



ARC Photovoltaics Centre of Excellence

“40% Efficient Photovoltaic Power Cube Tower Receiver”

Martin Green, Mark Keevers, Anita Ho-Baillie

University of New South Wales

UNSW



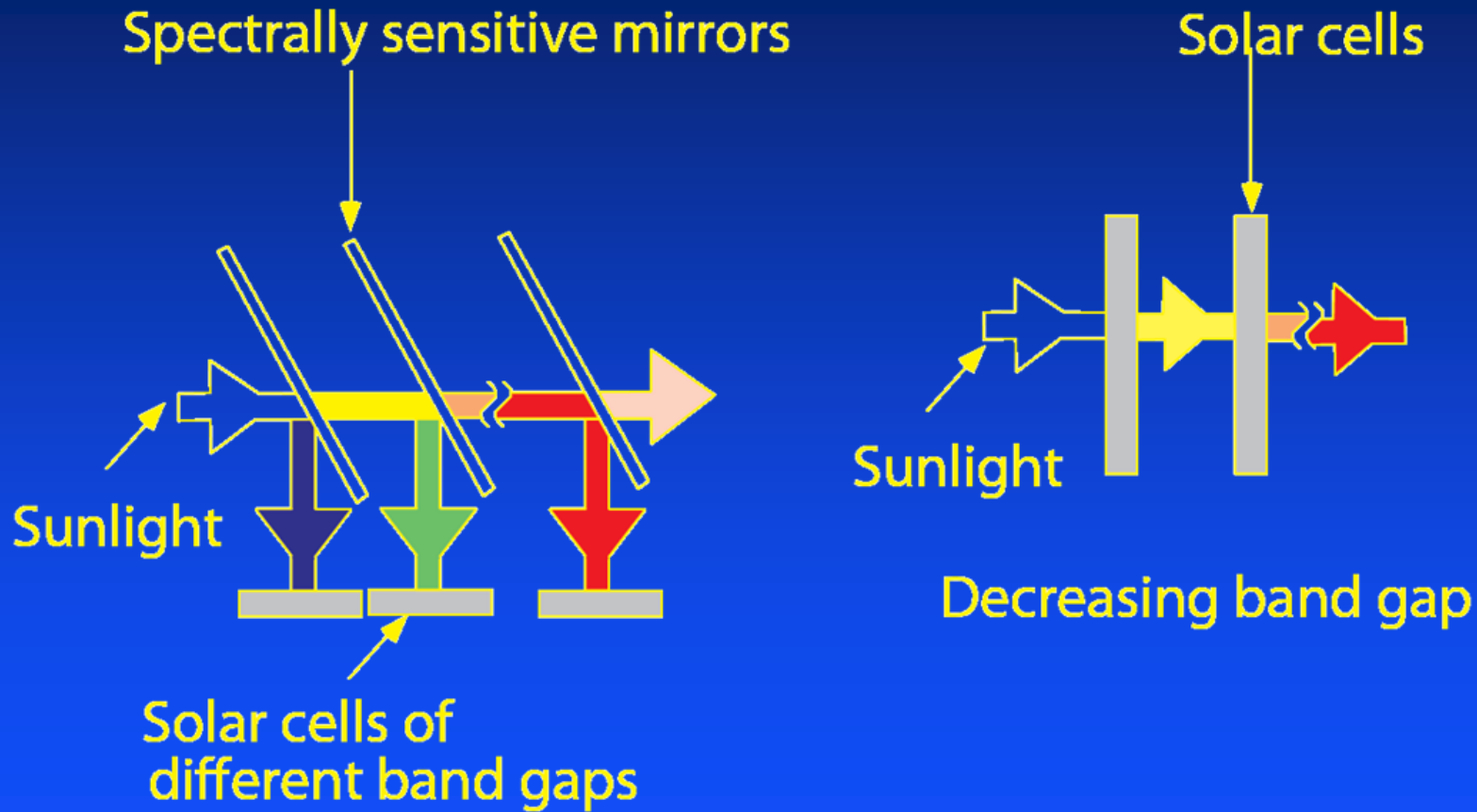


Stimulus 1: Solar Systems PV Power Tower





Stimulus 2: 43% Composite Cell Efficiency





Stimul

