



**WHERE  
GREAT  
MINDS  
WORK**



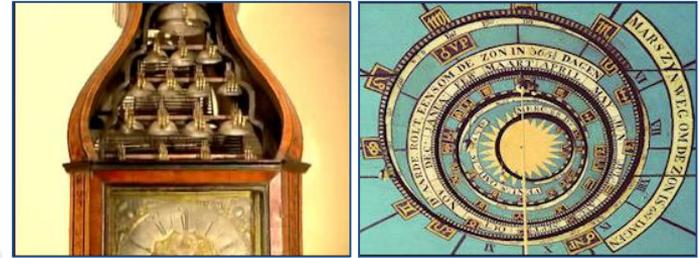
ICD?  
What's that?

# The innovatiecluster Drachten is the follow up of an old tradition in this region

## Mechanisation

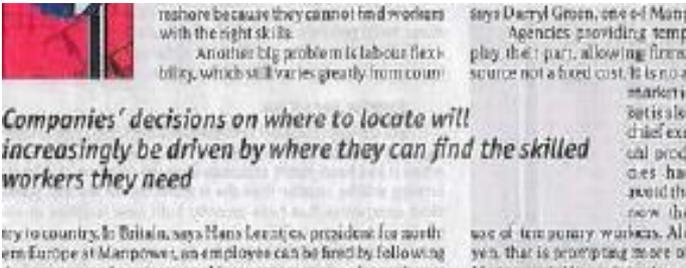


## Manufacturing instruments



# The innovatiecluster Drachten is the answer to today's strategic issues

## Strategic rooting in the region

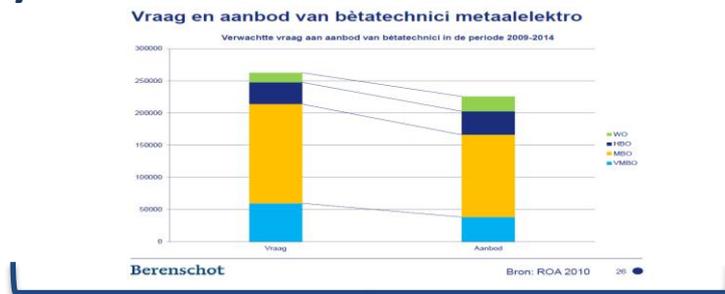


reshore because they cannot find workers with the right skills. Another big problem is labour flexibility, which still varies greatly from country to country. In Britain, says Hans Leunig, president for northern Europe at Manpower, an employee can be fired by following strict rules...

