DEPARTMENT OF MATHEMATICS
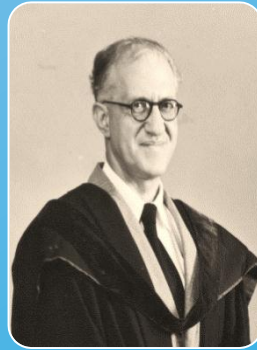# NATIONAL UNIVERSITY OF SINGAPORE

Our Milestones
1929 - 2014

HEADS OF DEPARTMENT, FROM INCEPTION TO PRESENT

1931 – 1959   Prof Alexander Oppenheim

1959 – 1962   Prof Daniel Pedoe

1962 – 1979   Prof P.H. Diananda

1979 – 1980   Prof Kumkum Kumar Sen

1980 – 1982   Prof TEH Hoon Heng

1982 – 1996   Prof PENG Tsu Ann

1996 – 2000   Prof Louis CHEN Hsiao Yun

2000 – 2006   Prof LEE Seng Luan

2006 – 2012   Prof CHONG Chi Tat

2012 – 2014   Prof SHEN Zuowei

2014 – present   Prof ZHU Chengbo

Top Row (from left):
Prof Alexander Oppenheim, Prof TEH Hoon Heng, Prof PENG Tsu Ann and Prof Louis CHEN Hsiao Yun

Bottom Row (from left):
Prof LEE Seng Luan, Prof CHONG Chi Tat, Prof SHEN Zuowei and Prof ZHU Chengbo

HEADS OF DEPARTMENT — A SNAPSHOT IN 2013

From left to right:
Prof LEE Seng Luan, Prof PENG Tsu Ann, Prof SHEN Zuowei,
Prof CHONG Chi Tat and Prof Louis CHEN

MILESTONES

1929

- The Department of Mathematics was among its first departments when Raffles College was officially opened in 1929.   There was only one faculty member – R.K. Butchart from the University of Edinburgh. Mathematics was taught to both Arts and Science students, and until 1940, the number of Arts and Sciences students did not exceed 50.

1931 to 1946

- The Department had 2 faculty members – Professor Alexander Oppenheim and one lecturer J.C. Cooke. They were assisted for many years by K.M.R. Menon of the Education Department of the Straits Settlement.   Menon eventually joined the Department as Lecturer in 1951 and left the university on retirement in 1955.

1949

- This year saw the formation of the University of Malaya.   Professor Oppenheim continued as Professor of Mathematics and Head of Department. In January 1957, Professor Oppenheim was appointed Vice Chancellor of the University of Malaya for 2 years after which he was to return to his position as Head of Department.   But in January 1959, he was re-appointed as Vice Chancellor of the University of Malaya for five years and he retired from the Chair of Mathematics which he had occupied for 28 years. He was later honoured by the government of Malaya with the award of Tan Sri and was knighted by the British government.

MILESTONES

1950 to 1951

- The Department of Mathematics, now part of the University of Malaya, introduced its first honours course in Mathematics, with 4 students. Students in the honours year had to read the same subjects in pure and applied mathematics and sat for six papers at the end of the course.

1952

- Members of the Department, with the help of some school teachers in mathematics, founded the Malayan Mathematical Society (later known as the Singapore Mathematical Society). Its aim was to raise the standard of mathematical education in the schools and to foster relations between those interested in mathematics in Singapore and the then Federation of Malaya. The Society also published a bulletin (the Bulletin of the Malayan Mathematical Society) containing mainly articles of general interest to its members. In 1956, the Society organized its first inter-school mathematical competition which attracted a large number of 345 candidates. The bulletin and competition have been continued till present, in its current form as Mathematical Medley and the Singapore Mathematical Olympiad (SMO).

MILESTONES

1951 to 1957

New faculty members joined the department during this period:

- 1951 - P.H. Diananda and Richard. K. Guy, both lecturers.

- 1952 – Eric. C. Milner and Malcolm. J. Wicks, both assistant lecturers. Wicks retired in 1988 and remained in Singapore after retirement.

- 1957 – Peter Lancaster, assistant lecturer.

- In the 1950s, Professor Oppenheim arranged visits by a good number of notable mathematicians, including several visits by Paul Erdos. At a later stage in their careers, Guy co-authored 4 papers with Erdos and Milner co-authored 15 papers with Erdos. Hence, Guy and Milner had Erdos number 1.

