

NEWS RELEASE

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NTU awarded \$150 million for Research Centre of Excellence in earth science

- *The Earth Observatory of Singapore to put Singapore at forefront of earth science*
- *World renowned scientists move to NTU to helm Observatory*

Singapore's Nanyang Technological University (NTU) has been awarded \$150 million from the National Research Foundation (NRF) and the Ministry of Education to set up a Research Centre of Excellence (RCE) in earth science.

The Centre, called the Earth Observatory of Singapore (EOS), will focus its research on hazardous natural processes that pose threats to the region, including tsunamis, volcanic eruptions, earthquakes and climate change.

Three world-renowned scientists, hailing from top international universities, are moving to NTU to lead the Observatory.

Professor Kerry Sieh, from the California Institute of Technology, will be EOS' founding director. Professor Paul Tapponier, from Institut de Physique du Globe of Paris, and Professor Chris Newhall, from the University of Washington, will take on senior positions at EOS. The three scientists have been conducting extensive research on earthquakes and volcanism in the region for the past few decades. (Please refer to Annex for their cvs).

Dr Su Guaning, President, NTU, says, "NTU's established strengths in related fields such as earthquake engineering make us a natural home for research in earth science. We are excited to welcome a dream team of scientists here, to lead the EOS and help establish Singapore as the foremost authority in earth science. Their work at EOS will be pivotal in creating safe and sustainable communities throughout Southeast Asia."

The focus areas of EOS include earthquake science, volcanology and climate science. The EOS aims to characterise and forecast natural processes in ways that are useful to governments, communities and businesses. Its scientific discoveries will enable Southeast Asian communities to better address the risks that Nature poses to human infrastructure and how those risks should be mitigated.

Initial research programmes will include refining tsunami forecasts for western Sumatra and the South China Sea, evaluating the likely impact of future great Sumatran earthquakes on Singapore and the region, creating a comprehensive database of earthquake faults in Southeast Asia to be used by the insurance industry and policy makers, and evaluation of volcanic potential in the region.

On the importance of EOS' research, Professor Kerry Sieh notes, "Singapore has made major commitments to and progress in human health through biomedical research and development. But progress in understanding the world within us will be for naught if we do not understand how to sustain a livable environment. Recent seismic and volcanic catastrophes and global warming demonstrate clearly serious incompatibilities between Earth's dynamic processes and humanity's footprint on the planet. Singapore recognizes the role that basic research must play in re-orienting human progress toward a more sustainable approach to the future."

He adds, "The EOS will be at the forefront of earth science, with linkages and programmes to translate knowledge of earth systems into political, social and economic action. Singapore is providing an astonishing opportunity to conduct basic research on earth processes and history that will affect hundreds of millions of Southeast Asians through the coming century."

Construction of the EOS' laboratories and offices at NTU will begin later this year. At full strength, envisaged in 5 years time, the Observatory will consist of 20 faculty, 70 graduate students and post-doctoral fellows, whose work will be supported by a strong technical and administrative staff.

EOS will build upon NTU's strengths in engineering and other fields. In addition to new hires in the earth science, EOS will draw on interdisciplinary talent from NTU's various schools and centres, including the Schools of Civil and Environmental Engineering, Computer Engineering, Humanities and Social Sciences, Art, Design and Media, and the S Rajaratnam School of International Studies, as well as the National Institute of Education, NTU's Intelligent Systems Centre and Maritime Research Centre. The EOS will also collaborate with other institutes, including with Caltech's Tectonics Observatory and the Centre for Remote Imaging, Sensing and Processing at NUS.

Media contact

Jackie Yu, Asst Director, Corporate Communications Office
Tel: 6790 5417; Mobile: 9688 4269; Email: jackieyu@ntu.edu.sg

About Nanyang Technological University

Nanyang Technological University (NTU) is a research-intensive university ranked among the top 25 technological universities in the world. The Yunnan Garden campus, NTU's main campus, is located in the south-western part of Singapore. The NTU@one-north campus, home to educational and alumni clubhouse facilities, is located near Singapore's biomedical research hub, Biopolis; and the new infocomm and media hub, Fusionopolis.

NTU has four colleges, namely:

- The College of Engineering, with six schools focused on technology and innovation and a research output among the top four in the world
- The College of Science which offers Singapore's only direct-honours bachelor's degree programme
- The Nanyang Business School (the College of Business), the first and only Singapore business school to be ranked in the top 50 of the Financial Times Global MBA 2008 rankings
- The College of Humanities, Arts, & Social Sciences, home to Singapore's first professional art school offering degree courses in art, design and interactive digital media; the Humanities and Social Science School; and the Wee Kim Wee School of Communication and Information, a top journalism and media school in Asia

The S Rajaratnam School of International Studies, one of two autonomous institutes of NTU, is a world authority on strategic studies and terrorism. NTU is also home to the internationally-acclaimed National Institute of Education, Singapore's only teacher-training institute.