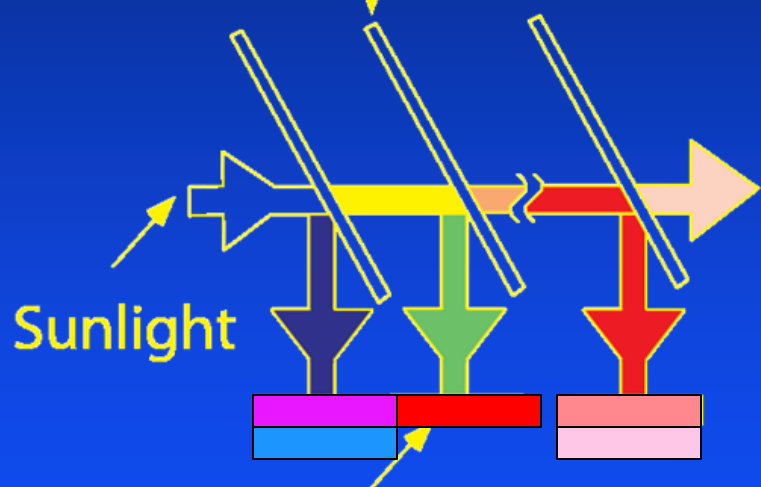
RESEARCH: SHORT COMMUNICATION: ACCELERATED PUBLICATION

Forty three per cent composite split-spectrum concentrator solar cell efficiency

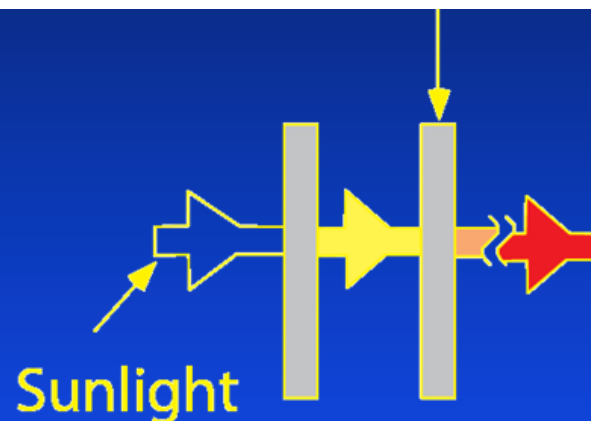
Martin A. Green* and Anita Ho-Baillie

ARC Photovoltaics Centre of Excellence, University of New South Wales, Sydney 2052, Australia

