Sino-Swedish academic collaboration

lessons learned from Lund

Gabriel Somesfalean

Nordic-Chinese Energy & Climate Day

2010.06.25

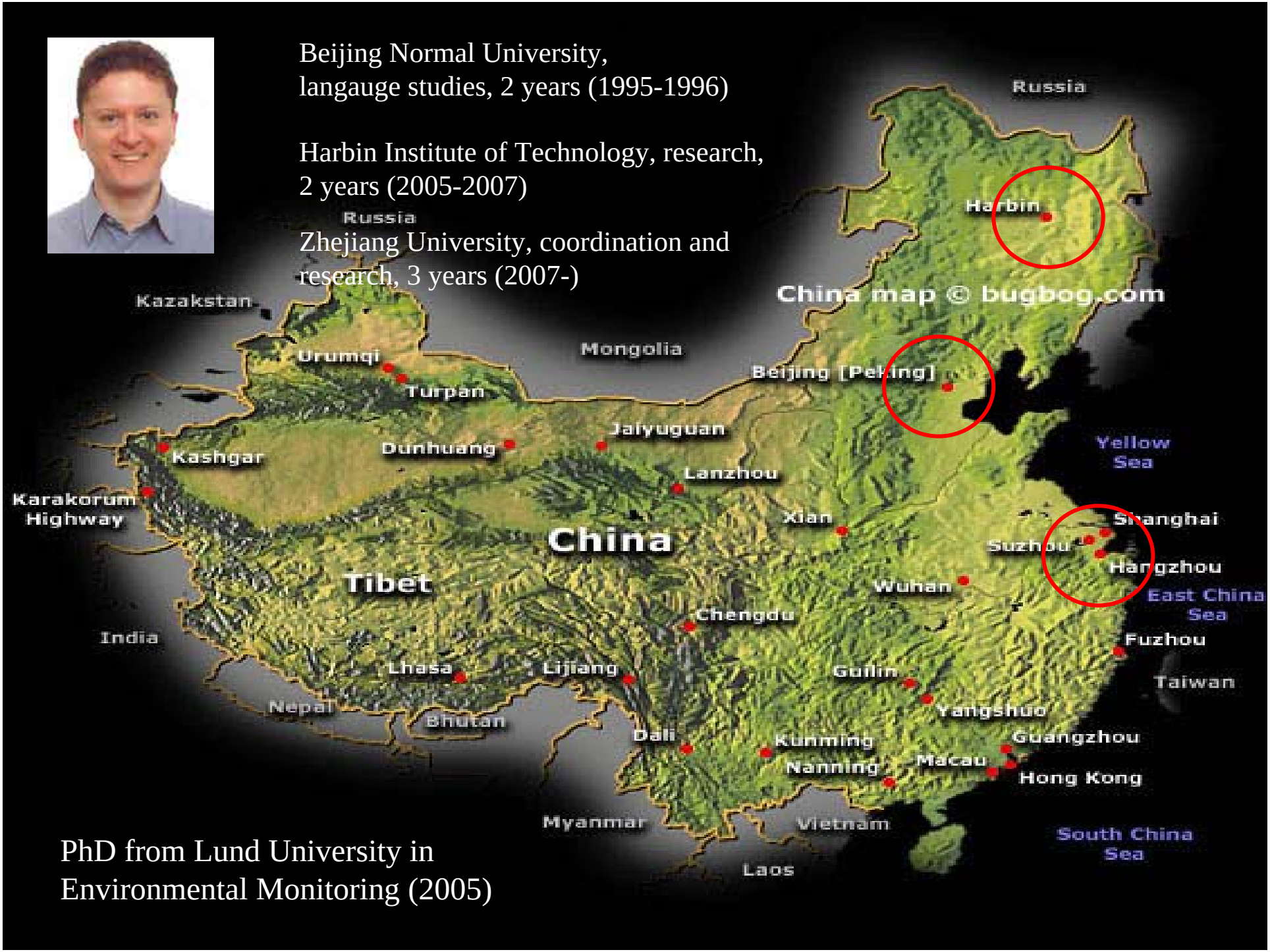
Outline

- Short background – myself, Lund University, Chinese partner universities
- Platforms of collaboration in research and education
- Integrating the innovation triangle
- Examples of climate, energy and environmental co-operation projects
- Opportunities and challanges for broader cooperation with China

Beijing Normal University,
langauge studies, 2 years (1995-1996)

Harbin Institute of Technology, research,
2 years (2005-2007)