- In 1962, Lancaster became the first person since founding of Raffles College to receive a Ph.D. degree in mathematics in Singapore

- Guy, Milner and Lancaster left to join the University of Calgary in the 1960s.

Malcolm. J. Wicks

MILESTONES

1956

- Nanyang University or Nantah was built from contributions and resources pooled from the Chinese Community, and a Department of Mathematics was formed.

南洋大學數學系全體師生合影一 1969 年

MILESTONES

1960s

▪The University of Singapore was established on 1 January, 1962.

From the 1950s to 1960s

▪The Department of Mathematics remained small with about 10 staff members, but number of students studying Math increased rapidly. There were 44 honours students in the 1969-1970 batch.   From 1949 to 1969, there was little change in the curriculum except for the introduction of courses in probability and statistics in the late 1960s.

▪**Notable publication**
  E.J. Brody, The topological classification of the Lens spaces, Ann. of Math., 1960.

MILESTONES

1970s

▪ Changes in curriculum including introduction of new courses in Numerical Analysis and Operations Research

▪ Members of the Department started Mathematical Medley, a publication of the Singapore Mathematical Society dedicated to the promotion of mathematics in Singapore. Its first issue was published in 1973.

▪ **Notable Publication**

Prof Louis Chen published a seminal paper "Poisson approximation for dependent trials" in the Annals of Probability, 1975.

MILESTONES

1980s

▪ The National University of Singapore was formed with the merger of the University of Singapore and Nanyang University in 1980.

▪ Department entered a new era. As a result of the merger, the Department acquired a staff strength of about 35.

▪ New campus in Kent Ridge, transfer of faculties and departments completed in 1986.

▪Department organized more than 10 conferences and workshops at the research level. This includes a major international conference the "Singapore Group Theory Conference", in 1987. Participants included W. Feit, G. Higman, J.-P. Serre, M. Suzuki,. and J. G. Thompson.

▪ Department sent some of her best honours graduates for PhDs in top overseas schools, under the Senior Tutorship Scheme.

▪ Department started recruiting international faculty in significant numbers from the late 1980s.

▪ Department had a staff of about 75 in 1989.

MILESTONES

"Singapore Group Theory Conference", in 1987.
Participants included W. Feit, G. Higman, J.-P. Serre, M. Suzuki,. and J. G. Thompson.

MILESTONES

1990s

▪The Department works towards providing an innovative teaching programme that covers very broad areas of mathematics, and designs its courses and programmes to cater to the diverse need of students.

▪Prof CHONG Chi Tat was appointed as Deputy Vice Chancellor of NUS in 1996.

▪The Department of Statistics and Applied Probability (DSAP) was formed in 1998, with the majority of its staff from the Department and the rest from other parts of the university, notably from the Faculty of Arts and Social Sciences.

MILESTONES

1990s

Research

▪ Research in mathematics is carried out in each of the five divisions of the Department, namely Algebra, Analysis, Geometry, Applied Mathematics, Combinatorics & Operations Research, and Statistics . The Department has also built up research groups to focus on strategic areas of research which are directly relevant to the economy of Singapore. These include: Cryptography and Computer Security ; Mathematical Economics and Financial Mathematics and Wavelets Strategic Research Programme

▪ The Department hosted the Center for Financial Engineering (CFE), which offered the MSc in Financial Engineering (MFE). CFE was the predecessor of the NUS Risk Management Institute (RMI). The latter was established in 2006 by NUS as a university-level research institute dedicated to the area of financial risk management.

▪ The Wavelets Strategic Research Programme was carried out through the Centre for Wavelets, Approximation and Information Processing (CWAIP), a faculty-level research center.

MILESTONES

Staff Receiving National Honours

▪Prof Louis Chen was the first faculty member of the Department to receive the National Science and Technology Award in 1991, and subsequently Excellence for Singapore Award in 1997.

▪Prof LEE Seng Luan, Dr SHEN Zuowei and A/Prof Wayne Lawton won for the department its first National Science Award in 1998. Other National Science Awards that followed were won by A/Prof SUN Yeneng (2000), Prof Harald Niederreiter, A/Profs LING San and XING Chaoping (2003), and Prof A.J. Berrick and A/Prof WU Jie (2007).