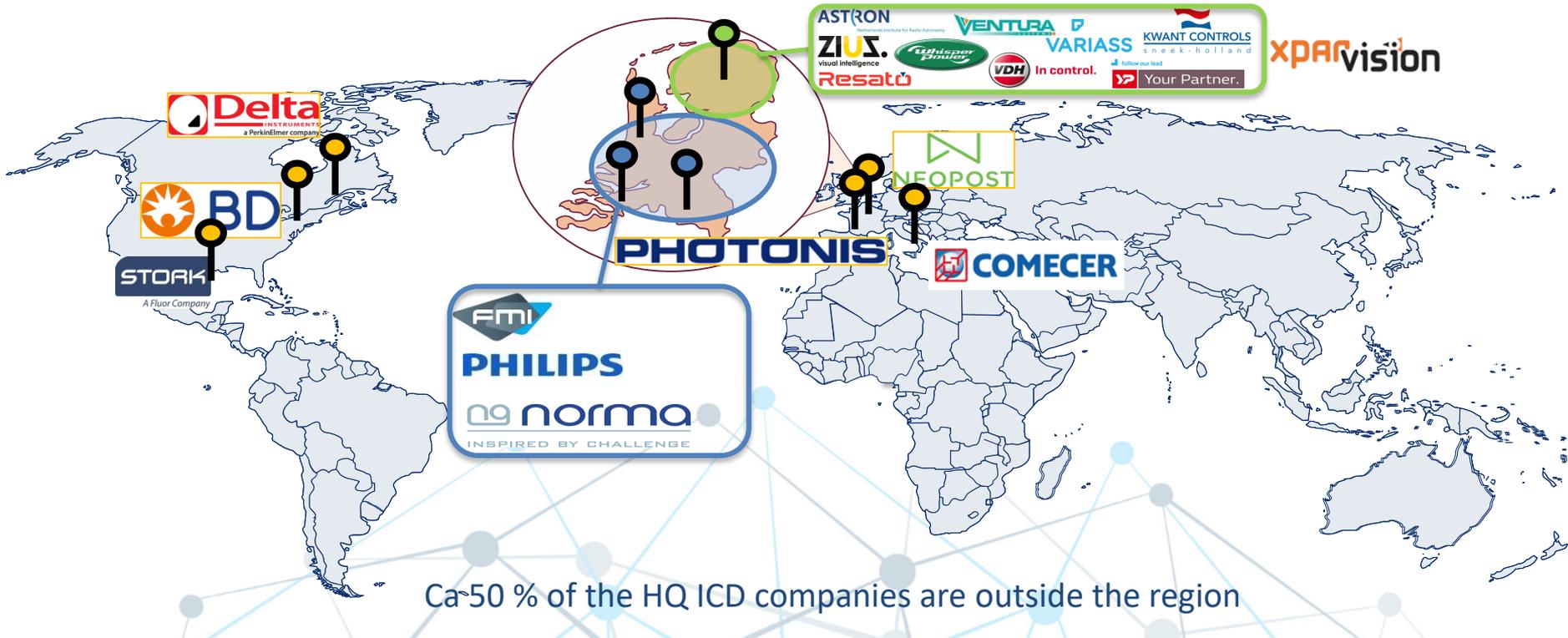
says Daeryl Green, one of Manpower's Agencies providing temporary employment, their part, allowing firms to source not a fixed cost. It is not a market. It is a chief executive product. It has to be sold to the new... the way of the primary workers. All of them, that is prompting more of...

**Companies' decisions on where to locate will increasingly be driven by where they can find the skilled workers they need**

## Scarcity technical talents



# The innovatiecluster Drachten is your start of an international career?



# The Innovation Cluster Drachten

## Focus, Facts & Figures in a glance

- 3800 FTE of which >1400 innovation related
- 19 International operating companies
- OEM-ers and market leaders
- Self-creating industry
- Over € 100 million R&D spend
- 45 nationalities in companies
- 275 internships 2019



Innovatiecluster  
high tech systems Drachten



# What are High Tech Systems?

All sorts of systems like:

- **Devices**
- **Instruments**
- **Machines**
- **Mechanisations**
- **Automotive**
- **Trucks & busses**
- **Airplanes**
- **Ships**



# New High Tech Systems



## New Additive Manufacturing systems



## New medical instruments



## New bottom-of-the pyramid product Autonomous cars

## New informatie & communicatie generaties



## New simulators

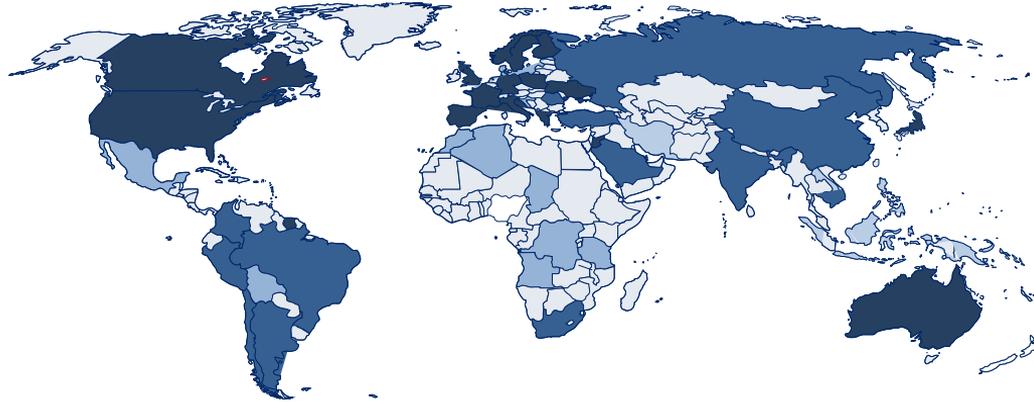


## New robotsystems



## Drones

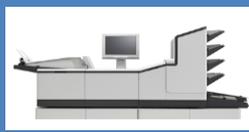
# The innovatiecluster Drachten is connected to the world by their connected installed base



