

# SDC

The university partnership  
Denmark – China



# Annual Report 2018

Sino-Danish Center for Education and Research



## List of Abbreviations

SDC Sino-Danish Center for Education and Research

CAS Chinese Academy of Sciences

UCAS University of Chinese Academy of Sciences

**Sino-Danish Center for Education and Research**  
**Annual Report 2018**  
**Published April 2019**

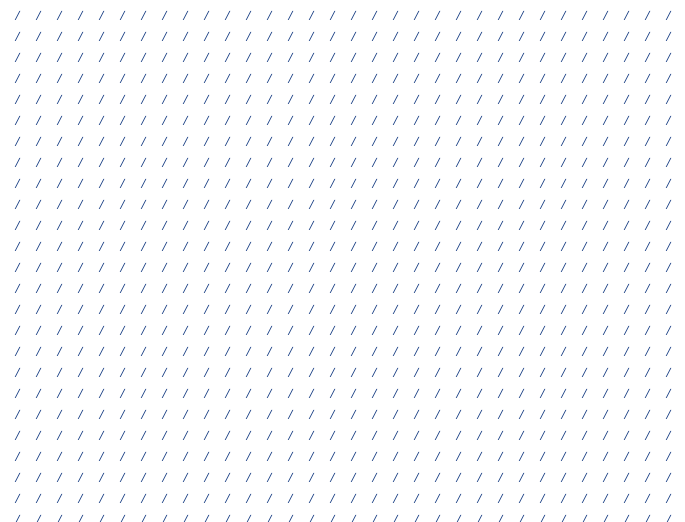
**Design and layout: Michael Bihlet and Lonnie Høgh**

[www.sdc.university](http://www.sdc.university)



# Table of Contents

|   |    |
|---|----|
| List of Abbreviations . . . . .                   | 1  |
| Table of Contents . . . . .                       | 2  |
| The Management's Report . . . . .                 | 3  |
| The Joint Managerial Committee . . . . .          | 4  |
| Graduate Employment Survey . . . . .              | 5  |
| Ready to Meet the World . . . . .                 | 7  |
| Highlights 2018 . . . . .                         | 9  |
| Research and Education . . . . .                  | 11 |
| Social Sciences . . . . .                         | 13 |
| Water and Environment . . . . .                   | 17 |
| Nanoscience . . . . .                             | 19 |
| Life Sciences . . . . .                           | 21 |
| Sustainable Energy . . . . .                      | 25 |
| Food and Health . . . . .                         | 27 |
| PhD Activities . . . . .                          | 29 |
| Facts & Figures . . . . .                         | 31 |
| House of the Danish Industry Foundation . . . . . | 33 |



# The Managements' Report

The present SDC Annual Report 2018 outlines the main activities and accomplishments of the Sino-Danish Center.

2018 was another eventful year at SDC, one of the highlights being the occupancy of The House of the Danish Industry Foundation in late June. After years of waiting, SDC is finally in its new home, and although there are still many issues to address before everything in the building will run smoothly, we already notice students, teachers and administrative staff benefit from the move. The SDC building is a beautiful and significant landmark on UCAS' Yanqihu Campus, and with such great facilities we are now ready to take SDC to the next level!

In June, we also celebrated a group of young, talented graduates who were ready to take the next step in their lives and pursue their first job in the private sector or a career in academia. SDC graduates are in high demand. A graduate employment survey conducted by SDC in late 2018 reveals high demand for SDC graduates with 93 per cent employed one year after graduation. Of these, 98 per cent have found full-time jobs. The numbers indicate that the close collaboration between SDC and private companies and public organisations yields tangible results, and we are working hard to extend our network to include even more partners.

A survey conducted by the Danish universities shows that the number joint research publications affiliated with SDC in 2018 was 121. The result clearly shows that SDC, now entering the ninth year since its establishment, is also making an impact in research.

Today, SDC covers six research themes and offers seven Master's degree programmes in Beijing. In the present annual report, you can read about SDC's activities and learn how dedicated scientists and teachers work together to find the best solutions to tomorrow's societal challenges of both countries and train talented young people.

Enjoy!

The Management of SDC

# The Joint Managerial Committee of SDC



**Li Shushen**  
President  
University of Chinese  
Academy of Sciences



**Hans Müller Pedersen**  
Director General  
Danish Agency for  
Science and Higher  
Education



**Cao Jianlin**  
Vice Minister  
Ministry of Science and  
Technology



**Brian Bech Nielsen**  
Rector  
Aarhus University



**Wang Yanfen**  
Vice President  
University of Chinese  
Academy of Sciences



**Nikolaj Malchow-Møller**  
President  
Copenhagen Business  
School



**Chen Lin**  
Director of the State  
Key Laboratory of Brain  
and Cognitive Science  
Chinese Academy of  
Sciences



**Philip John Binning**  
Senior Vice President,  
Technical University of  
Denmark



**Zhang Suojiang**  
Director  
Institute of Process  
Engineering, Chinese  
Academy of Sciences

# 2018 Graduate



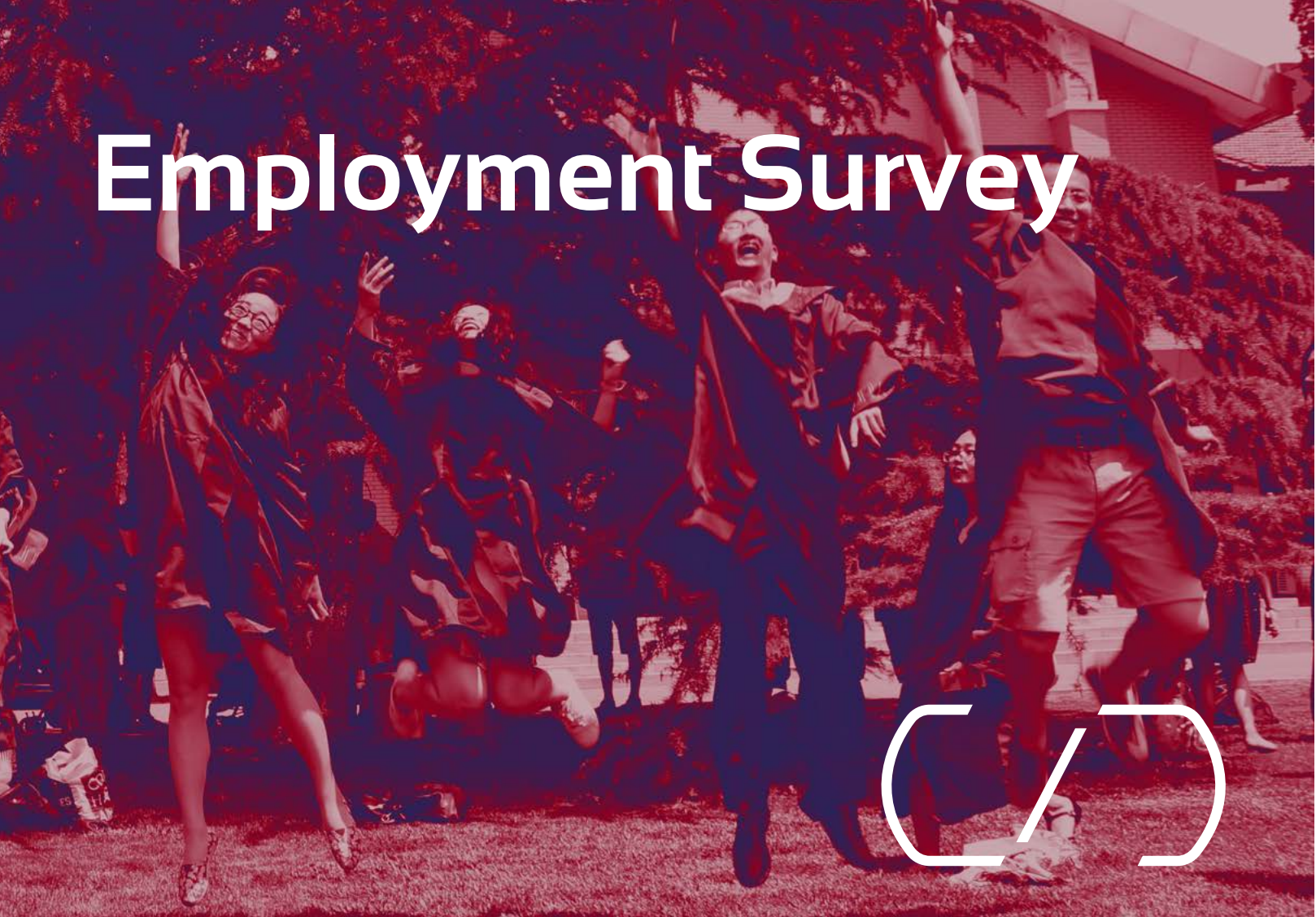
At the end of 2018, SDC carried out its first ever graduate employment survey. It was carried out among all students across programmes that graduated before the summer of 2017.

