

Power and Academia in a Fast Developing Asian Country – The Singapore Story



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Singapore – East Meets West

- **Gained independence in 1965**
 - Population size: ~5.3m (2012)
 - Land area: 716 sq km (2012)
 - Literacy rate: 96.1% (2011)
- **3rd richest country in the World (2012):**
GDP per capital of ~USD 57K
- **Multicultural, highly cosmopolitan and diverse** with people of Chinese, Malay, Indian & other ethnicities
- **English as academic working language**
- **A rapidly emerging country when it comes to Academia & Research**



Singapore



Asia Light

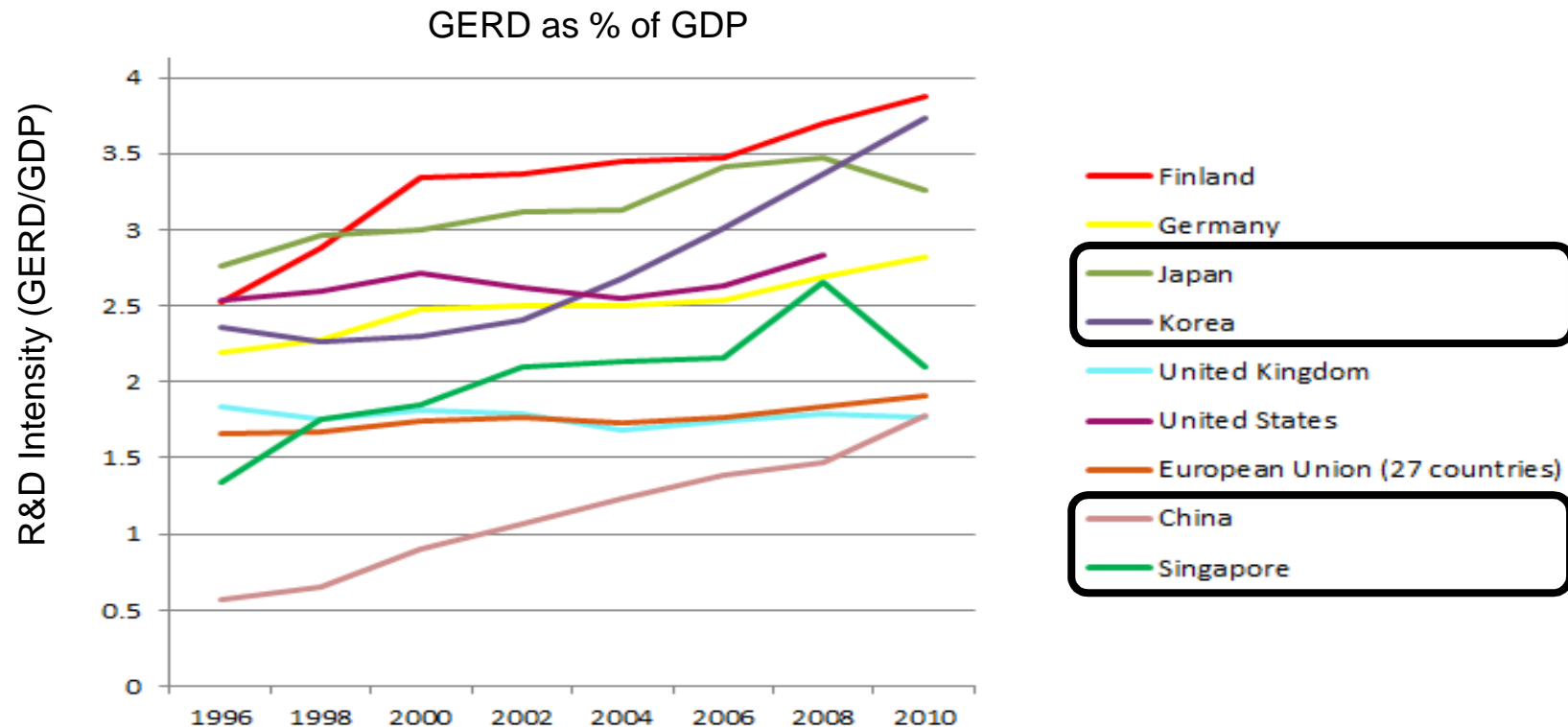
The Rise of Asia – Back to The Historical Norm