Zhejiang University, coordination and
research, 3 years (2007-)



PhD from Lund University in
Environmental Monitoring (2005)

Lund University

- Founded in 1666
- 38 000 students
- 2 300 postgraduate students
- 5 200 employees
- 560 professors (16 % women)
- Eight faculties
- Several campuses
- 5 300 SEK million turnover

Collaboration with China

- Lund University develops strategic international collaborations
- China – a major player in the future science and technology as well as the largest potential economic market in the world
- Building collaboration platforms with key comprehensive universities – Zhejiang University, Peking University, Fudan University

Zijingang campus @ Zhejiang University

Founded 1897 as the "Qiushi Academy" – 113 years old
A comprehensive university with 21 colleges

Total number of full time students: 41,800
25,100 undergraduates (5000 admitted every year)
11,200 master students
5,500 Ph.D. students – largest PhD program in China

Three No. 1 in China:
- SCI papers (>3000 papers/year)
- Patents
- NSFC grants

- ZJU aims to become one of the best 100 universities in the world
- Enormous ambition from the university leadership to the individual
- Several science parks in the Hangzhou area – also called the "Silicon valley of Paradise" – catalyses innovation and technological development. Many entrepreneurs and start-up companies
- ZJU is very strong in engineering

ROYAL INSTITUTE OF TECHNOLOGY

Joint Research Center of Photonics

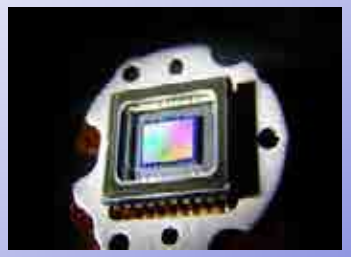
瑞典皇家工學院—浙江大學

聯合光子研究中心

- JORCEP founded October 2003
- A model of Sino-Swedish academic collaboration
- Enables KTH and ZJU to stay at the forefront of Photonics research

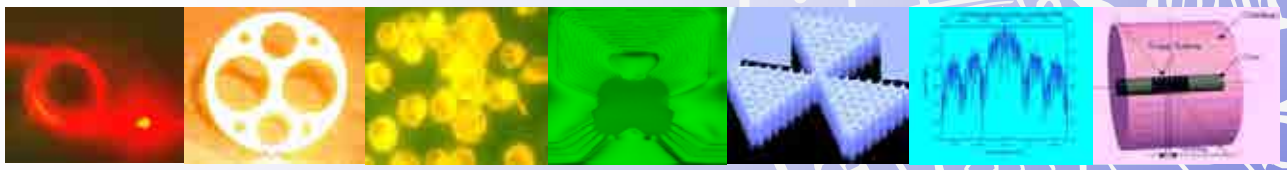
Photonics

- Widely recognized as one of the major innovation-enabling disciplines for the 21st century
- Key importance in industrial sectors such as the energy sector (solar cells), the tele- and data communication, the sensor and biotechnology industry, etc
- Photonics contributes to a greener society
- Photonics @ ZJU holds the No. 1 position in China**.** The birthplace of optical engineering in China – the Laboratory of Optical Instrumentation founded in 1952



JORCEP – Research

- World-class research in strategic areas:
  - Nanophotonics and integrated lightwave circuits
  - Metamaterials
  - Biophotonics
- Collaboration with Lund University since 2007 including environmental monitoring – complementary expertise
- Publications in the name of the center
  - > 150 SCI-indexed journal publications



Clean room

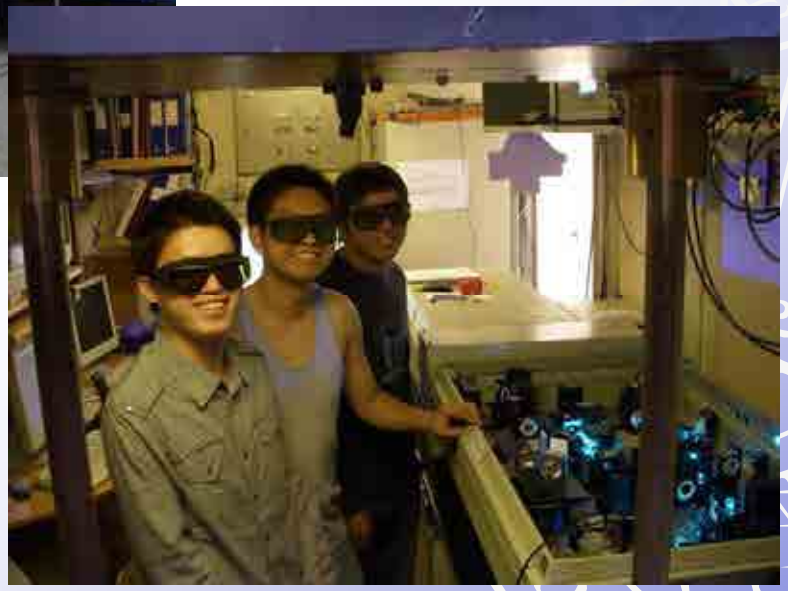
Publications in Major Optics and Photonics Journals (2006)