Spectrally sensitive



Solar cells of different band gaps



UNSW

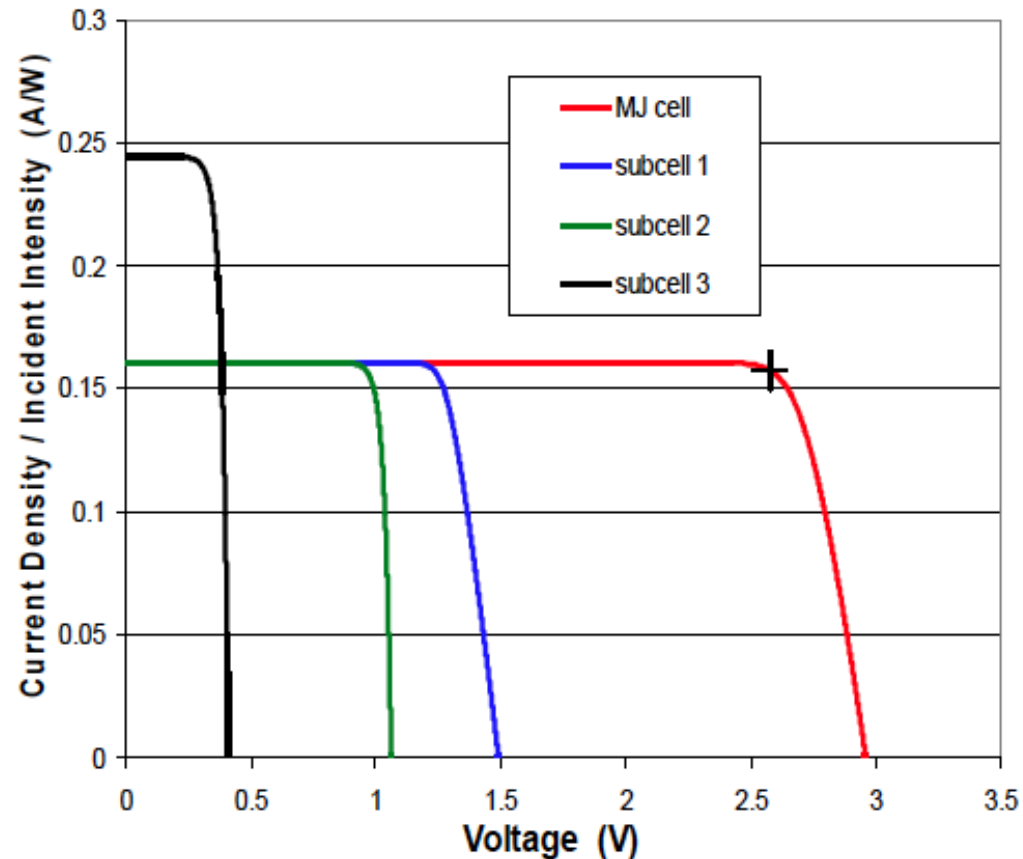
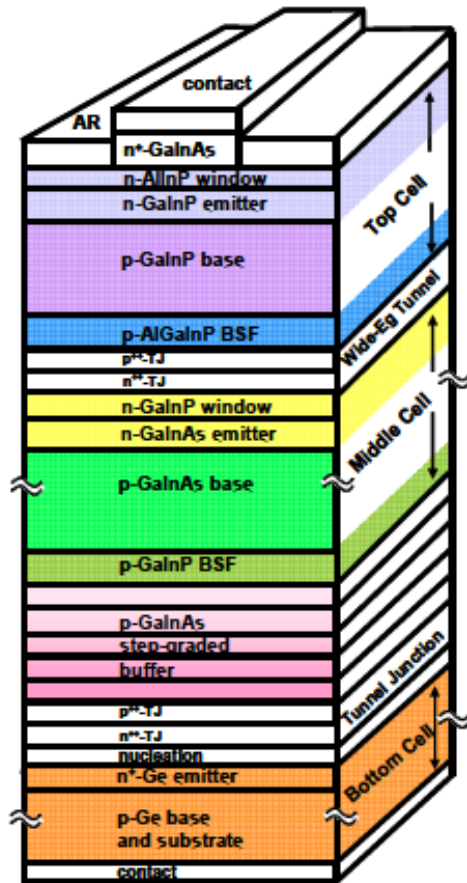
Table II. New composite split-spectrum

Cell	Supplier	Spectral range (nm)	Efficiency (%)
GaInP/GaAs (two terminal stack)	Emcore [4]	280–890	31.7
Si	UNSW	890–1100	5.7
GaInAsP/GaInAs (three terminal stack)	NREL [4]	1100–4000	5.6
		1100–1350	3.7
GaInAsP/GaInAs		~1350–1800	1.9
Five cell combination	—	—	43.0 ± 1.9

