



## WEBINARS

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# Industry Innovations in Fiber-Based Frequency Combs: Ultrabroadband Comb with Sub-3-kHz Free-Running Linewidths

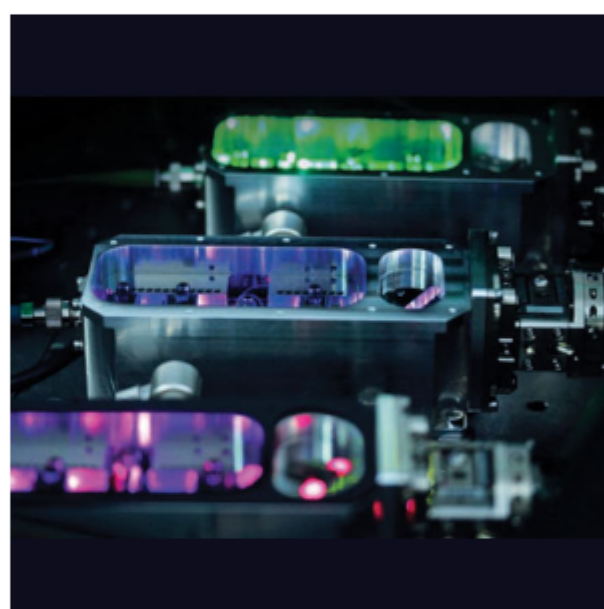
**Tuesday, August 27, 2024 1:00 PM - 2:00 PM EDT**

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Femtosecond frequency combs represent unparalleled measurement tools with diverse applications in spectroscopy, metrology, and quantum physics. This discussion delves into the critical aspects of maximizing the passive stability of these instruments to unlock their full potential in fundamental science and high-tech industries. By studying the noise properties of fiber-based frequency combs across varying intracavity dispersion, pump power, and repetition rate parameters, researchers have notably identified distinct minima where the free-running linewidth of the carrier-envelope offset (CEO) frequency ( $f_{CEO}$ ) drops below 1 kHz. A comprehensive analysis of individual comb lines across a broad spectral range unveils the specific contributions to phase noise and their interplay. Leveraging these insights, this presentation showcases the development of frequency combs with sharp teeth at designated positions throughout the spectrum from  $f_{CEO}$  to 300 THz. These compact systems offer ultrabroadband stability, presenting a new standard for front-end measurement, such as integrated quantum clock experiments based on Strontium atoms. Sponsored by [Toptica Photonics](#).



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