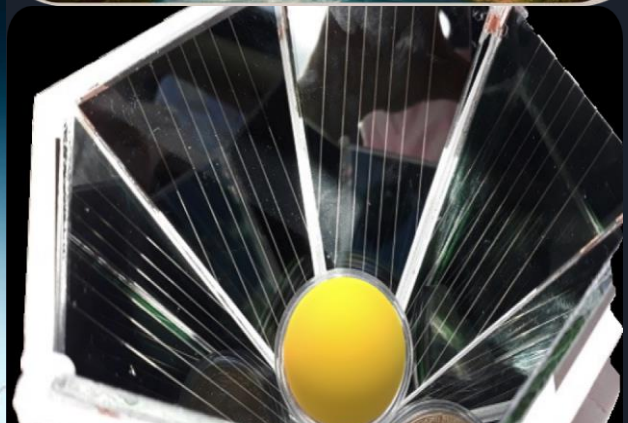
3D/SOLAR

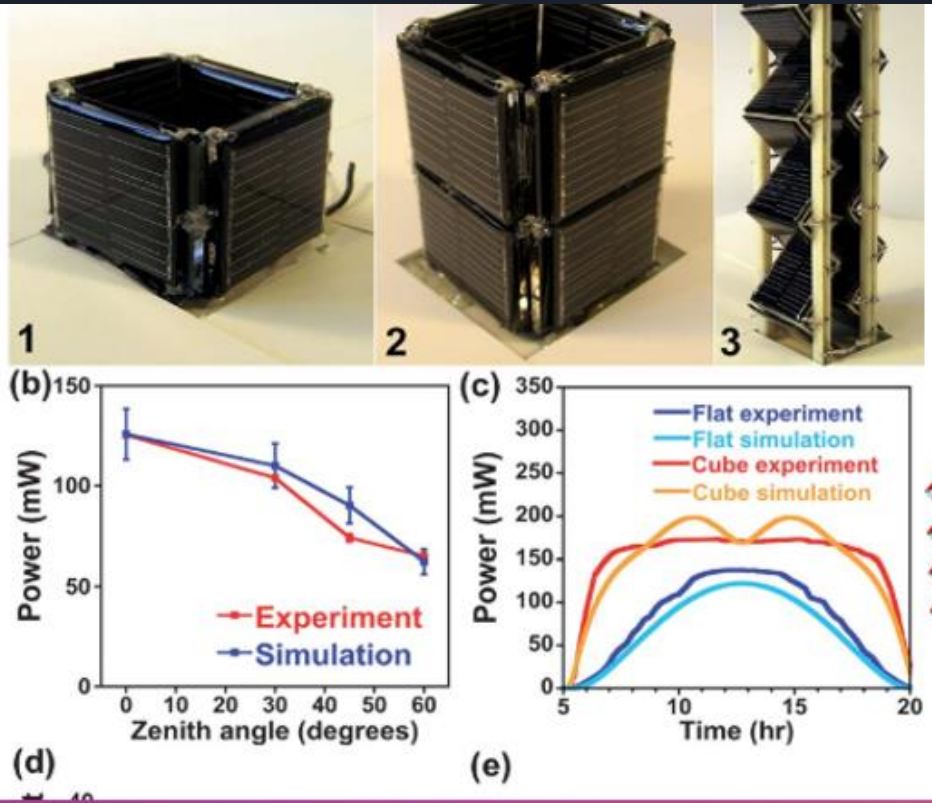
3D Solar Modules

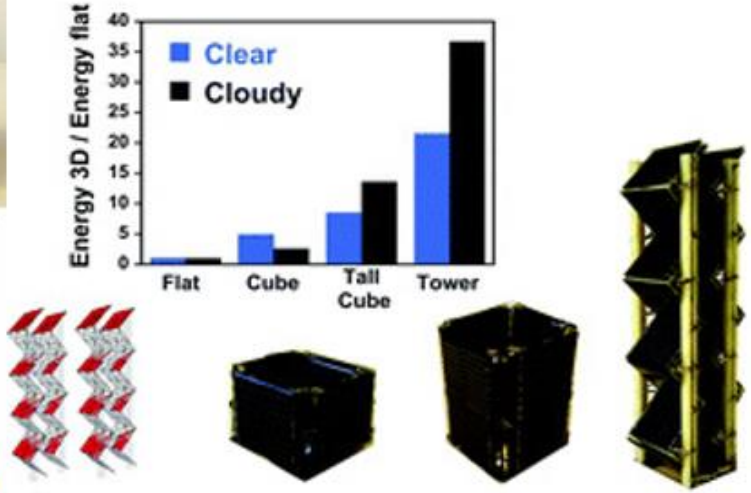
with more power made from glass waste!

