

How industry looks at physics & bio-nano students

TN1661
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Agenda

- Who am I
- The Peacock Effect & The Delft Downside
- What you can do after studying physics
 - General Industry, Specialist Industry, Further Research, Strategy Consultants, Startup life, Finance & Banks
- What you can do while studying physics



We already had color photos at the time (1996). Seriously.



Physics, VvTP board, Delftse Bedrijvendagen, Grafico in lustrumjaar

Helped found Casema Internet, growth from 50 users to 50k

PowerDNS powers around 30% of the world's internet

Exciting things at Dutch government, where I was a long-time member of a hiring committee

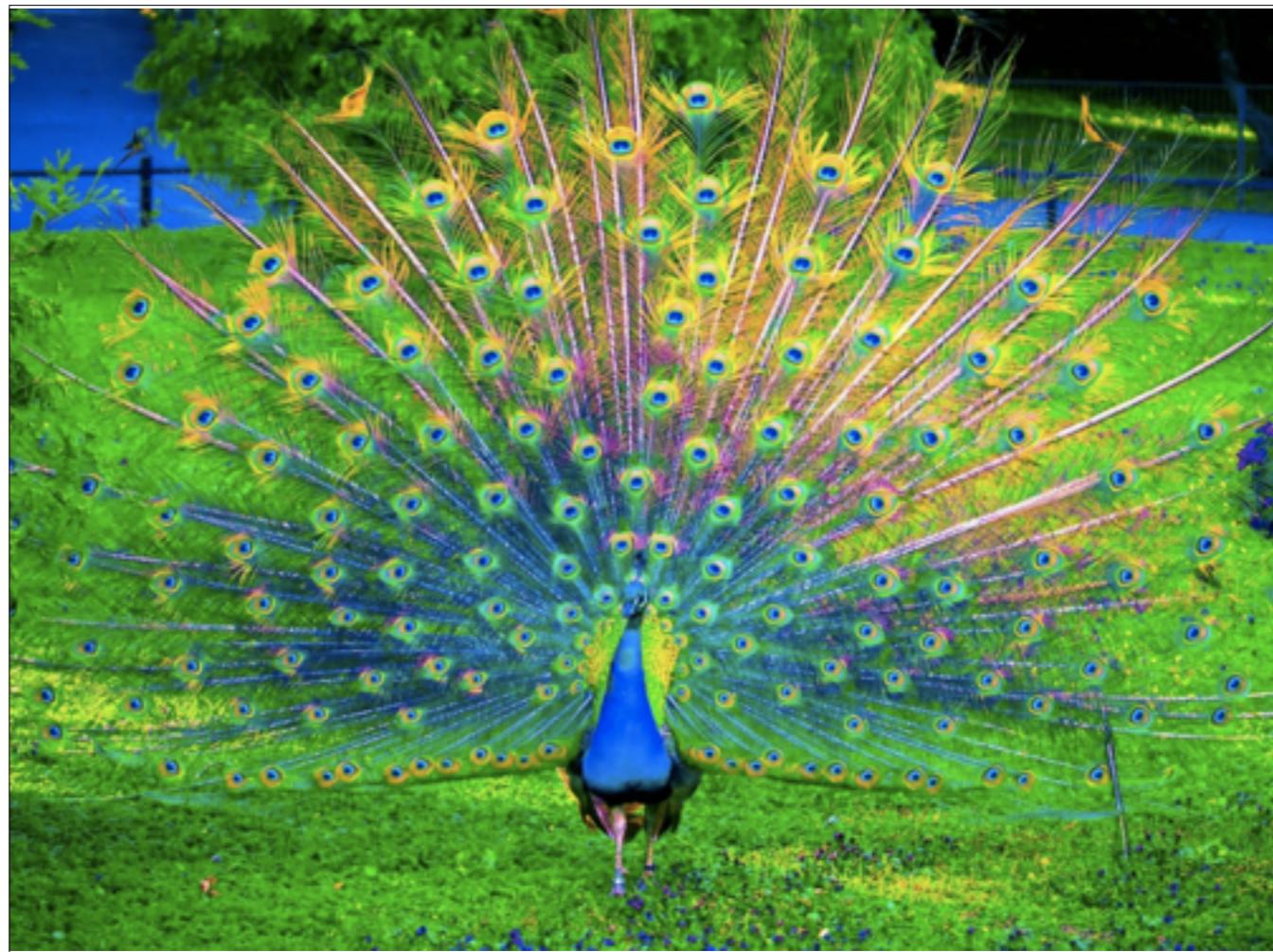
Fox-IT Replay Joint venture, hired loads of Delft people, sold that