	1700	1820	1952	1978	1995	2003
China	22.3	32.9	5.2	4.9	11.1	15.1
India	24.4	16.0	4.0	3.3	4.6	5.5
Japan	4.1	3.0	3.4	7.6	8.1	6.6
Europe	24.9	26.6	29.3	27.8	23.8	21.8
United States	0.1	1.8	27.5	21.6	21.2	20.6
USSR/Russia	4.4	5.4	9.2	9.0	3.8	3.8

Source: Madison, A.(2003). The world economy: historical statistics. Paris, France: Development Centre of the Organisation for Economic Co-operation and Development

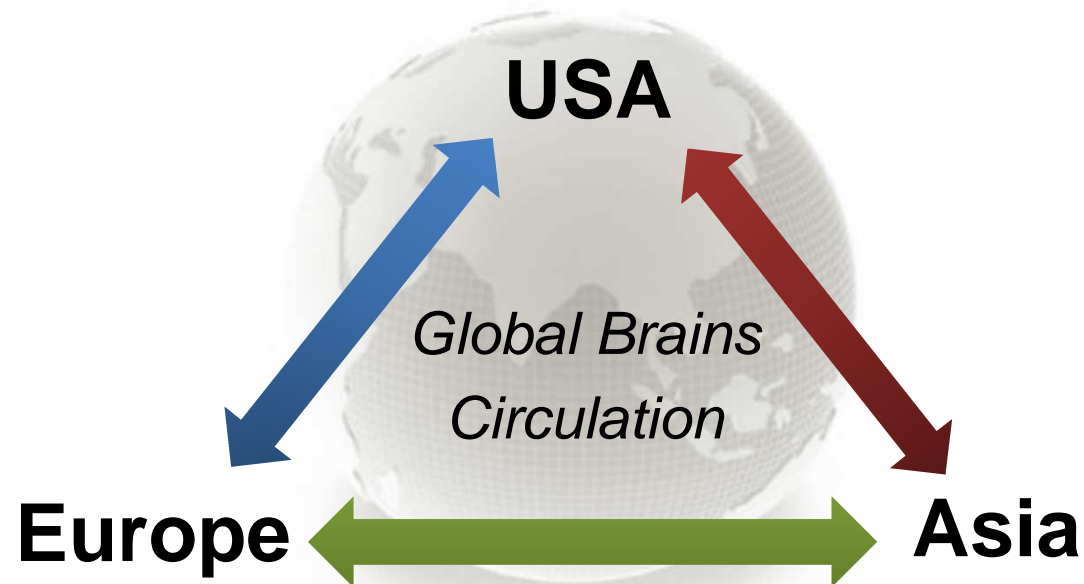
Asian Revolution in Science & Technology

“Things are moving at an incredible pace in Asia. ‘Asian revolution’... Significant investments, both private and public, are devoted to research.”






















Trend of Higher Education in Asia

- Asia rising from poverty with rapidly emerging economies
- Investing heavily in higher education & research
- Moving from bipartite global dynamics (US/Europe) to tripartite dynamics (US/ Europe/ Asia)



Top-ranked Asian Universities in QS Rankings – 19 in Top-100

University	Ranking	University	Ranking
University of Hong Kong (PRC-HK) 	23	Osaka University (Japan) 	50
National University of Singapore (Singapore) 	25	Korea Advanced Institute of Science and Technology (Korea Republic) 	63
The University of Tokyo (Japan) 	30	Tokyo Institute of Technology (Japan) 	65
Hong Kong University of Science and Technology (PRC-HK) 	33	Tohoku University (Japan) 	75
Kyoto University (Japan) 	35	National Taiwan University (Republic of China-Taiwan) 	80
Seoul National University (Korea Republic) 	37	Nagoya University (Japan) 	86
The Chinese University of Hong Kong (PRC-HK) 	40	Fudan University (PRC) 	90
Peking University (PRC) 	44	City University of Hong Kong (PRC-HK) 	95
Nanyang Technological University (Singapore) 	47	Pohang University of Science and Technology (Korea Republic) 	97
Tsinghua University (PRC) 	48		