The survey was distributed to 370 graduates and 143 responded, resulting in a response rate of 38.6 per cent. 75 Chinese, 62 Danish and 6 international graduates completed the survey.

# 93%

found work within the first year of their graduation.

# Employment Survey



94%

would recommend their Master's programme to others.

97%

of graduates believe they acquired the ability to cooperate with people that have a different background from their own.

# Ready to Meet the World



A new wave of SDC graduates were ready to take on the future, when they were celebrated at the 2018 graduation ceremony at SDC in June.

Their academic achievements were marked at the occasion where they were joined by their fellow students, family and friends. The Ambassador of Denmark to China, A. Carsten Damsgaard and President of UCAS, Li Shushen were among the many guests to join the celebration and congratulate the joyful graduates on a memorable day.







*'Before I stood here, I was trying to find the right word to describe SDC. I think the word should be 'bridge'. SDC is a bridge linking China and Denmark...each of us is a small bridge, and I believe the existence of SDC will fundamentally contribute to the cooperation between China and Denmark.'*

**Commencement speech by Pang Kanglei, 2018 graduate with a Master's degree in Nanoscience and Technology.**



*'Initially, when I applied for a Master's at SDC, my bachelor supervisor called it 'an academic investment in my future'. Little did I know that it would turn out to be a lot more than that.'*

**Commencement speech by Naghmeh Salami, 2018 graduate with a Master's degree in Public Management and Social Development.**



# Highlights



## January

The year started with a visit by China's Vice Premier Liu Yandong, a clear recognition of the joint Danish-Chinese efforts. The Vice Premier participated in a guided tour at SDC lead by Danish Executive Director, Morten Laugesen, and met with Danish and Chinese students.

## February

SDC was included when the President of UCAS Ding Zhongli hosted a visit from a delegation from Kobe University, Japan. The visit focussed on academic exchange.

## April

Danish and Chinese researchers attended a workshop at SDC on particle, astroparticle and astrophysics to look into the opportunities for a research collaboration within the area.

## May

The worldwide organisation Startup Grind held the first ever university chapter event in China at SDC. An Innovation Management student organised the event, and it attracted an audience of more than 200 people. Startup Grind connects people with expertise in entrepreneurship and technology in cities all over the world.



## June

Graduates from the 2015 and 2016 cohorts were celebrated at the annual graduation ceremony. Attendants included the Danish Ambassador to China, A. Carsten Damsgaard, and the President of the University of Chinese Academy of Sciences, Li Shushen. It was the fifth time SDC graduates were celebrated at a formal ceremony.

# 2018

## June

All teaching activities and the administration moved into the House of the Danish Industry Foundation. The relocation is a great foundation for the further development of SDC.



## October

### Sixth Meeting of the Joint Managerial Committee

The committee is the supreme decision making body of SDC and responsible for SDC's long-term development. It has five members from China and five members from Denmark.

### UCAS' 40 Years Anniversary

The members of the Joint Managerial Committee joined UCAS' 40th anniversary celebrations, and the Chairman of the Danish board of SDC, Philip John Binning was invited to give a formal speech, as the only speaker from abroad. Furthermore, the Danish director of SDC took part in a workshop focusing on the scope for future collaboration between Chinese universities and the rest of the world.

### Neuroscience and Neuroimaging Symposium

Researchers and students within neuroscience and neuroimaging convened for its annual symposium. The event is an annual gathering of Master's degree students, PhD students and professionals affiliated with the programme in Neuroscience and Neuroimaging. The symposium is a great opportunity to get insight into what fellow students and researchers are working on.



## November

Innovation Centre Denmark, the University of Chinese Academy of Science and SDC hosted the Corporate Innovation Days at SDC. This year's Corporate Innovation Days were devoted to exploring how Chinese and international companies take advantage of co-creation, user-centricity and digitisation in China. Innovation managers from Danish, international and Chinese companies, researchers and students attended the event.

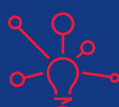
# Research / Education

Within the framework of SDC there are six research themes. Each theme has one or two affiliated Master's degree programmes.

Research themes 

Master's degree programmes

Social Sciences



Innovation Management



Public Management and Social Development

Water and Environment



Water and Environment

Nanoscience

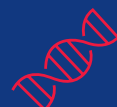


Nanoscience and Technology

Life Sciences



Neuroscience and Neuroimaging



Life Science Engineering and Informatics

Sustainable Energy



Chemical and Biochemical Engineering

Food and Health



International Food Quality and Health

The International Food Quality and Health programme has been approved and will be launched in 2020.





As our research collaboration in social sciences consolidates, 2018 saw more people involved and relations between Danish and Chinese researchers develop, resulting in an increase in joint publications and special issues coming out of SDC research projects.

In November, SDC hosted the Corporate Innovation Days in collaboration with Innovation Centre Denmark with presentations by invited scholars and companies. This was a great opportunity for researchers and business people to learn from each other and establish relations. Students from the two affiliated Master's degree programmes

were also invited to attend the Innovation Days, allowing them to learn and talk to companies resulting in internships and

*'We now have researchers from seven Danish universities involved in research and teaching.'*

During 2018, researchers from SDC Social Sciences organised a range of workshops on timely topics such as: Catch-up Cycles and Green Energy, Middleclass on the Move, Innovation Conceptualizations, Artificial Intelligence and Machine Learning and The Intercultural Classroom.

possible collaborations and become acquainted with international innovation developments.

These workshops were well attended by both sides, across research projects, as well as participation from Tsinghua University, the Chinese Academy of Social Sciences, Fudan University, Zhejiang University, Renmin University and Peking University, among others.

During the year we had a focus on helping Danish PhD students to succeed by, for instance, including them in existing research projects and relations, making them more integrated in the host institutions.

In August, the SDC Social Sciences group participated in the annual international CICALICS conference, which focusses on innovation in China.

Two SDC PhD courses were offered in Beijing, and a project proposal writing workshop to help the Chinese PhD students get enrolled at the Danish universities was launched. And finally, a new PhD school in Public Management at UCAS has been established, creating a pathway for Public Management and Social Development students to pursue PhD degrees through UCAS.



## 2018 CICALICS

In August, the Innovation Management group engaged with the annual international CICALICS conference, which focuses on innovation in China.

CICALICS was organised by SDC Social Sciences, Tsinghua University and the 2018 host, Zhejiang University.

In 2019 CICALICS will be hosted by SDC Social Sciences in the SDC building at the Yanqihu Campus.



The Public Management and Social Development programme explores the challenges of securing quality of life for citizens, social mobility, social cohesion, and economic competitiveness in China and Europe. The focus on Europe and China reflects the increasing significance of the relationship between them and invites students to become part of forging the future of that relationship.

for less formal discussions on course content and bringing students and researchers closer together. In 2018, we also provided students with opportunities to undertake concrete and varied methods training, including quantitative and qualitative components to reflect both Danish and Chinese traditions.

*'2018 was an outstanding year in the development of the programme.'*

The programme explores the processes that condition how the public and private sectors interact to produce or retard social development and innovation and how this interaction is best managed to optimise welfare, governance and market outcomes.