▪Dr ZHU Chengbo and Dr CHAN Heng Huat received the Singapore Young Scientist Award respectively in 1998 and 1999.

Notable Publications

▪M. Ru, Integral points of PN Integral Points of PN - (2N+1 Hyperplans in General Position), Invent. Math., 1991.

▪Dr TOH Kim Chuan co-authored an influential paper "SDPT3 - A Matlab software package for semidefinite programming, Version 1.3" in Optimization Methods and Software, 1999.

Prof Louis Chen

Dr SHEN Zuowei, Prof LEE Seng Luan and A/Prof Wayne Lawton

MILESTONES

2000

▪ The Institute for Mathematical Sciences (IMS) was established on 1 July 2000 as a university-level research institute, with Prof Louis Chen as the founding director.

The mission of the Institute is to foster mathematical research, both fundamental and multidisciplinary, in particular, research that links mathematics to other disciplines, to nurture the growth of mathematical expertise among research scientists, to train talent for research in the mathematical sciences, and to serve as a platform for research interaction between the scientific community in Singapore and the wider international community.

MILESTONES

- Singapore-Warwick Initiative in Mathematical Sciences (SWIMS), a four-year international collaboration project, commenced in 2000. It sponsored the Singapore International Symposium on Topology and Geometry (SISTAG) in July 2001 in NUS.

- International Conference on Fundamental Sciences: Mathematics and Theoretical Physics 2000 was held in Singapore. Its aim was to address challenges in mathematics and theoretical physics for the twenty-first century, and was jointly organized by the Faculty of Science (NUS) and the Isaac Newton Institute for Mathematical Sciences (Cambridge University).

- In January 2001, the Department took ownership of the Major in Computational Finance, a multidisciplinary programme that combines mathematics, statistics, finance and computing. It changed its name to Major in Quantitative Finance in 2004/2005.

MILESTONES

- Prof CHONG Chi Tat received the Public Administration Medal (Gold), 2002 National Day Awards.

- A/Prof LING San and A/Prof CHAN Heng Huat received the Singapore Youth Award respectively in 2001 and 2003.

- Prof Harald Niederreiter was the first faculty member to speak at the International Congress on Industrial and Applied Mathematics (ICIAM) 2003, held in Sydney, Australia.

- Prof CHONG Chi Tat was named University Professor, the highest academic appointment in NUS, in 2004.
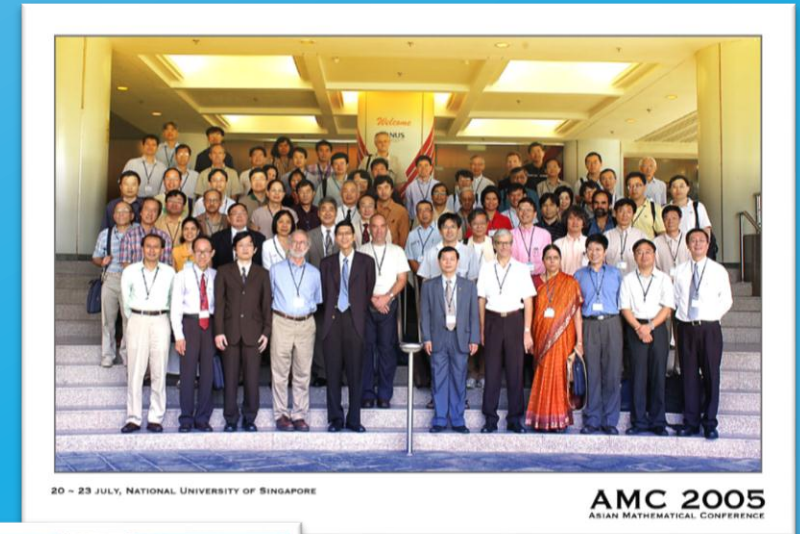
MILESTONES

2005

▪The Special Program in Mathematics (SPM) is launched. Its aim is to nurture talented students with passion in mathematics and to enable these students to build a solid foundation for a future career in mathematical research or state-of-the-art application in industry.

▪ Prof LING San was appointed as Head of the Division of Mathematical Sciences, of the newly formed School of Physical and Mathematical Sciences, NTU.

