

Reflections on a career in

Semiconductors and Academia

Mark Lundstrom
December 12, 2025



The two strands of my career



Purdue

Semiconductor
Science and
Technology

- | | |
|-------------|---|
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| 1973 | BEE |
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| 1975 | IC process development and manufacturing |
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| 1980 | Joined Purdue faculty |
| 1991 | Got a taste of administration |
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| 2020 | Acting Dean of Engineering |
| 2021 | Principal Advisor to the EVPSI |
| 2022 | Interim Dean |
| 2023 | Chief Semiconductor Officer |

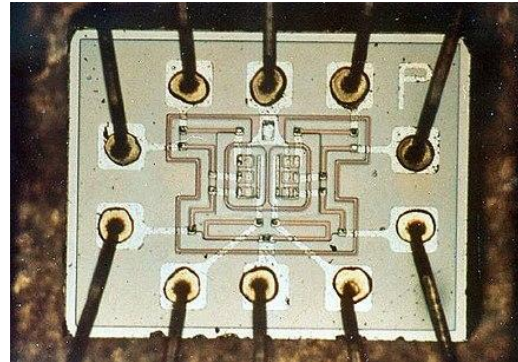
"The greatest moment since mankind emerged as a lifeform"



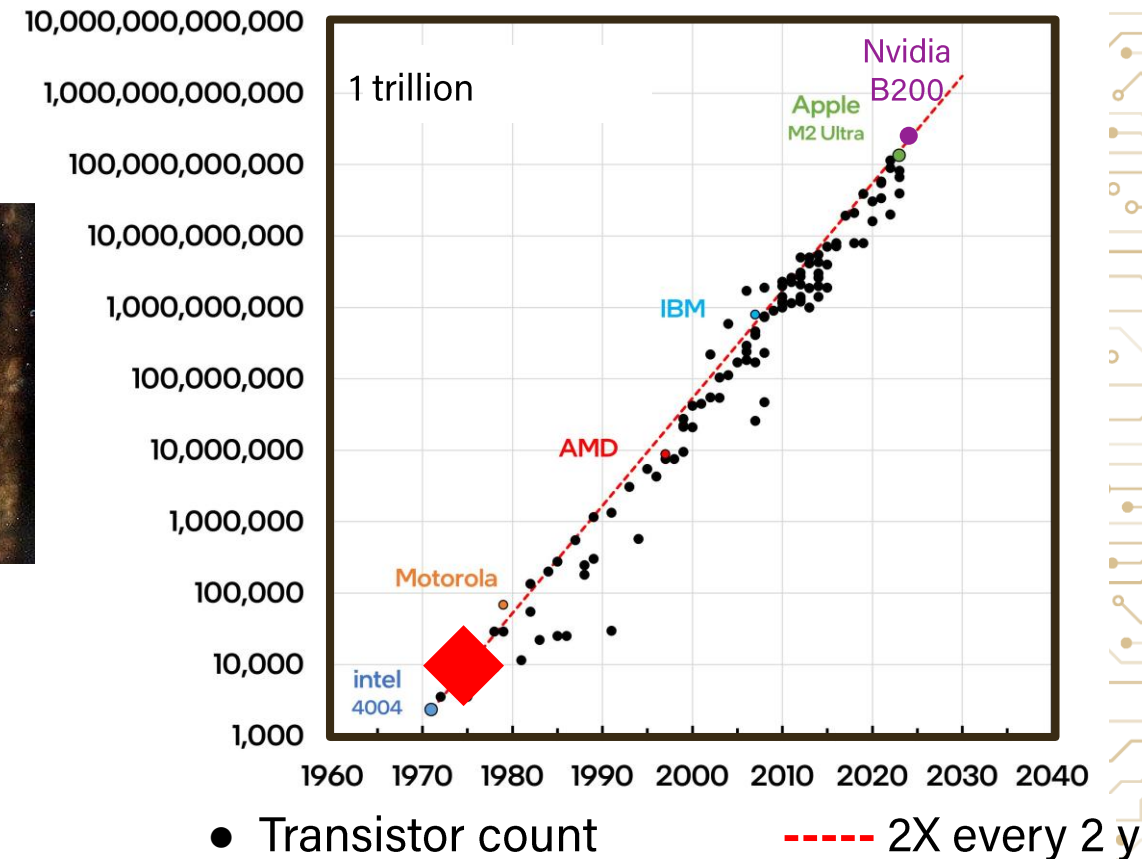
Vacuum tube
1904



Transistor
1947, 1960



Silicon chip
1960



Moore's Law

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Molecular electronics (late 1990's)



