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CALTECH

ASTRONOMICAL SPECTROGRAPHS ON A CHIP - GETTING READY FOR THE NEXT-GENERATION TELESCOPES

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Astrophotonics is the application of versatile photonic technologies to channel, manipulate, and disperse guided light from one or more telescopes to achieve scientific objectives in astronomy in an efficient and cost-effective way. The photonic platform of guided light in fibers and waveguides has opened the doors to next-generation instrumentation for both ground- and space-based telescopes in optical and near/mid-IR bands, particularly for the large and extremely large telescopes (ELTs). Utilizing the photonic advantage for astronomical spectroscopy is a promising approach to miniaturize the next generation of spectrometers for large ground- and space-based telescopes. In this talk, I will discuss some of the recent results from our efforts to design and fabricate high-throughput on-chip spectrometers based on Arrayed Waveguide Gratings (AWG). These devices are ideally suited for capturing the AO-corrected light and enabling new and exciting science, such as large-scale near-IR galaxy surveys to map the cosmic filaments or characterizing exoplanet atmospheres. I will also discuss specific approaches to make this technology science-ready for the ELT era.