베르틸 안데르손 노벨재단 평의회 이사
 “노벨상, 경제 일으키는 기폭제”
 Money & Biz # 22p

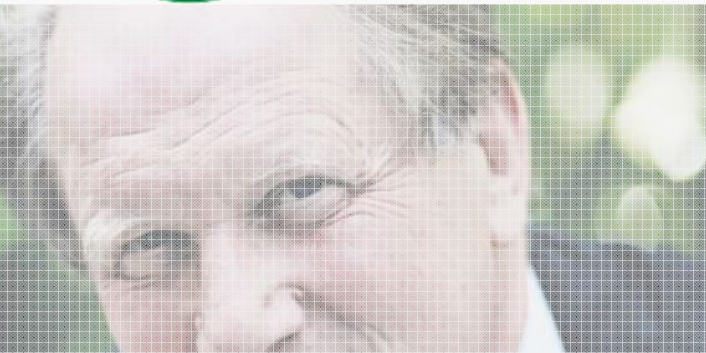


News

28. March 2007 14:07

European Science Foundation says farewell to its Chief Executive Bertil Andersson

Inside the beautiful mind of a simple boy



CAREER VIEW

MOVERS

Why Asia? Why Singapore?

“Maybe in Europe, we talk too much... in Singapore, they act!”

TODAY EXCLUSIVE

‘Superstars’ to lift NTU onto world stage

New provost wants to recruit top scientists to lead research efforts

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BARELY three weeks after settling into his new office, the Nanyang Technological University’s (NTU) first provost, Professor Bertil Andersson, is already gunning to boost the university’s research efforts with world class “superstars.”



provost feels efforts fall short. He hopes for less competition and more tie-ups among local universities in the coming years.

Likening the knowledge-based economy to a car engine, he said: “The universities should be the cylinders in this motor, and these have to be well-tuned if the motor is to run efficiently. I will meet the other universities to see what synergies we can have.”

A biochemist by training, Prof Andersson is also taking a keen personal interest in NTU’s new School of Biological Sciences.

“Maybe I’ll set up a small research group there myself. It’s always beneficial to get

Linköping, Sweden
 1996-99: Dean, sciences department, pro-dean of the faculty, Stockholm, Sweden

s to Bertil Andersson like speed he was captivated by the fast place in nerves. But his super actions in photosynthesis — a it in the mid-1970s.

ursued a graduate degree in bio established Umeå University in had a pioneer spirit — perfect the burgeoning field of plant mo stdoc at Australia’s Commonwe Scientific and Industrial Research Organisatio

About Nanyang Technological University

- Provost (2007); President (2011)
- University founded in 1991 (in its present form)
- Already ranked in Top-50 & no. 4 among universities of 50 years or younger
- Biggest Engineering university in the World
- But also having a
 - Business School
 - Science
 - Humanities & Social Sciences
 - Art School
 - Communications School
 - National Institute of Education
 - Medical School (2013; collaboration with Imperial College London)
- ~34,000 students
 - Undergraduate: ~23,500 (25% are international)
 - Graduate: ~9,500 (~55%)
 - Faculty: ~1,700 (57%)
 - Research staff: ~2,400 (~81%)
 - Total staff: ~6,800



Yunnan Garden Campus – A place for vibrant student life



Singapore's Research Performers

- 4 universities

- Nanyang Technological University (NTU)
- National University of Singapore (NUS)
- Singapore Management University (SMU)
- Singapore University of Technology & Design (SUTD)



- Fifth & sixth universities to be established

- SIM University (UniSIM)
- Singapore Institute of Technology (SIT)