Challenging the Status Quo

Maximizing Sunlight Capture

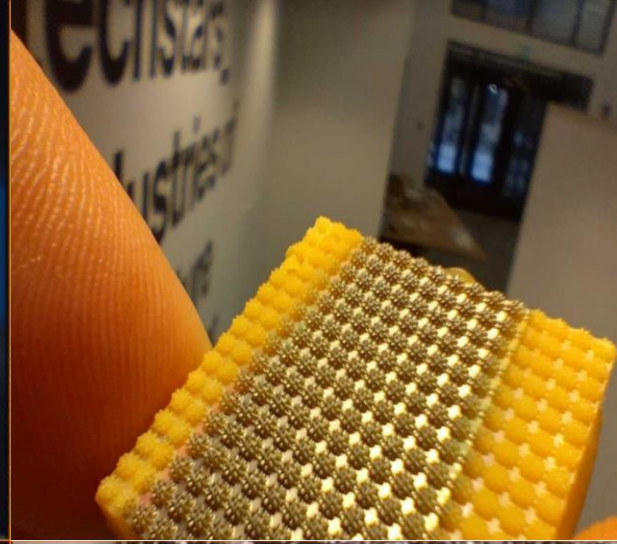



1
2
3
(b)
Power (mW)
Zenith angle (degrees)
Experiment
Simulation
(c)
Power (mW)
Time (hr)
Flat experiment
Flat simulation
Cube experiment
Cube simulation
(d)
(e)


Energy 3D / Energy flat
Clear
Cloudy
Flat
Cube
Tall Cube
Tower

MIT 3D Solar

Paradigm Shifters Presents Micro 3D CdTe Solar Cells



Key Metrics:

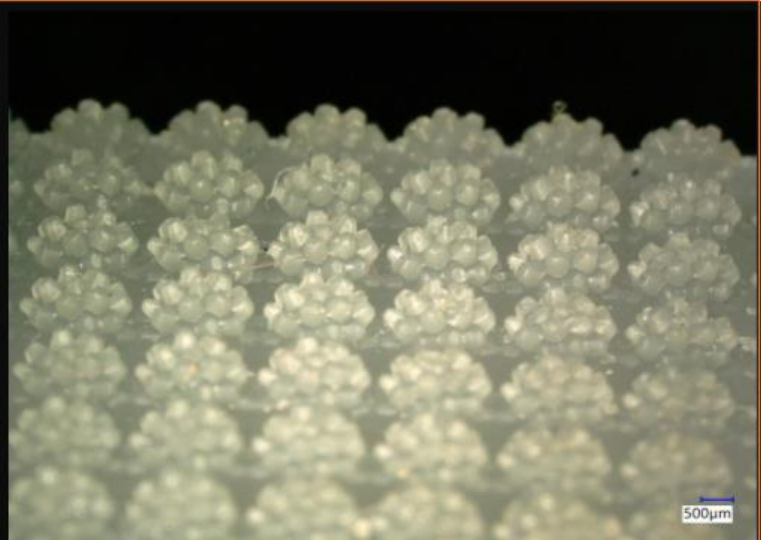
🌧️ Year-Round Reliability: Say goodbye to winter IV curve issues.

🌄 Maximized Sunlight: 3D surfaces capture more light from 7 AM to 7 PM.

🦆 Duck Curve Solution: Solve California's energy challenges.

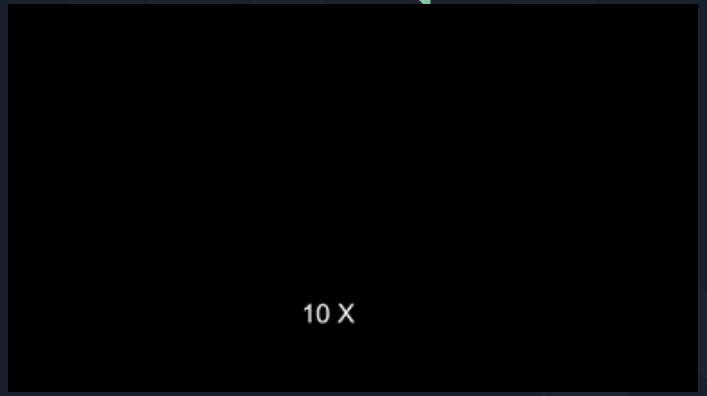
⚡ Unmatched Power: 15-100% more energy in the same ground area.

🔥 Heat Efficiency: 3D structure boosts power by 39% in hot regions.



