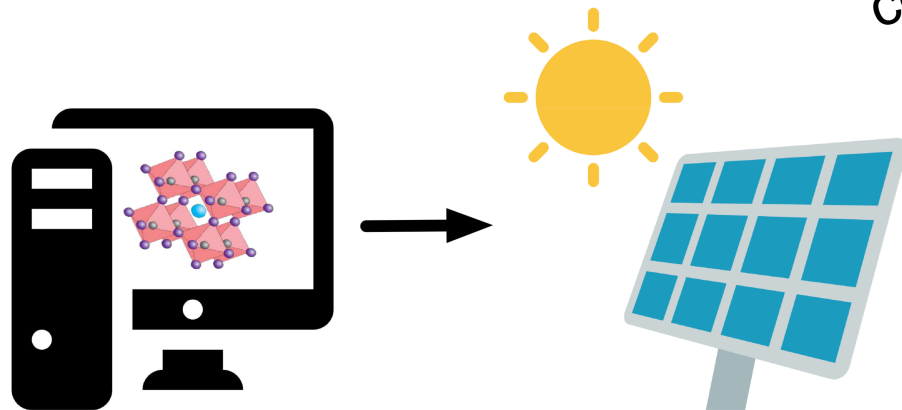
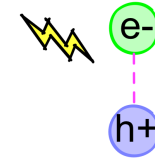


# Lucy Whalley

## Materials Design Group



Steps for  
efficient light-  
to-electricity  
conversion

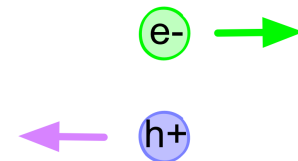


**1. Charge carrier generation**



**2. Charge carrier separation**

**electron  
mobility in  
hybrid halide  
perovskites**

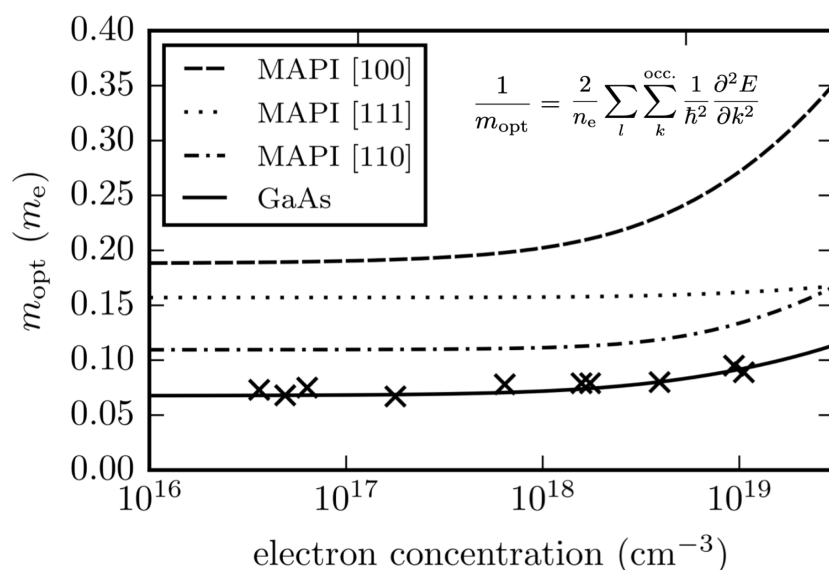


**3. Charge carrier transport**

# Lucy Whalley

## Materials Design Group

**intrinsic limitation:** *effective mass*



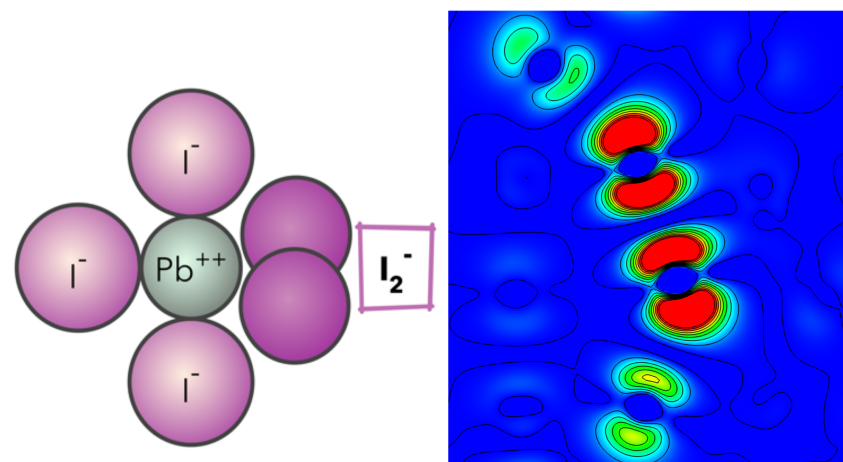
At a carrier concentration of  $10^{20} \text{ cm}^{-3}$  the effective mass has doubled

Physical Review B **99** (8), 085207

electron transport in  
hybrid halide  
perovskites



**extrinsic limitation:** *point defects*



After hole capture the iodine interstitial forms a  $\text{I}_2^-$  dimer with a self-trapped hole

ACS Energy Lett. **2** (12), 2713-2714