Sunlight



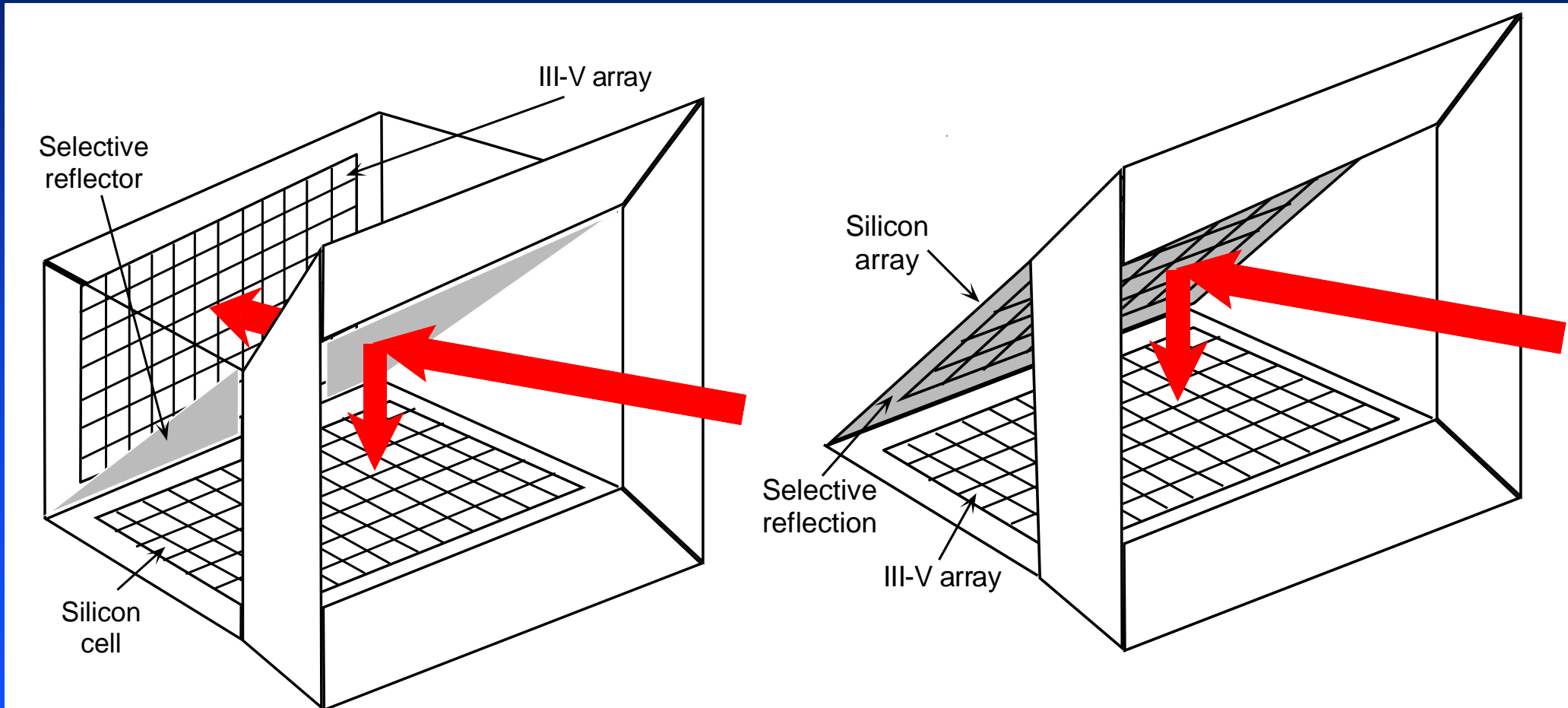
Stimulus 3: 40.7% Spectrolab Efficiency



Lattice-Mismatched
or Metamorphic (MM)