- Agency for Science, Technology and Research (A*STAR):
14 Research Institutes

- Other Government Laboratories

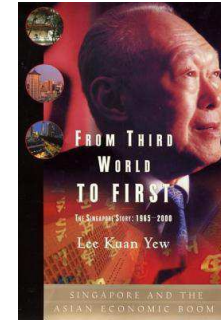
- Industrial Laboratories

- Foreign universities (MIT, ETH, TUM, Cambridge, Berkeley, Hebrew Uni, Technion, others)



Singapore Government

- Singapore has been dominated by the People's Action Party (PAP) ever since Singapore became independent in 1965
- “Founder” of the nation: Mr Lee Kuan Yew
- Soft authoritarian government
- Opposition gaining ground (40%) in General Election 2011 & have won recent by-elections
- Today a vibrant metropolis & not as strict as 10 years ago
- Singapore driven top-down (Singapore Inc)
- Universities governed by Ministry of Education until 2006



Singapore as a S&T Hub with R&D as the Basis for a Knowledge-intensive, Innovative & Entrepreneurial Economy



Mr Lee Hsien Loong,
Prime Minister of Singapore

“To transform Singapore into a knowledge-intensive economy, build up our capabilities, enhance our competencies in existing technologies, and seek out promising new areas ... and raise Singapore’s profile as a vibrant centre for R&D and technological applications.”

In Singapore, politicians “walk the talk”

The Singapore Story – Climbing the Research Ladder

“Our R&D programme takes a longer term perspective... The Government remains fully committed to investing in R&D... that will keep our economy competitive in the long term”

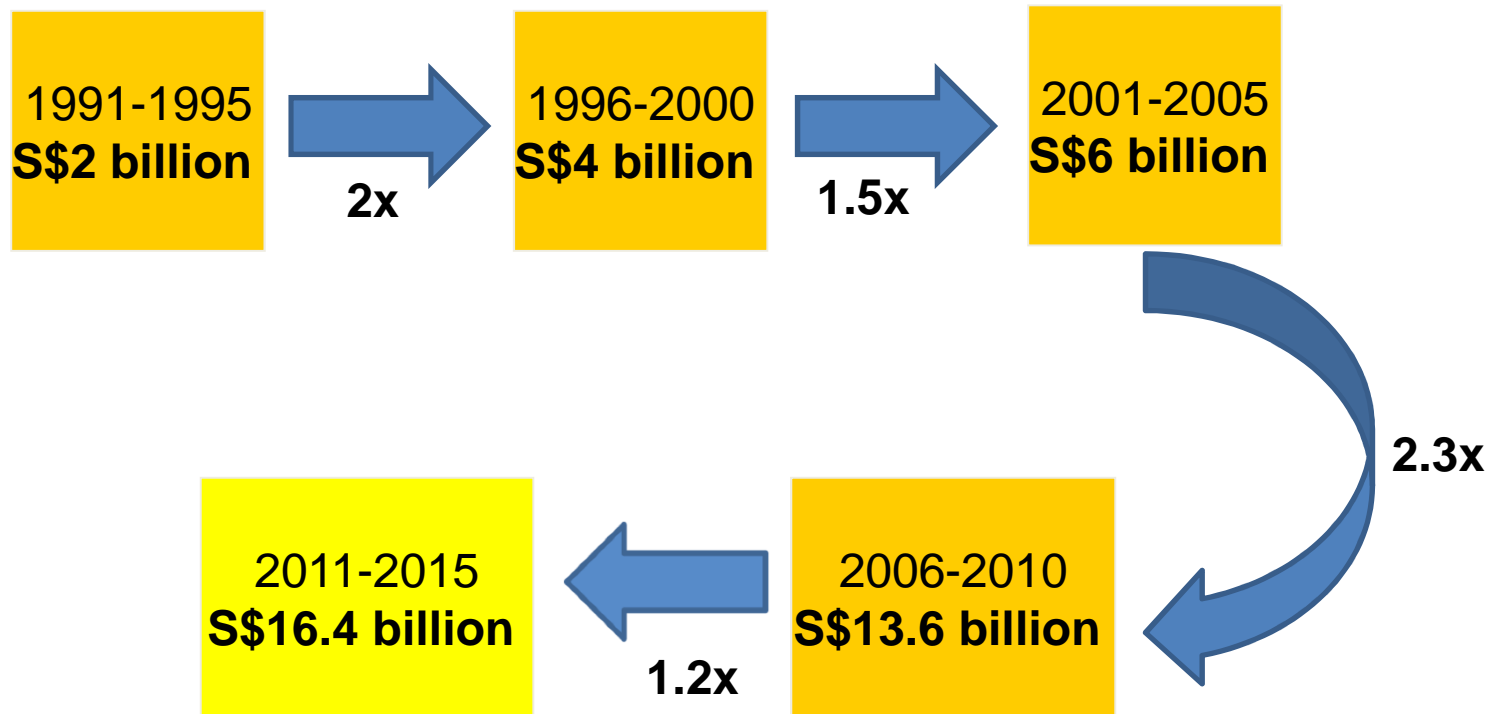
Mr Lee Hsien Loong,
Prime Minister of Singapore
Opening of Fusionopolis, October, 2008