Professor Supriyo Datta

Current-Voltage Characteristics of Self-Assembled Monolayers by Scanning Tunneling Microscopy

Supriyo Datta and Weidong Tian

School of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana 47907-1285

Seunghun Hong and R. Reifenberger

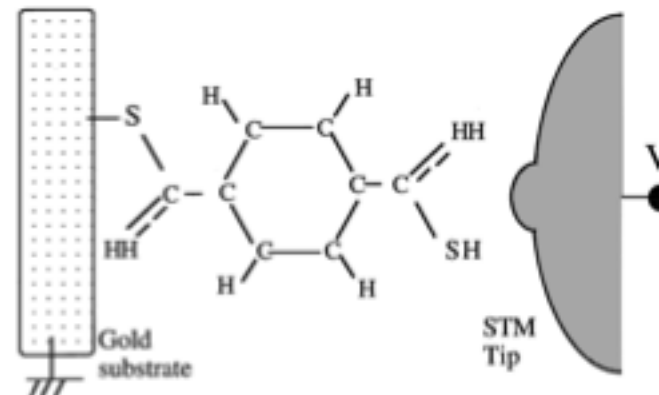
Department of Physics, Purdue University, West Lafayette, Indiana 47907-1285

Jason I. Henderson and Clifford P. Kubiak

Department of Chemistry, Purdue University, West Lafayette, Indiana 47907-1285

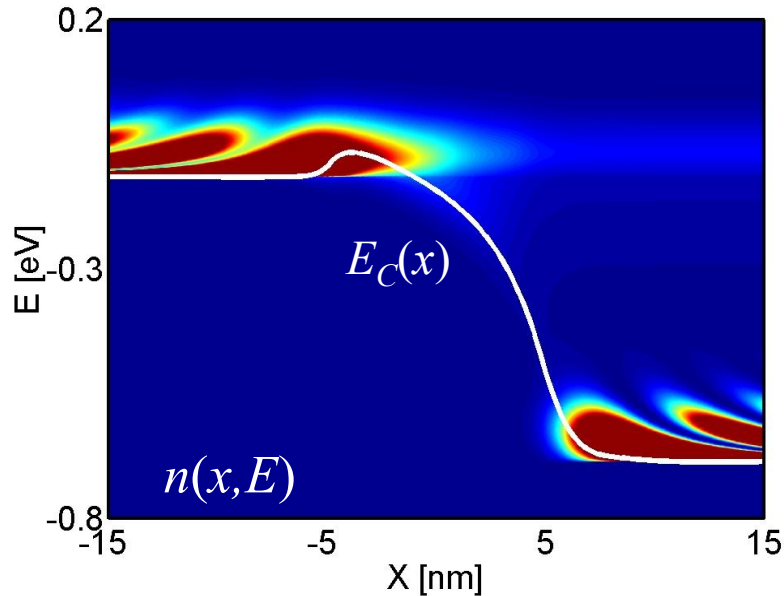
(Received 9 June 1997)

This paper presents a comparison of the theoretical and experimental current-voltage (I - V) characteristics of a self-assembled monolayer of α, α' -xylyl dithiol molecules on a gold substrate measured with a scanning tunneling microscope probe. Good quantitative agreement is obtained with the tip-molecule distance as the only "fitting parameter." Several other thiol-coupled molecules that we have studied also show similar agreement. The conceptual picture presented in this paper could be useful for the interpretation of I - V measurements on molecular monolayers in general. [S0031-9007(97)04094-5]