Solution & Competitive Advantage: Material Agnostic GEL Casting

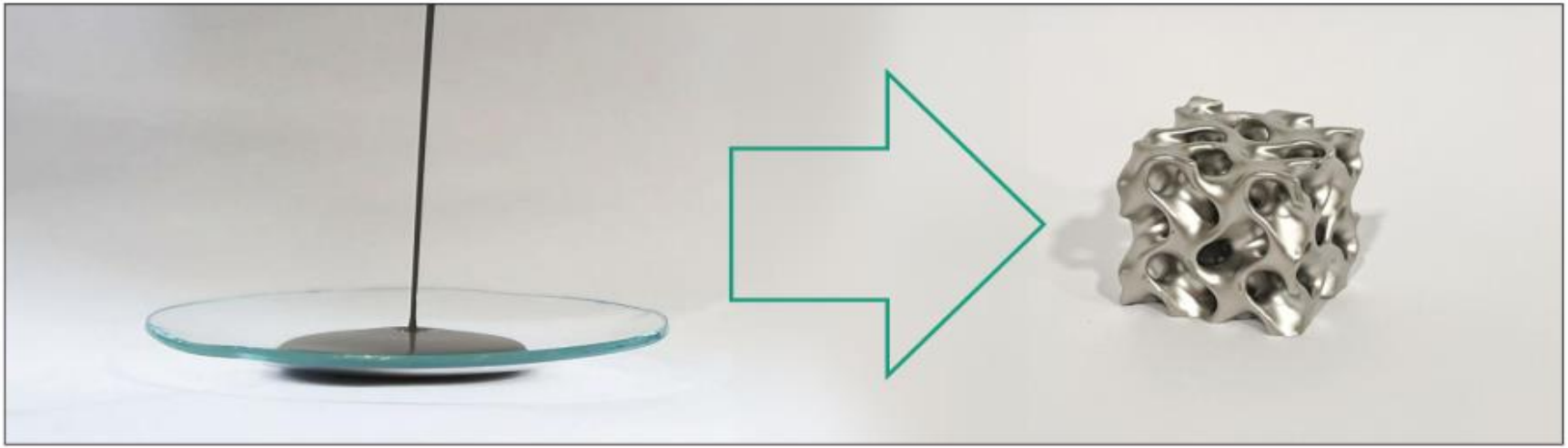
4 x 4 inch Micro 3D Glass Wafers



Gel Casting

The approach

From slurry to complex component – without printing defects and typical layering issues: Gel Casting!



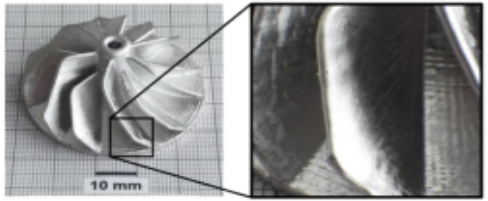
Gel Casting

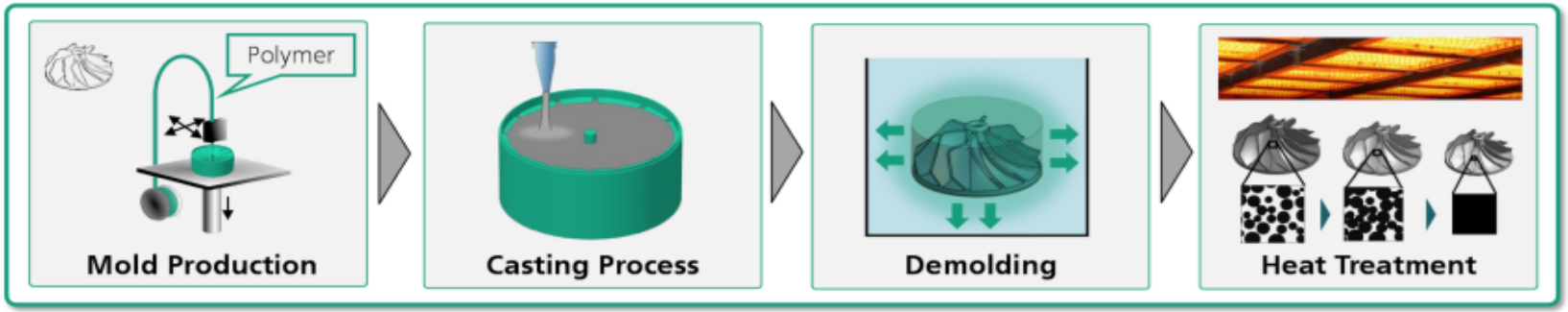
The process chain

Process steps

1. Production of a permanent mold or lost mold by any method (here: FFF)
2. Heating of the suspension and casting into the mold
3. Cooling and solidification of the suspension to a metallic gel
4. Demolding - directly or by dissolving the mold
5. Heat treatment: Thermal debinding and sintering