Our Danish and international students seized opportunities to intern at a range of organisations, including the Royal Danish Embassy in Beijing, Danske Bank, Novo Nordisk and UNIDO. Such internships provide significant hands-on learning experiences. Also, for the first time, two Chinese students undertook full internships in Denmark, one at NordicFlexHouse and the other at the Confederation of Danish Industry.

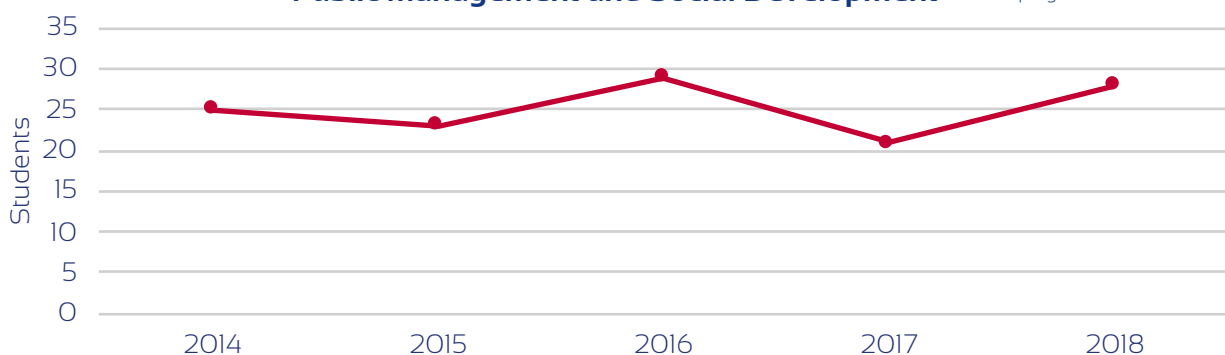
In 2018, we introduced a new course, Business and Global Governance, which aims to provide students with an understanding of and the ability to operate in environments that are increasingly conditioned by international processes. To enhance the learning experience, we launched an afternoon seminar taught by PhD students, allowing

We know that our alumni are meeting the promise of the programme and the SDC with graduates working in significant roles at various intersections between Europe and China. One example is that in 2018, for the second time, a Public Management and Social Development graduate became General Manager at the Danish Chamber of Commerce in China.



**Intake of Master's Degree Students  
Public Management and Social Development**

The programme has 30 seats.





In September 2018, with the new cohort of 29 Master's degree students the programme moved into its seventh year.

In the spirit of innovation and preserving the elements that proved to work well in the past, the programme continued experimenting and exploring new initiatives throughout 2018. The curriculum

employability of the graduates, we continued to place special emphasis on problem-based learning and engagement with industrial partners. Several new company collaborations in different parts of China were added, including Innoway and Daimler in Beijing, Orient Sundar Group in Gaobeidian and RAIDiCAL in Shanghai, leading to company visits, guest lectures and research

*'... having more companies like these in our network will help to profile SDC as a well-connected institution in China.'*

collaboration with the companies. Looking ahead, having more companies like these in our network will help to profile SDC as

of the Master's degree programme saw the introduction of a new course on Product Design and Development. The new course aims at equipping the students with not only the latest innovation theories, but also hands-on tools for turning ideas into innovative solutions to marketplace needs, wants and desires.

a well-connected institution in China.

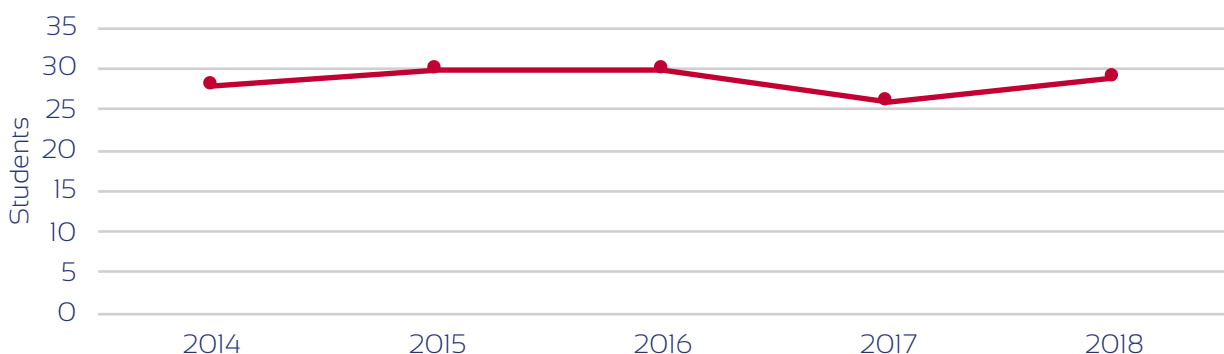
In order to ensure the practical relevance of the Master's degree programme and enhance the

In the spring, all of the Chinese students from the 2016 cohort were in Denmark to spend face-to-face time with their Danish supervisor while they worked on their Master's degree thesis as well as participated in research activities, company visits and seminars. We see it as an essential part of qualifying for the double degree that they experience the Danish university environment.



**Intake of Master's Degree Students  
Innovation Management**

The programme has 30 seats.









The Water and Environment research theme has matured further over the course of 2018. The research conducted within this framework is delivering significant results published in high impact journals.

Within the theme we work with a catchment approach, meaning that we work with water and environment in urban areas, open country, lakes and fresh water systems. The research is integrated, as

and Environment research theme.

New research was initiated between the Department of Agroecology at Aarhus University and the Chinese Academy of Sciences Center for Agricultural Resources Research on increasing the water and nutrient use efficiency in crops. It involves in-depth analyses based on drone imagery using reflective and thermal sensor technologies for monitoring crop water and nutritional status. The work is led by Professor Mathias N. Andersen and

*'In 2018, Danish researchers cooperated with more than 30 institutes all over China.'*

shown by the broad involvement of researchers in Denmark and China. This idea of doing integrated research is also visible through the close connection to the teaching on the affiliated Master's degree programme.

The Water and Environment research theme has been operative since the establishment of SDC, and has resulted in many productive relations between Danish and Chinese researchers and institutes. In 2018, Danish and Chinese researchers from more than 30 institutes all over China and Denmark collaborated within the framework of the SDC Water

and Environment research theme. Professor Hu Chunsheng and conducted by SDC PhD Student Vita Antoniuk and SDC Postdoc Kiril Manevski.

In 2018, an SDC-affiliated project team from the University of Copenhagen initiated work sponsored by the China Europe Water Platform (CEWP), which aims for joint research by Chinese and European researchers and institutions. Focus is on the sponge city concept, which balances green and grey infrastructure, water environmental aspects and urban planning.





# Water and Environment

Freshwater resources are under pressure due to overuse, pollution and climate change. The Master's degree programme in Water and Environment focusses on the growing need for innovative and sustainable solutions and better water management systems on a global scale.

Working with these challenges in China, which is so diverse, and where the government and industry invest heavily in research, gives Master's degree students a unique opportunity to understand these complex and large-scale issues.

how surface waters in the stream and lake interact with the surrounding natural ecosystems, and how the water quality is influenced by human activities, i.e. crop cultivation, aquaculture and discharge of sewage from households.

As in previous years, the six-day excursion to Shijiazhuang and Lake Taihu in June provided students with a great opportunity to apply theory from the classrooms in the real world, collecting and analysing samples. This intense trip also serves the purpose of bringing Danish and Chinese students

together for group assignments and socialising, strengthening their cultural understanding and ability to collaborate.

*'...the six-day excursion to Shijiazhuang and Lake Taihu in June provided students with a great opportunity to apply theory from the classrooms in the real world...'*

During the autumn of 2018, we began to take advantage of the possibilities that come with moving from Beijing City to the Yanqi Lake, where we can explore natural bio-hydrological systems for teaching, which brings great potential for the Water and Environment programme.