Mechanisations



Machines



Devices  
Desktop



Devices  
Hand held



Subsystems



# The innovatiecluster Drachten provides opportunities to work at the cutting edge of technologies



3D metal printen	Remote sensing & big data	Visual intelligence	Robotics	Renewable propulsion
Complex metal parts HP plastics Printed-electronics	Sensor fusion Cyber security Telemetry Apps/Hololenses Predictive maintenance	Multi- spectral Images Neural networks Deep Learning	Cobots & robots Autonomous vehicles Edurobotics	PV energy Battery mgt Hydrogen

Meet our Big Five !!!

# The innovatiecluster Drachten provides 16 shared facilities at the companies

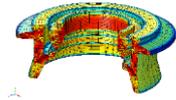
ASTRON

PHILIPS

ASTRON



ASTRON



Antenne meetkamer

FEM berekeningen

Outdoor  
Test facility

Microbiologisch lab

CARS software

Klimaat kamer

Temp test room

3D scanner

ASTRON

PHILIPS

ASTRON

ASTRON



Optical/electronic  
integration

Acoustisch lab

Solar Radiation  
chamber

Climate test  
chamber

Precisie meetkamer

Starlight room

Waterjet cutting

Xray

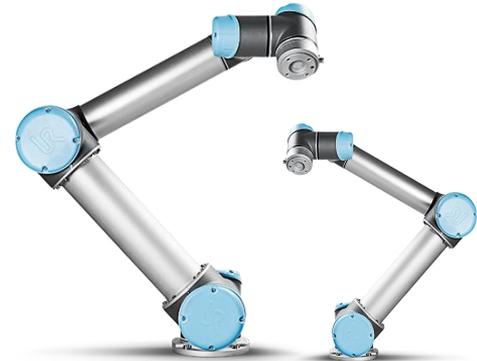
# The innovatiecluster Drachten owns 4 shared facilities