Component of sketch below





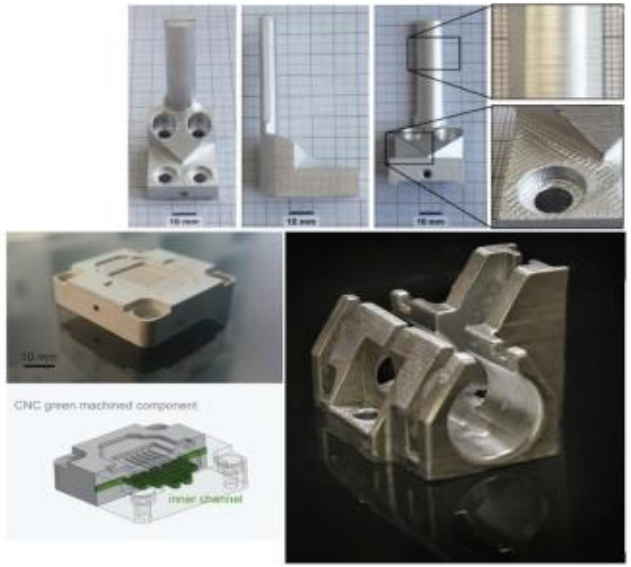
Gel Casting

Geometries

Geometrical opportunities

▪ Complexity	free form ability using lost molds
	→ to be discussed on component
▪ Wall thickness	0.3 mm to 40 mm proven to be suitable
▪ Part weights	> 2000 g possible
▪ Inner channels	>1 mm possible
▪ Inner cavities	possible only with increased effort
▪ Limitations	sinter-related limitations
	to be discussed on component

→ Each component has its own challenges. Please ask, we will be happy to take a look at your component together!



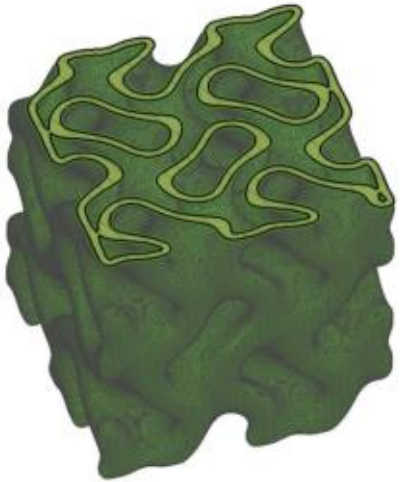
Gel Casting

Surface quality - smoothing

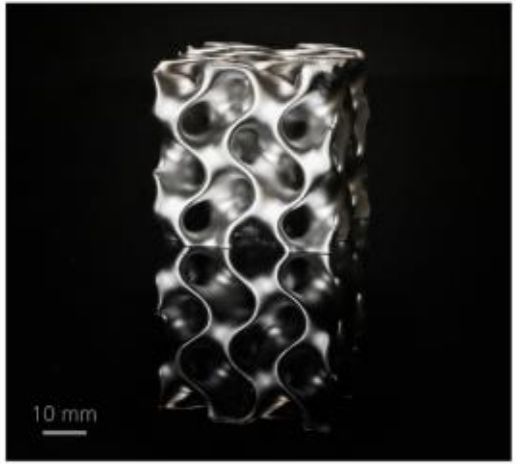
FFF mold smoothing

- Printed FFF molds made of plastic can be easily smoothed in a solvent steam/bath

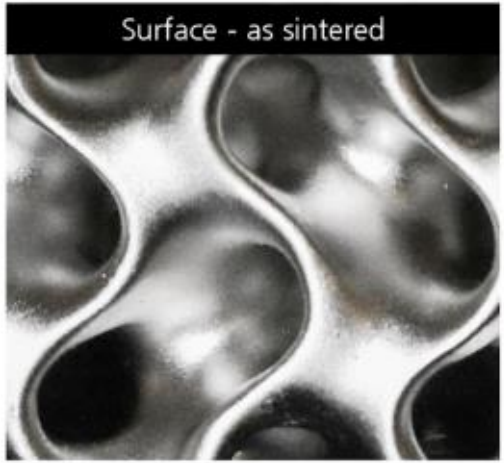
1:1 representation of mold surface quality