Research at Bionanoscience, helped recruitment at QuTech and BN

All in all I've helped hire 20+ Delft students, read thousands of CVs

Some real honest truth about Physics & Industry

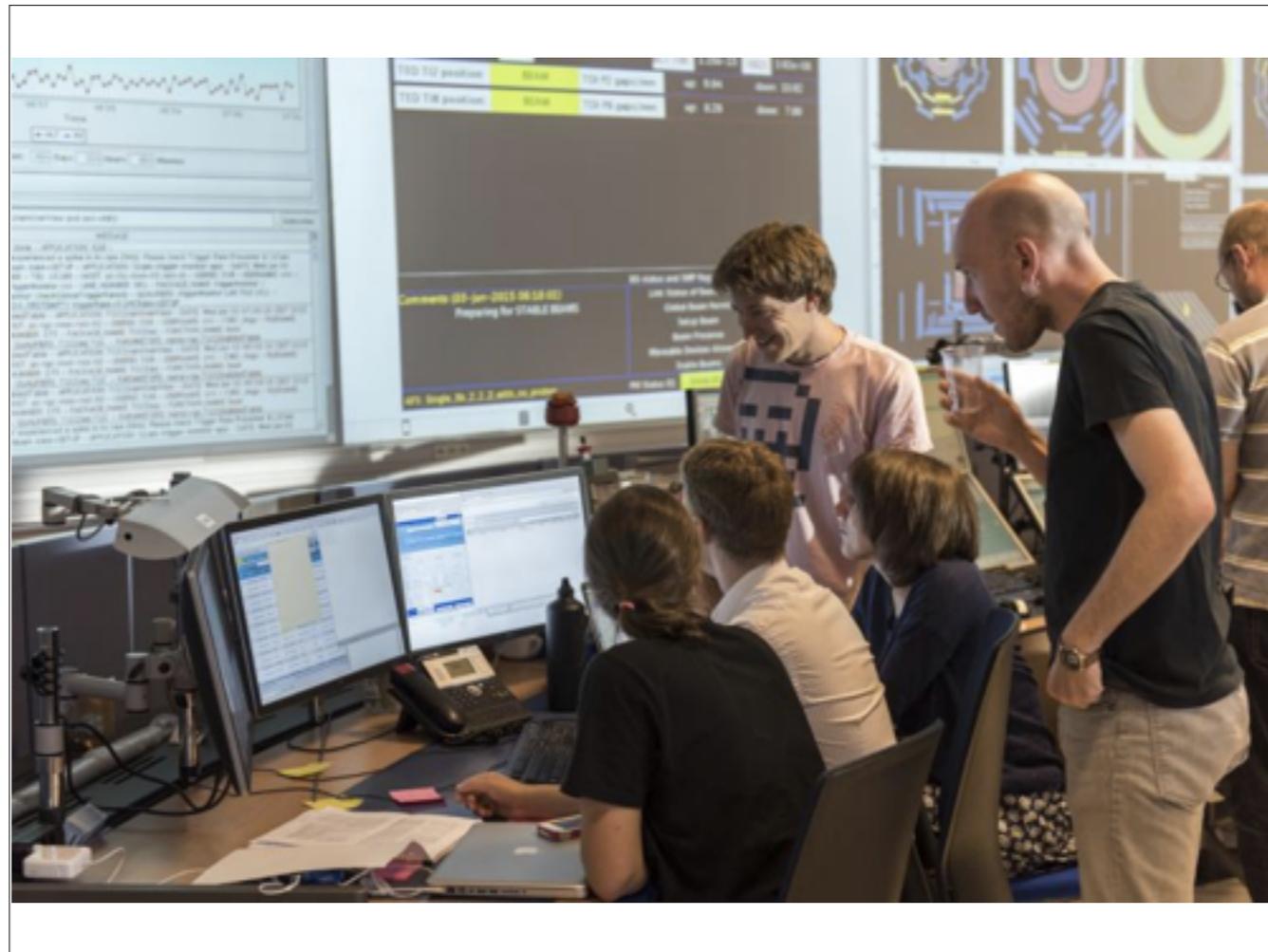
- Let's get this out of the way
- **Most of the industry does not need your mastery of Quantum Physics or Meiotic Spindles :-)**
- Few people end up doing actual physics or even science when done with academia
- Delft students are famously unaware of how business works and how to sell themselves
- YET! Everyone still wants to hire them!



Peacocks are well known for their ridiculous tail. One theory is that this giant tail signals to mates that “look, I survive with this idiotic tail, so you can well imagine how incredibly strong and fit I am!”. This is what studying physics is like. Mastering quantum mechanics is everything people need to know about you. Physics was a good choice!



The Delft Disadvantage. While the technical parts of your education here in Delft are mostly great, graduates are famously unaware of how business works. It is not rocket science to learn this stuff, but people from Rotterdam and perhaps even LEIDEN, already know this stuff. Secondly, they are also a lot better at selling themselves and generally “being social”.



Actual physicists rebooting the LHC *this morning* at CERN. Woohoo! Note the red button.

The Default CV Problem



Where you
could
be

You are here!

The default CV! "2008-2014 Gymnasium. 2014-2019 Physics. 2015-2016 Albert Heijn. 2016-2018 Cafe de Sjees". Please hire me?

The default CV (complete)

Education

2008 - 2014 VWO

2014 - 2019 Physics, graduated on “Meiotic Spindle Peeling in Prokaryotes”

Work experience

2013 - 2015 TNT Post mail delivery

2015 - 2017 Jumbo Supermarket

2017 - 2019 Cafe de Sjees

Y U NO HIRE ME? Note how this CV communicates only one number to most companies: you graduated in 2019. The rest is of no value, since the graduation subject might as well be in Chinese to them.

