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Microresonator Optical Frequency Combs

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The invention of optical-frequency combs has transformed the fields of precision metrology, spectroscopy, and electronic/photonic signal generation. Now, a new and incredibly promising platform for frequency combs has emerged—one in which phase coherent combs are generated in nanofabricated ring resonators using quantum nonlinear photonics. I will present the principles behind microresonator combs, their recent implementation in integrated-photonics optical synthesizers and optical clocks, and a new experiment using laser cooling to control the particle-like properties of the comb light itself.