▪The 4th Asian Mathematical Conference (AMC 2005) was held in NUS in conjunction with the centennial celebration of NUS.

2007

▪Prof TAN Eng Chye was appointed as Deputy President (Academic Affairs) and Provost, NUS.

20 ~ 23 JULY, NATIONAL UNIVERSITY OF SINGAPORE

AMC 2005
ASIAN MATHEMATICAL CONFERENCE

MILESTONES

2000 to present

Notable Publications

- A. Dembo, B. Poonen, **Q.-M. Shao** and O. Zeitouni, Random polynomials having few or no real zeros, J. Amer. Math. Soc., 2000.
- **J. Berrick**, F. R. Cohen, **Y. L. Wong and J. Wu**, Configurations, braids, and homotopy groups, J. Amer. Math. Soc., 2006.
- **D.Q. Zhang,** A theorem of Tits type for compact Kahler manifolds, Invent. Math., 2009.
- A. Avila, J. Kahn, M. Lyubich and **W. Shen,** Combinatorial rigidity for unicritical polynomials, Ann. of Math., 2009.
- **S.H. Yu**, Nonlinear Wave Propagations over a Boltzmann Shock Profile. J. Amer. Math. Soc., 2010.
- J.-F. Cai, B. Dong, S. Osher and **Z.W. Shen**, Image restoration: total variation, wavelet frames, and beyond, J. Amer. Math. Soc., 2012.
- X.Z. Chen and **X.W. Xu**, The scalar curvature flow on S^n – perturbation theorem revisited, Invent. Math., 2012.
- B. Sun and **C.-B. Zhu**, Multiplicity one theorems: the Archimedean case, Ann. of Math., 2012.
- **C.T. Chong**, Theodore A. Slaman and **Y. Yang**, The metamathematics of Stable Ramsey's Theorem for pairs, J. Amer. Math. Soc., 2014.
- **W.T. Gan**, Y. Qiu and S. Takeda, The regularized Siegel-Weil formula (the second term identity) and the Rallis inner product formula, Invent. Math., 2014.
- **W.T. Gan** and A. Ichino, Formal degrees and local theta correspondence, Invent. Math., 2014.
- **W.-K. To** and S.-K. Yeung, Finsler metrics and Kobayashi hyperbolicity of the moduli spaces of canonically polarized manifold, Ann. of Math., 2015.
- B. Sun and **C.-B. Zhu**, Conservation relations for local theta correspondence, J. Amer. Math. Soc., 2015.

- Prof SHEN Zuowei co-authored an influential paper "A Singular Value Thresholding Algorithm for Matrix Completion" in SIAM Journal on Optimization, 2010.

MILESTONES

2009

▪The Department started the Masters in Science in Quantitative Finance by Course Work (MQF), with its first intake in AY2009/10.

▪Prof SHEN Weixiao was the first faculty member to receive an international award the "Chern Shiing Shen Prize'', by the Chinese Mathematical Society.

2010

▪Prof SHEN Zuowei was the first faculty member to speak at the International Congress of Mathematicians held in Hyderabad, India.

2011-2014

▪ Six of our faculty members were elected as fellows of the Singapore National Academy of Science:
   - Profs Louis Chen, CHONG Chi Tat, SHEN Zuowei, TAN Eng Chye (2011)
   - Profs SUN Yeneng, ZHU Chengbo (2014)

MILESTONES

2012

▪Prof SHEN Zuowei received the Wavelet Pioneer Award from the Society of Photographic Instrumentation Engineers (SPIE), USA.

▪The Department's alumnus YEO Sze Ling (BSc Hons, class of 2001, and PhD, class of 2006) received the Singapore Youth Award 2012.

2013

▪Prof BAO Weizhu was awarded the 10th Feng Kang Prize for Scientific Computing by the Chinese Society of Computational Mathematics.

MILESTONES

2014

- Four faculty members Profs BAO Weizhu, GAN Wee Teck, SHEN Weixiao and YU Shih-Hsien (from left to right in above photo) were invited to give talks at the International Congress of Mathematicians (ICM) held in Seoul, Korea.

- Prof TAN Eng Chye received the Public Administration Medal (Gold), 2014 National Day Awards.