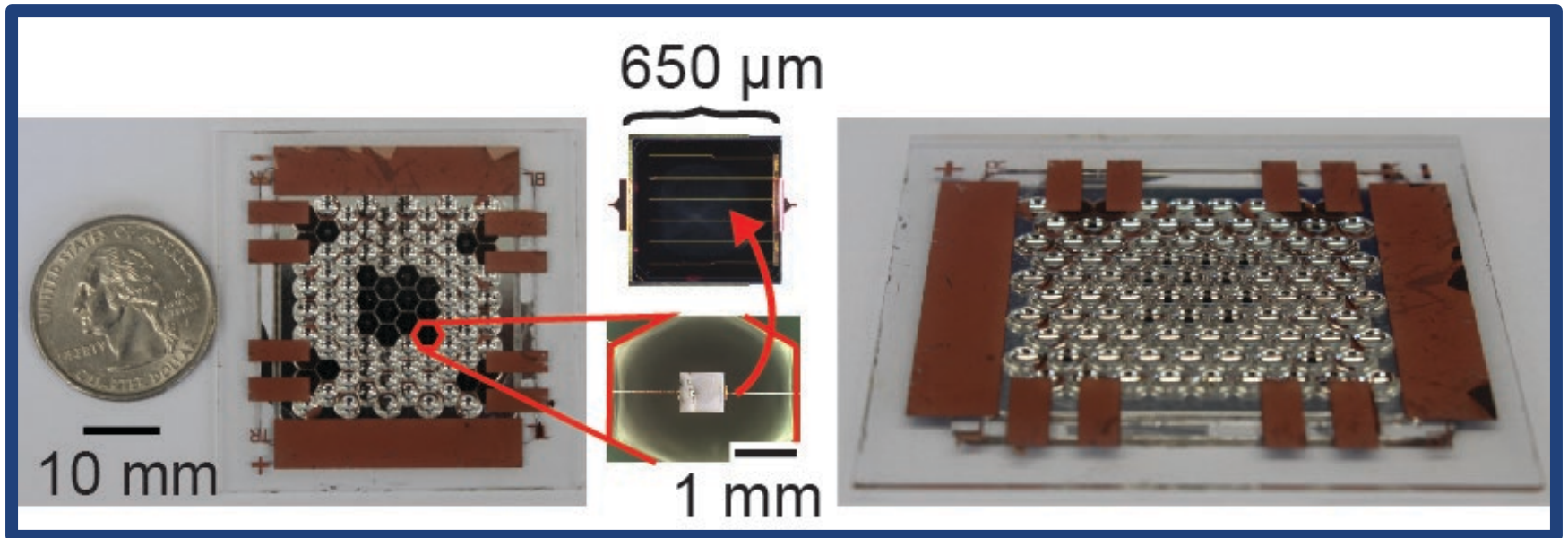


Ultra-Compact Microcell Concentrators for Space

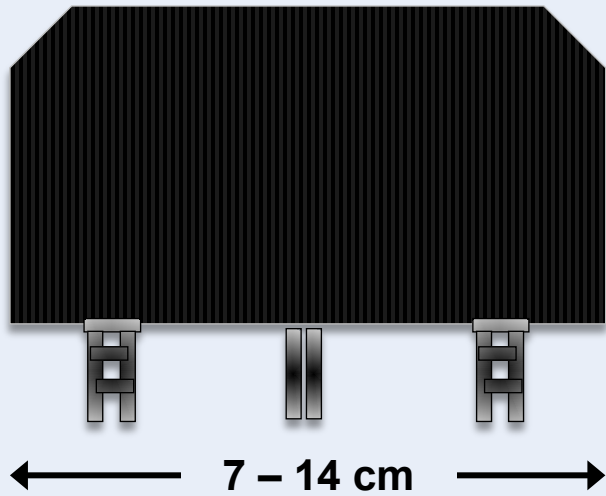


**Christian Ruud, Jeffrey Gordon, Robert McCarthy,
Brent Fisher, Noel Giebink**