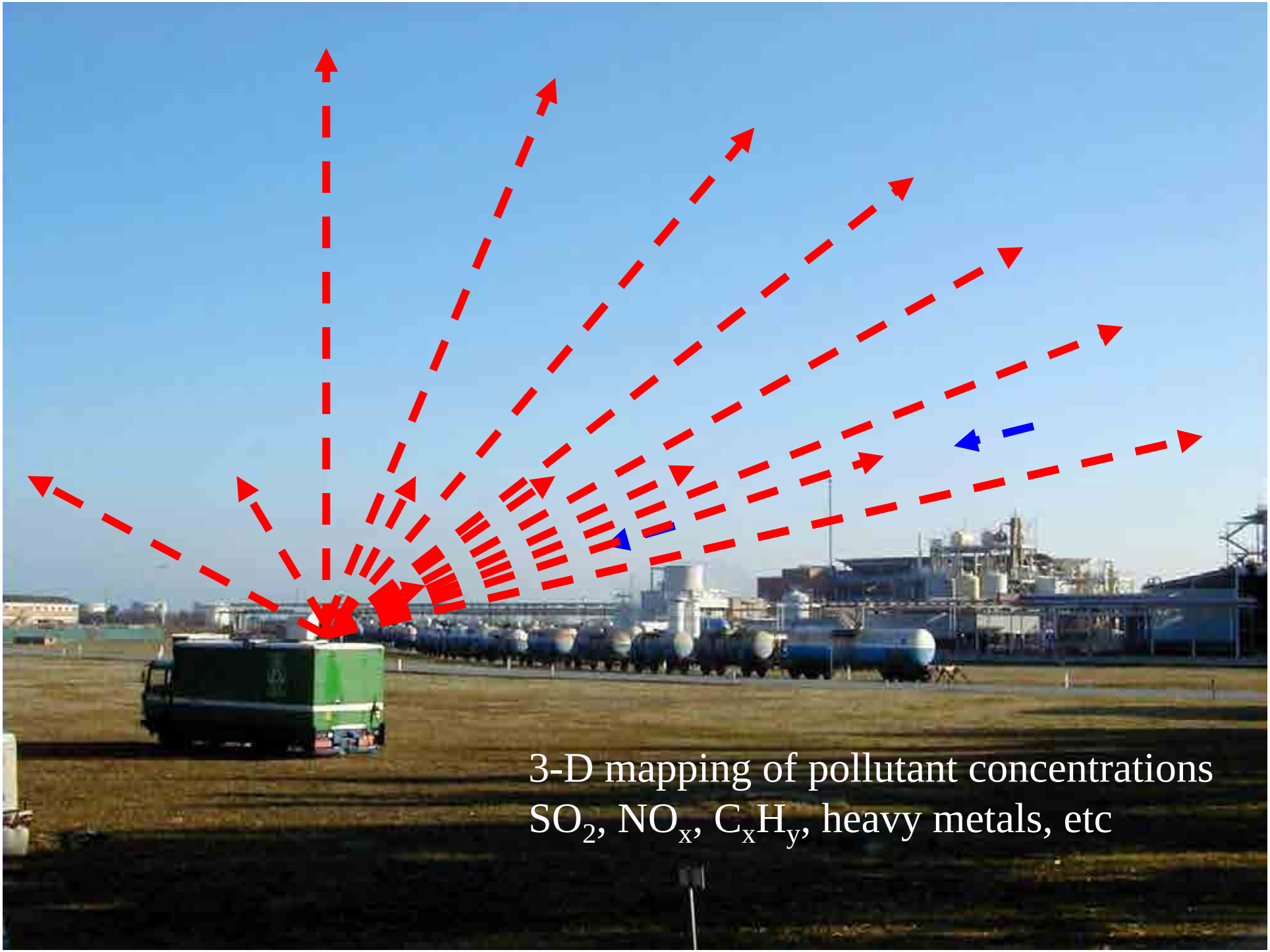
- provided by National Chiao Tung University (Taiwan)