Various parts of industry

- General industry: big companies with tens of thousands of people, most of them not doing difficult things. “We are in the business of doing business”
- Specialist industry: they actually DO physics, math, biology, programming, pharma things
- Non-university research
- Startups
- (Strategy) consultants, investment banks

This is not an exhaustive list. You could also go work for government (worked for me!), become a teacher, join a charity and improve healthcare in the third world etc.

General industry

- Most of the large ones claim to want to hire the best and the brightest (ie, physicists!)
 - Unsure why they do that because they rarely make good use of the brains they hire
- “Big enterprise” is more about process than about innovation, so they actually don’t need too many big brains
- There are notable exceptions though

They love physicists and smart people, but be prepared to be disappointed. Large enterprises move slowly. You won’t be asked to join the boardroom to set their strategy, so at first you’ll be executing things “which have been like that for ages”

Specialist industry

- ASML, Shell Research, Fugro, Mapper, NXP, FEI etc.
- They not only want physicists, they NEED them
 - “The marketing department is not going to discover that oil field”
 - This is sort of why you study physics if you don't go into academia
- Bad (?) news: only limited number of these in The Netherlands -
> prepare to move abroad (recommended!)
 - **Especially for bio-nano**

You can quickly get depressed about opportunities in The Netherlands. There are LOADS of opportunities in the (near) abroad. Also, immediately after your studies is a GREAT time to spend a few years in another country - no kids yet, your partner (if any) may enjoy the adventure too or join in etc.

Non-university research

- Most famous examples are TNO and ECN
 - Do “research for industry”
 - Or more accurately, do “research for EU grants”
- Can't exist without exact sciences graduates
- Currently not the most exciting place to end up, it is a troubled industry

Startups

- Biggest source of innovation. Great way to actually make new things, solve problems etc.
- Lively scene in The Netherlands and beyond (Yes!Delft, Yes! Delft Students can help you)
- Depending on nature of startup, they can't function without you
 - Since they actually invent things that haven't been done before
- We love the best brains!
- Join a startup or start one



See <http://xs.powerdns.com/exact-sciences-entrepreneur/> Really.

(Strategy) consultants, investment banks

- Feed on an exclusive diet of the smartest students
 - Actually do know what to do with them too
 - Hire clearly exceptional students
- Hope to make money by getting your brain to work
- Very much a lifestyle choice (or perhaps a **non**-lifestyle choice)
- Lots of excitement, definitely an adventure
- Not for everyone

You don't get here with the Delft Disadvantage and a default CV.

How to get there?

- Solve the “Delft Disadvantage” problem
- Solve the “Default CV” problem
- Do relevant research work, gain specific skills

Solving Delft Disadvantage

- Are there business courses you can take as part of your study -> do it
 - Even better if you can do that in Rotterdam or abroad
- Do everything you can do to gain “people skills”
 - Social skills sufficient for Delft do NOT get you to the board room (trust me). I hit that ceiling.

Real life example: in Delft it is completely acceptable to ask people “do you think that or do you KNOW that?”. Outside of Delft and in business that is an insult.

The Default CV challenge

- Organize stuff! Seriously! If you haven't, industry will draw (correct!) conclusions
 - Lustrum, student trips, student societies, (international) contests (iGem), career fairs, just DO something!
- Win stuff!
 - Participate in iGem, take part in contests, win prizes!
- Get an interesting job



iGem is tremendous fun, do join it.

“The side job”

- Studying costs money, you may well need a job to fund yourself
- But by ALL means try to make this job interesting and somewhat relevant eventually
- 5 years of ‘Jumbo’ supermarket or Cafe de Sjees is not what should be on your CV
 - Work on this!

Do relevant research work, gain experience

- Combine your research results with things industry likes (currently: programming, “big data”)
 - Within BN, most disciplines involve “big” data processing. Most research would be better with more programming.
- Once you graduate, you’ll be somewhat of a programmer, laboratory professional, big data scientist etc
- Great for research, great for you

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The new CV

Education

2008 - 2014

VWO

2014 - 2019

Physics, graduated on analyzing high-frequency image captures and through machine learning classifying cell division modes

2015

Course in Business Administration at Erasmus University

Experience

2013 - 2014

TNT Post mail delivery

2015

Treasurer symposium committee SVNB Hooke

2015 - 2017

Assistant lab tech TNO

Awards

2018

Second prize iGem competition, Paris, France

Note that the difference in effort between this and the previous CV is only a few weeks of work per year.

Summarizing

- Industry loves physics students
 - Lots of them need better social and business skills though
 - The “default CV” does not get you a (great) job
- Escape default CV by organising things, participating in contests, doing exciting research and **gaining relevant skills during research**
 - It is not a sin to think of your next job as you do research!
- Specialist Industry is mostly abroad, be prepared to travel
- Really want to innovate? Ponder doing/joining a startup.

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