香港浸會大學
HONG KONG BAPTIST UNIVERSITY
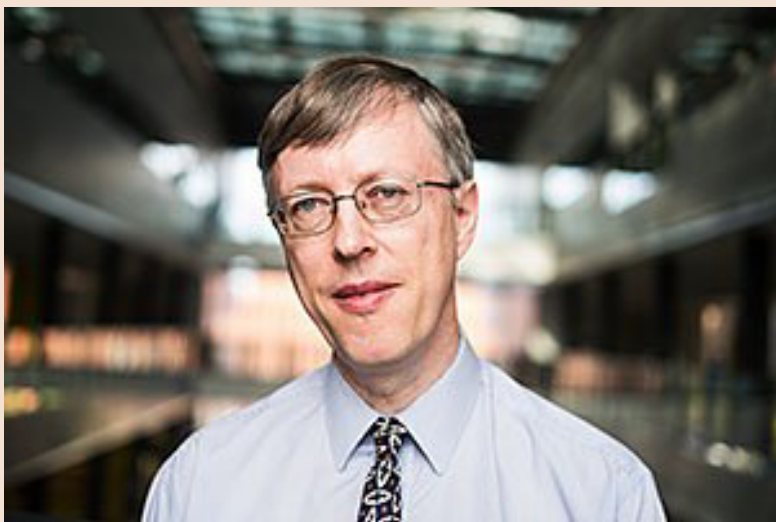
Department of
Mathematics

Distinguished Lecture Series

Exploiting Multiprecision Arithmetic

Professor Nicholas J. Higham

Royal Society Research Professor and
Richardson Professor of Applied Mathematics
Past President of Society for Industrial and Applied Mathematics (SIAM)
Fellow of the Royal Society
SIAM Fellow, Turing Fellow
Member of Academia Europaea
ISI Highly Cited Researcher

Date:　　8 January 2019 (Tuesday)

Time:　　10:30 - 11:30 am (Preceded by Reception at 10:00 am)

Venue:　　LT1, Cha Chi-ming Science Tower,
　　　　　Ho Sin Hang Campus, Hong Kong Baptist University

Abstract

There is a growing availability of multiprecision arithmetic: floating point arithmetic in multiple, possibly arbitrary, precisions. Demand in applications includes for both low precision (deep learning and climate modelling) and high precision (long-term simulations and solving very ill conditioned problems). We discuss
- Half-precision arithmetic (fp16 and bfloat16): its characteristics, availability, attractions, pitfalls, and rounding error analysis implications.
- Quadruple precision arithmetic (fp128): the need for it in applications, its cost, and how to exploit it.

As an example of the use of multiple precisions we discuss iterative refinement for solving linear systems. We explain the benefits of combining three different precisions of arithmetic (say, half, single, and double) and show how a new form of preconditioned iterative refinement can be used to solve very ill conditioned sparse linear systems to high accuracy.

✦✦✦　All are welcome　✦✦✦

For enquires please contact　Ms. Cindy Yeung, 3411 2346.
http://www.math.hkbu.edu.hk/