As Singapore's main science and technology university, NTU makes significant contributions to the nation's renewed drive for research and innovation spearheaded by the Singapore National Research Foundation (NRF). NTU's strengths in biomedical sciences, environmental and water technologies, and interactive and digital media mirror the NRF's research focus.

NTU has a strong and broad international reach covering academic and research partnerships with top institutions in the US, Europe and Asia, such as MIT, Stanford University, Cornell University, Caltech, University of Washington, Georgia Institute of Technology, and Carnegie Mellon University; Cambridge University, Imperial College and Swiss Federal Institute of Technology; and Peking University, Shanghai Jiaotong University, Waseda University, and Indian Institute of Technology.

For more information, visit www.ntu.edu.sg

ANNEX: curriculum vitae



Professor Kerry Sieh

Robert P Sharp Professor of Geology,
California Institute of Technology

Academic degrees:

Ph.D. (Geology), Stanford University, 1977

A.B. with highest honors (Geology), University of California, Riverside, 1972

Selected Awards and Honors:

- Fellow, American Geophysical Union, 2001.
- National Academy of Sciences, member, 1999.
- Fellow, Geological Society of America, 1996.
- National Academy of Sciences Award for Initiatives in Research, 1982.
- E.B. Burwell, Jr., Memorial Award of the Engineering Geology Division, Geological Soc. of America.

Selected recent service:

- Member, Advisory Panel, Institute of Earth Sciences, Academia Sinica, Taiwan (2000-present)
- Member, Assessment Committee, Department of Geosciences, National Taiwan University, Taiwan (2004)
- Member, U.S. National Committee for the International Union of Geodesy and Geophysics (2000-2003)
- Caltech Faculty Board, (2000-2001)
- Member, Committee on the Science of Earthquakes, Nat'l Research Council, Nat'l Academy of Sciences (1996-1998)

Biographical sketch:

Kerry Sieh is currently a chaired professor in Caltech's Tectonics Observatory and is a member of the US National Academy of Sciences. He initiated the field of paleoseismology 30 years ago with his discovery of how often California's infamous

San Andreas fault has generated great earthquakes. This and Sieh's later studies laid the observational foundation for reliable seismic hazard evaluations, upon which risk assessment depends critically. In the formative years of the Southern California Earthquake Centre, Sieh led its effort to characterise earthquake faults beneath Los Angeles, enabling assessment of that megacity's seismic potential. His work along the great under-sea Sunda megathrust revealed patterns of ancient rupture and current straining that led to forecasts of recent and impending large Sumatran earthquakes and tsunamis. In the early 2000's, Sieh and others at Caltech created the Tectonics Observatory. This US\$30m privately funded multi-disciplinary scientific effort now includes his extensive GPS network in western Sumatra. He and his students recently completed a 6-year study that redefined the active tectonics of Taiwan and have begun a comprehensive study of the neotectonics of Myanmar. Sieh is co-author of a graduate-level textbook and a popular book on earthquakes and volcanoes. He advised Taiwanese scientists and government in the creation of their modern research program in earthquake science and has continued to help build the Indonesian program.



Paul Tapponnier is the most influential and accomplished neotectonicist of his generation. Early in his career he discovered the great active faults of Tibet (Molnar and Tapponnier, 1975; Tapponnier and Molnar, 1977) and how they are accommodating the collision of India into Asia (Tapponnier et al., 1982). Subsequently he built the world-renowned Laboratoire Tectonique at the University of Paris and trained a generation of younger scientists, continuing to keep his group at the forefront of neotectonic discovery in Asia and into other areas such as the Middle East. Tapponnier's interests include continental dynamics and tectonics (with particular emphasis on collision zones, plateaux and mountain belts in Asian-Mediterranean regions), active faulting and seismotectonics, earthquake hazard assessment, quantitative geomorphology, current rates of active deformation processes, and rock mechanics and rock deformation physics

Academic degrees

- M.S. Ecole Nationale Supérieure des Mines de Paris, 1970. Geology - Geophysics
- Ingénieur Civil des Mines de Paris
- Doctorat d'Etat: Université des Sciences et Techniques du Languedoc, Montpellier, 1978.

