

Forum on Creativity in the Arts, Science & Technology 2006

List of Speakers & Topics

Professor Gerard 't Hooft

Nobel Laureate in Physics (1999)

Gerardus 't Hooft obtained his Doctoral degree in physics 1972 at the University of Utrecht, and has been the Professor of Physics at the same university since 1977. He is one of the world's leading theoretical physicists, making original, profound and lasting contributions in many areas in physics such as elementary particle physics, quantum gravity and black holes, and fundamental aspects of quantum physics.

Professor Gerardus 't Hooft has received numerous awards and honours, including the 1979 Dannie Heineman Prize from the American Physical Society, membership of the Dutch Academy of Sciences since 1982, the 1982 Wolf Prize for his work on renormalizing gauge theories, the 1995 Franklin Medal http://www.fi.edu/winners/1995/thooft_gerard.faw?winner_id=3094, Philadelphia, and together with, Professor M. Veltman, the 1999 Nobel Prize <http://www.nobel.se/> in Physics.

The 1999 Nobel Prize in Physics by the Royal Swedish Academy of Sciences, Stockholm, was awarded to Professor 't Hooft for "ellucidating the quantum structure of electroweak interactions in physics." The electroweak interactions play an extremely important role in nature. Electromagnetic interaction is responsible, for instance, for the existence of atoms and the Sun would not shine without weak interaction. The two interactions are unified through a scheme based on the Yang-Mills gauge fields, proposed by C N Yang and R Mills in 1954.

Professors Gerardus 't Hooft and Veltman have made a decisive contribution in electromagnetic and weak interactions of the building blocks of matter. They have placed particle physics theory on a firmer mathematical foundation; in particular, they

have shown how the theory may be used for precise calculations of physical quantities. Their work has given researchers a well-functioning "theoretical machinery" which can be used for, among other things, predicting the properties of new particles, for instance, the mass of the top quark, the sixth quark in the standard model of fundamental constituents of matter.

Topic: "Highlights in Subnuclear Physics"

The physical properties of the nuclei of atoms are caused by the particles they are built of: protons and neutrons. When they are bombarded hard by other particles, other tiny objects can be produced, unstable particles that are similar to protons and neutrons, or altogether different kinds of particles. The last three decades of the 20th century have brought enormous advances in the understanding of these objects, the forces that they exert on one another, and their kinematical properties. This is due to a large number of beautiful, ingenious and painfully accurate measurements, in combination of elaborate theoretical calculations. It turned out that protons, neutrons and other similar particles each consist of three "quarks". There exist six species of quarks, called "flavors", and each quark flavor can have three different "colours". Besides these quarks there are six kinds of "leptons", of which the electron is the prime representative. Leptons have no color. Quarks and leptons all show rotational motion, called "spin".

Physicists were surprised to discover that the forces acting between quarks and leptons can be described extremely accurately. Three types of force have been observed directly: first the electro-magnetic force, which is associated to a special particle called the photon, the quantum particle of light. Then there is the strong force, responsible for the tight binding of all particles carrying color. The special particle responsible for this force is the "gluon", which is similar to the photon but more complex. Finally, there is the weak force, carried by heavy photon-like particles called "intermediate vector bosons". The complete equation quantifying all these forces is known as "the Standard Model".

There is one other force however, which is not yet properly included in the Standard Model: the gravitational force. Of course we know that gravity exists, and we do have precise equations for it: Einstein's equations, discovered way back in 1915. But these equations do not match easily with the ones for the Standard Model. The gravitational

force acting between two individual particles is so weak that it could never be directly observed, and a proper mathematical synthesis between gravity and the other forces could not yet be achieved.

In fact, there are more reasons to suspect that the Standard Model is not complete. Even if it works very well for the particles observed in experiments so-far, we know that the Model does not predict very precisely what happens in collisions where the energy is much higher. Then tinier substructures of the particles may come into play, and we are not sure of their nature. Europe's biggest particle laboratory near Geneva, CERN, now has nearly completed a new, large facility where protons will be allowed to collide with more force than ever observed before in such detail, and we are eagerly awaiting its findings.

Other information is hiding in the vast depths of the Universe. There, it has been noted that sources of gravitational attraction exist that cannot be due to particles of the kind we know. It is a challenge to identify this so-called "dark matter".

Studies of the Cosmos have led to more surprises, and we can only hope that the day will come when the missing pieces of our puzzle can be fitted together into one superior scheme.

Professor William S W Lim
Independent Theorist & Writer

William S W Lim graduated from the Architectural Association (AA) London and continued his graduate study at the Department of City and Regional Planning, Harvard University. Lim is a citizen of the Republic of Singapore. His professional work involves architecture, planning and development economics. He was principal architect at Malayan Architects Co-Partnership from 1960-1967, Design Partnership (later renamed DP Architects) from 1967 to 1991, and William Lim Associates from 1981 to 2002.