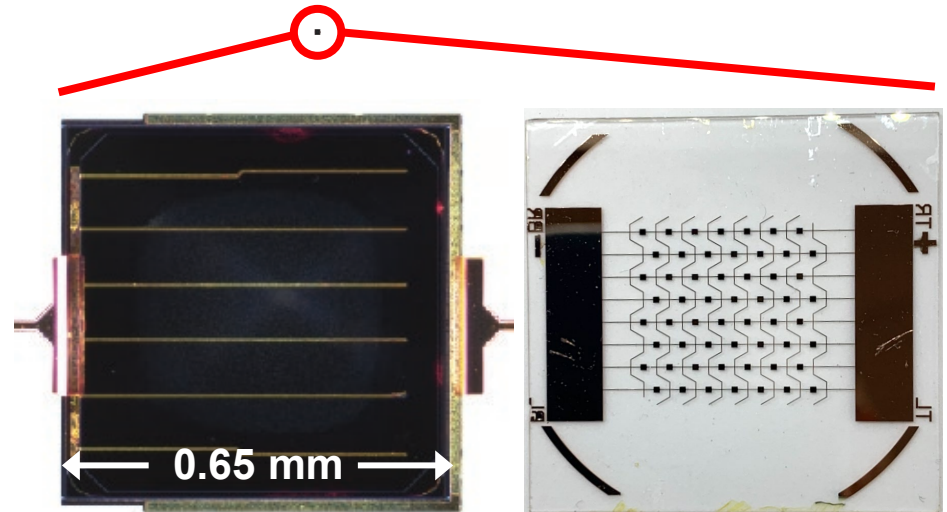


Microcells & concentrators

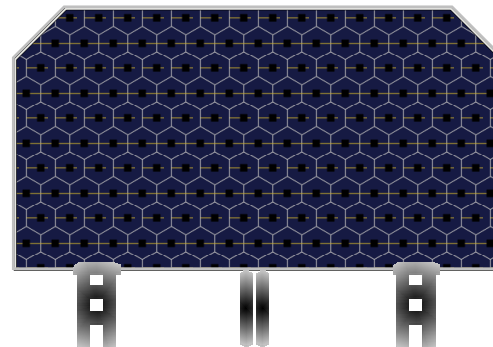
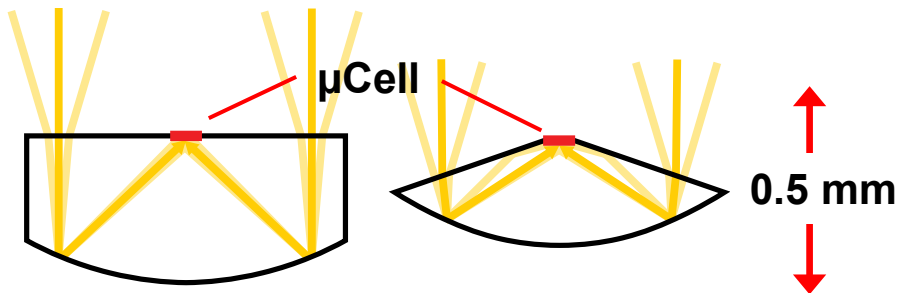
Coverglass Interconnected Cell



