We've all been there. You're surfing the net looking for a cheap flight and you end up at the best deal after shopping around only to find the ticket price has gone up... Well, you have Albert Menkveld to thank for that! After gaining his degree in econometrics, he started at KLM and was part of a team that developed algorithms to optimize ticket prices. But after a year, the intellectual challenge began to wane and Menkveld finally opted for a career in science. He has become an internationally renowned expert in the automation of the financial markets.

One of his goals is to end a pointless arms race in the securities markets that is devouring millions of euros. It’s a race that revolves around milliseconds. Robots have taken over the role of human traders. In less than a second, these high frequency traders (HFTs) can decide whether to buy or sell. And, they continue to increase their action speed. Menkveld believes it potentially is a waste of economic resources. "These machines already make decisions in under two milliseconds. Robits have taken over the role of human traders. In less than a second, these high frequency traders (HFTs) can decide whether to buy or sell. And, they continue to increase their action speed. Menkveld believes it potentially is a waste of economic resources. "These machines already make decisions in under two milliseconds.\n
FLASH CRASH is fascinated by the way automation has transformed trading. For one thing, it has cut the cost of trading in shares. But Menkveld also has his concerns: "We are not really part of the game anymore." And the situation can rapidly spiral out of control if something goes wrong. In May 2010, all HFTs suddenly could not resell and ended up trading with one another. In one minute, share prices dropped by four per cent. The destruction of capital equaled the cost of the Iraq war. The uncertainty generated by such a fluctuation can spark a new crisis: investors become afraid to invest, companies are starved of credit, banks collapse. Menkveld was therefore keen to know what caused this 'flash crash'. Last year, fellow researchers made a breakthrough. They discovered that, during that fateful minute, the HFTs were engaged in intensive buying and selling with each other but had not with investors. Menkveld and his colleagues believe investors misinterpreted this spike of activity. It seemed as if the disproportionate volume indicated a lot of liquidity – in other words, a lot of participation of investors – and the investor that sold the initial block might have misinterpreted this as a signal to accelerate his sales. But, HFTs could not resell and prices collapsed. In November 2012, Menkveld published an economic model with fellow researcher Bart Zhou and Vuyelwa to encapsulate this phenomenon.

ECONOMIC FORCES. Now he is carrying out an empirical study aimed at substantiating that descriptive model. The fact that Chicago-based data company Nanex gave him access to their data not only speaks volumes about the trust that Menkveld enjoys as an academic, but also about how urgent his research is for today’s securities markets. That is why he is also involved in regular discussions with central banks and financial regulators, especially the European Securities and Markets Authority and the French Autorité des Marchés Financiers.

They want to lay a new cable that costs 300 million euros at the bottom of the Atlantic, because the old one is five milliseconds too slow.\n
"The worst scientists come up with the biggest models". It's a matter of simplifying things, Menkveld believes. "The worst scientists come up with the biggest models. They want to encompass everything in a large mathematical model, feed it to a computer and let the computer crunch the numbers. But, ultimately, these numbers then come from a black box. The most fascinating part of my job is reduction. You need to bring it an economic issue down to its most powerful forces; forces you can jot down with pen and paper, as it were. Even at that level you can gain a wonderful perspective on what is happening in the economy and ways to go about improving it."

TANGO. In his spare time, Menkveld likes to do things that are entirely unrelated to his rational, computer-driven and number-driven working environment. He dances tango and has recently taken up horse riding. He reckons you need these escapes from the scientific world if you want to stay the pace as a scientist, because science requires great stamina. For instance in 2008-2009, as a visiting researcher at New York University, he looked at daily trading in US equities over a ten-year period, in order to analyse the behaviour of market makers at the New York Stock Exchange. But the final step from data to mathematical model proved elusive. "I felt like I was going round in circles. The hardest part of this job is not knowing whether or not there is a solution. You therefore always wonder if you shouldn’t just stop investing all that energy in a problem. This level of uncertainty is a terrible burden. But a new day dawns and you find yourself right back at it again." Staring out of his window one day at the skyscrapers of Manhattan, he suddenly saw the link between reality and his model. "It clicked into place! The market makers did what the model had predicted. That’s a real kick. That weekend, I really tied one on!"