	NCTU	Seoul Univ	Univ Singapore	Peking Univ	Chinese Univ Hong Kong	Hong Kong Univ Sci & Technol	Tokyo Univ	Univ Calif Berkeley	Zhejiang Univ, (COER)
Opt. Exp.	14(13)	8	4	4	6	6	16	11	22(5)
Opt. Lett.	11(10)	2	2	3	3	3	10	6	12(4)
JQE	1(1)	0	0	0	0	1	0	2	0
JSTQE	1(1)	1	0	0	3	2	4	0	3(2)
JOSA B	0(0)	1	1	1	3	2	2	3	1(1)
PTL	22(20)	12	5	0	8	2	16	8	8(6)
Appl. Phys. B	2(0)	1	3	0	0	0	6	3	5(1)
JLT	4(3)	4	2	1	2	0	8	5	5(4)
JOSA A	3(3)	2	2	0	2	0	0	2	10(5)
Appl. Opt.	7(5)	6	4	4	1	1	2	4	10(4)
Total	65(56)	37	23	13	28	17	64	44	76(32)

LU – JORCEP activities

Laser radar (lidar) based environmental monitoring - half year long campaign @ ZJU (2009-2010)

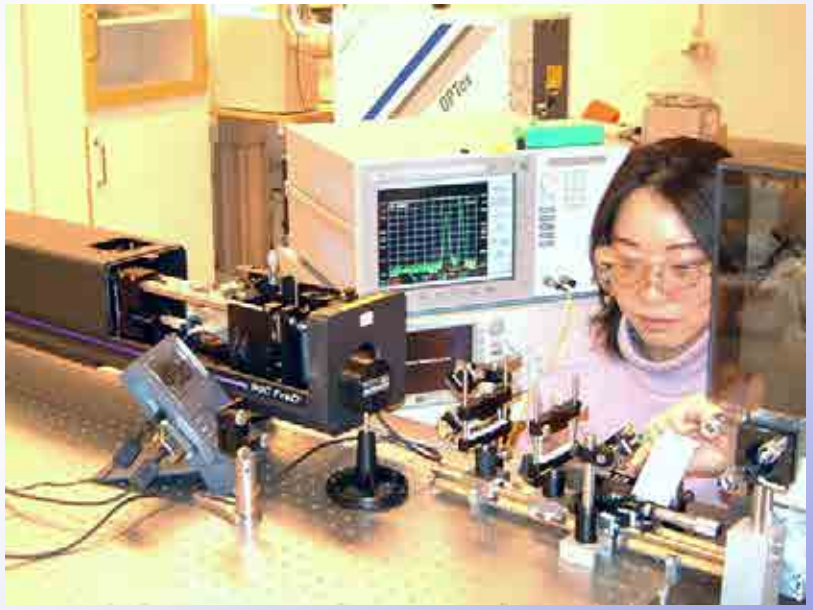



3-D mapping of pollutant concentrations
SO_2, NO_x, C_xH_y, heavy metals, etc

Ph.D. Education

- Large exchange of students
  - Mostly from China to Sweden (CSC)
  - More Swedish students to China needed

- Joint courses in the future



Conferences

- Co-organizer of Meta-materials workshop in Hangzhou, Aug. 2005
- Organizer of Int'l Symposium on Biophotonics, Nanophotonics and Metamaterials in Hangzhou, June 2006 (IEEE LEOS technical co-sponsor)
- Organizer of APOC in Hangzhou, October 2008
- Nanophotonics conference (iNOW) in Saltsjöbaden, 2009
- Central in the organisation of the Asian Conference on Optical Communications (ACP), 2009