*3D metalprinter*



*3D HP polymerprinter*



*UR5 robotarms*

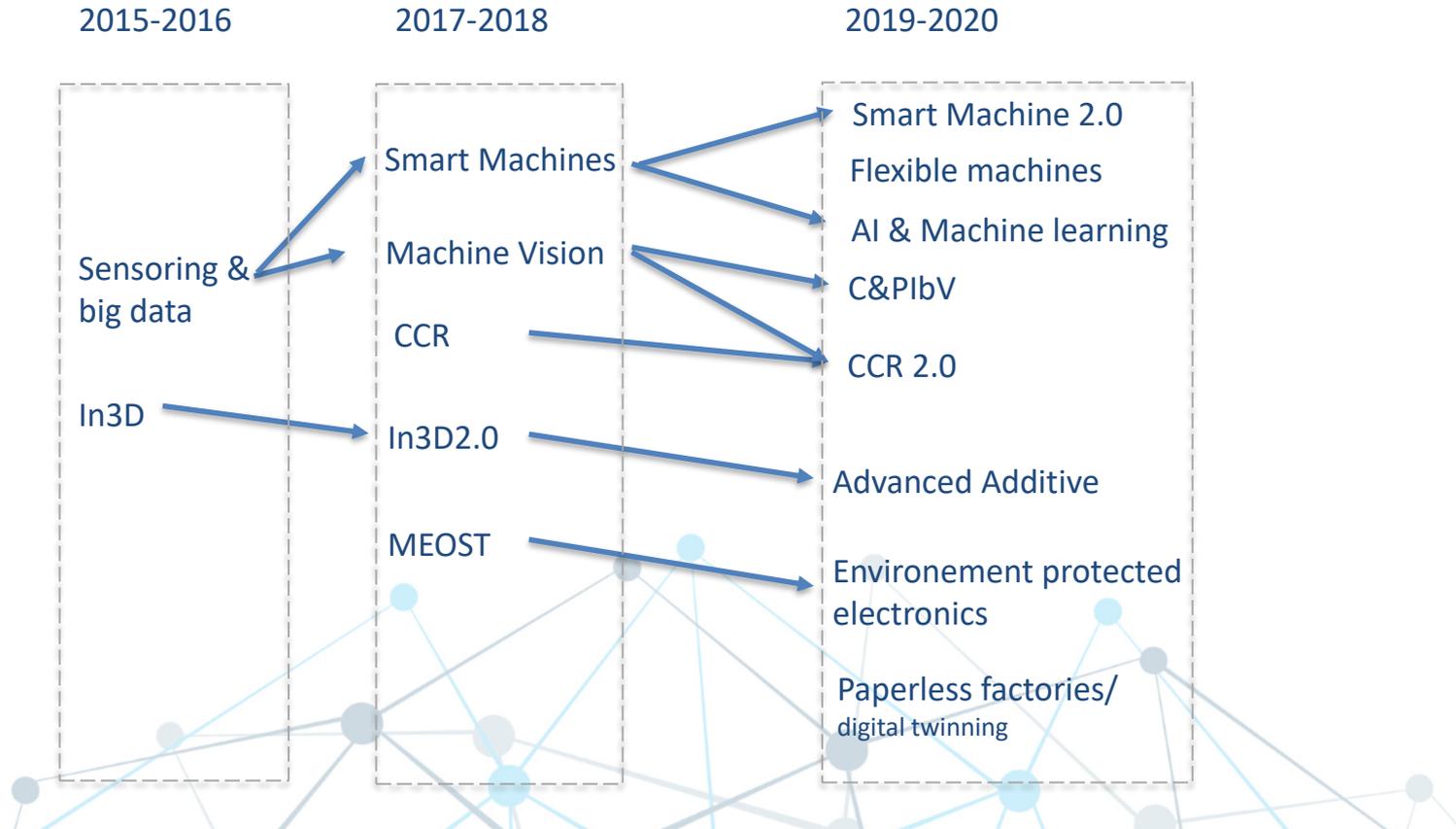
*MEOST experts*

## The innovatiecluster Drachten provides **opportunities for students**

1. Contribution in R&D projects by internships
2. High Tech Career Competition
3. International exchange program with Boston
4. Master Honours program High Tech Systems
5. Masters Mechanical engineering
6. Your first job in this region.....



# 1. Internships in R&D projects



## ***2. Internships matchmaking at the High Tech Career Competition***

2 times per year: the change to meet our companies

50 – 70 internships

- 25th of May in Assen 11.00 hrs for the period after summer 2019
  - Apply from end of April
- Medio November for the period the period after january 2020
  - Apply from mid of October



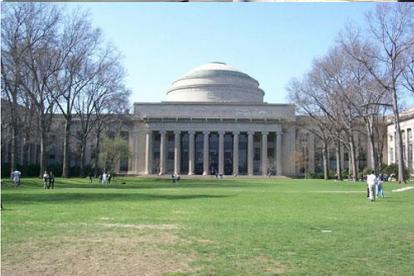
### 3. International High Tech Student Exchange program Boston –Top Dutch region



Harvard



WPI



MIT



Innovatiecluster  
high tech systems Drachten

RuG



NHLStenden



Hanze



Started january 2019: extra 10.000 Euros grant: 2 places left

# 4. 5th Edition Master Honours programme starting nov 2019

## For whom?

The highly selective admission procedure is open to students from both the University of Groningen and the University of Twente.

Talented, ambitious students from the following course programmes are welcome to apply:

- (Applied) Physics
- Chemistry
- Chemical Engineering
- Industrial Engineering and Management
- Industrial Design Engineering
- Mechanical Engineering
- Electrical Engineering
- Other science studies with a clear technical component applicable to the HTSM sector, such as computer science, mathematics, biomedical engineering, life sciences & technology and molecular biology.

## Selection criteria

- A Bachelor's degree by 1 September with good to excellent results, including a Bachelor's thesis marked above average.
- Good oral and written skills in English (TOEFL 580).
- Highly motivated toward the focus of the programme: multidisciplinary, innovative, high tech product development.
- Able to pair a great intellectual ability with technical skills and interests.
- Specific personal qualities (innovative, independent, creative, original, proactive and persevering).
- Motivated and able to collaborate with other (technical) disciplines in multidisciplinary teams.
- The desire to widen your knowledge beyond the borders of your own discipline and beyond technical and non-technical borders.