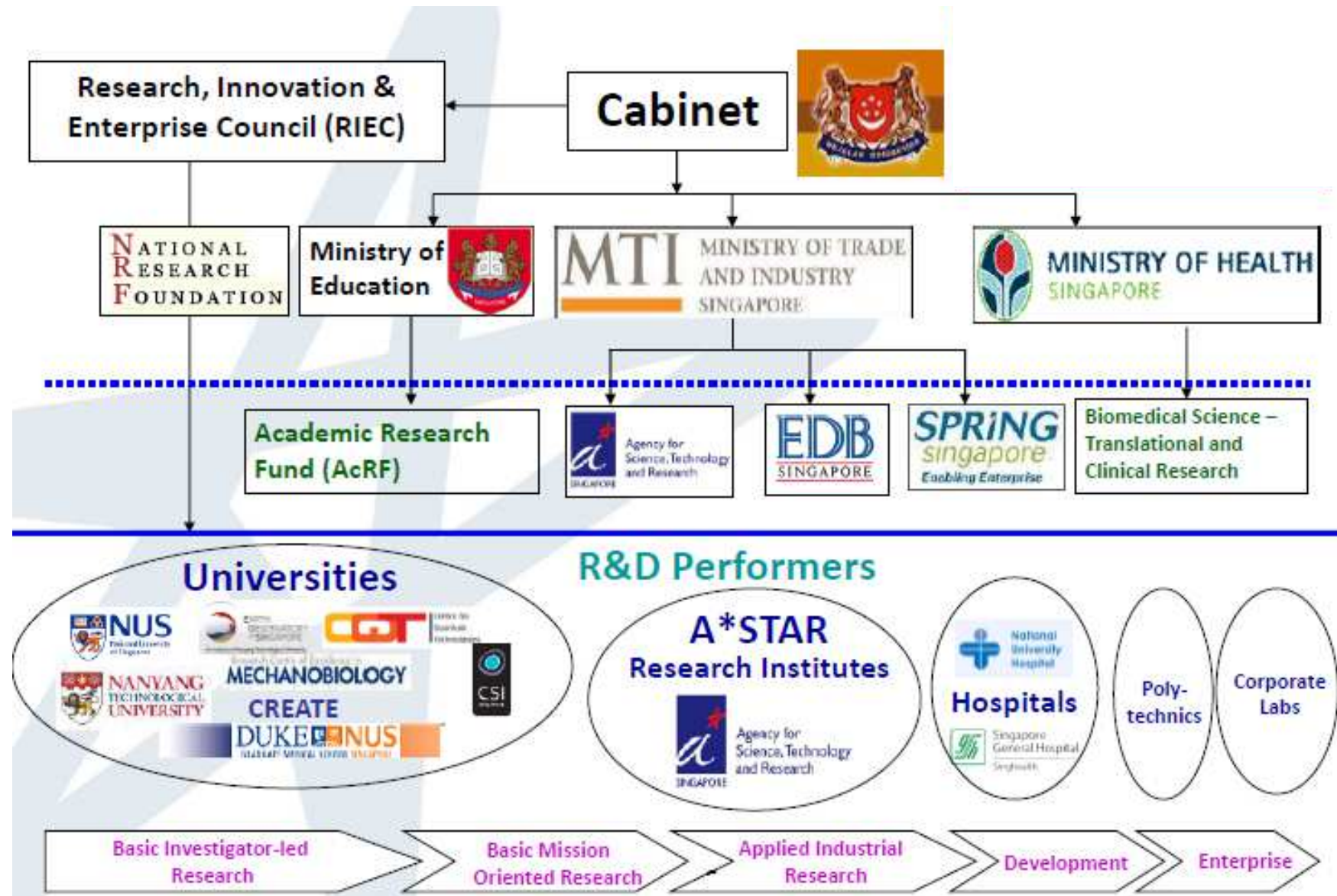
Research as a major instrument of Government policy