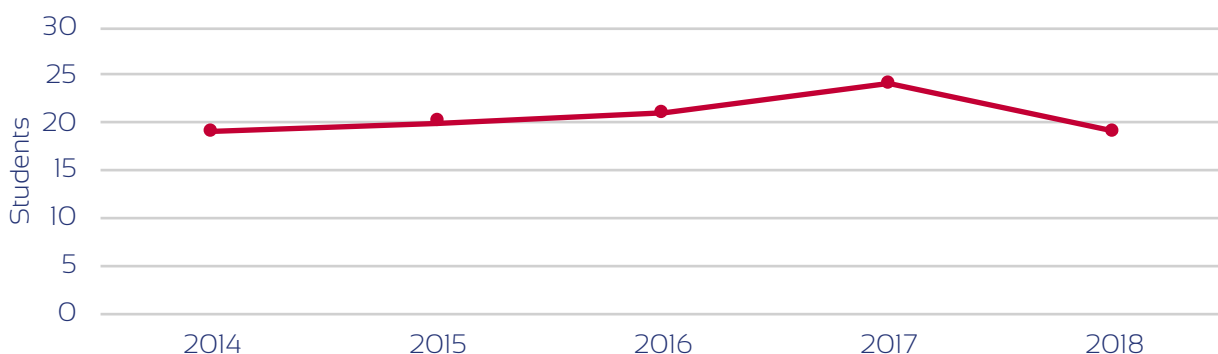
As part of the introduction week we included a field excursion along the Yanqi River, ending up at the Yanqi Lake. The aim was to show the students

Our Chinese students from the 2016 cohort all spent around two months in Denmark during 2018, giving them the opportunity to work closely together with their Danish thesis supervisors as well as experience from working in a Danish research environment. The cultural learnings they take home with them are also very important and an aspect of the programme that we continue to prioritise.



**Intake of Master's Degree Students  
Water and Environment**

The programme has 30 seats.





Nanoscience is one of the driving forces of new technologies in the 21st century, and the field has boundless potential applications and the ability to revolutionise key areas in modern society such as energy, environment, IT, medicine, and food.

Chinese and Danish research environments have delivered strong results in the field, thus building the

and Danish research environments are considered among the world elite, while also being characterised by their close collaboration with the industry.

The SDC Nanoscience theme builds on close relations between Chinese research groups at the National Centre for Nanoscience and Technology, the Institute of Chemistry, both of which fall under

*'The PhD students play an integral part in the research activities and collaboration'*

the Chinese Academy of Sciences, and Danish research

foundation for an attractive collaboration.

China has become a frontrunner in nanoscience research due to ambitious research targets and large investments. Four of the top 10 institutions for high quality nanotechnology output are located in China, according to the 2018 Nature Index.

Danish universities were among the first in the world to establish interdisciplinary nanoscience centres,

environments including Centres of Excellence. The research theme is built on the basis of positions of strength and common interests within five subthemes:

functional nanomaterials, self-assembly of molecular nanostructures, nanoenergy materials, nanomedicine, nanoelectronics and -photonics.

**Staff news:**

**In November, Senior Researcher Morten Foss from iNANO, Aarhus University was appointed Danish Principal Coordinator for SDC's Nanoscience theme. He replaced Professor Flemming Besenbacher from Aarhus University.**





Nanoscience is one of the driving forces behind the development of new knowledge and technologies within energy, environment, health, electronics and much more, and it plays an increasingly important role in everyday life and in combatting some of the world's problems.

is exceptionally skilled at cryo-TEM, a field which yielded a Nobel Prize in chemistry in 2017. In April, the entire 2017 cohort was in Denmark for a month. They participated in a three-day workshop in Copenhagen followed by visits to several nano research facilities in Denmark.

*'...bionanoscience, nanotechnologies and pollution and nanoelectronics were popular Master's thesis topics.'*

For the remaining part of the stay the students worked closely with their Danish

The focus of the SDC Master's programme in Nanoscience and Technology is how to manipulate nanostructures and material structures and how to develop new functionalities and areas of application, giving students a broad understanding of fundamental theories and the ability to handle concepts and methods used in the field of nanoscience and nanotechnology.

thesis supervisors. This year, bionanoscience, nanotechnologies and pollution and nanoelectronics were especially popular Master's thesis topics.

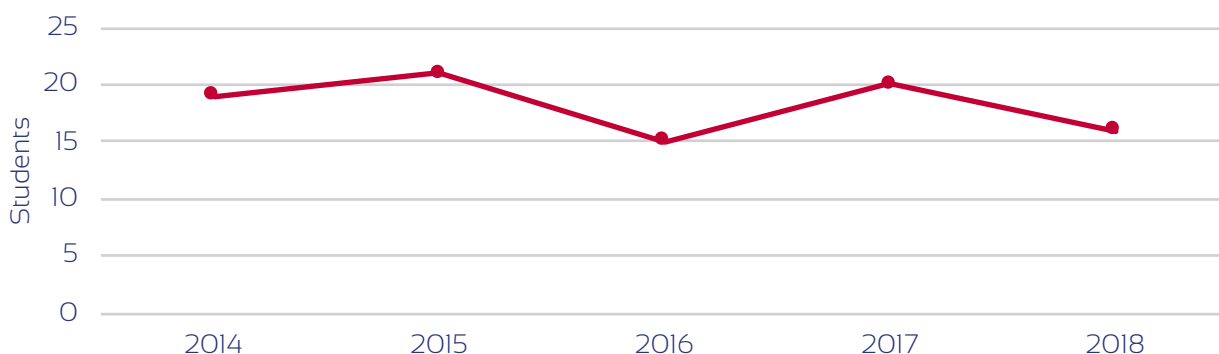
In 2018, the CAS Institute of Biophysics has strengthened its involvement in SDC through i.e. an increase in supervisions of Danish Master's and PhD students. Among other fields, the institute

In order to increase awareness of the Master's degree programme at SDC and support student recruitment on the Danish side, we took on a new approach in 2018. In October, 19 Danish third-year bachelor students from Nanoscience, Physics and Chemistry at the University of Copenhagen and Aarhus University joined a week-long study trip to SDC in Beijing to give them an intense opportunity to experience life as a student at SDC first-hand.



**Intake of Master's Degree Students  
Nanoscience and Technology**

The programme has 30 seats.





China and Denmark form a solid partnership within SDC's Life Sciences research theme, and in these years, we see a significant number of researchers partnering up across the two countries. Neuroscience is a traditional stronghold in Danish research, and over the last decade China has recruited leading foreign and Chinese researchers

in China and in the spring a visit was paid to the HUST-Suzhou Institute for Brainmatics to learn more about their facilities for mapping brain structures and connections using a highly sophisticated automated technology. The visit also aimed at raising awareness of SDC within the industrial technology research centre.

*'... we see a significant number of researchers partnering up across the two countries'*

for state-of-the-art research institutes and facilities in China. The Sino-Danish collaboration within the Omics disciplines has a strong track history even before SDC came in to existence and the partners have continued to develop their joint activities within this field.

A delegation of SDC neuroscience researchers also visited the Beijing Institute of Technology, which works with robotic prosthetics. Likewise, the researchers of the Life Sciences area continue to explore new venues for collaboration with the Danish partner institutions.

The two subthemes Neuroscience and Cognition, and Omics now reap the fruits of years of scientific collaboration, for instance when it comes to co-published scientific publications. Several Danish researchers have solid collaborations with Chinese researchers at the Institute of Biophysics, the Institute of Genetics and Developmental Biology, the Institute of Psychology, the Beijing Institute of Genomics as well as the Shanghai Advanced Research Institute.

In August, a group of five researchers from CAS institutes, including the Chinese Head of Educational Programme, Professor Xue Rong, visited their Danish partners. The visit aimed to strengthen their already existing connections with Danish research environments and to extend their network.

Through 2018, new research institutes are explored

During their stay, the Chinese researchers gave presentations to Danish research colleagues within the field of neuroscience at Aarhus University, Technical University of Denmark and University of Copenhagen.



