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Academic qualifications

PhD in Physics, California Institute of Technology (Caltech), USA — Aug 2004 – Sep 2009
MEng in Applied Physics, Cornell University, USA — Aug 2002 – Jun 2003
AB in Physics (*summa cum laude*) & Mathematics (*magna cum laude*) *with distinction in all subjects*, Cornell University, USA — Aug 1999 – Jun 2002

Professional experience

Current position

Associate Professor, Yale-NUS College (YNC), the Centre for Quantum Technologies (CQT), and the Department of Physics, National University of Singapore (NUS)
Divisional Director (Science), Yale-NUS College
Head of Studies, Physical Sciences major, Yale-NUS College.

Research Leadership

Deputy Director (NUS), Majulab (France-Singapore joint research lab), Jan 2023 –
Associate Editor, IEEE Transactions on Quantum Engineering, Jan 2023 –
Co-Editor, EPL Europhysics Letters (letter journal of the European Physical Society), Apr 2019 –

Past positions

Assistant Professor (Physics), YNC — Jul 2013 – Jun 2019
Research Fellow, CQT, NUS (joint appointment) — Apr 2010 – Jun 2013
Senior Member of Technical Staff, DSO National Laboratories, Singapore — Oct 2009 – Jun 2013
Member of Technical Staff, DSO National Laboratories, Singapore — Aug 2003 – Aug 2004

Research focus

Physical aspects of quantum information and computation (theory), with expertise in quantum error correction and fault tolerance, quantum noise, and quantum tomography.

Selected research articles

M Fellous-Asiani, JH Chai, Y Thonnart, HK Ng, RS Whitney, and A Auffèves, *Optimizing resource efficiencies for scalable full-stack quantum computers*, accepted in PRX Quantum (2023) (arXiv:2209.05469).

JH Chai and HK Ng, *On the fault-tolerance threshold for surface codes with general noise*, Adv Quantum Technol, 2200008 (2022) (invited article).

M Fellous-Asiani, JH Chai, RS Whitney, A Auffèves, and HK Ng, *Limitations in quantum computing from resource constraints*, PRX Quantum 2, 040335 (2021).

Y Gu, R Mishra, B-G Englert, and HK Ng, *Randomized linear gate set tomography*, PRX Quantum 2, 030328 (2021).

Y Quek, S Fort, and HK Ng, *Adaptive Quantum State Tomography with Neural Networks*, npj Quantum Inf 7, 105 (2021).

A Jayashankar, AM Babu, HK Ng, and P Mandayam, *Finding good codes using the Cartan form*, Phys Rev A 101, 042307 (2020).

J Shang, Z Zhang, and HK Ng, *Superfast maximum likelihood reconstruction for quantum tomography*, Phys Rev A 95, 062338 (2017).

J Shang, HK Ng, A Sehrawat, X Li, and B-G Englert, *Optimal error regions for quantum state estimation*, New J Phys 15, 123026 (2013).

HK Ng, DA Lidar, and J Preskill, *Combining dynamical decoupling with fault-tolerant quantum computation*, Phys Rev A 84, 012305 (2011).

HK Ng and P Mandayam, *Simple approach to approximate quantum error correction based on the transpose channel*, Phys Rev A 81, 062342 (2010).

R Blume-Kohout, HK Ng, D Poulin, and L Viola, *Characterizing the structure of preserved information in quantum processes*, Phys Rev Lett 100, 030501 (2008).

Awards and fellowships

Yale-NUS College Early Career Teaching Award, Jan 2019. Inaugural recipient.
CQT Fellowship, Jan 2019 – Dec 2023.
Graduate Research Assistantship, Caltech, Aug 2008 – Sep 2009.
Betty and Gordon Moore Fellowship, Caltech, Aug 2004 – Jul 2008.
David Delano Clark Award (Best MEng project, School of App & Eng Phys), Cornell University, 2003.
Paul Hartman Prize in Experimental Physics, Cornell University, 2022.
Defence Technology Training Award (undergraduate scholarship), Singapore, 1999 – 2003.