Lim is co-founder and chairman of the Asian Urban Lab (2003) and president of AA Asia. He was also president of the Singapore Heritage Society from 1988 to 1997, and of the

Singapore Planning and Research Group (SPUR) from 1966 to 1968. Presently, Lim is Adjunct Professor of the Royal Melbourne Institute of Technology (RMIT) University, Australia, and Guest Professor of Tianjin University, China. Lim was conferred a Doctor of Architecture Honoris Causa by RMIT University in 2002 and Honorary Professor of LaSalle-SIA College of the Arts (Singapore) in 2005.

Currently, Lim writes and lectures on a wide range of subjects relating to architecture, urbanism and culture in Asia as well as on current issues relating to the postmodern, glocality and social justice.

Topic: “The Postmodern and Creativity”

A new era has dawned. The postmodern has arrived to challenge the static mainstream values. Universality, conformity and stability are insufficient. New values such as local peculiarities, individuality and creativity are hailed.

Postmodernity is spreading faster and wider everywhere, in particular to the younger generation. Time-space compression by the ICT revolution has liberated the youths beyond their immediate surroundings and information from all corners of the globe is available at the click of a mouse. They interact on a global level and the only constant in their life is change. A contest between generations over lifestyles and values is unavoidable.

This presentation thus examines the postmodern condition and argues that creativity needs to be substantially redefined and evaluated in this dynamic new era.

Dr Catherine Lim
PhD in Applied Linguistics

Catherine Lim who has a doctorate in Applied Linguistics is a full time writer in Singapore. She has published 18 books, comprising short story collections, and novels, some of which have been translated into many languages, and are used in schools and colleges as literary texts. She spends her time writing, reading and giving lectures.

Topic: “Magic and Madness –The Confessions of a Writer”

Catherine Lim will talk about the pure exhilaration of the creative writer exploring the magical world of the imagination, with all that it implies of unconventionality, risk and even folly. But she will reveal, through her own life story, and its many vicissitudes, that it is precisely this madness that is part of the magic of all artistic endeavour.

Ms Lien Siaou-Sze

Business Leader

Listed in Fortune Magazine’s “50 Most Powerful Women outside US”

Lien Siaou-Sze is one of Singapore’s most widely-recognized business leaders — listed five times in Fortune Magazine’s “50 Most Powerful Women outside US.” Currently pursuing her PhD after a 28-year-plus career at HP, Siaou-Sze is known for her skill at creating a winning business environment and culture— then consistently achieving financial results. She is a vocal advocate for the principles of continuous improvement of people, processes, and technologies.

Starting as a systems engineer in Singapore, Siaou-Sze’s career evolved into a series of management positions in Singapore, South East Asia, and the Asia-Pacific region. Along the way, she became the first woman in the region to attain the title of Vice President, and later was the first to be named Senior Vice President. She served as Managing Director of HP Asia-Pacific prior to the acquisition of Compaq, led HP’s Technology Solutions Group, and most recently led HP Services for Asia-Pacific and Japan with a staff of more than 8,000 people.

Well-known for her competitiveness, business acumen and boundless energy, Siaou-Sze is a member of Board of Trustees of Nanyang Technological University in Singapore, serves as Deputy Chairman of Board of Governors of Republic Polytechnic Singapore, and is a member of the Board of Directors of Luvata, a conglomerate headquartered in Finland.

Born in Singapore, Siaou-Sze holds a Bachelor's degree in Physics and a Master's in Computer Science from London University, Imperial College Science & Technology, London, England. She has her fingers crossed that she will receive her PhD at Cambridge University in early 2007.

Topic: “Finding and Nurturing the Creative Spirit”

An all too familiar scenario: the desperate search for a solution to a seemingly unsolvable problem for weeks on end. Just as things seem hopeless, the answer suddenly appears in the form of a brilliant idea.

Whether this experience might be labeled ‘serendipity knocking at the door’ or a ‘eureka moment,’ one thing is for certain: the sheer power of ideas is blatant. In fact, ideas are arguably the world’s most valuable commodity.

The world today is one that constantly demands ideas and innovation. From podcasting to medical breakthroughs, it is clear that many people’s lives have been touched by invention and change. Indeed, brilliant ideas have the power to make the world a better place for everyone.

Therefore, it is creative societies that will shape and define the future. Those who are unwilling or unable to effect change will inevitably fade into irrelevance.

Without a doubt, the creative spirit is humanity’s most precious commodity.

Dr Woffles Wu
Craniofacial Surgeon
Woffles Wu Aesthetic Surgery & Laser Centre

Armed with an impeccable eye for beauty, balance and harmony, Dr Woffles Wu is dubbed Asia’s Beauty Guru by the Hongkong press. He has both developed and reinvented surgical techniques, including the world-renowned WOFFLES LIFT.

