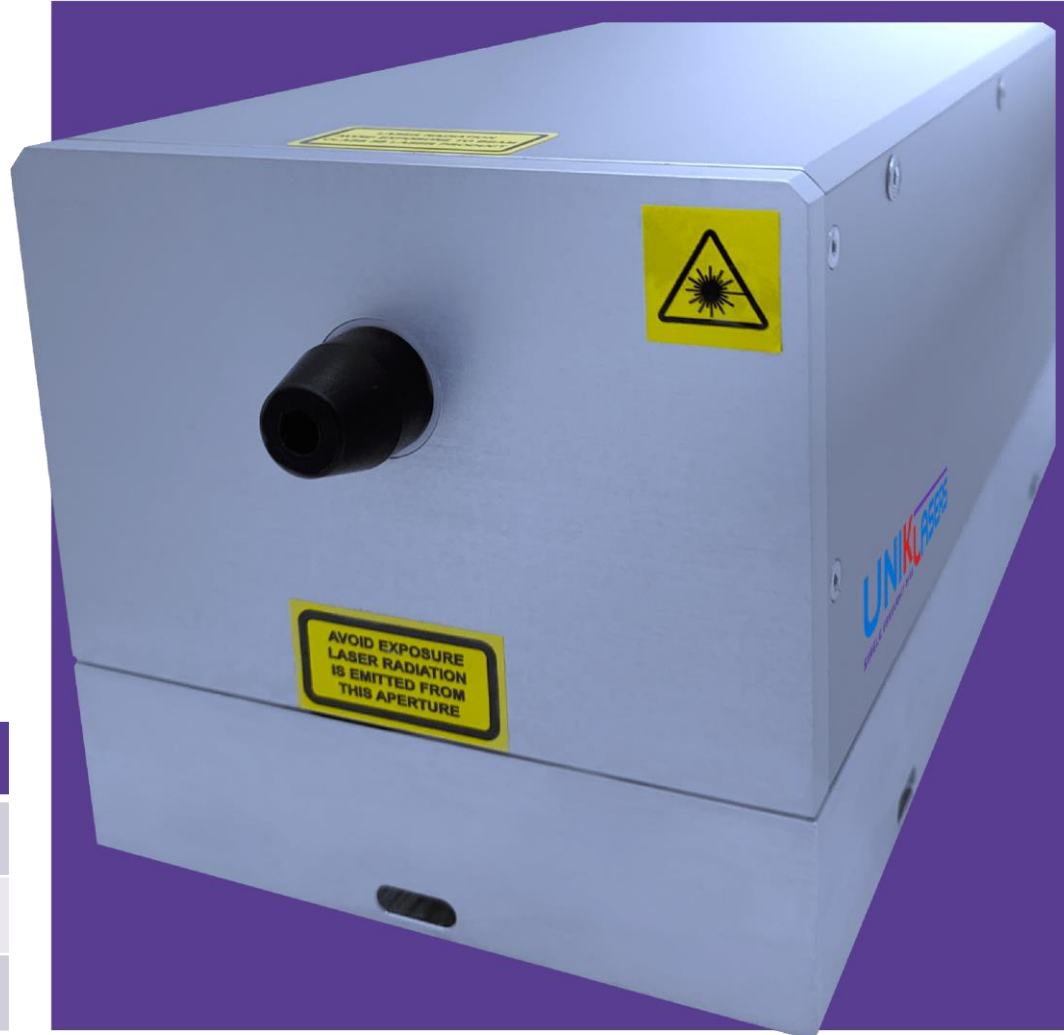


Developed and funded by National Research Projects, including '**QT Assemble**' – a project led by Fraunhofer's Centre for Applied Photonics (CAP), to make quantum technology easier to adopt by addressing the challenges of size, weight, power and reliability of systems.

Power Specifications	
High Output Power	50 mW
High Power Stability	< 2% over 8 hrs
Low Noise	< 0.1% RMS

Spectral Specifications	
Narrow Linewidth	< 500 kHz
High Power Stability	±1 pm over 8 hrs
High Coherence Length	> 100 m

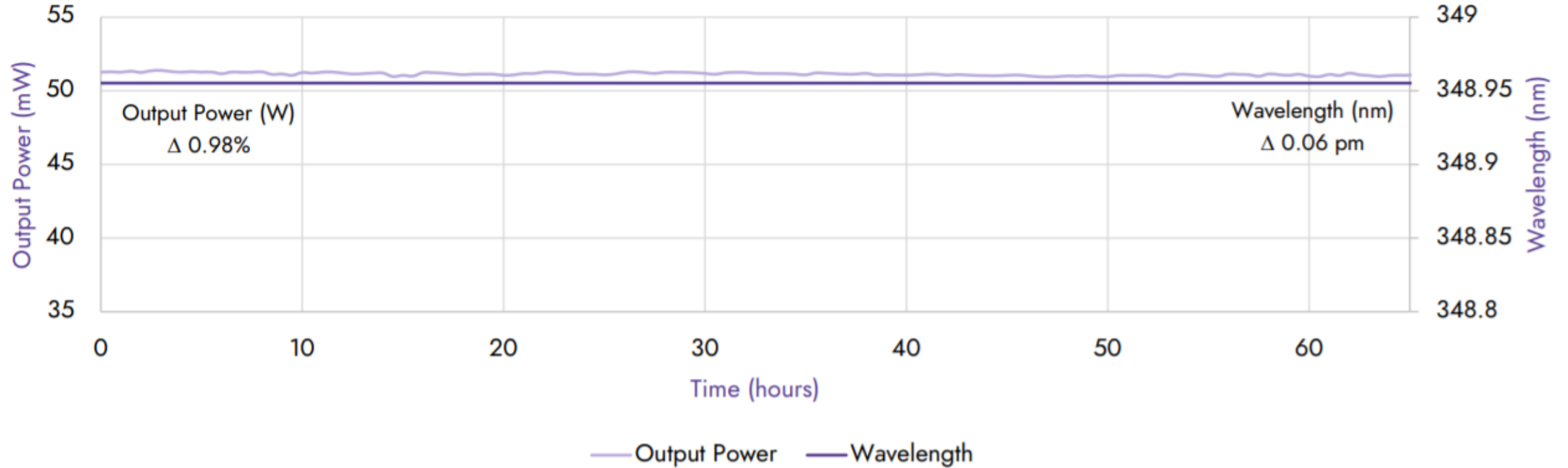
Beam Specifications	
Small Beam Diameter	0.8 – 1.2 mm
Low Beam Divergence	< 2 mrad *diff ltd
High Pointing Stability	< 5 µrad/°C



Biomedical
Flow Cytometry
Diffraction Gratings
Lithography
Semiconductors
Wafer Inspection
Photoluminescence
Raman

Performance Data

Longterm Wavelength and Power Stability





Designed for
Integration

Small Footprint ($\sim 0.2 \times 0.1$ m)

USB Connectivity

Software Controlled

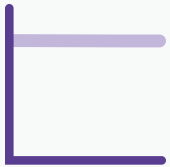
Remote Diagnostics



High Spectral Stability
 ± 1.0 pm

Ease of Data Analysis

High Repeatability



High Power Stability
 ≤ 2.0 %

Long Operational Lifetime



Narrow Linewidth
 ≤ 0.5 MHz

High Selectivity

Long Coherence Lengths



Many Thanks for your attention! Questions?

Johnny Bray

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