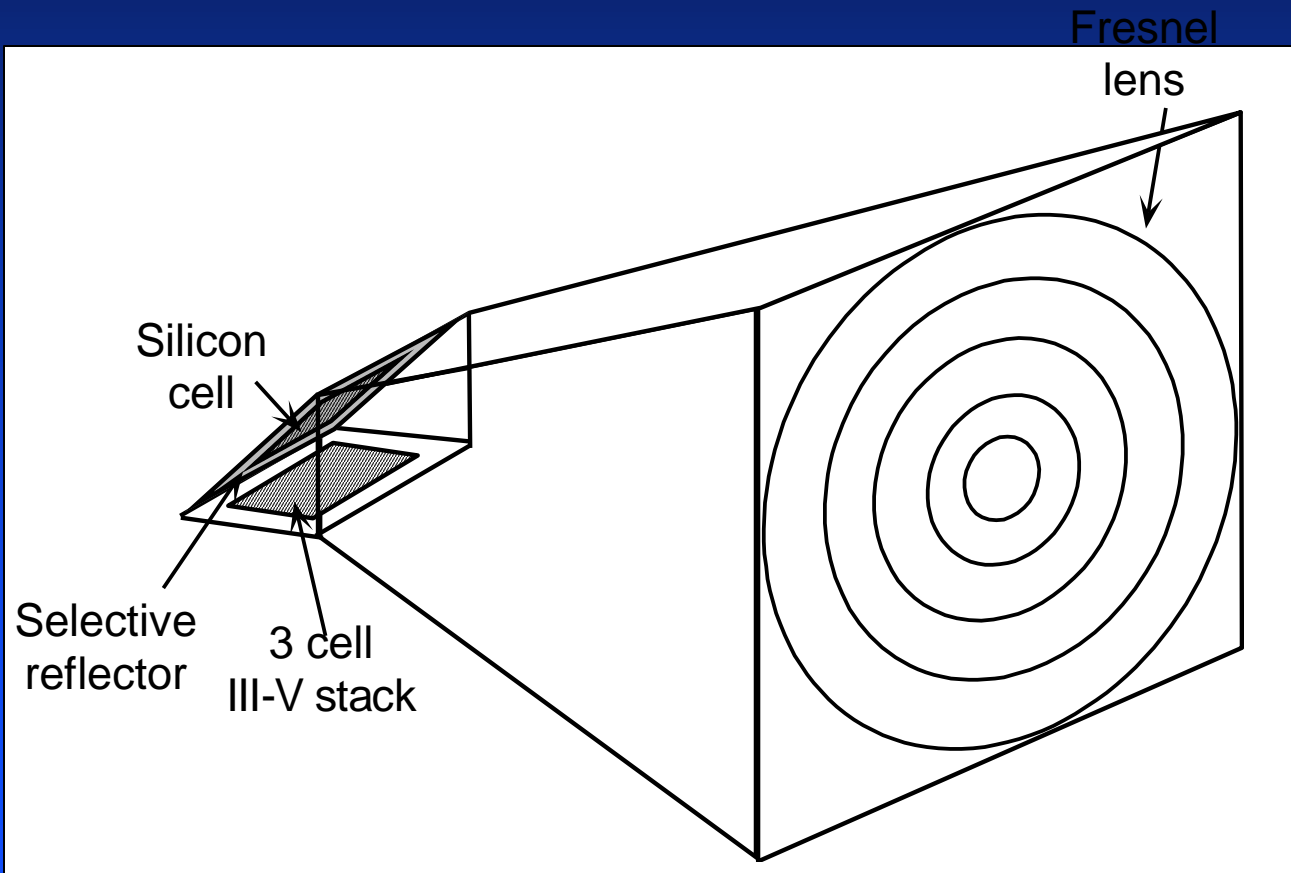
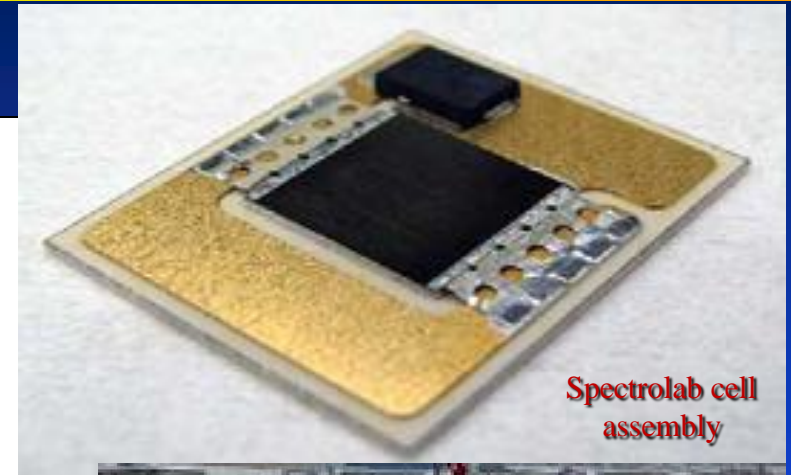


Power Cube Concept





40% Prototype (incl. optical losses)



Project Schedule

