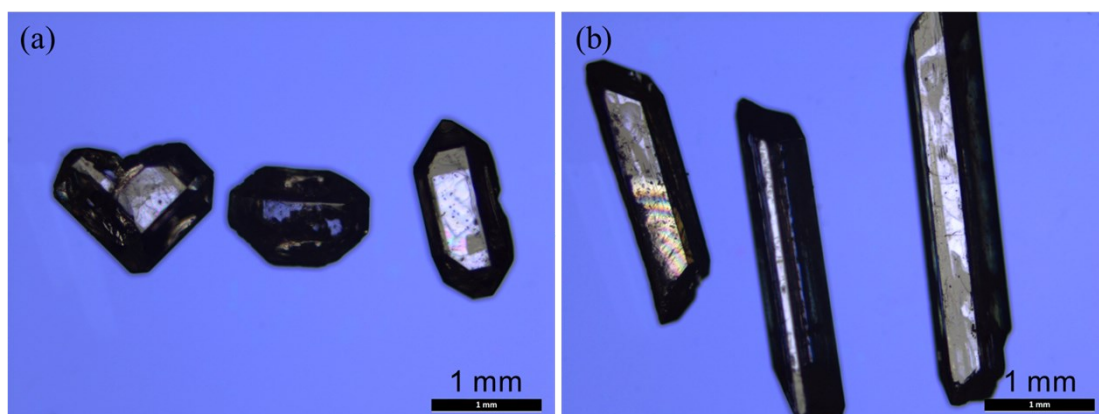


Electronic Supplementary Information ESI for:

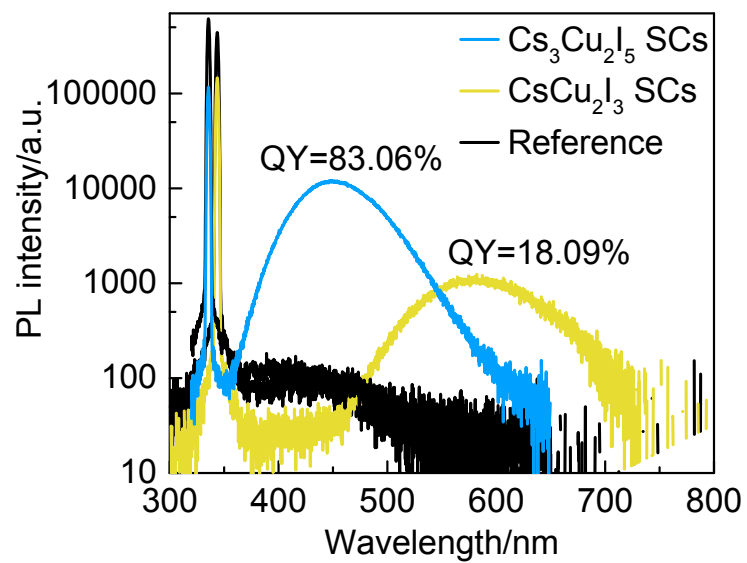
## **Multiphoton Absorption in Low-Dimensional Cesium Copper Iodide Single Crystals**

