

Michael P.C. Watts, Ph.D.

8028 Via Verde Drive

Austin TX

512-565-9024

mpcwatts@impattern.com

I am retired from a career in semiconductor technology. I applied my academic background as a material scientist, into a 30 year career in high technology in system engineering, materials development, business development and applications. I have published and presented at conferences throughout my career as part of technical marketing strategies.

Most recently I have worked as a technology and business consultant to high tech startups, expert witness in over 30 patent cases and writer for a technology web site “semiengineering.com”. I have 45 patents.

Employment History

From: 2005 **Impattern Solutions, Inc.**

To: 2019 Austin, TX

Position: *President*

Impattern Solutions is an independent consultant practice specializing in strategic imprint process design and demonstration. Part of start up team for Agoura Technology that developed reflective polarizers for LCD displays

From: 2002 **Molecular Imprints, Inc.**

To: 2005 Austin, TX

Position: *Vice President, Engineering & Applications*

Molecular Imprints (MII) is the only venture funded start up in nano-imprint technology. It was recently voted “Most Promising New Technology”, in the 2005 *EE Times*’ Annual Creativity in Electronics (ACE) Award.

One of the four member founding team that wrote the original business plan that resulted in funding. Grew the company to 100 people in 4 years, personally built 2 engineering and process teams. Delivered first product 6 months from initial funding. Made the presentation that won the Nanotech Ventures — Early Stage Companies competition at Nanotech 2005 in Anaheim CA.

Responsibilities included working with high resolution printing techniques for producing sub 100 nm features. Developed plan for display applications.

From: 1998 **Seriate Solutions, Inc.**
To: 2002 Portola Valley, CA
Position: *President*
Seriate Solutions, Inc. develops 3D security systems and operates an independent consultant practice specializing in semiconductor microlithography, technology forecasting, and strategic product development. Two patents applied for in the area of 3D security for a stereo camera and stereo graphical user interface. Another patent applied for to be assigned to a client that involves statistical-based production alarms for an excimer laser.

From: 1994 **Pixel Systems, Inc.**
To: 1998 Cupertino, CA
Position: *President and CEO*
Founder of a start up company in flat panel display inspection, developed business plan and market strategy. Generated \$1M in contracts, system sales and patent revenue. Won a United States Display Consortium competition for flat panel inspection equipment worth \$2M in matching funds. Two Patents issued for the inspection system, one patent was issued for a vertical prober.

From: 1990 **Electroglas, Inc.**
To: 1994 Santa Clara, CA
Position: *Director of Engineering*
Responsible for planning and directing overall engineering activities relating to the creation and design of new products together with engineering support functions. Reported to the President and C.O.O. The engineering group consists of 89 people with budget of \$9.5M. Member of management team that took Electroglas public in an IPO worth \$95M in 1993. Electroglas is the world's #2 manufacturer of wafer probers used in the final test of integrated circuits.

From: 1988 **Semiconductor Systems**
To: 1990 Fremont, CA
Position: *Director of Marketing*
Responsible for directing marketing functions including product line marketing, quote evaluation, strategic marketing, and communications. Reported to the President. Semiconductor Systems manufactures automated photolithography coat and develop systems.

From: 1984 **AZ Photoresist Products, Division Hoechst-Celanese, GmbH**
To: 1988 Sunnyvale, CA
Position: *Manager, Western Region Applications*
Responsible for technical marketing support in the development and implementation of customer applications and companies products, including evaluation of new products, assisting customer

installations of new products and processes. Reported to the General Manager and Unit Vice President. Responsible for two patents. By 1988, AZ Photoresist was the US #1 direct supplier of photoresist materials.

From: 1979 **Hewlett Packard Labs**
To: 1984 Palo Alto, CA
Position: *Member, Technical Staff*
Responsible for the development of new optical, electron beam and X-ray materials and processes. Co-patentee on the optical multi-layer technology that "won" the race for the HP 1 μm process. This 1 μm process placed 500,000 transistors on a chip in 1981.

Education

<u>Year</u>	<u>College/University</u>	<u>Degree</u>
1979	University of Massachusetts, Department of Polymer Materials Science, specializing in ultra-high modulus materials	Postdoctoral Research
1978	University of Manchester, Institute of Science and Technology, England, Department Polymer Science and Engineering "Broadening of Mechanical Damping Peaks in Multiblock Polymers"	Ph.D.
1974	University of Manchester, Institute of Science and Technology, England, Polymer Science and Engineering	B.Sc.

Publications (Partial List)

The following list of publications does not include a regular blog I write at semiengineering.com.

"Design strategy for Low ϵ windows with effective insulation"
Proceedings Volume 8981-53: Photonics West March 2014

"Wire grid polarizers fabricated by low-angle deposition"
Proceedings Volume 8613: Advanced Fabrication Technologies for Micro/Nano Optics and Photonics VI, March 2013

"Advances in roll to roll processing of optics"
Proceedings Volume 6883: Advanced Fabrication Technologies for Micro/Nano Optics and Photonics, February 2008

"The value, solutions, and costs of patterning LEDs"
Proceedings Volume 6462: Micromachining Technology for Micro-Optics and Nano-Optics V and Microfabrication Process Technology XII, February 2007

“Design and performance of a step and repeat imprinting machine”
Proceedings Volume 5037: Emerging Lithographic Technologies VII, June 2003

“A Novel Method For The Prediction Of Process Sensitivity In Photolithography,” *Proc SPIE Microlithography*, 1988

“Study Of The Reaction Kinetics Of The Photoresist Aging Process,” *Proc SPIE Microlithography*, 1988

“Photoresist As Its Own Process Monitor,” *Solid State Technology*, 1988

“The Reduction Of Reflective Notches Using Dyed Photoresist,” *Poly. Eng. & Sci.*, v26, p1185, 1986

“Analytical model of positive photoresist applied to line width control,”
J.Vac.Sci.Technol., p434, 1985

“A New Response Surface Analysis Procedure For Evaluating Process Control In Photolithography,” *Proc SPIE Microlithography*, 1984

“Electron Beam Resist Systems - A Critical Review Of Recent Developments,” *Solid State Tech*, p59, 1984

“Optical Positive Resist Processing - Exptl And Analytical Model,” *Proc SPIE Microlithography*, 1983

“A High Sensitivity Two Layer Resist Process For Use In High Resolution Optical Lithography,” *Proc SPIE Microlithography*, 1983

“New Methods Of Production Of Highly Oriented Polymers By Solid State Extrusion,”
Solid State Extrusion 297, 1983

“A Two Layer Photoresist Process In A Production Environment,” *Proc SPIE Microlithography*, 1982

“Push Pull Extrusion: A New Approach For Solid State Deformation,” *J.App.Poly.Sci.*, V26, p1309, 1981

“Solid State Extrusion Of Ultra High Molecular Weight Polyethylene,”
Poly.Eng.&Sci.,V20, p555, 1980

“Shrinkage As A Measure Of Deformation Efficiency Of Ultra Oriented Polyethylene,”
J.Mat.Sci., p426, 1980

“Solubility Ratio, Sensitivity, And Line Width Control In Positive E-Beam Resists,”
Proc. 9th Electron and Ion Beam Conf., p378, 1980

“Solid State Extrusion Of Polymer Powders Illustrated With UHMWPE,”
J.Poly.Sci.Letters, V17, p485, 1979

“Phase Separation And Mechanical Properties Of An Amorphous Poly(Ether-B-Ester),”
Multiphase Polymers, A.C.S. V 176, p153, 1978