### Kick-Starting the Academic Network

In October, the sixth annual SDC Neuroscience and Neuroimaging Symposium took place at SDC. At the symposium, all the second-year students presented their Master's thesis projects to senior research associates. For many students, the symposium is a foundation on which they build future academic networks. The symposium was extended with a PhD Opening Speech session for PhD students.



## Strengthening the Ties Between Research Environments

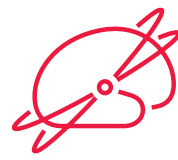
In August, a group of five researchers from CAS institutes, including the Chinese Head of Educational Programme, Professor Xue Rong, visited their Danish partners. The visit aimed to strengthen their already existing connections with Danish research environments and to extend their network.

During their stay, the Chinese researchers gave presentations to Danish research colleagues within the field of neuroscience at Aarhus University, Technical University of Denmark and University of Copenhagen.



**In July, Associate Professor Kim Ryun Drasbek from Aarhus University was appointed Danish Principal Coordinator for the Life Sciences research theme. He replaced Professor Peter Roepstorff from the University of Southern Denmark.**





The Master's degree programme in Neuroscience and Neuroimaging entered its seventh year, when a class of 21 students joined the neuro family in September 2018.

The unique combination of advanced imaging techniques and broad knowledge of basic and clinical neuroscience continues to attract students who are also eager to use their skills at the Chinese

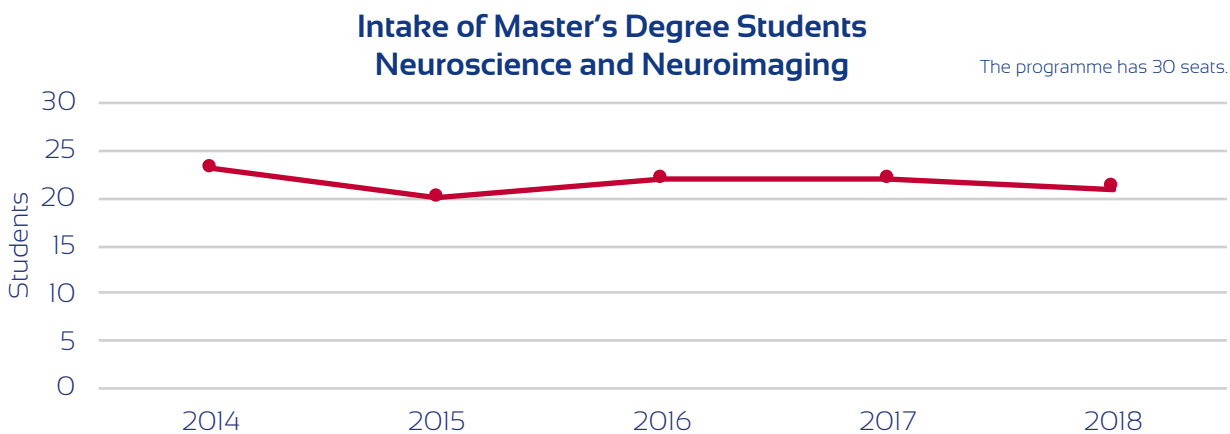
potential in collaboration across the Master's degree programmes and research areas within SDC.

During the year, Chinese students from the 2016 cohort completed a two-month stay in Denmark, giving them an opportunity to spend face-to-face time with their Danish supervisor, become familiar with Danish laboratories and get introduced to neuroscience and neuroimaging communities

*'There is a great potential in collaboration across the study programmes and research areas within SDC'*

research institutes. This year the Danish principal coordinator for Water and Environment was invited to talk about their best practices and how they work within the SDC framework focusing on inter-programme collaborations. There is a great

potential in collaboration across the Master's degree programmes and research areas within SDC.







The combination of molecular biology and bioinformatics is becoming increasingly important for biochemical and biotechnological research and production, for example in the pharmaceutical and food industries. Research and development within this area leads to an overall increase in the industrial output and an improvement in the biomedical outcomes.

environments, facilities and equipment, and the country is home to some of the most accomplished scientists in the world. In some fields, for instance genomics, the competences and equipment at the Chinese institutes are unmatched.

*'...the competences and equipment at the Chinese institutes are unmatched.'*

There is a wish to extend the existing collaboration and facilitate an even stronger connection between

Chinese and Danish researchers. New Danish teachers will broaden and

Through the Master 's degree programme in Life Science Engineering and Informatics students, acquire the skills to generate, integrate, analyse and model large biological data in order to find results that are not obtainable through traditional reductionist methods within the field of biochemistry or molecular biology.

strengthen their relations to Chinese colleagues with similar research lines by giving lectures at relevant CAS institutes such as the Institute of Biophysics and Beijing Institute of Genomics.

Over the last two decades, the Chinese government has invested massively in advanced research

In the long run, we have initiated discussions with biotechnological and pharmaceutical industries in order to create stronger connections through internships and collaborative Master's thesis.

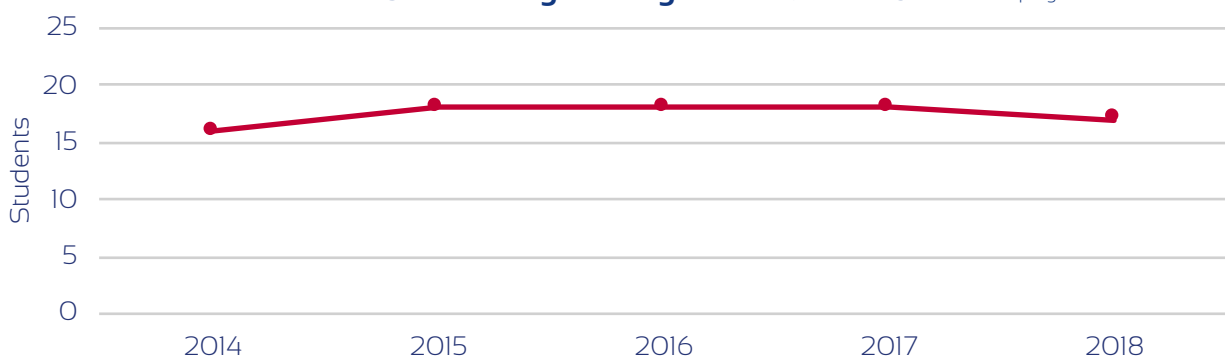
In September 2018, responsibility for the Danish side of the Master's programme in Life Science Engineering and Informatics was transferred from the University of Southern Denmark to Technical University of Denmark and also adopted its new name.

**Staff news**  
Associate Professor Paolo Marcatili from Technical University of Denmark took up the position as Danish Head of Educational Programme. He took over the role from Finn Kirpekar from the University of Southern Denmark.



**Intake of Master's Degree Students  
Life Science Engineering and Informatics**

The programme has 30 seats.





The year has revolved around the development of a new research strategy for the Sustainable Energy theme. Until now the theme has focused primarily on the supply side of energy systems, including fusion, solar, wind, bioenergy (biomass and waste), and gradually also energy systems. Since the launch of the Master's degree programme in Chemical and Biochemical Engineering (CBE) in 2013, research resources have especially supported this activity, and in 2017 the non-CBE research activities were phased out, waiting for a reorientation of the research theme.

research strategy.

The new research areas all have a high degree of relevance in relation to the development of a sustainable energy system in China and Denmark, and they complement biomass and waste.

The areas focus on:

- Energy systems analysis and markets
- Smart energy systems
- Flexibility options Digitisation

*'The new research areas all have a high degree of relevance in relation to the development of a sustainable energy system'*

The future research areas have been defined in collaboration with leading researchers from Danish and Chinese universities. Danish experts engaged in the Sino- Danish strategic partnership have been consulted to ensure relevance, including the energy counsellor at the Royal Danish Embassy in Beijing and the chief expert at the China National Center on Renewable Energy. Our Chinese partners from UCAS, CAS Institute of Electrical Engineering and CAS Institute of Science and Development have continuously been involved in developing the

First step in the development of the new research areas will be a joint kick-off seminar in China and the launch of PhD projects.