Government's strong commitment to R&D

5-year Science & Technology Plan



Singapore's Research Funding Landscape



Total funding: >S\$20 billion over 5 years

Source: A*STAR

Research Funding in Singapore

The architect behind Singapore's
quantum leap in research



Dr Tony Tan Keng Yam,
President of Singapore (since 2011)
Former Deputy Prime Minister
Former Chairman of National Research Foundation



University Governance (1)

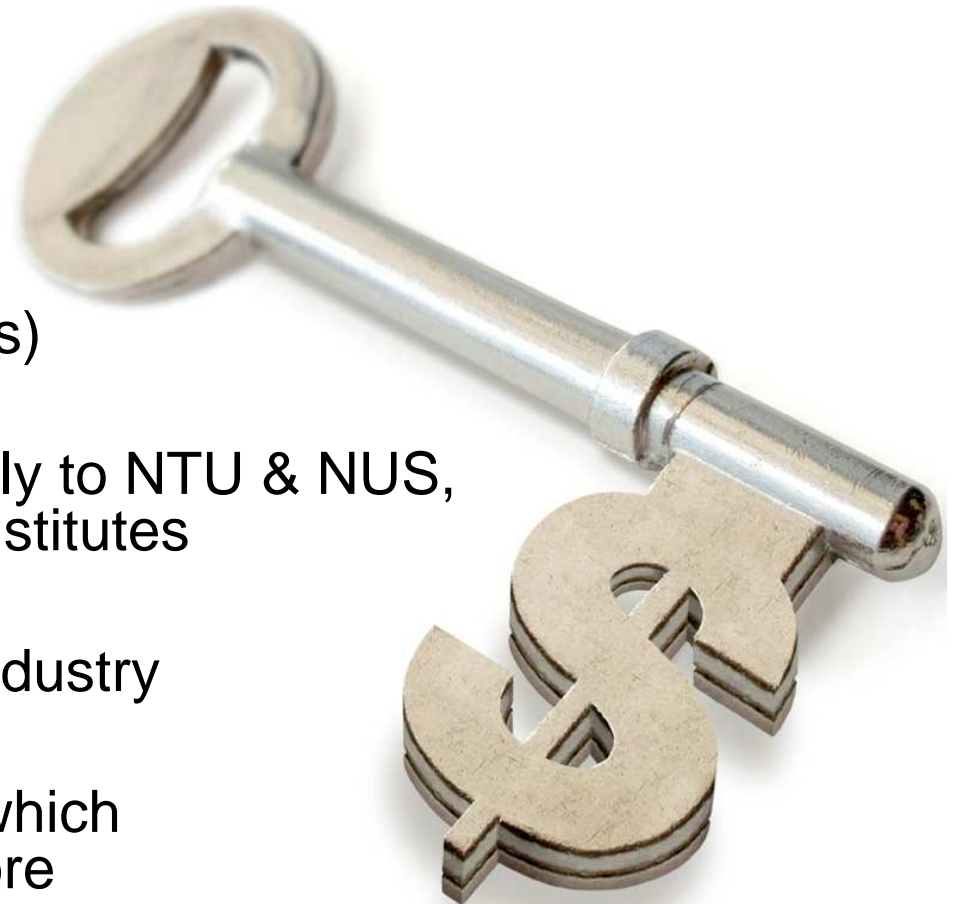
- Universities autonomous after 2006; directly governed by Ministry of Education before that
- Government still provide >90% of the funding & still has a significant influence
- University has a Board of Trustee (BOT) with ~20 members
- The BOT is dominated by representatives from the Government sector & business people, with few academics
- The BOT is quite hands-on
- Appointments of BOT Chairman and the University President needs to be approved by Government
- Universities thoroughly evaluated every 5th year by high-level national & international panels which report to the Government

