

3D Nanofabrication Process

3D, lithographic nanofabrication process for nanostructure fabrication

Complex 3D nanostructure fabrication made easy with optical lithography.

Annual Sales Forecast for USA *				Innovation Status		Idea
Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling	Development Status	Proprietary Protection Status	Concept Score
Ultra Low	\$3	\$230,000	\$2.8 M	2 of 5 Successful Prototypes	2 of 5 Patent Pending	31 29 is Average
Low Support	\$3.4 M	\$12.7 M	\$36.7 M			
Medium Support	\$25.0 M	\$88.3 M	\$223.9 M			
High Support	\$77.8 M	\$251.7 M	\$625.2 M	Remaining Time & Cost to First Sale		
Ultra High	\$137.9 M	\$457.0 M	\$1.1 B	1-2 yrs	\$100k-\$1M	

3D Nanofabrication Process - 3D, lithographic nanofabrication process for nanostructure fabrication

Final Decision Maker: people who will benefit from Lab- on- a- Chip applications including medical diagnostics, national security, criminal forensics

Nanofluidic structures are usually fabricated by etching a channel pattern into a glass or silicon wafer with the same procedures used to manufacture circuit patterns on computer chips. These flat rectangular fluidic channels are then topped with a glass cover that is bonded into place. Because of the limitations inherent to conventional nanofabrication processes, almost all nanofluidic devices to date have had simple geometries with only a few depths. This limits their ability to separate mixtures of nanoparticles with different sizes or study the nanoscale behavior of biomolecules (such as DNA) in detail. Other types of lithographic nanostructures have been similarly limited in form and function by planar fabrication processes.

To solve the problem, NIST's Samuel Stavis and Michael Gaitan teamed with Cornell's Elizabeth Strychalski to develop a process to fabricate nanostructures with complex three dimensional surfaces. As a demonstration of their method, the researchers constructed a nanofluidic chamber with a "descending staircase" geometry etched into the floor. See the "[3D Nanoparticle Sorter](#)" Business Simulation Report on this site.

The NIST- Cornell nanofabrication process utilizes a single layer of grayscale photolithography and a novel nanoscale pattern transfer process to build 3D nanofluidic devices. Photolithography has been used for decades by the semiconductor industry to engrave microcircuit patterns onto a chip. Circuit patterns are defined by templates, or photomasks, that permit different amounts of light to activate a photosensitive chemical, or photoresist, sitting atop the chip material, or substrate. Conventional photolithography uses photomasks as "black- and- white stencils" to remove all of the photoresist in the shape of the pattern, which is then etched to a single depth into the substrate. Grayscale photolithography uses shades of gray to activate and sculpt the photoresist in three dimensions. The lighter the shade of gray, the more light that passes through the photomask, and therefore, the more photoresist that is removed. The NIST- Cornell nanofabrication process takes advantage of this characteristic, allowing the researchers to transfer a 3D structure pattern with numerous depths into a substrate with nanometer precision across the nanometer length scale.

\$5,000 for nanofabrication expenses

Seeking: Purchase, Investment, Manufacturing/ R&D

-  Email Inventor(s)
-  Link to Website With More Info
-  Link to YouTube Video
-  Inventor(s) Open to Consulting Requests
-  Agree to use Fair Contract
-  Invention can be exported

* Consumption sales forecast. Does not include "Random" events or Inventory Fill . Forecast is for Year 1 for Large or Year 2 for Small Companies. Forecast should be read as ... With Low marketing support there is an 80% odds of achieving sales of at least...



Report Assumptions and Inventor(s) Commentary

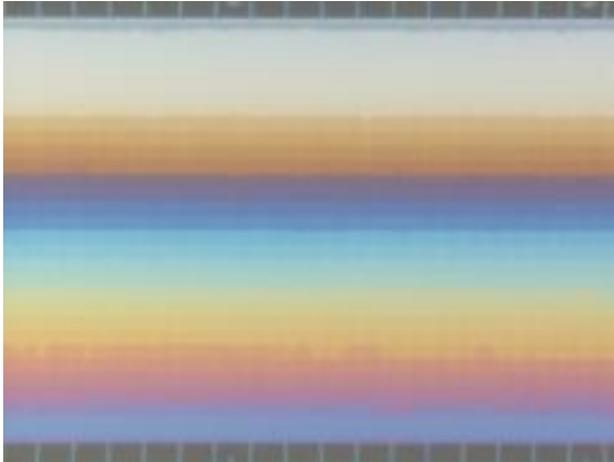
Inventor(s) Assumptions	"Most Likely" Estimate	Confidence	Inventor(s) Commentary Data Source or Basis for Assumptions
# of Possible Final Decision Makers	1,000,000	20%	This process will enable the fabrication and integration of 3D nanofluidic structures with Lab- on- a- Chip technologies, which will have a transformational impact when realized.
Revenue per First Purchase	\$100.00	40%	This fabrication process utilizes conventional integrated circuit manufacturing tools and techniques.
% that will Repeat	10%	20%	
Number of Annual Repeats	2	20%	
Revenue per Repeat Purchase	\$100.00	20%	
Reseller (Trade) Margin	N.A.	N.A.	
Producer Profit (EBITD)	25%	20%	