Microcells

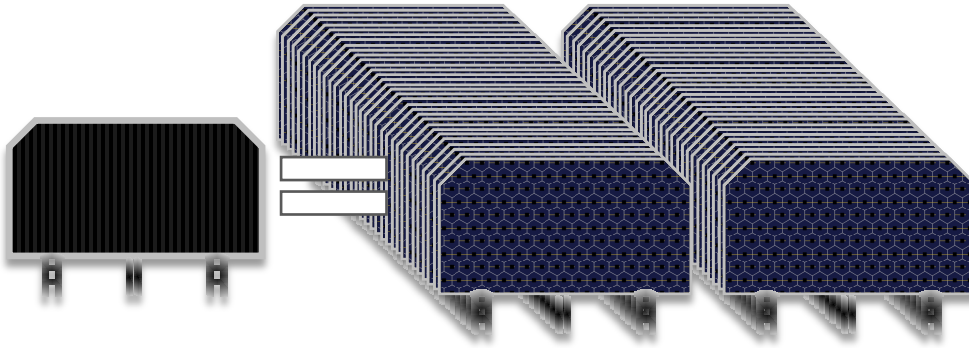


Ultra-compact

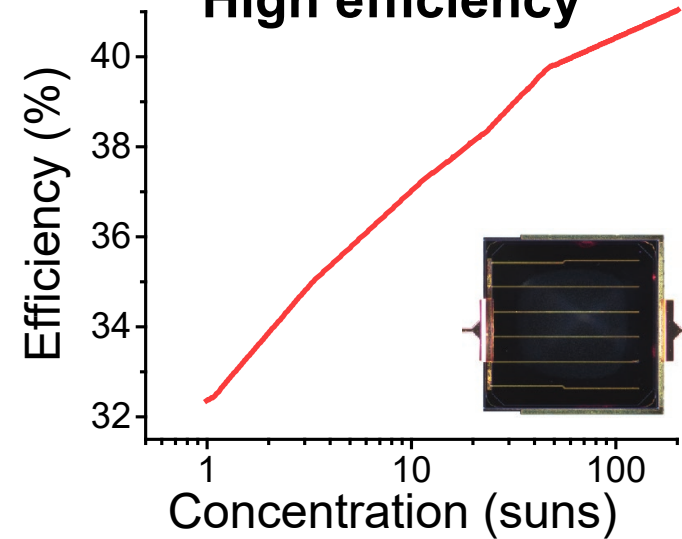


Advantages

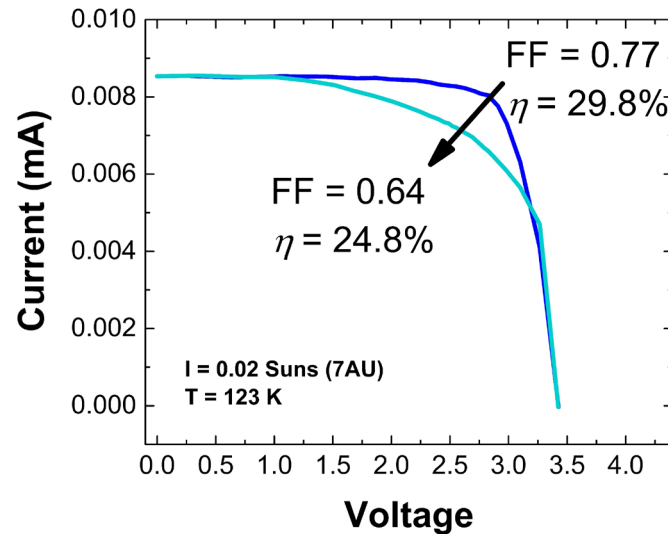
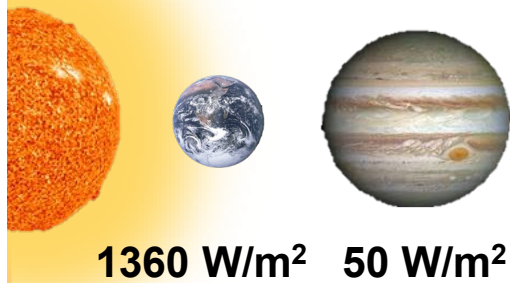
Lower material cost



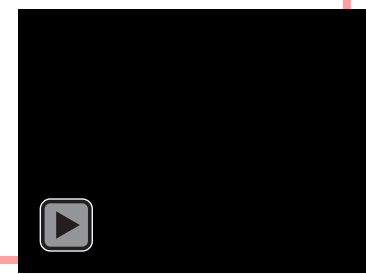
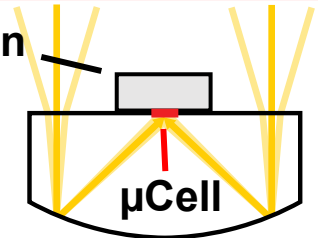
High efficiency



Extreme environments



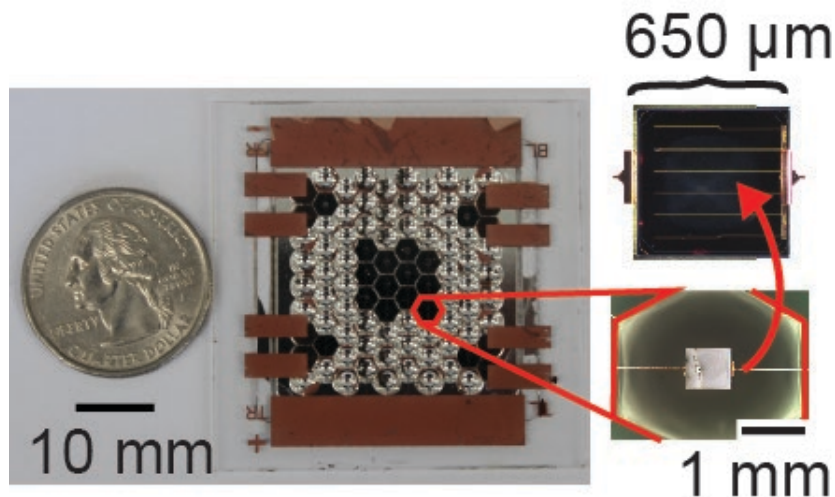
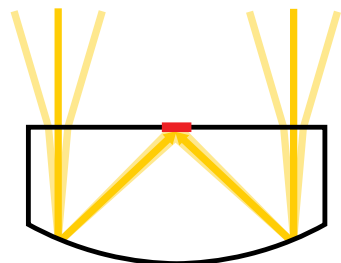
Radiation shield



Center bottom plot adapted from S. Benson, "Solar power for outer planet study," NASA Glenn, 2007.