University Governance (2)

- University led by President & Provost (American system)
- Substructure of Colleges & Schools, as well as Research Institutes/Centres (matrix structure)
- President & Provost has top-down power
- Top-down power all through the academic system
- Faculty Senate since 2009 (advisory role)
- American-style tenure system with a high bar
- Tight audit from Government and Government agencies (including funding agencies)
- Student involvement has been poor in the past but is rapidly improving
- Influence of unions limited

Research Funding

- Research funding system under governance of Prime Minister & 6 other Ministers plus ~15 international experts
- Grant allocation is controlled by international peer review panels
- High proportion of block grants & centre grants
- Poor funding of Humanities & Social Sciences (with exceptions)
- Research funding directed mainly to NTU & NUS, as well as A*STAR's research institutes
- Funding for collaboration with industry
- Funding of foreign universities which establishes research in Singapore



Singapore – Positives for Excellence (1)

- **Investing heavily in R&D**
- **Ambition & speed**
- **Building up institutions into leading organisations (universities & A*STAR)**
- **Providing world-class research infrastructure**
- **Strong recruitment of top international researchers (also for management)**

Singapore – Positives for Excellence (2)

- **Rigorous use of international peer review**
- **Competitive & generous funding system**
- **Open country, promotion of international collaboration**
- **Strong higher education drive building on world-leading schools system**
- **Strict international bench-marking**
- **Criteria include economic & societal relevance**

Singapore – Some Negatives With Respect to Excellence

- Impatience sometimes for rapid economical returns hampers long-term vision
- Lack of administrative experience in research funding
- Funding generous but fragmented
- Humanities & social sciences under-funded
- Brand driven, rather than content driven
- Fixated on rankings
- Education not sufficiently stimulating creativity



NTU's Research Centres of Excellences (RCEs)

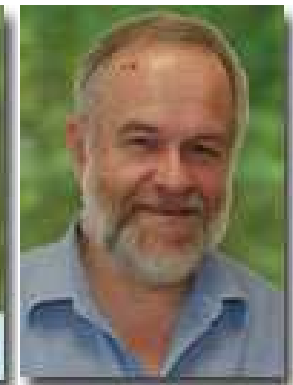
- Earth Observatory of Singapore (EOS): NTU's first RCE; Awarded S\$150m
 - Region's flagship institute for earth sciences research & innovation
 - Research focus: Processes of natural hazards such as earthquakes, tsunamis, volcanic eruptions & climate change



Kerry Sieh



Paul Tapponnier



Chris Newhall

- Singapore Centre on Environmental Life Sciences Engineering (SCELSE): NTU's second RCE; Awarded S\$120m
 - Catalytic platform to synergise research on environmental sciences & life sciences
 - Research focus: Environmental microbiology with objective to create practical environmental solutions & a new discipline in bio-films



Staffan Kjelleberg



Yehuda Cohen



Stephan Schuster

Strong Presence of German Research Ecosystem in Singapore

- Many German universities have research collaborations in Singapore



- TUM has a strong physical presence
- Frequent visits of Federal & local politicians



- Strong commercial presence of German industry in Singapore but also very well-developed research collaborations with the universities & A*STAR



- Many German experts on R&D are active in various advisory boards and collaborative efforts





Thank You
Vielen Dank