Through 2018, the biomass and waste research collaboration between DTU Chemical Engineering and the CAS Institute of Process Engineering has continued to grow. A joint PhD book, contributed to by 28 PhD students involved in the collaboration over the last five years, was published in September 2018. The abstract book is oriented towards other researchers and the industry.



### The second joint seminar – held in China

Within the biomass and waste research subarea, the second joint seminar was held at SDC in September with participants from DTU Chemical Engineering, the CAS Institute of Process Engineering, and Vice President of UCAS Wang Yanfen, among others. The researchers discussed the possibilities of a future Sino-Danish Laboratory for Sustainable Process and Product Engineering. Also a number of research projects with common interests were discussed and defined, and several co-supervisors for Master's and PhD projects were identified.



The world's resources are under pressure and the need for securing sustainable energy solutions is growing. So is the demand for innovative green methods to convert raw materials into valuable products through improved process technology. The aim of the Master's degree programme in Chemical and Biochemical Engineering is to educate graduates who are able to take new methods from the laboratories into industrial production. In recent years, product design has become more

large-scale chemical unit operations. The laboratory offers state-of-the-art pilot-scale equipment, which simulates industrial-scale operations. Furthermore, the eight-week stay in Denmark strengthened the Chinese students' connection to Denmark and the Danish universities.

In 2018 the strong relations to leading chemical engineering companies in China and Denmark have been strengthened, and this year's company visits,

guest lectures and thesis collaborations included a high degree of involvement from Hempel, Haldor

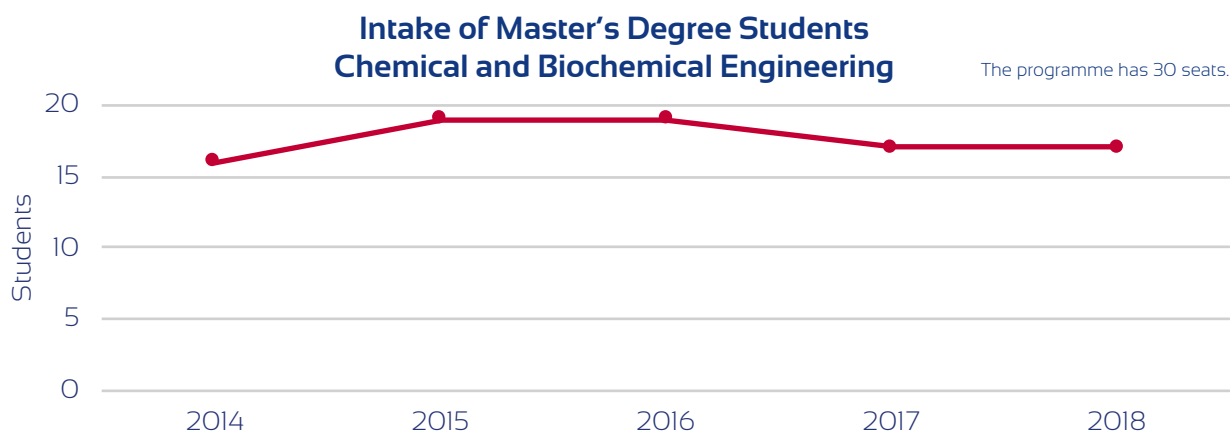
*'relations to leading chemical engineering companies in Denmark and China have been strengthened..'*

important for the chemical industry, and in order to strengthen the graduates' competences within this field a new course, Coating Science and Technology, was introduced in 2018

Topsøe and Novozymes, among others. During the year, 15 students from the 2016 cohort defended their DTU Master's degree thesis, and some of the students did their thesis in collaboration with a company.

The year has been characterised by a continued focus on the academic and intercultural exchange between the students. From June to August students took two courses at Technical University of Denmark's Department of Chemical and Biochemical Engineering. This gave all of the students the opportunity to take a unique lab course within

PhD Student Bozidar Anicic carried out the first PhD defense in the SDC building, and he invited the Chemical and Biochemical Engineering students to participate, as the defense was included as a lecture in the Progress in Research course.





The research theme is growing rapidly with more people getting involved, and in connection with the launch of the Master's degree programme in International Food Quality and Health the intention is to make a strong impact for the food industry in the coming years. The development will include further building of strong bonds between Chinese and Danish counterparts.

The focus areas span the entire food chain 'from farm to fork':

- Food quality, processing and production
- Microbial food safety and hygiene
- Food business, marketing and the consumer
- Food sociology, economics and supply chain management
- Nutrition and health

*'...the intention is to make a strong impact for the Danish food industry in the coming years.'*

The global food and food technology market is rapidly expanding, and food investment is central in both the Danish and the Chinese government's growth plans. SDC's Food and Health research area has been developed to meet Chinese and Danish food market challenges.

The research area focusses on application-oriented food science for sustainable, healthy and high-quality food supply and security. Chinese and Danish university partners have complementary competences that span from primary production to consumer behaviour including food quality, economics, marketing and health as core aspects in food solutions.





## Master's Degree Programme in International Food Quality and Health to be launched in 2020

The Master's degree programme in International Food Quality and Health will be launched in the autumn of 2020. With a Master's degree in International Food Quality and Health graduates will have a firm grasp of the journey of food products from farm to fork with a key cross-cultural focus. Through the Master's degree

programme students will gain an understanding of the food chain across different disciplines by immersing themselves in subjects such as sustainable food production, food safety, food quality, nutrition and marketing for the international market.



**The workshop that kicked off the development of the Master's degree programme was held in Copenhagen.**

# PhD Activities

PhD students play a vital part in the collaboration between Chinese and Danish research environments and SDC in general and the partners have been strengthening the framework for collaboration on PhDs. Part of this effort includes the settling of general double degree agreements between UCAS and the relevant Danish Graduate Schools. Furthermore, several PhD courses were conducted in the SDC building in 2018.

## 'We Hit the Jackpot When Signe Came Here to Do her PhD'

Signe Kirk Fruekilde brought her Master's degree in Neuroscience and Neuroimaging and experience from the CAS Institute of Neuroscience in Shanghai to Aarhus University (AU), when she started her PhD titled 'The effect of chemogenetics, optogenetics, and inflammation on capillary transit time heterogeneity in mice'.

Co-supervisor on the project Postdoc Eugenio Gutierrez has been employed at the Center of Functionally Integrative Neuroscience at AU for eight years, and the supervision turned out to add value to both his and Signe's work, despite their different experiences and skills. Overall his research focus is on brain hemodynamics for which he uses optical imaging. Within optical imaging, it is recommended to perform experiments on awake animals, but before Signe started they had never worked with these techniques. Signe had gained experience during the year she worked on her Master's thesis.

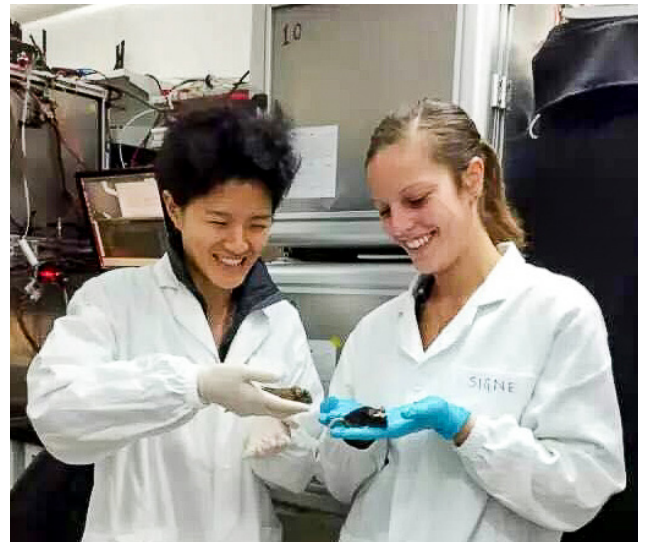
'We hit the jackpot when Signe came here to do her PhD. It was crucial that she came at the time she did, as I was about to start using optical imaging techniques with awake animals. Signe ended up being a key figure in the training of the animals', Eugenio says.