## More information

More information about the programme and selection procedure is available on the following website:  
[www.rug.nl/honours/htsm-masterprogramme](http://www.rug.nl/honours/htsm-masterprogramme)

University of Groningen  
tel: 050-3638484/3839970  
email: [htsm-honours@rug.nl](mailto:htsm-honours@rug.nl)  
Honours College  
Academy Building  
Broerstraat 5, 9712 CP Groningen, The Netherlands



university of  
 groningen



## HTSM Master's Honours Programme

'Excel together at the frontiers of knowledge:  
high tech, human touch'



[www.rug.nl/honours/htsm-masterprogramme](http://www.rug.nl/honours/htsm-masterprogramme)



Honours College

UNIVERSITY OF  
 TWENTE.



PHILIPS

# 5. Four new High Tech mastertracks at RuG/ GEC

Tabel 1. Schematisch Curriculum Overzicht masteropleiding Mechanical Engineering Rijksuniversiteit Groningen

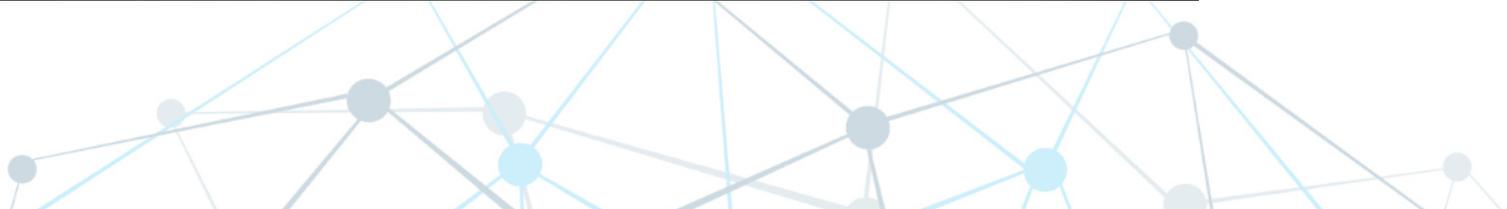
Track	Materials for Mechanical Engineering	Advanced Instrumentation	Smart Factories	Process Design for Energy Systems
Compulsory courses (each course 5 ECTS)	<ul style="list-style-type: none"> <li>- Computational Mechanics I</li> <li>- Introduction to Data Science</li> <li>- Experimental Design</li> </ul>			
	<ul style="list-style-type: none"> <li>- Micromechanics</li> <li>- Engineering Materials</li> </ul>	<ul style="list-style-type: none"> <li>- Basic Detection Techniques</li> </ul>	<ul style="list-style-type: none"> <li>- Analysis and Control of Smart Systems</li> </ul>	
	<ul style="list-style-type: none"> <li>- Surface Engineering and Coating Technology</li> </ul>		<ul style="list-style-type: none"> <li>- Robotics</li> <li>- Advanced Processing for Complex Materials</li> </ul>	<ul style="list-style-type: none"> <li>- Computational Fluid Dynamics for Engineers</li> <li>- Advanced Process and Energy Technologies</li> </ul>
Courses in Business, Management and society (choose one course of 5 ECTS)	<ul style="list-style-type: none"> <li>- Environmental and Research Economics</li> <li>- Strategic Management of Information Technology                             <ul style="list-style-type: none"> <li>- Global Change</li> </ul> </li> <li>- Process Improvement and Change                             <ul style="list-style-type: none"> <li>- Game Theory</li> </ul> </li> <li>- Sustainability for Engineers</li> <li>- Technology Based Entrepreneurship</li> </ul>			
Electives (choose five courses of 5 ECTS each)	<ul style="list-style-type: none"> <li>- Computational Mechanics II</li> <li>- Physical and Chemical Kinetics</li> <li>- Electronics</li> <li>- Principles of Measurement Systems</li> </ul>			
	<ul style="list-style-type: none"> <li>- Product Design by the Finite Element Method</li> <li>- Multiscale Contact Mechanics and Tribology</li> <li>- Structure at Macro, Meso and Nanoscale                             <ul style="list-style-type: none"> <li>- Characterisation of Materials</li> <li>- Systems Engineering</li> </ul> </li> </ul>			<ul style="list-style-type: none"> <li>- Advanced Reactor Technologies</li> <li>- Sustainable Process Design</li> <li>- Advanced Process Design</li> <li>- Advanced Thermodynamics</li> <li>- Advanced Powder Technologies</li> <li>- Advanced Process Dynamics</li> <li>- Compressible Flows</li> </ul>
	<ul style="list-style-type: none"> <li>- Advanced Processing for Complex Materials</li> <li>- Computational Fluid Dynamics for Engineers</li> <li>- Multibody and Non-Linear Dynamics                             <ul style="list-style-type: none"> <li>- Rheology</li> <li>- Fracture of Materials</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Advanced Detection Techniques</li> <li>- Fitting Dynamical Models to Data</li> <li>- Scientific Visualisation</li> <li>- Modelling and Control of Complex Nonlinear Engineering Systems                             <ul style="list-style-type: none"> <li>- Opto-Mechatronics</li> </ul> </li> </ul>		
		<ul style="list-style-type: none"> <li>- Robotics</li> <li>- Space Mission Technology</li> <li>- Medical Imaging Instrumentation</li> <li>- Applied Optics</li> <li>- Advanced Instrumentation and Extreme Environments</li> </ul>	<ul style="list-style-type: none"> <li>- Advanced Polymer Processing</li> <li>- Advanced Process and Material Modelling</li> <li>- Surface Engineering and Coating Technology</li> </ul>	
			<ul style="list-style-type: none"> <li>- Basic Detection Techniques</li> <li>- Polymer Physics</li> <li>- Design of Smart Factories</li> </ul>	
Second year	Design Project (20 ECTS)			
	Research Project (40 ECTS)			