CAD of FFF mold



Sintered part



Cutout sintered part

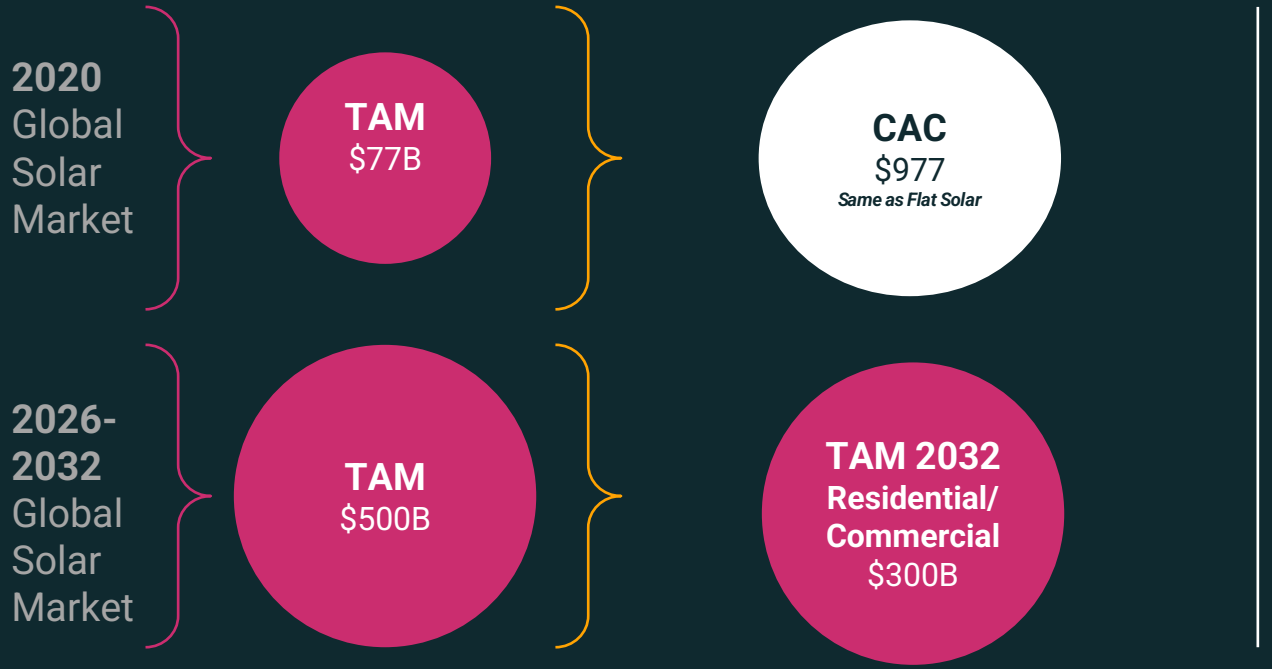
Current State of Play
Business Model + Traction

Patented with defensible designs and scalable manufacturing processes

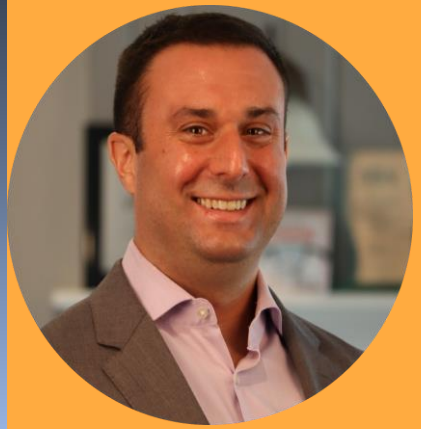
Research Partner **IMEC** & Colorado School of Mines

Approach: Licensing Mode

Solar Energy Market Overview



A team of three seasoned experts, ready to use Advanced Manufacturing to enable Industries of the Future tech



Michael Leshinsky, M.B.A.
CFO
https://www.linkedin.com/in/michaelleshinsky/

Daniel Clark, CEO
https://www.linkedin.com/in/3dprintingextrordinaire867530 9/

Santanu Bag, Ph.D.
CTO
https://www.linkedin.com/in/santanu-bag-46289a14/

Our Patents

- Solar:
  - US 20180240923A1
  - US 9899956B2
  - India 202017045298
  - SG 11202007571XA
  - CN 111919380A
  - PCT W02019164782A1
- Volumetric 3D Printing
  - US10967578B2
  - US10843410B2
  - US2021029146A1

Others pending in pre-publish state

Lawyer- Roy Gross
https://www.linkedin.com/in/roy-gross-0a42037/

"Advanced Projects"
Jim https://www.artcraftplating.com

Milestones

MVP
Developed

Capital
Raised 255K

Patents

Contact us:
daniel@3dsolar.co