Selected professional positions

- Institut de Physique du Globe de Paris
1978-1980 Assistant Professor
1980-1985 Associate Professor (with tenure)
1986-1990 Full Professor
1991-present Full Professor (Physicien, classe exceptionnelle)
1991- present Director, Tectonics Department
- Unité Mixte de Recherche 7578, "Tectonique, Mécanique de la Lithosphère" (one of the research laboratories of the Centre National de la Recherche Scientifique)
1984-1996, 2001-2004 Director
- Jet Propulsion Laboratory, Pasadena, CA, USA Distinguished visiting scientist Caltech
January-July 2000 Visiting professor

Selected awards and Honors:

- Silver Medal of Centre National de la Recherche Scientifique, France, 1984.
- "Alfred Wegener" Medal of European Union of Geosciences, 1985
- Grand Prix Scientifique de la ville de Paris, 1990.
- Knight of National Order of Legion of Honour,(France, 1991).
- Best Paper award, Geological Society of America, 1994
- Fellow of American Geophysical Union (1994).
- Honorary Fellow of Geological Society of America (1996)
- Francis Birch Lecturer, American Geophysical Union, 1999.

- Lyell Medal, Geological Society, London, 2001
- Foreign associate Member of the National Academy of Science (USA), 2005
- Member of the French Academy of sciences (2005) , (Corresponding member since 1994)

Professional Affiliations

- Académie des Sciences
- American Geophysical Union
- Geological Society of America
- Geological Society of London
- European Union of Geosciences

Editorial Boards

- Associate Editor of Tectonophysics (1981-1989),
- Associate Editor of Geology (1982-1985), Tectonics (1982-1988)
- Editor of Earth & Planetary Science Letters (1992 to 1996)

Selected lecture venues

- *France*: Universities of Orsay, Montpellier, Rennes, Nantes, Grenoble, etc
- *U.S.*: M.I.T., Caltech, Harvard, Lamont D.G.O. of Columbia University, Cornell, UC Los Angeles, Davis, Santa Barbara, Berkeley, and Santa Cruz, Princeton University, etc
- *Europe*: Universities of Cambridge, Oxford, Leeds, Newcastle Upon Tyne, Karlsruhe, Mainz, Neuchâtel, Lausanne, Uppsala, Utrecht, Calabria (Cosenza), Camerino, etc
- *China*: Institute of Geology of Academia Sinica (Beijing), Ministry of Geology (Beijing), State Seismological Bureau (Kunming), Geological Institute (Xian), Geological Institute (Chengdu), University of Hong Kong
- *South and Southeast Asia*: Institut de Géologie et Géophysique (Hanoi, Vietnam), Peshawar Centre of Excellency (Pakistan), Geological Society of Thailand (Bangkok)



Chris Newhall is the world's foremost authority on volcanism of Southeast Asia. He invented the widely used Volcanic Explosivity Index (VEI) and led efforts to forecast successfully the timing and nature of the great 1991 eruption of Mt Pinatubo, north of Manila. His current work as a volcano "epidemiologist" includes reinterpretation of historical eruption precursors, study of modern volcanic unrest, and reconstruction of eruptive behavior from stratigraphic, petrologic, and historical data. Newhall brings strength to the Earth Observatory both in both the academic and mitigation aspects of volcanology. Until recently with the US Geological Survey and University of Washington, Newhall now lives and works in the Philippines.

Geologist, US Geological Survey (emeritus)
Affiliate Professor, Univ. Of Washington

Formal Education:

- Univ. California (Davis), BS Geology 1970, MS Geology 1976
Including: Univ. Canterbury (NZ) 1968; School for International Training 1970
- Dartmouth College, PhD, 1980 (1981) (Geology of the Atitlán Calderas, western Guatemala and development of the widely used Volcanic Explosivity Index, VEI)

Professional Service:

1970 - 1972, 1974-76 Peace Corps volunteer, geology instructor, Aquinas U, Philippines

1977 - present Geologist, US Geological Survey's Volcano Hazards Program,

- Mapper, stratigrapher in the San Francisco Volcanic Field, at Mount St. Helens, at several volcanoes in the Philippines, Indonesia, Japan, Guatemala
- Promoter of history and analogues to understand processes at Long Valley, Iwo-jima, Campi Flegrei, Rabaul, and other young, restless calderas
- Early organizer of scientific and industry response to ash hazard to aviation
- Pioneer in use of event trees in volcanic risk assessment and eruption forecasts
- Co-leader, Philippine-US team at Pinatubo 1991-2001 that successfully forecast the large 1991 eruption and subsequent lahars and saved many lives.
- Charter member (and since 2005, contractor) of the USGS' international volcanic crisis assistance team

1993 - present Affiliate Professor, Earth and Space Sciences, Univ. of Washington.

Recent courses: Volcanic Processes; Field Volcanology (Pinatubo)

Various years Leader of various activities and commissions within the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), including Commission on Mitigation of Volcanic Disasters, Subcommittee for

Decade Volcanoes, Subcommittee for Crisis Protocols, Asst. Executive Editor
of Bulletin of Volcanology
2000-2005 Chairman, World Organization of Volcano Observatories (WOVO)
2000-present Co-leader of the WOVOdat project, a global database of volcanic
unrest.

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