Starting september 2019

## ***5. Second year Smart Factory at our shared facilities ICD***



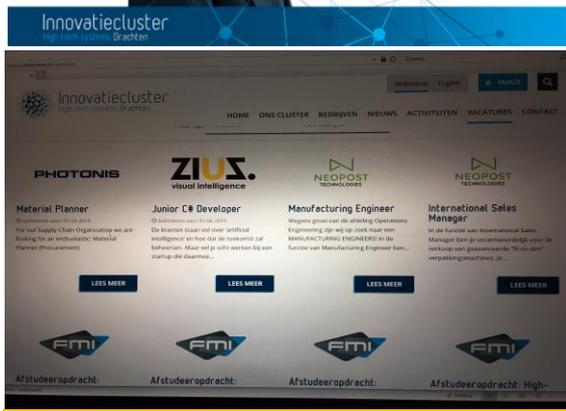
Master Thesis  
subject guaranteed  
by the ICD cluster  
companies !!





**Nice to meet us!**

# The innovatiecluster Drachten provides a career instead of a job !!



Jobs: [www.icdrachten.nl](http://www.icdrachten.nl)



Rolf Moedt

**YACHT**

Project manager

**norma** 60

Directeur  
Norma-IMS

**PHOTONIS**

Plant Manager



Bas Nieuwenhuis

**PHILIPS**

Projectleider  
Floorcare

**neopost**  
TECHNOLOGIES

R&D mgr  
Mechanisch

**BD Kiestra**

R&D  
Site leader



Jan Reinder Fransens

**PHILIPS**

Ontwikkelaar  
IMS

**Irmato**  
developing your future

Systeem  
Architect

**lode**  
THE STANDARD IN ERGOMETRY

R&D mgr

Potentieel  
ICD lid

# The innovatiecluster Drachten provides a career instead of a job in a glance!!

	Astron	BD	Comecer	Delta Instruments	FMI	Horus VR	Kwant Controls	NTS Norma	Philips	Photonis	Neopost	Resato	Stork Turbine blades	Variass	VDH	Ventura	Whisper Power	XparVision	YP your partner	Ziuz
Mechanical engineering	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x
Electrical engineering	x	x	x	x	x	x	x		x	x	x	x		x	x	x	x	x		x
Maritime engineering							x								x		x			
Aerospace engineering	x	x											x					x		
Physics	x	x				x			x	x								x		x
Applied Physics	x	x	x	x		x			x	x	x				x			x		x
Material engineering								x	x			x	x	x						
Chemical engineering									x	x								x		
Mathematics	x					x												x	x	x
Applied Mathematics	x			x					x	x								x	x	x
Industrial design	x	x	x			x	x		x	x				x			x	x		
IT science	x	x	x	x	x	x			x		x							x	x	x
Data science	x	x		x	x	x			x		x							x	x	x
Biomedical engineering		x	x	x					x					x						
Automotive engineering																x				