In “Aesthetic Surgery”, a book published in April 2005 by the prestigious Taschen Books, Dr Woffles Wu was featured as one of the world’s 19 most celebrated aesthetic surgeons. In a recent article published in the German edition of “Vogue”, Dr Wu was featured as one of the top ten aesthetic surgeons in the world to watch out for.

In addition, Dr Wu is an Advanced Botox trainer for the Asia Pacific region and has made over a hundred television and magazine appearances throughout Asia, India, Australia and the USA.

In 1987, Dr Wu worked under Cleft Palate surgeon, Prof. ST Lee and has remained firm friends with his mentor ever since, crediting him with the early spark and guiding hand in his career. A breakthrough came in 1990 when Dr Wu won the Young Surgeon of the Year Award for his groundbreaking research on Nasal Anatomy. That same year he was awarded the SEAMIC scholarship that enabled him to visit and study under distinguished Reconstructive and Aesthetic surgeons in Thailand, the Philippines and Japan.

An accomplished sportsman, Dr Wu was a national level ten pin bowler and pool player in his youth, and has represented Singapore at International level. He is also an avid fan of painting and sculpting, and has exhibited his unique style of Psychoerotic paintings in Taiwan and Singapore, using the proceeds for charity.

A keen cinephile since young, Dr. Woffles Wu executive and co-produced the hit feature film, “Singapore Dreaming” in 2005/6, which tells of the daily struggles, aspirations and loss of a mildly dysfunctional Singaporean family. It was an official selection of the 19th Singapore International Film Festival and the 54th San Sebastian Film Festival 2006, and was also awarded the Montblanc Prize for Best Screenplay.

Professor Lim Hock

Director, Temasek Laboratories

Deputy Director, Office of Research

Professor, Department of Physics and Department of Electrical and Computer Engineering

National University of Singapore

Professor Lim Hock graduated with B.Sc. (First Class Honours) in physics from the University of Singapore in 1970, and with Ph.D. in geophysical fluid dynamics from the University of Reading, UK, in 1975. He began his career as a meteorological officer at the Meteorological Service Singapore. From 1979-83, he led the effort of computerizing the operations of Meteorological Service Singapore, and was later in charge of the computerization projects of the Ministry of Communications.

He joined the National University of Singapore in 1983, and is currently a Professor in the Department of Physics and the Department of Electrical and Computer Engineering. Besides teaching and research, he has established the Laboratory for Image and Signal Processing (LISP) in 1988, the Centre for Remote Imaging, Sensing and Processing (CRISP) in 1992, and coordinated the development of a Computational Science Programme from 1989 to 1993 (the Computational Science Programme has since become the Department of Computational Science of the Faculty of Science in NUS). He was assigned the task of setting up the Temasek Laboratories in 2000, and is currently serving as the Director. He has also been appointed Deputy Director of Research since 2001.

His research interest ranges from fluid dynamics, dynamics of the atmosphere and ocean, image restoration, remote sensing, electromagnetic materials, to fluid dynamics.

He was awarded the World Meteorological Organisation Young Scientist Award in 1980. In 1989, he was appointed George J. Haltiner Research Chair Professor at the Naval Postgraduate School, Monterey, California, USA. He was awarded the Singapore Public Service Medal (Community Service) in 1992 and Public Administration Medal (Silver) in 1999. The other awards he has received include the Excellence for Singapore Award (for CRISP) in 1999, Chevalier des Palmes Académiques conferred by the Republic of France in 2002, and the Defence Technology Prize (Individual, R&D Category) in 2003.

Topic: How Things Fly

Birds and insects flap their wings in flight. This may lead us to believe that birds and insects manage to remain afloat by pushing air down during the down strokes of the wings. However, early attempts at building flying machines with flapping wings had all failed.

Modern aircraft flies with rigid wings. The wings are designed to create a strong downwash of air in its wake. The aircraft just has to push itself forward at a high enough speed, and the wings will naturally create the force to lift it off the ground. The basic principle of this surprising phenomenon is explained with videos showing the flows and vortices that create the tremendous force that can readily lift a Jumbo Jet. It is interesting to note that in fact larger birds, such as albatross, fly by the same principle.

A simple analysis of the forces involved will then be presented to show that wing flapping is in fact for birds to push themselves forward rather than to keep themselves afloat.

Tiny birds and insects have other ways of generating lift, and their skill in flight still amazes scientists.

Videos of birds and insect in flight, taking off, landing, and hovering will be shown. The problems they encounter and the ingenious solutions they have evolved are highlighted and explained.