APOC

AOE

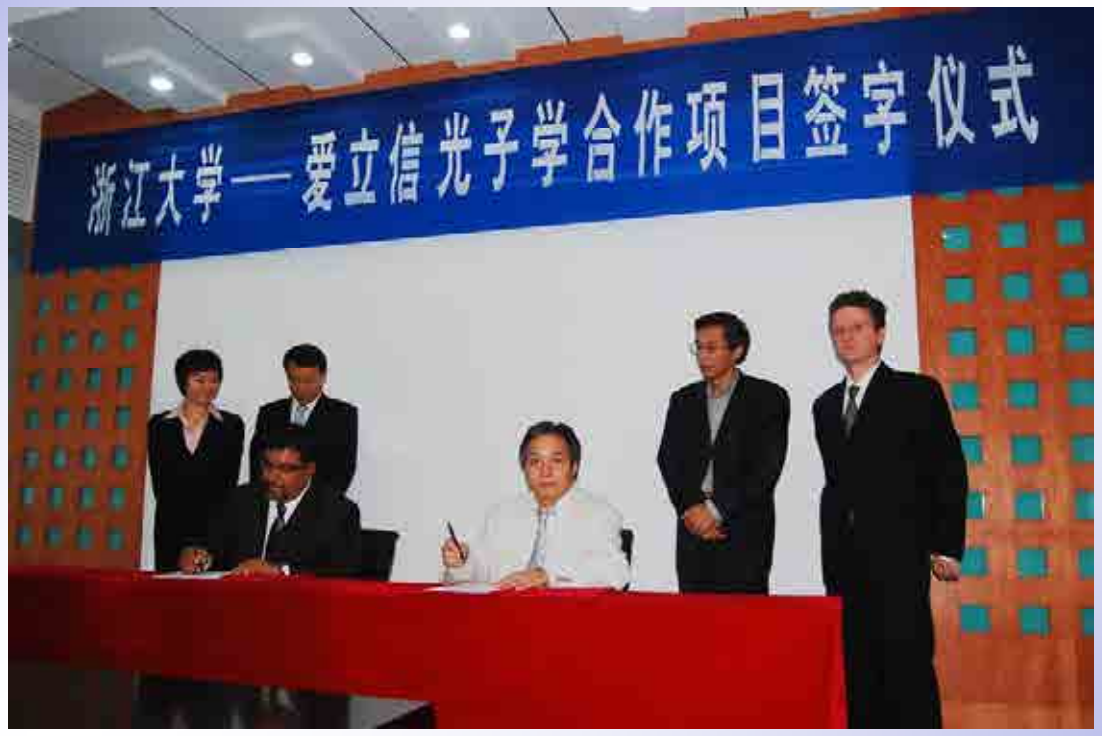
ACP

Best Student Paper Awards at APOC 2008, AOE 2008 & ACP 2009

Joint Research Center of Photonics

www.kth-zju.org

Collaboration with Industry



- The signing ceremony of the research collaboration agreement between JORCEP and Ericsson – Oct 2008

Collaboration with Industry

- Focused Photonics Inc – a world-leading environmental monitoring company @ Hangzhou high-tech park – employing 800 people, incl. more than 50 PhDs and 300 Masters in engineering (www.fpi-inc.com)

Recent JORCEP activities

ZJU

KTH

LU

- 6 years anniversary workshop in November 2009

Joint Research Center of Photonics

www.kth.zju.org

JORCEP – Lund University collaboration

- Vice minister delegation @ JORCEP in May 2010

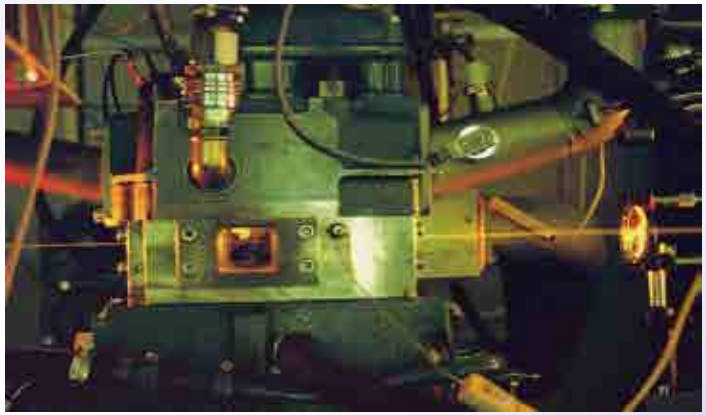
The future?

ROYAL INSTITUTE OF TECHNOLOGY

Joint Research Center of Photonics

ZJU-LU Centre for Combustion Diagnostics

- Collaboration between Division of Combustion Physics (LU) and Institute for Thermal Power Engineering (ZJU)
- Laser diagnostics for clean coal utilization, combustion and gasification, carbon capture and sequestration, particles measurement and alternative fuels
- Collaborative project: Technology development related to solid-fuel gasification and oxy-fuel combustion



LU-China activities in Education

- China Profile program – approx 20 Swedish MSc students in Electrical Engineering, Computer Science Engineering, Information and Communication Engineering acquire diverse multicultural experience
- Half a year @ ZJU together with Chinese students and teachers

Study visits,
Autumn 2009

China profile (Structure)