# Facts & figures Astron

**ASTRON**  
Netherlands Institute for Radio Astronomy

DISCOVERIES IN RADIO ASTRONOMY



Career opportunities for:

- Astronomy
- Physics
- Applied Physics
- Mechanical Engineering
- Electrical Engineering
- Aerospace engineering
- IT science
- Datascience

- Institute
- Location: Dwingeloo, HQ idem
- Size: 220 FTE, 60 PhD
- Astronomy
- High Tech instruments
- XXL Big Data

- MBO
- HBO
- WO
- PhD

# Facts & figures BD



MEDICAL TECHNOLOGY



Career opportunities for:

- Biomedical engineering
- Physics
- Applied Physics
- Mechanical Engineering
- Electronical Engineering
- Aerospace engineering
- Datascience
- IT embedded software
- Industrial design

- Shareholder company
- Location: Drachten, HQ Baltimore USA (60.000 FTE)
- Size: 280 FTE, 120 FTE innovation
- Lab automation
- 3 sites in Drachten
- Saving lifes

- MBO
- HBO
- WO
- PhD



# Facts & figures Comecer



Career opportunities for:

- Biomedical Engineering
- Applied Physics
- Mechanical Engineering
- Electronical Engineering
- IT science
- Industrial design

- Shareholder company
- Location: Joure, HQ Bologna (280 FTE)
- Size: 40 FTE
- Nuclear therapy systems
- Rontgen

- MBO
- HBO
- WO

# Facts & figures Delta Instruments



Career opportunities for:

- Biomedical Engineering
  - Mechanical Engineering
  - Electronical Engineering
  - Applied Physics
  - Applied Mathematics
  - IT Science
  - Datascience
- 
- HBO
  - WO
  - PhD

- Shareholder company
- Location: Drachten, HQ Waltham USA Perkin Elmer (7000)
- Size: 40 FTE
- Advanced instruments
- Sensoring & big data

# Facts & figures FMI



Career opportunities for:

- Mechanical Engineering
- Electronical Engineering
- IT science
- Datascience

- MBO
- HBO
- WO

- Private owned company
- Location: Drachten, HQ Bergen op Zoom (1500)
- Size: 45 FTE
- Advanced mechanisations and robotics
- Vision & big data

# Facts & figures Kwant controls



NAUTICAL INSTRUMENTS & CONTROL SYSTEMS



Career opportunities for:

- Mechanical Engineering
  - Electrical Engineering
  - Maritime engineering
  - Industrial design
- 
- MBO
  - HBO
  - WO

- Private owned company
- Location: Sneek, HQ
- Size: 55 FTE
- Maritime controls (ship dashboard)
- Mechanical precision & electronics
- Former Stork company

# Facts & figures NTS-Norma



COMPLETE MECHATRONIC SYSTEMS



Career opportunities for:

- Mechanical Engineering
- Material Engineering
  
- MBO
- HBO

- Shareholder owned company
- Location: Drachten, HQ Eindhoven (1500)
- Size: 90 FTE
- UH Mechanical precision & automation
- 3D printing

# Facts & figures Neopost



AUTOMATED PACKING SOLUTIONS



Career opportunities for:

- Applied Physics
- Mechanical Engineering
- Electronical Engineering
- Datascience
- IT science
- Industrial design

- MBO
- HBO
- WO
- PhD

- Shareholder owned company
- Location: Drachten, HQ Paris (7000)
- Size: 250 FTE, 60 FTE innovation
- HP Mechtronics
- Booming business



# Facts & figures Philips

**PHILIPS** PHILIPS DRACHTEN, DEVELOPMENT EN PRODUCTION



Career opportunities for:

- Applied Physics
- Biomedical Engineering
- Material Engineering
- Chemical Engineering
- Mechanical Engineering
- Electrical Engineering
- Datascience & clouds
- IT science: embedded software/ Apps
- Industrial design