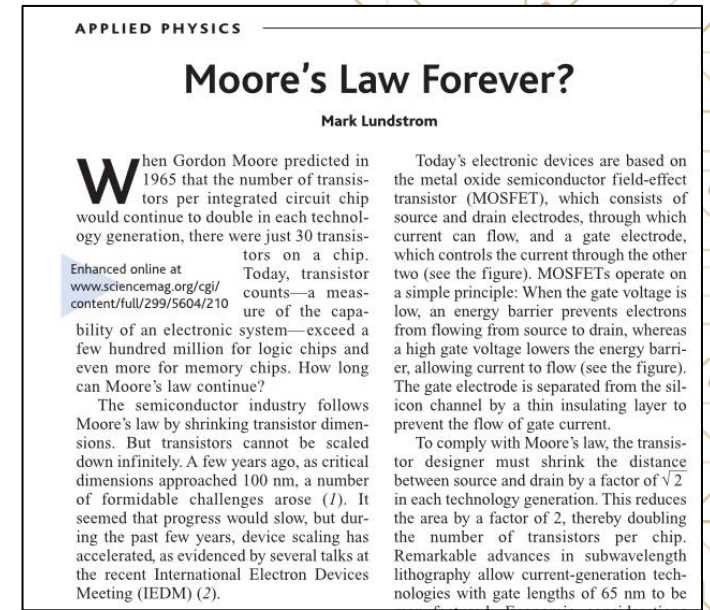
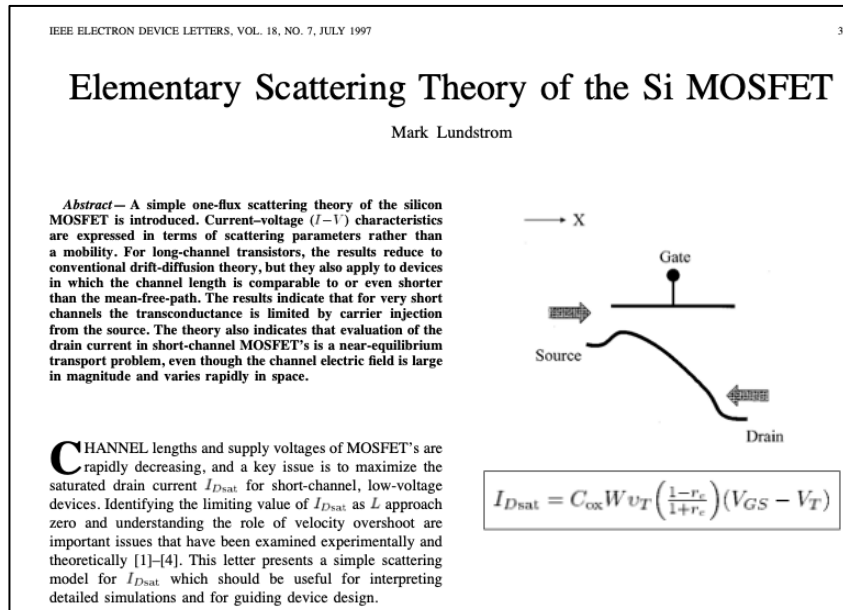
Computational electronics at the atomic scale

$L = 10 \text{ nm}$




Position along channel (nm)

Ren, Venugopal, Goasguen, Datta, and Lundstrom, TED, **50**, p. 2185, 2003.



