

# LASERS



## Tech Pulse



September 2020

Lasers Tech Pulse is a special edition newsletter from Photonics Media and Bristol Instruments covering key developments in laser technology. Manage your Photonics Media membership at [Photonics.com/subscribe](https://www.photonics.com/subscribe).

sponsor

**Laser Wavelength Measurement and Spectral Analysis**

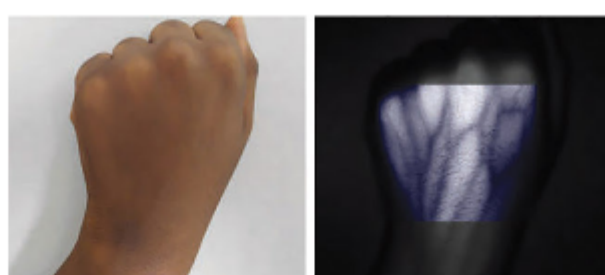
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### Filtering Visible Light According to Wavelength and Bandwidth

Some supercontinuum lasers have an output power in the range of tens of watts with a wavelength range that covers the entire UV-VIS range and a portion of the NIR region. With these performance specifications, the combination of a tunable filter and a broadband light source is more efficient than multiple discrete light sources.



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### Promoted Content: Bristol Instruments Inc.

#### High-Speed Laser Wavelength Meter

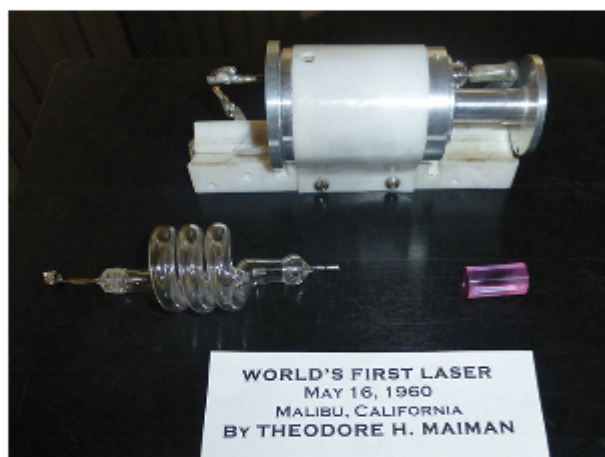
The 871 Laser Wavelength Meter measures laser wavelength at a sustained rate of 1 kHz, enabling the wavelength characterization of every single pulse for most lasers. The combination of proven Fizeau etalon technology and automatic calibration with a built-in wavelength standard ensures the uncompromised accuracy needed for the most meaningful experimental results. Operation is available from 375 nm to 2.5 μm.



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### The Laser Turns 60

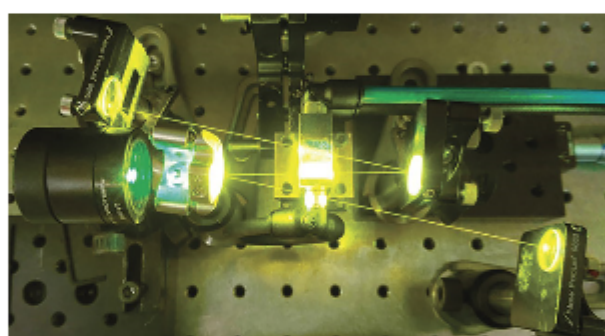
Six decades ago, in a windowless lab on a hilltop above the Pacific Ocean, Theodore (Ted) Maiman — assisted by Irnee D'Haenens — tested a palm-size device that would upend the scientific establishment. Working at Hughes Research Lab (now HRL Laboratories and formerly the research arm of Hughes Aircraft Co.) in Malibu, Calif., Maiman had built the prototype in less than nine months with a paltry budget of \$50,000. It was a fraction of what his competitors working on well-funded projects worldwide at powerhouse facilities had to accomplish the same task, which was to build the world's first laser.



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### Diamond Raman Lasers Offer Multifaceted Potential

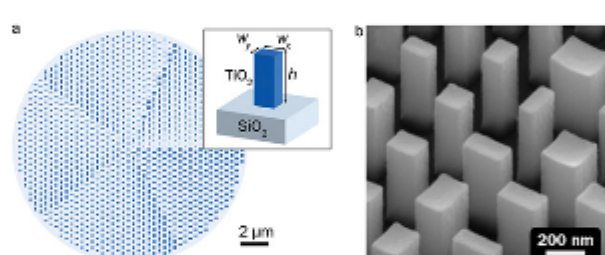
The development of optical gain media has become a critical area of study for many science and engineering fields. While traditional approaches have generated coherent light by incurring a population inversion within the lasing media, more creative methods, such as Raman lasing, have since emerged to permit the tuning of laser light, specifically at high power densities.



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### Supertwisted Light from a Metasurface Laser

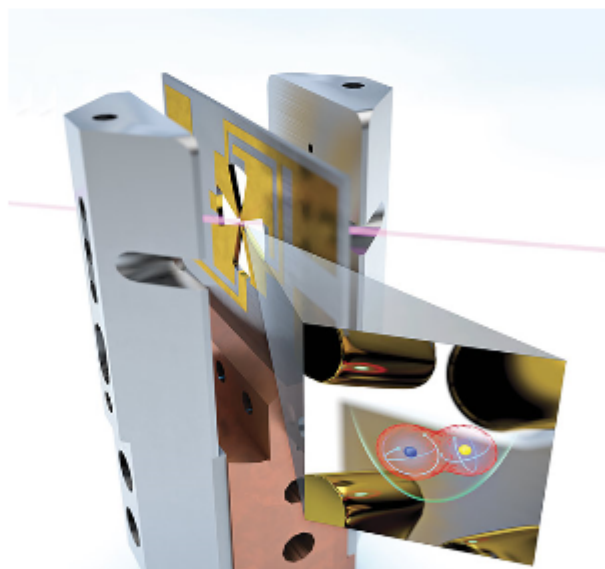
Structured light refers to the tailoring or shaping of light in all its degrees of freedom. The recent development of structured light supports applications such as optical communications, enhanced resolution in imaging, and optical trapping and tweezing. Chiral light is foremost among the family of structured light fields that carries spin angular momentum ( $\pm\hbar$ ; per photon, depending on the handedness) and orbital angular momentum.



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### Tiny Quantum Effects Promise Big Impact on Future Instruments

While the quantum world may seem abstract and remote from day-to-day life, researchers are discovering that quantum effects such as photon entanglement could improve the performance and precision of everyday tools. Advancements in quantum metrology could help sharpen sensor location data, improve the precision of atomic clocks, or enable more versatile detectors for sensing greenhouse gas emissions.



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### A Laser Points Toward Disease Diagnosis

A critical starting point in reducing the incidence of chronic disease involves detecting, locating, and accurately evaluating disease in its initial stages. One important step in tackling these challenges will be developing light-based technologies such as near-infrared (NIR) and mid-infrared (MIR) spectroscopy.



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### Laser Direct IR Imaging Projects Microplastics Analysis

Contamination of soil, air, and drinking water by microplastics is a growing focus of attention around the world. Environmental agencies are increasing the monitoring of waterways, and governmental bodies are seeking to protect these resources. Simultaneously, research institutions are trying to determine the extent and potential toxicological impacts of microplastic contamination. Optical technologies are playing a vital role in these studies.



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