Madam Fang Yuan

Principal of NAFA School of Young Talents

Musician and Educator

Educated at the Shanghai Conservatory, majoring in piano, Madam Fang has been a famous concert artist in the Shanghai Philharmonic Orchestra and has given concerts in

China and worldwide. Many of her performances were recorded and her music arrangements published.

She was the Founder of the Gifted Young Pianists Course at NAFA in 1991 and was subsequently appointed as the Principal of School of Young Talents cum Head of Junior Music Department in 1999.

Through Madam Fang's dedicated efforts, the School has nurtured hundreds of young musicians and established a reputable brand name. Its gifted young musician's programme has achieved national and international recognition and a remarkable world record of 97% ABRSM examination distinction rate. Her professional teaching method is highly acclaimed and her students are warmly received by renowned music schools.

Madam Fang's name was honored and listed by the Cambridge International Biographical Centre in the "Directories of 'International Who's Who in Music and Musicians'", "International Who's Who of Intellectuals" and the "Dictionary of International Biographies" in 1992. In 2006 she received the Compass Meritorious Award for her outstanding contribution to the music education in Singapore.

Topic: "The Daring Spirit of Creativity"

The speaker shares her personal experience, building up from nothing 15 years ago to the reputable Gifted Young Pianist Course and the successful School of Young Talents at the Nanyang Academy of Fine Arts. Her achievement demonstrates the fact that the common essence of creativity in both the sciences and the arts is to be "Daring". For a creative venture to be successful, one needs the spirit to dare to think and to take challenges. But creativity in the arts also requires a scientific attitude to respect natural law, fundamentals and reality.

Madam Fang appreciates the government's efforts in promoting the arts in recent years, but acknowledges that time is needed to attain world-class standards. To achieve this, it is her earnest wish that the government takes bold measures to improve the education system, national service and media publicity; and to appreciate and encourage artistic talents, so that Singapore will become a global city for the arts and culture.

Associate Professor Kwek Leong Chuan

Natural Sciences & Science Education

National Institute of Education

Nanyang Technological University

Fujitsu Visiting Professor, University of Cambridge

Dr Kwek Leong Chuan completed his undergraduate education at the University of Otago under a Colombo Plan scholarship from 1981-1984. He subsequently obtained his MSc and PhD at the National University of Singapore. He is one of the local drivers for an A*Star Project on Quantum Information Science and an investigator or co-investigator of several quantum information and biomedical projects. He is also currently the Vice-President of the Institute of Physics, Singapore and the Association of the South East Asian Theoretical Physics. In 2004, he has also been appointed as the Fujitsu Visiting Professor at the University of Cambridge, UK. Recently, he received the Institute of Physics Premier Research award for his efforts in promoting quantum information science in Singapore and he was also one of the recipients of the National Science Award 2006.

Topic: “Unleashing Creativity: A Scientist’s Perspective”

Looking up Wikipedia for the meaning of “creativity” may not be much of a creative act, yet what it says makes sense: “Creativity (or creativeness) is a mental process involving the generation of new ideas or concepts, or new associations between existing ideas or concepts”. If so, can one pretend to be creative; or are all human beings born to be creative? In this discussion, the speaker examines how one may adopt certain uncreative strategies to be creative.

Mr Ong Peng Tsin
Chairman & Founder
Eccentuate

Peng Tsin is the founder and chairman of Eccentuate. He founded Eccentuate in 2001 to address the need to provide enterprises with strong and usable digital identity systems that can be incrementally deployed without extensive expenditures in time and resources.

Prior to founding Eccentuate, Peng was the founder and chairman of Interwoven, Inc., the leading provider of content infrastructure. He was the president and CEO of Interwoven through 1997, and its chairman through 2002. During his tenure at Interwoven he led the company to a successful IPO (NASDAQ: IWOV). For his vision and leadership in building Interwoven into the world's leading provider of enterprise-class content infrastructure software, in 2002 Peng was awarded the University of Illinois Urbana-Champaign College of Engineering's Alumni Award for Distinguished Service.

Before Interwoven, Peng was co-founder and chief architect of Electric Classifieds, Inc.—the creators of Match.com. He has also held various engineering and management roles at Illustra (now IBM Informix), Sybase Inc., and Gensym Corporation.

Peng co-authored two patents for technologies developed during his time at Interwoven and Electric Classifieds. He also has five pending patents for Eccentuate.

More recently in 2002, Peng served as one of the twenty members of Singapore's Economic Review Committee. The ERC was a high-level committee whose task was to review the economic plans for the future of Singapore. Peng serves on the board of the Infocomm Development Authority of Singapore. He is a founding member of the Majulah Connection and also contributes to the Action Committee for Entrepreneurship.

Peng graduated from the University of Texas at Austin with a B.S. in Electrical Engineering and received his Masters of Science in Computer Science from the University of Illinois at Urbana-Champaign.