The surgery they perform comprises implanting a small glass window in the skull of mice. Afterwards they examine the animal under the microscope and scan it to see the effects when the brain or another part of its body is stimulated. It calls for microsurgical

experience, intensive training and expertise in handling the animals, and this is exactly what Signe brought back from her laboratory stay in China.

'It is a rather new technique, and it requires a permit from the Animal Experiments Inspectorate to perform the procedure, but through knowledge sharing both Signe and I are now able to use the technique', says Eugenio who has taught Signe how to use optical imaging techniques while she has taught him how to handle and train the animals.

In October, Signe attended the annual Neuroscience and Neuroimaging Symposium in China to present her array of techniques for investigating cerebral capillary blood flow.



**Signe Kirk Fruekilde and postdoc Chun Yu in the lab at the Institute of Neuroscience in Shanghai.**

## Successful PhD Students are the Best Ambassadors



Henrik Birkedal and Chen Yaqing meet every Monday to discuss the progress of the project.

A personal meeting was pivotal for Henrik Birkedal, when he decided to invite former SDC Master's degree student Chen Yaqing to join his research group at Aarhus University

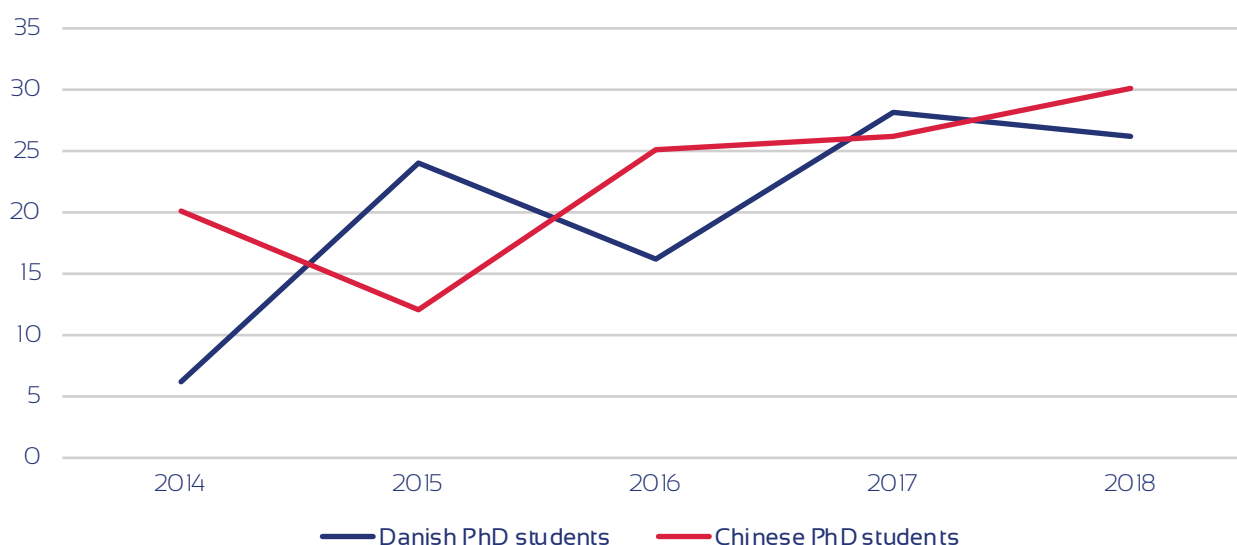
While visiting Denmark as part of the Nanoscience and Technology programme, Chen Yaqing seized the opportunity to meet with Associate Professor Henrik Birkedal and discuss how his research group at iNANO approaches making new biological and bioinspired materials.

'We talked for a long time and I could tell Chen Yaqing was very talented and interested, so we decided to try to find a way to have her join the group as a PhD student. The fact that we had a personal meeting was key in that decision', Henrik Birkedal explains

Subsequently, they applied to the Chinese Scholarship Council. Chen Yaqing received funding for a full PhD scholarship in Denmark and took up the position in August 2018. Henrik Birkedal wants to support Chen Yaqing's development and help her become a successful scientist, but he sees more benefits to taking someone like her in.

'Foreign PhD students who come to Denmark and have a positive experience are the best ambassadors you could want, because they will typically take up management positions within research, education or administration in their home countries. Much of the cooperation that is established is done through personal relations, which is why having someone like Yaqing here is priceless', says Henrik Birkedal.

