

MAR11-2010-006922

Abstract for an Invited Paper
for the MAR11 Meeting of
the American Physical Society

Foundational Forces & Hidden Variables in Technology Commercialization

BRANDON BARNETT, Intel Corporation

The science of physics seems vastly different from the process of technology commercialization. Physics strives to understand our world through the experimental deduction of immutable laws and dependent variables and the resulting macro-scale phenomenon. In comparison, the goal of business is to make a profit by addressing the needs, preferences, and whims of individuals in a market. It may seem that this environment is too dynamic to identify all the hidden variables and deduct the foundational forces that impact a business's ability to commercialize innovative technologies. One example of a business "force" is found in the semiconductor industry. In 1965, Intel co-founder Gordon Moore predicted that the number of transistors incorporated in a chip will approximately double every 24 months. Known as Moore's Law, this prediction has become the guiding principle for the semiconductor industry for the last 40 years. Of course, Moore's Law is not really a law of nature; rather it is the result of efforts by Intel and the entire semiconductor industry. A closer examination suggests that there are foundational principles of business that underlie the macro-scale phenomenon of Moore's Law. Principles of profitability, incentive, and strategic alignment have resulted in a coordinated influx of resources that has driven technologies to market, increasing the profitability of the semiconductor industry and optimizing the fitness of its participants. New innovations in technology are subject to these same principles. So, in addition to traditional market forces, these often unrecognized forces and variables create challenges for new technology commercialization. In this talk, I will draw from ethnographic research, complex adaptive theory, and industry data to suggest a framework with which to think about new technology commercialization. Intel's bio-silicon initiative provides a case study.