Innovation Status			
Development Status	2 of 5 Successful Prototypes		A 3D nanofabrication process has been developed and utilized to produce fluidic nanostructures with complex 3D surface topographies of arbitrary design.
Cost to First Sale (remaining)	\$100k-\$1M	20%	
Time to First Sale (remaining)	1-2 yrs	20%	
Confidence in Concept Claims made in description		30%	This nanofabrication process has been used to build nanofluidic devices with complex 3D surfaces of arbitrary design, as described in a publication in the journal Nanotechnology.
Proprietary Protection Status	2 of 5 Patent Pending		Patent applications have been filed.

Concept Score & Diagnostics						
 Merwyn Concept Score With Confidence Bands			Concept Diagnostics	Red	Yellow	Green
			Percentile Group	Bottom 40%	Middle 40%	Top 20%
Pessimistic 80% odds of at Least	Most Likely 50% odds of at Least	Optimistic 20% odds of at Least	Overt Benefit			
			Reason to Believe			
21%	31%	46%	Dramatic Difference			

Inventor Commentary & Alternative Development Scenarios
Inventor(s) Sales Goals

Minimum Goal	N/ A	Current GOAL	N/ A
--------------	------	--------------	------



Overhead view of a 3D nanofluidic device showing a nanofluidic channel with 30 different depth levels spanning the nanometer length scale.

Inventor(s) Commentary:
CURRENT SALES FORECAST

Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	\$3	\$230,000	\$2.8 M
Low Support	\$3.4 M	\$12.7 M	\$36.7 M
Medium Support	\$25.0 M	\$88.3 M	\$223.9 M
High Support	\$77.8 M	\$251.7 M	\$625.2 M
Ultra High	\$137.9 M	\$457.0 M	\$1.1 B

If MARKETING CONCEPT Improved

(Increase Concept Score by +20 Points)

Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	\$5	\$380,000	\$4.7 M
Low Support	\$5.8 M	\$21.5 M	\$61.0 M
Medium Support	\$43.7 M	\$152.7 M	\$370.2 M
High Support	\$135.8 M	\$434.3 M	\$1.0 B
Ultra High	\$238.2 M	\$787.7 M	\$1.9 B

If PRODUCT/ SERVICE Improved

(Increase Repeat Rate & Number of Repeats by 30% and Revenue Per Purchase 20%)

Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	\$4	\$270,000	\$3.4 M
Low Support	\$4.2 M	\$15.1 M	\$43.2 M
Medium Support	\$31.2 M	\$106.0 M	\$263.1 M
High Support	\$93.4 M	\$302.0 M	\$733.9 M
Ultra High	\$171.6 M	\$546.6 M	\$1.3 B

If MARKETING CONCEPT and PRODUCT/ SERVICE Improved

(Increase Concept +20 Points, Repeat Rate & Number of repeats by 30% and Revenue per purchase 20%)

Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	\$6	\$470,000	\$5.7 M
Low Support	\$7.2 M	\$25.7 M	\$72.3 M
Medium Support	\$56.4 M	\$185.9 M	\$437.2 M
High Support	\$161.8 M	\$523.0 M	\$1.2 B
Ultra High	\$287.1 M	\$933.6 M	\$2.2 B