### PhD Student Grants 2014-2018

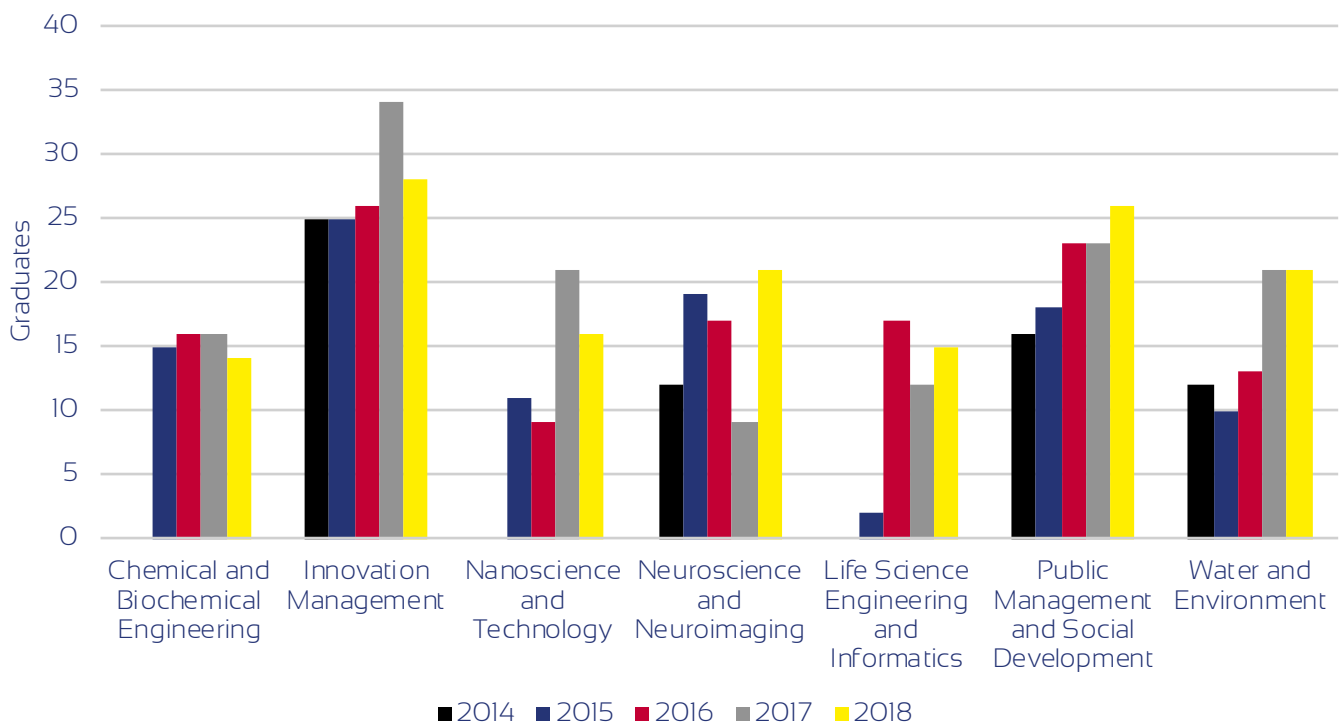


# Master's Degree Students and Graduates

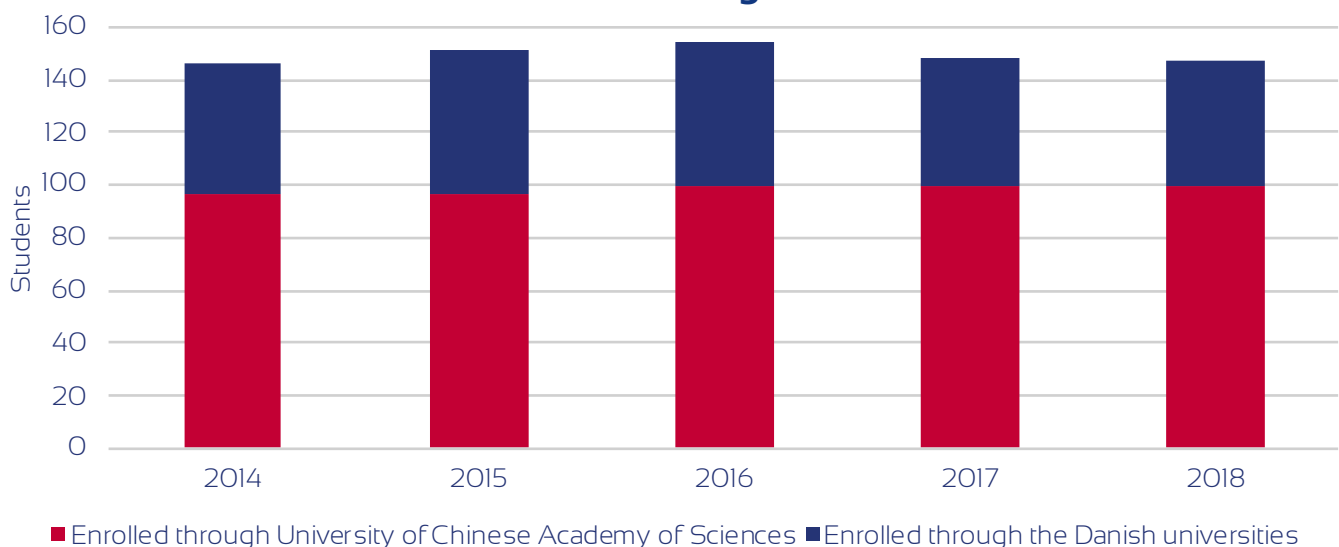
# 141

**Master's degree students graduated from SDC in 2018**

**Graduates 2014-2018**

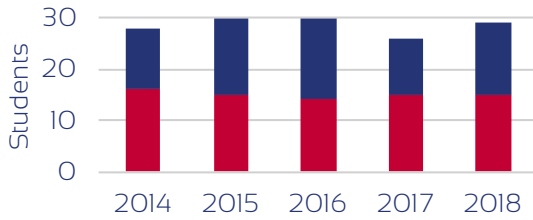


**Intake of Master's Degree Students**



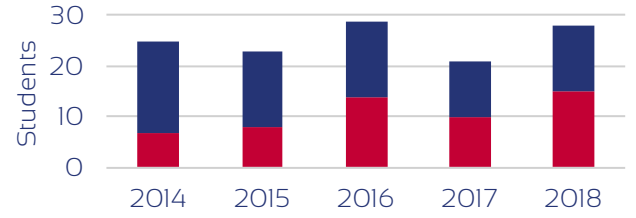


### Intake of Master's Degree Students Innovation Management



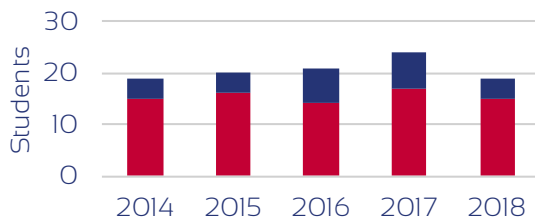
- Enrolled through Aalborg University
- Enrolled through the University of Chinese Academy of Sciences

### Intake of Master's Degree Students Public Management and Social Development



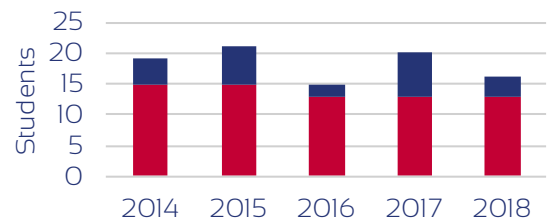
- Enrolled through Copenhagen Business School
- Enrolled through the University of Chinese Academy of Sciences

### Intake of Master's Degree Students Water and Environment



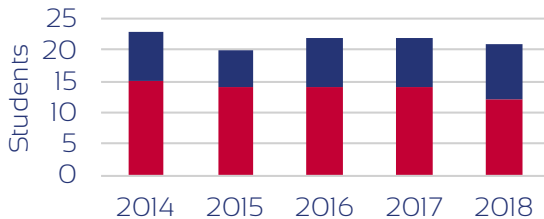
- Enrolled through the University of Copenhagen
- Enrolled through the University of Chinese Academy of Sciences

### Intake of Master's Degree Students Nanoscience and Technology



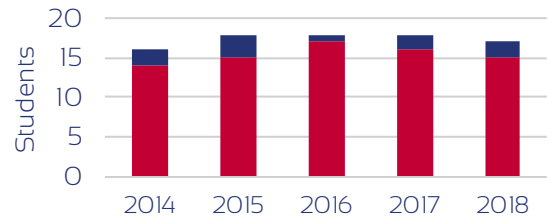
- Enrolled through the University of Copenhagen
- Enrolled through the University of Chinese Academy of Sciences

### Intake of Master's Degree Students Neuroscience and Neuroimaging



- Enrolled through Aarhus University
- Enrolled through the University of Chinese Academy of Sciences

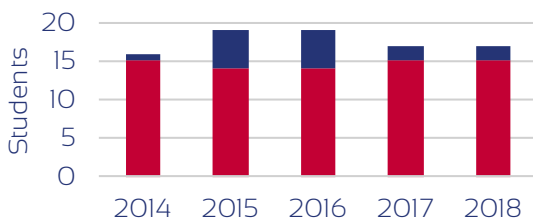
### Intake of Master's Degree Students Life Science Engineering and Informatics



- Enrolled through the Technical University of Denmark\*
- Enrolled through the University of Chinese Academy of Sciences

\*In September 2018, the Master's degree programme was transferred from the University of Southern Denmark to the Technical University of Denmark

### Intake of Master's Degree Students Chemical and Biochemical Engineering



- Enrolled through the Technical University of Denmark
- Enrolled through the University of Chinese Academy of Sciences

# House of the

Opening the doors of a Danish building in China was a landmark event, and it attracted attention in both countries when the home of SDC was inaugurated by His Royal Highness The Crown Prince of Denmark and Zhang Baowen, Vice-Chairman of the Standing Committee of the 12th NPC on 25 September 2017. In 2018, all educational activities and the administration moved into the building, and for the

first time it enables SDC to compile teaching and research activities under one roof.

The building design is based on a proposal by Danish architects Lundgaard & Tranberg, and it is located at UCAS' Yanqihu Campus 60 km north of the Beijing city centre.



## Events in 2018

The new facilities create a wide range of opportunities to strengthen SDC's relations to industrial collaborators. SDC is open to companies, universities and institutions with activities in China, and since the building was inaugurated in 2017, it has hosted activities organised by the Danish universities, CAS institutes and companies such as Novo Nordisk. In 2018 SDC hosted more than 70 activities in the building.

**24** Symposia and workshops  
*'Daimler workshop', Corporate Innovation Days, 'Green Windows of Opportunity in China', 'Middle Class on the Move', 'Entrepreneurship Research', among others*

**3** Visits from a Danish minister or high-level Chinese officials

... and more

**16** Visits from Danish and Chinese educational institutions

**30+** PhD courses, guest lectures, meetings and student-driven events

# Danish Industry Foundation



## Facts About the Building

The building has five floors and covers almost 11,000 m<sup>2</sup>. On a daily basis it is frequented by 200 Master's degree students, PhD students, teachers and researchers, guests and staff.

The building contains:

- 20 flats for teachers and researchers
- 1 lecture hall
- 1 lecture room
- 10 classrooms
- 8 group rooms
- 10 research offices
- 8 PhD offices
- 6 thesis offices
- 4 meeting rooms
- Lounges for students and teachers
- Common areas with study stations
- 4 administration offices



