

## A Minute with David Leinweber

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In each issue, *Algorithmic Finance* features a brief interview with one member of our advisory or editorial boards or another leading academic or practitioner. These brief conversations are intended to provide a glimpse of their current thinking. In this issue, we talk with David Leinweber.

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DAVID LEINWEBER, author of “Nerds on Wall Street: Math, Machines and Wired Markets”, <http://tinyurl.com/nerdsonwallst> was recently named one of the Top Ten Innovators of the Decade by *Advanced Trading* magazine. As founder of two financial technology firms, and as manager of multi-billion dollar quantitative equity portfolios, he brings a practical approach to innovation. He is now principal of Leinweber & Co., and in a public service role, co-founder of the Center for Innovative Financial Technology at Lawrence Berkeley Lab. <http://www.lbl.gov/CS/CIFT.html>

LBL is one of the premier data intensive science research facilities in the world. Two of LBL’s most recent Nobel laureates used methods of “data intensive science” for physical problems on some of the largest computers in the world. CIFT is supported by financial firms and foundations.

CIFT’s key idea is that systemic risk includes the risk of systems. Jason Zweig of the *WSJ* put it this way: “Could Computers Protect the Market from Computers?”

Leinweber combines the expertise of a computer scientist with the financial experience of a pioneering practitioner in electronic markets and computer driven investing. He has undergraduate degrees in Physics and Computer Science from MIT and a PhD in applied mathematics from Harvard University and is a frequent keynote speaker and writer. He blogs at <http://blogs.forbes.com/people/David%20Leinweber/> and <http://nerdsonwallstreet.typepad.com>.

### **What are your research interests right now?**

At LBL, we focus on how modern information technologies can make markets more stable, safe and secure. A collection of well-tested stable systems, in aggregate, and operating on time scales so much faster than their users, can be unstable and unpredictable.

Cyber security of markets in aggregate is so complex that it has taken its place at the back of the queue.

The stock market is only the most visible because of its high transparency. Resolution of issues in much larger markets, such as swaps (including what were once known as “toxic assets”) in the highly politicized SEF and FPML efforts, as we saw in 2008, can be more damaging than events in the stock market. An amazingly well written and detailed account of these issues in modern markets is found in Scott Paterson’s book “Dark Pools” which is about much more than dark pools in the narrow industry sense.

At Leinweber & Co, our commercial work has been looking to extend quant methods into the “quant-textual” world, where information comes as “big data” in the form of words as well as numbers. Understanding complex evolving events are an area where humans still have game against computers.

### **What do you see as academically exciting?**

I have a Higgs Boson in my sock drawer, but don’t tell. I also have a copy of Emanuel Derman’s rules for financial engineers to avoid bad or catastrophic model behavior. I think they should be tattooed on the inside of the eyelids of all financial engineers.

### **What would you work on if you had lots of time?**

That is truly a tough question. In the book “How I Became a Quant” <http://www.amazon.com/How-Became-Quant-Insights-Streets/dp/0470050624> I ‘fessed up to being an “accidental quant”, where early work on real-time defense systems at RAND led to early “electronic order working”, which accelerated into algorithmic trading, and HFT (which has both white-hat and black-hat practitioners).

In the 90s and early 2000s, I was pleased to tell my kid’s friends what I did for a living in electronic markets, and see from their reactions that I was doing something good. Since 2008, the sign on those reactions has flipped. At the end of the Manhattan Project, just before the test of the first atomic bomb, some physicists were worried that it might set the sky on fire. The non Wall Street twenty-somethings of today seem to feel that the misapplication of financial technology has set their future on fire. It doesn’t have to be this way. Derman’s credo of responsible

modeling is more important than anything else in the curriculum. Recipes with too much leverage, too little liquidity, and too much complexity should not be served again.

If I was a new graduate, there are so many fascinating areas. Kurzweil talks about the coming singularity, when machine intelligence rivals humans. When the Google Goggles of 2050 go inside our heads, we

will be a different species. Medical Nanotechnology offers the potential to cure diseases in unprecedented ways, and engineer world-changing devices, like bacteria that turn sunlight and green-house gases into clean electricity. Some science fiction authors see a dystopic future. Others see limitless potential for improvements in the human condition; I'd join that team.