- Shareholder owned company
- Location: Drachten, HQ Amsterdam (90000)
- Size: 1800 FTE, >700 FTE innovation
- Largest W-EU site + 200-250 FTE coming from UK
- From consumer business to med tech

- MBO
- HBO
- WO
- PhD

# Facts & figures Photonis

**PHOTONIS**

PHOTO SENSOR IMAGING TECHNOLOGIES



Career opportunities for:

- Physics
- Applied Physics
- Material Engineering
- Mechanical Engineering
- Electrical Engineering
- Applied Mathematics
- IT science
- Industrial design

- Shareholder owned company
- Location: Drachten, HQ Bordeaux (12000)
- Size: 300 FTE
- Photonics
- 130 processes including clean room

- MBO
- HBO
- WO
- PhD

# Facts & figures Resato

**Resato**

HIGH PRESSURE TECHNOLOGIES



Career opportunities for:

- Material Engineering
  - Mechanical Engineering
  - Electrical Engineering
  - IT science
- 
- MBO
  - HBO
  - WO

- Privater owned company
- Location: Assen , HQ
- Size: 120 FTE
- Virtual Reality

# Facts & figures Stork Turbine Blades



Career opportunities for:

- Mechanical Engineering
- MBO
- HBO

- Shareholder owned company
- Location: Sneek , HQ
- Size: 90 FTE
- Reversed engineering and 3D scanning
- 3D printing comp centre Stork

# Facts & figures Variass



Career opportunities for:

- Mechanical Engineering
- Electronical Engineering
  
- MBO
- HBO

- Private owned company
- Location: Veendam en Drachten , HQ Veendam
- Size: 110 + 30 FTE
- EMS + Med Tech systems
- Cobots

# Facts & figures VDH products



## MEASURING AND CONTROL SYSTEMS



Career opportunities for:

- Mechanical Engineering
- Electrical Engineering
  
- MBO
- HBO

- Private owned company
- Location: Roden, HQ Roden
- Size: 65 FTE
- Sensoring T, p en humidity
- Application : climate control for processes

# Facts & figures Ventura



DOOR SYSTEMS FOR PUBLIC TRANSPORT



Career opportunities for:

- Material Engineering
  - Mechanical Engineering
  - Electronical Engineering
  - Datascience
- 
- MBO
  - HBO
  - WO

- Private owned company
- Location: Bolsward, HQ Bolsward
- Size: 120 FTE + 30% growth 2018
- System innovator
- Electric propulsion & IoT

# Facts & figures Whisper Power



Generating Confidence

## INDEPENDENT POWER SYSTEMS



Career opportunities for:

- Material Engineering
  - Mechanical Engineering
  - Electronical Engineering
  - Datascience
- 
- MBO
  - HBO
  - WO

- Private owned company
- Location: Drachten HQ
- Size: 45 FTE
- System innovator
- Electric propulsion & IoT

# Facts & figures YP your partners



Career opportunities for:

- IT embedded software
  - IT classic
  - IT communication
  - IT Human Machine Interface
  - Datascience
- 
- HBO
  - WO

- Private owned company
- Location: Drachten HQ
- Size: 18 FTE (smallest company)
- Telemetry (remote sensing & control)
- AR

# Facts & figures Xpar Vision

**xpar**vision<sup>1</sup> WORLDWIDE INNOVATION LEADER  
IN THE GLASS PACKAGING INDUSTRY



Career opportunities for:

- Material Engineering
- Physics
- Mathematics
- Mechanical Engineering
- Electronical Engineering
- Datascience

- Private owned company
- Location: Groningen HQ
- Size: 35 FTE
- sensing & fast data control)
- Robotcis

- HBO
- WO
- PhD

# Facts & figures Ziuz



VISUAL INTELLIGENCE



Career opportunities for:

- Physics
- Medical Technology
- Mechanical Engineering
- Electronical Engineering
- Datascience
- Mathematics

- HBO
- WO
- PhD

- Private owned company
- Location: Gorredijk HQ
- Size: 55 FTE
- Neural Networks & Deep Learning
- Medtech



**Scotty,  
Beam me up to the ICD !**