Year 1	Prog 15p	Prog 15p	Prog 15p	Prog 15p
	China and Chinese culture (3p)			
Year 2	Prog 15p	Prog 15p	Prog 7,5p	Prog 7,5p
			Chinese 15p	
Year 3	Chinese 15p		Prog 15p	Prog 15p
	SigProc 7,5p	Control 7,5p		
Year 4	Prog 7,5p	Prog 7,5p	Prog 7,5p	Prog 7,5p
	Optional	Optional	Optional	Optional
Year 5	Optional	Optional	Master's work	

Erasmus Mundus
External Cooperation Window
伊拉斯谟世界对外合作窗口

向世界
开放

EUROPEAN COMMISSION

- Erasmus Mundus External Cooperation Window (EMECW) mobility program co-ordinated by Lund University
- Includes 20 top EU and Chinese universities

- EMECW together with bilateral exchange student & staff agreements reinforce the education and research collaboration

ZJU-LU collaboration in Innovation and Entrepreneurship

- Innovation and entrepreneurship have gained an increasingly strategic role in today's globalized world, being embedded in many disciplines and having a great impact throughout the society.
- The city of Lund and the municipality of Hangzhou – twin cities since 2008
- Öresund and the Yangtse delta area – two very dynamic and economically well-developed regions with good collaboration potential

ZJU-LU Joint Centre of Innovation and Entrepreneurship

- ZJU-LU Joint Centre of Innovation and Entrepreneurship established 25 May 2010
- A co-operation platform covering different aspects of the knowledge triangle in a broad and multidisciplinary approach
- Encompassing, e.g.: innovation systems; innovation policies; technology innovation and commercialization; innovation management, etc

ZJU-LU Joint Centre of Innovation and Entrepreneurship

- Planned activities: joint research; joint educational activities; exchange of students, scholars and researchers; industry-university co-operation; joint business incubators; joint workshops, international symposia, etc
- Collaboration with Ideon Science Park, Venture Lab

VENTURELAB

Study visit at ZJU Science Park, May 2010

LU – Nordic Centre @ Fudan

- LU very active in the collaboration – LU director Peter Honeth was chairman for 8 years
- LU responsible for the MSc course in Nordic Studies (50 students/year, 2000-) – including environmental issues
- Joint Master program in International Relations and Public Affairs

LU – European Centre @ PKU

- LU initiated the establishment of the first European-Chinese university center in 2009

Member Universities:

•Peking University (PKU)
•Aristotle University of Thessaloniki
•Lund University
•Universidad Autónoma Madrid
•Università degli Studi di Milano
•Université de Strasbourg
•Paris Universitas
•University College Dublin
•University College London
•University of Vienna
University of Warsaw

LU – European Centre @ PKU

Main tasks:

- Increase the possibilities to establish joint research projects (comparative studies)
- Increase the knowledge about Europe and China – by establishing courses in European and China studies at the master/PhD level
- Arrange conferences at PKU and at European partner universities

LU – European Centre @ PKU

Ongoing project:

- 30 Master´s students from the LU Department of Architecture collaborating with Chinese students of Landscape Architecture at Peking University
- The students come from 15 different countries and are enrolled in the International Master´ s Program "Sustainable Urban Design"
- Finding ways to transform the Olympic Park into a sustainable urban environment

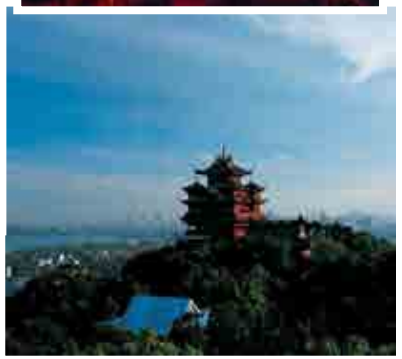
Future ways of collaboration

- China is in a rapid process of transformation – partners must be active and show commitment
- Integrate research, education and industry collaboration – the innovation triangle
- Form joint platforms or Centres of Excellence to promote collaboration projects. Attract the best students and scientists to a common goal for the benefit of science and society

Future ways of collaboration

- There are large regional differences – select suitable partners
- Select collaboration areas of mutual interest and secure needed support – incl. financial and political (in China). Focus on areas of strong expertise
- Create win-win situations for a suistainable development
- Visibility, presence in China and mobility offers understanding and create opportunities
- Build up extensive contact networks
- We expect that the academic co-operation will catalyze further links and exchange of experience between industry, high-tech companies and labor market in both Sweden and China

Keys to success

- People
- People
- People
- Money & Support

Thank you!