

## In-plane anisotropic and ultra-low-loss polaritons in a natural van der Waals crystal

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Polaritons -hybrid light-matter excitations- play a crucial role in fundamental and applied sciences, as they enable nanoscale control of light. Polaritons with anisotropic propagation along the surface of vdW materials have been predicted, caused by in-plane anisotropic structural and electronic properties. Here we report anisotropic polariton propagation along the surface of  $\alpha$ -MoO<sub>3</sub>, a natural vdW material using infrared nano-imaging and nano-spectroscopy techniques. In-plane anisotropic polaritons could enable directional and strong light-matter interactions, in applications such as bio-sensing, among others.