

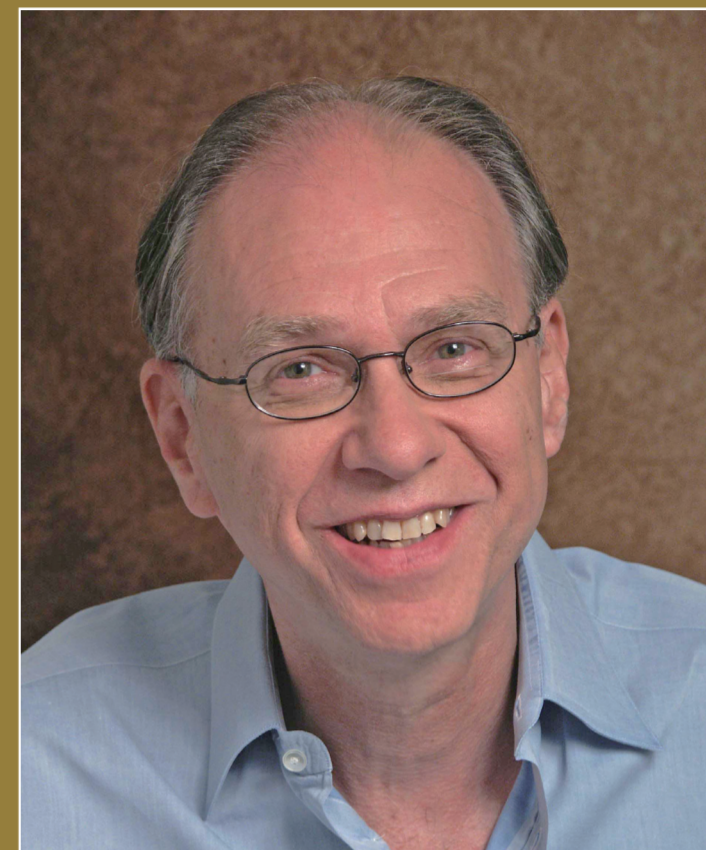


香港城市大學  
City University of Hong Kong  
三十周年紀念 30th Anniversary

## City University Distinguished Lecture Series

Speaker

**Professor Michael Waterman**  
*University Professor at University of Southern California*



# Mathematical and Statistical Problems from DNA Sequencing

on

Monday, 8 September 2014 at 10:30 am

at

Connie Fan Multi-media Conference Room

4/F Cheng Yick-chi Building

City University of Hong Kong

Tat Chee Avenue, Kowloon

### Abstract

The ability to produce DNA sequence has dramatically increased since the 2001 announcement of the human genome sequence. This lecture will survey a few of the algorithmic and statistical issues in this area. The volume of raw sequence reads from which genomes must be estimated has caused a shift from the computational methods used in the Human Genome Project. Those methods have been used and improved since the mid 1970s. A new approach reduced computation time, but required much more memory. This result brought about new memory reduction techniques. At the same time, traditional sequence comparison methods used since the early 1970s have in part been replaced by so-called alignment-free methods.

### Biography

Professor Michael Waterman holds an Endowed Associates Chair at USC. He came to University of Southern California (USC) in 1982 after positions at Los Alamos National Laboratory and Idaho State University. He has a bachelor's degree in Mathematics from Oregon State University, and a PhD in Statistics and Probability is from Michigan State University. He has held visiting positions at the University of Hawaii (1979–80), the University of California at San Francisco (1982), Mt. Sinai Medical School (1988), Chalmers University (2000), and in 2000–2001 he held the Aisenstadt Chair at University of Montreal.

Professor Michael Waterman was named a Guggenheim Fellow (1995). He is an elected member of the American Academy of Arts and Sciences (1995), the National Academy of Sciences (2001) and the National Academy of Engineering (2012). Also he is an elected Fellow of the American Association for the Advancement of Science (1990), Institute of Mathematical Statistics (1991), Society of Industrial and Applied Mathematics (2009) and International Society of Computational Biology (2009). In fall 2000 he became the first Fellow of Celera Genomics. He received a Gairdner Foundation International Award (2002) and the Friendship Award from the Chinese government (2013). He is an elected Foreign Member of the French Académie des Sciences (2005) and the Chinese Academy of Sciences (2013). He received Doctor Philosophiae Honors Causa from Tel Aviv University (2011) and Southern Denmark University (2013).

During 2003-2008, Professor Waterman held a 5-year term as Faculty Master of Parkside International Residence College at USC. PIRC is a residential college that is home to over 600 undergraduates and serves as a center for internationally oriented cultural, academic and social events.

From May 2008 to May 2013, in addition to his USC appointment Professor Michael Waterman became Chair Professor at Tsinghua University in Beijing. He led a team of distinguished scientists consisting of Michael Zhang (Cold Spring Harbor Labs), Wing Wong (Stanford), Jun Liu (Harvard), Tao Jiang (UC Riverside) and Fengzhu Sun (USC). The team collectively worked to enhance Tsinghua's programs in bioinformatics and computational biology.

Professor Waterman works in the area of Computational Biology and Bioinformatics, concentrating on the creation and application of mathematics, statistics and computer science to molecular biology, particularly to DNA, RNA and protein sequence data. He is the co-developer of the Smith-Waterman algorithm for sequence comparison and of the Lander-Waterman formula for physical mapping. His paper with Idury in 1995 introduced the use of Eulerian and De Bruijn graphs for sequence assembly.

**Online registration:**

[http://www.cityu.edu.hk/vprt/distinguished\\_lecture\\_series/upcoming.htm](http://www.cityu.edu.hk/vprt/distinguished_lecture_series/upcoming.htm)

**Enquiries:**

Office of the Vice-President  
(Research and Technology)

Tel: 3442 4666

Fax: 3442 0386

Email: [vprrtdl@cityu.edu.hk](mailto:vprrtdl@cityu.edu.hk)



Distinguished Lecture Series