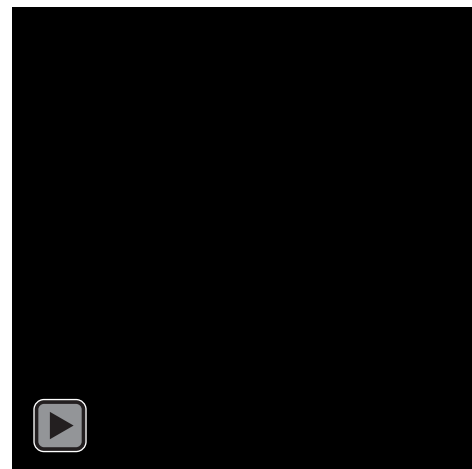
Top right plot adapted from X. Sheng, et al., *Nature Materials*, 13:593–598, 2014.

Space microconcentrators

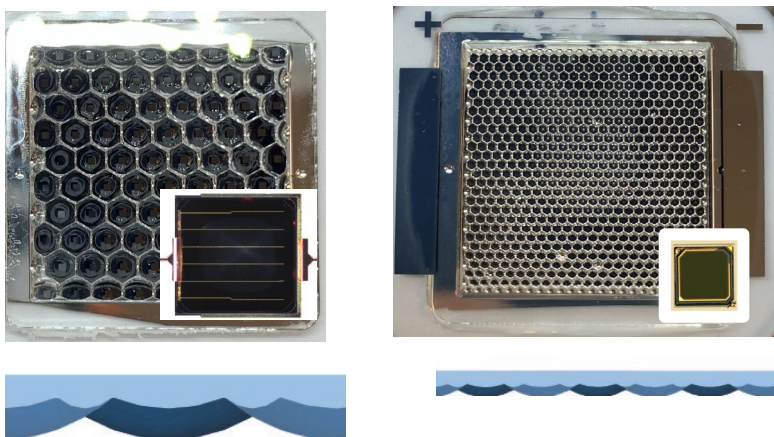


$$\eta_{\text{PCE}} = 26\%$$

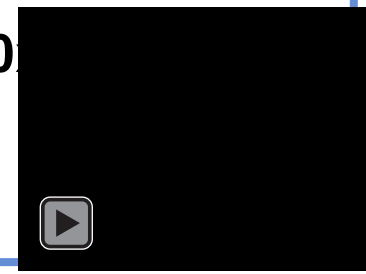
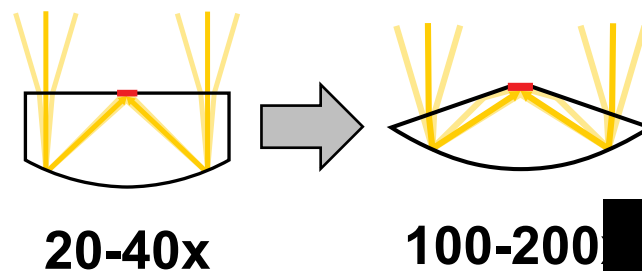
$\pm 9.5^\circ$ Acceptance angle



Scaling down

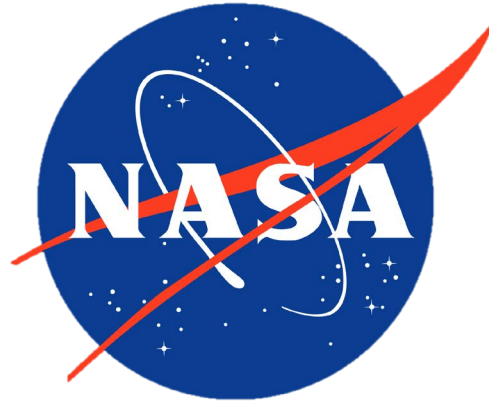


Higher concentration



Acknowledgements

Thank you!



This work was supported by the Air Force Research Laboratory under contract number FA9453-17-C-0421P00006, and a NASA Space Technology Graduate Research Opportunity.