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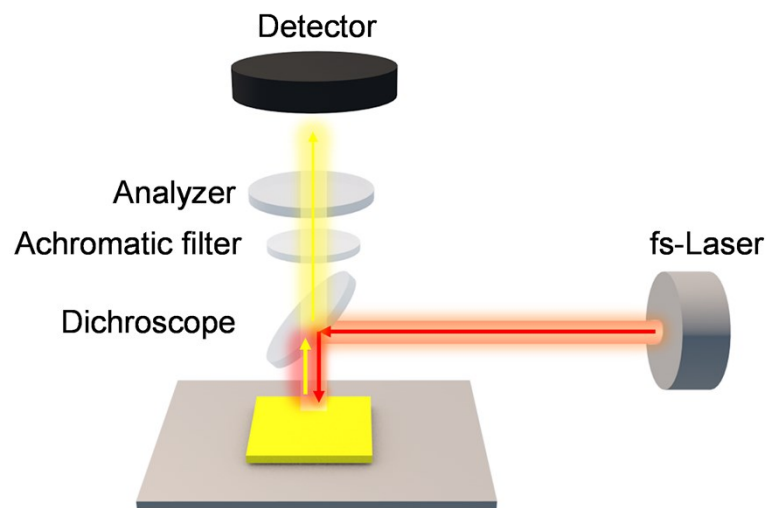
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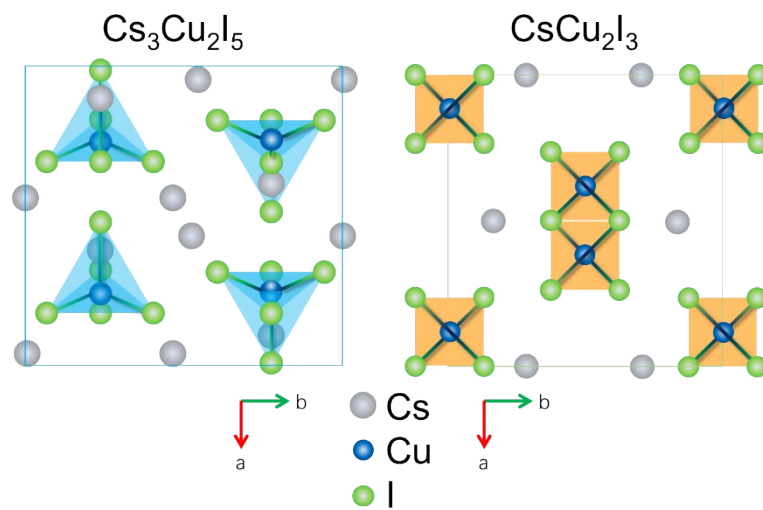
**Fig. S1** Optical microscopy images of a)  $\text{Cs}_3\text{Cu}_2\text{I}_5$  and b)  $\text{CsCu}_2\text{I}_3$  millimeter-level SCs.



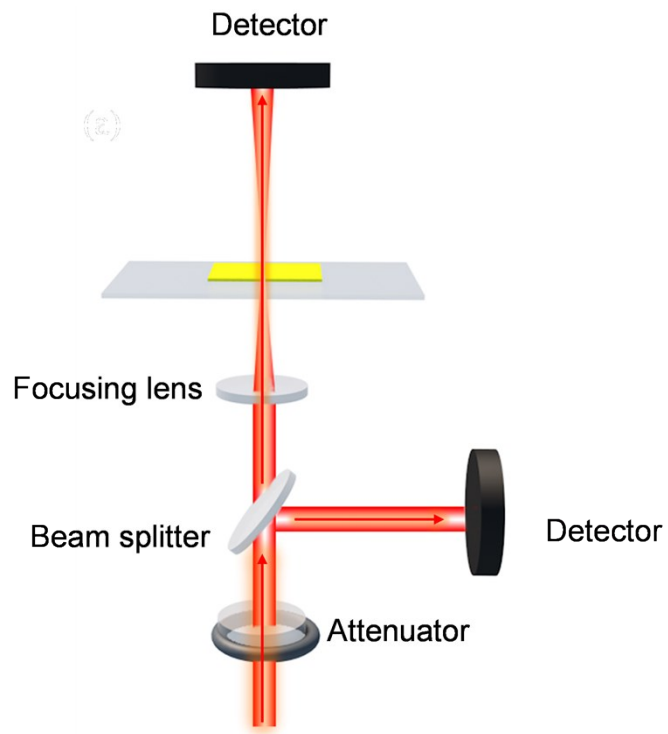
**Fig. S2** Absolute PLQY measurements of the  $\text{Cs}_3\text{Cu}_2\text{I}_5$  and  $\text{CsCu}_2\text{I}_3$  SCs.



**Fig. S3** The measurement configuration for two- and three-photon excited PL spectra.



**Fig. S4** Top view of the crystal structures of the  $\text{Cs}_3\text{Cu}_2\text{I}_5$  and  $\text{CsCu}_2\text{I}_3$  SCs.



**Fig. S5** The schematic diagram for our home-built micro-area nonlinear optical characterization system.