

Overview

Going forward, I would like to transfer my semiconductor/data knowledge to additive manufacturing, gene therapy, artificial intelligence, or applied neuroscience themes.

Given the privilege, my degrees in Chemical Engineering and Physical Chemistry, along with a solid research background in Materials Science, provide ample experience to perform the duties required of this position. Most semiconductor projects I encountered, involved either processing or analysis, so I am strong in both areas.

With over 20 years as a Research Scientist, I have coauthored roughly 16 papers, half under the direction of John Haggerty at MIT, and the remainder with support from Klaus Bachmann at NC State. During the course of research, I have: (1) grown the first laser-induced, chemical vapor deposition, amorphous silicon solar cells, (2) developed a microwave plasma, chemical vapor deposition system, to create polycrystalline diamond from methane gas, in a regime where kinetics dominates over thermodynamics, (3) monitored the surface evolution of compound semiconductor heterostructure films, in a chemical beam epitaxy system, with plane polarized reflectance spectroscopy, pioneered by our research group.

In more recent years, I plunged into the world of macroeconomics, human behavior, and statistical analysis, through futures trading. Using quantitative investment strategies, participants seek high probability trades. To handle market data, I applied digital signal processing techniques, in the spirit of John Ehlers, an Electrical Engineer from Raytheon. Along the way, I combined statistics with digital signal processing to produce highly responsive indicators, enhancing trade signal clarity. By immersing myself in the data science of financial markets, and backtesting of trading strategies, I have improved my computer programming skills, and established more techniques to deal with data interpretation.

Going forward, I would like to transfer my semiconductor/data knowledge to additive manufacturing, gene therapy, artificial intelligence, or applied neuroscience themes. I invite you to visit my personal website to view current literature and computational projects. If you have any concerns, feel free to contact me.

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Profile	Chemical Engineer with over 20 years of semiconductor research and 10 years of data science seeking to redefine opportunity in the industrial sector:		
	crystal growth	plasma chemistry	gene therapy
	surface science	laser excitation	applied neuroscience
	chemical vapor deposition	optical characterization	computer modeling
	molecular beam epitaxy	electrochemical methods	statistical analysis
	semiconductor devices	additive manufacturing	process control
Thesis	Real Time Reflectometry of Ga-based Compound Semiconductor Films on Silicon during Plasma Enhanced Molecular Beam Epitaxy, NCSU Materials Science Dept: 1999.		
	Clifton Strengths		
Character	Strategic	faced with any given scenario, can quickly spot the relevant patterns.	
	Learner	have a great desire to learn and want to continuously improve.	
	Ideation	able to find connections between seemingly disparate phenomena.	
	Futuristic	inspired by the future and what could be.	
	Self-Assurance	possess an inner compass yielding confidence in decision making.	
Milestone	Invent a new approach for process control to optimize laser power.		
	Write a Pascal based data acquisition program for DOS environment in 1986, long before LabView enters the Windows market.		
	Analyze optical signals from a ceramic powder reaction chamber, leading to a computer monitoring scheme, which replaces a human operator.		
	Construct interferometer to measure film thickness, providing a realtime signal, to calibrate growthrate.		
	Refine process control loop to stabilize laser power, producing a steady deposition rate with reliable material properties.		
	Collect in-situ stress measurements of growing films, through deflection of an optical laser, as sample curvature evolves.		
	Grow the first laser-induced, chemical vapor deposition, amorphous silicon solar cell.		
	Develop a microwave plasma, chemical vapor deposition system, to create polycrystalline diamond from methane gas, in a regime where kinetics dominates over thermodynamics.		
	Achieve a unique ellipsoidal plasma advantageous for film growth over spherical plasmas.		
	Design a radio frequency nitrogen plasma source for GaN film growth.		
	Monitor the surface evolution of compound semiconductor heterostructure films, in a chemical beam epitaxy system, with plane polarized reflectance spectroscopy.		
	Derive substrate temperature from plane polarized reflectance intensity.		
	Apply cyclic voltammetry to find: catalytic activity in gold compounds for methanol oxidation, and electrochemiluminescence in a ruthenium compound for DNA analysis.		
Experience	Engineering Consultant, Independent (1/18 to present)		
	Futures Trader, Independent (9/06 to present)		
	Research Assistant, Maine Chemistry Dept: Orono, ME (8/03 to 5/06)		
	Research Assistant, NCSU Materials Science Dept: Raleigh, NC (1/87 to 5/99)		
	Research Specialist, MIT Advanced Energy Materials Lab: Cambridge, MA (11/84 to 1/87)		
Education	MS Physical Chemistry	Rutgers: New Brunswick, NJ	Jan 2003
	MS Material Science	North Carolina State: Raleigh, NC	unofficial
	BS Chemical Engineering	Texas A&M: College Station, TX	May 1984
	HS Diploma	Waltham High: Waltham, MA	Jun 1979
Honor	Bausch & Lomb Science Award		