

A decorative background pattern of orange circuit board traces and nodes on a dark red background. The pattern is most dense on the left side and tapers off towards the right.

INDUSTRIALIZING THE RED PLANET

JUSTIN KUGLER | MADE IN SPACE, INC.

THREE STAGES OF INDUSTRIAL CAPACITY

EARTH-DEPENDENT

- Martian production limited to small batch items using 3D printers and/or other methods
- Most critical systems manufactured on Earth & transported to Mars

BULK CONSTRUCTION

- Creation of bulk/commodity materials from local resources
- Structural elements & shielding
- Life support consumables
- Feedstock for mechanical part production

MARS AETERNUM

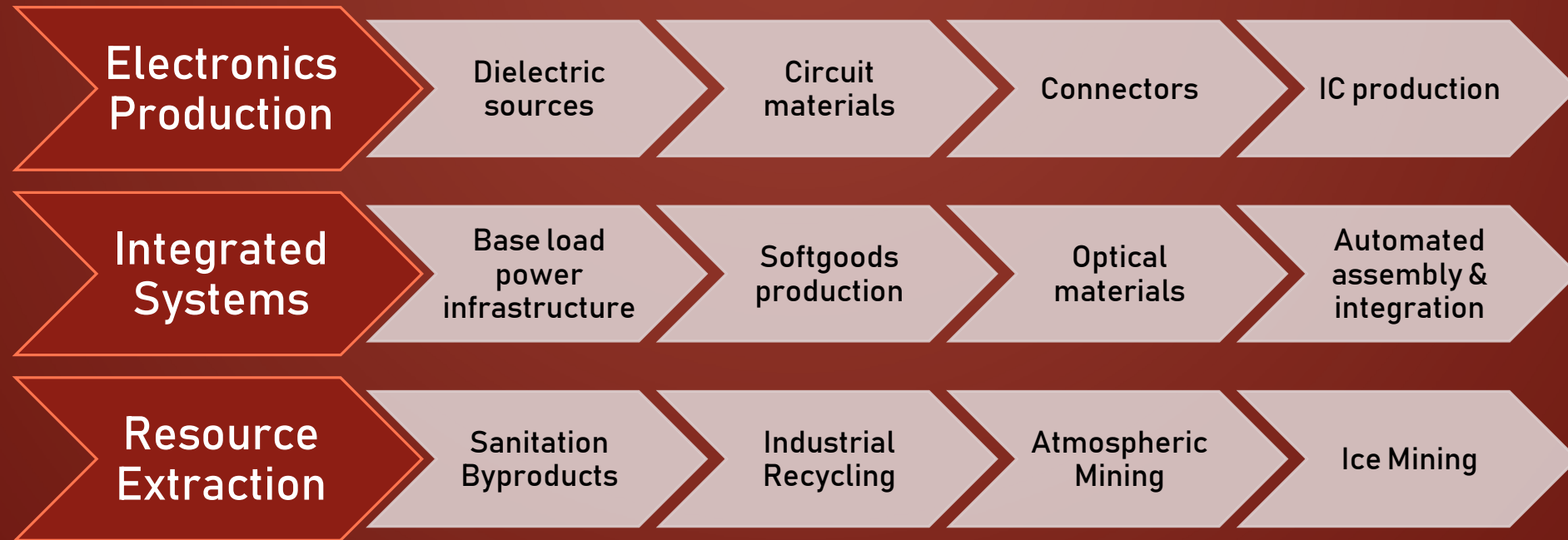
- Local production of electronics from Martian resources
- Fabrication of integrated systems
- Self-sustaining material and consumable cycles for human settlements

BULK CONSTRUCTION

- Generate thermopolymer binder from organic volatiles or atmospheric gas
- Utilize local regolith as aggregate
- Self-encapsulating construction material for human habitats
- Tested on JSC-1A and MARS-1



PATHS TO MARS AETERNUM



RESOURCES

- Use of Extraterrestrial Resources for Human Space Missions to Moon or Mars; Donald Rapp; Springer Praxis; 2013
- Benefits of Mars ISRU Regolith Water Processing: A Case Study for the NASA Evolvable Mars Campaign; NTRS; 2016
- Report of the Mars Water In-Situ Resource Utilization (ISRU) Planning (M-WIP) Study; Abbud-Madrid, A., et al; April 2016