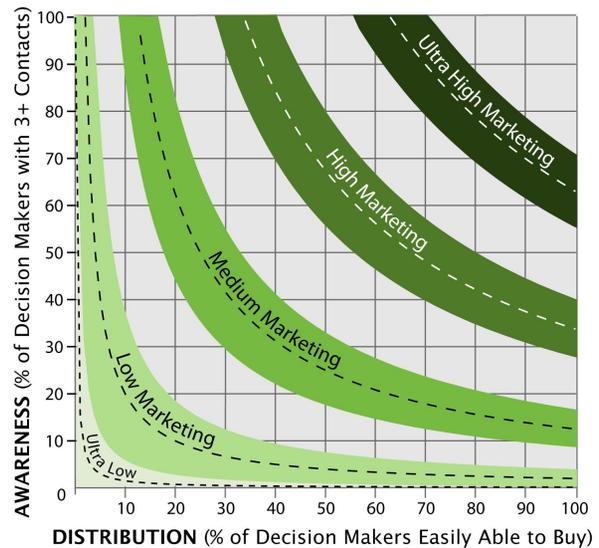


Additional Details

Fair Market Royalty (%)					
	Conservative - 80% Odds Royalty Percentage		Most Likely - 50% Odds Royalty Percentage		Aggressive - 20% Odds Royalty Percentage
At CURRENT State & Status	2.2%		3.3%		4.6%
Sales & Marketing Support Level	Annual Inventor Royalty Revenue			3 Year Value to Inventor If 50% Odds	
	80% Odds	50% Odds	20% Odds		
Ultra Low Support	\$10,000	\$29,000	\$58,000	\$88,000	
Low Support	\$200,000	\$500,000	\$930,000	\$1.5 M	
Medium Support	\$1.3 M	\$3.2 M	\$5.9 M	\$9.6 M	
High Support	\$3.7 M	\$8.9 M	\$16.5 M	\$26.6 M	
Ultra High Support	\$6.8 M	\$16.3 M	\$29.7 M	\$48.9 M	

Sales & Marketing Support Level Assumptions				
Sales & Marketing Support Level	Sample Numbers		% Aware x % Distribution (Aware & Able)	Inventor Estimate of Odds
	% Distribution	% Awareness		
Ultra Low Support (Word of Mouth)	5%	3%	0.2%	N/A
Low Support (Small Company)	20%	10%	2%	N/A
Medium Support (Medium Sized Company)	50%	25%	13%	N/A
High Support (Large Company)	75%	45%	34%	N/A
Ultra High Support (Mega or Niche)	90%	70%	63%	N/A

Graph of EQUIVALENT (Awareness x Distribution) Combinations



NAICS Industry Codes For This Invention
32541 - Pharmaceutical and Medicine Manufacturing
33441 - Semiconductor and Other Electronic Component Manufacturing

Patent Numbers that apply to this Product/ Service
61/120,864
61/205,577

Inventor(s) PEDIGREE	
Years EXPERIENCE in related industry	20
GRANTED Patents	9
Licensing Deals SIGNED	2
Innovations that have SHIPPED	2

For USA Patents: Utility Patent = 7 digit number, Design Patent starts with D, Planet Patent starts with PP. Provisional Application "61/ xxx,xxx", Non provisional application "12/ xxx,xxx", Design patent application "29/ xxx,xxx"

CAUTION: This Merwyn Business Simulation Research Report includes no warranty or guarantee. Results and opinions should be considered rough and directional in nature. This is because the report is based upon inventor-supplied data and simplified modeling methods. If you are looking to invest, distribute, purchase or become involved with this innovation, in any way, we strongly urge you to validate the inventor data and sales forecasts BEFORE committing yourself or your resources. Merwyn Research, Inc. shall not be responsible for any liability or damages arising out of the failure to perform such investigation and validation. Changes in the concept description, product, pricing, or input assumptions will almost certainly change results.



Additional Forecasts for Other Countries

Annual Sales - Probability Forecast - for Canada 			
Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	\$0	\$25,000	\$310,000
Low Support	\$370,000	\$1.4 M	\$4.1 M
Medium Support	\$2.8 M	\$9.8 M	\$24.8 M
High Support	\$8.6 M	\$27.9 M	\$69.3 M
Ultra High	\$15.3 M	\$50.6 M	\$125.6 M

Assumptions: exchange rate of \$1.00 US = \$1.01083 CAN; population of 33,390,141

Annual Sales - Probability Forecast - for United Kingdom 			
Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	£0	£23,000	£280,000
Low Support	£340,000	£1.3 M	£3.7 M
Medium Support	£2.5 M	£8.9 M	£22.5 M
High Support	£7.8 M	£25.3 M	£62.9 M
Ultra High	£13.9 M	£46.0 M	£114.0 M

Assumptions: exchange rate of \$1.00 US = £0.50458 UK; population of 60,776,238

Listing #: USA.75.032709.035

Page 5 of 5

Date Posted: 2009-04-13

©2008. Eureka! Institute. All Rights Reserved. Patents Granted or Pending Eureka! Ranch International www.EurekaRanch.com (513) 271-9911