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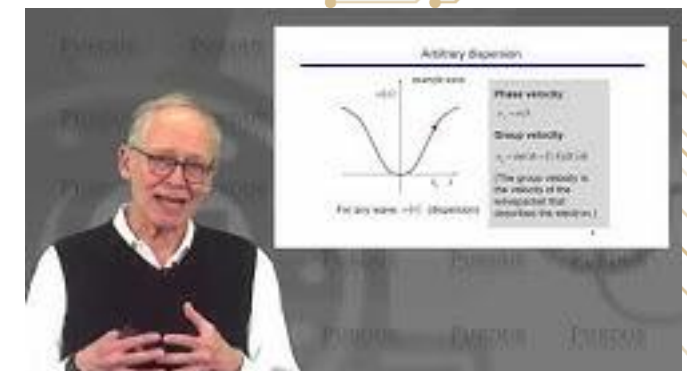
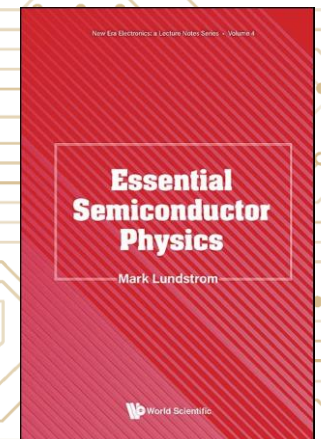
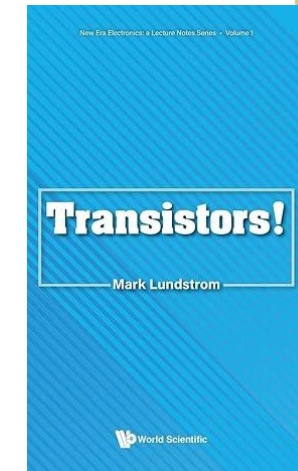
Surface Chemistry

Battery Materials

Pharmaceutical Formulations

Polymeric Materials

Consumer Packaged Goods



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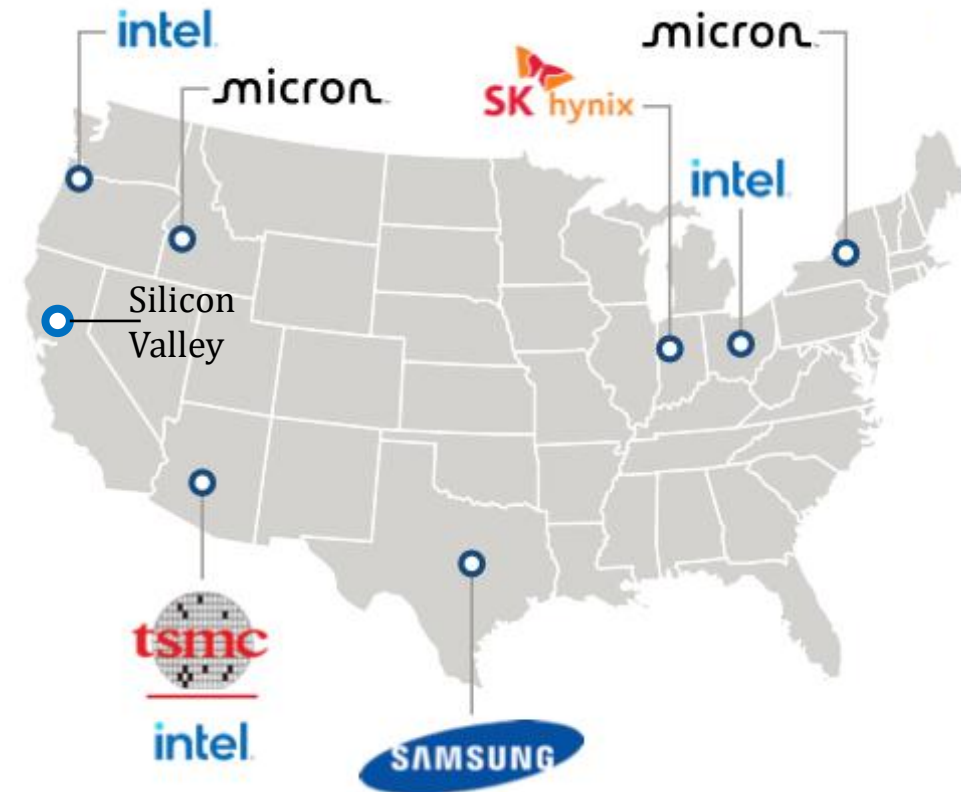


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Semiconductors@Purdue...



Looking back...



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| ???? | Professor Emeritus |