

NOBEL FORUM

3 AUGUST 2023

Perdana Room 1 & Room 2, Second Floor

Royal Lake Club

Lake Gardens, Kuala Lumpur

HIGHLIGHTS

Sharing on:

1. Lost and Found: In search of archaic human genome and the human origin
2. Quantum Science: From Demystifying Spooky Entanglement to Disruptive Technology

REGISTRATION DETAILS

Registration Fee: (per person)	RM50 for MINDS/ATAS/MOSTA members RM100 for non-members
Payment:	All cheques are to be made payable to “ Persatuan Rekacipta dan Rekabentuk Malaysia ” before the Forum. For direct bank-in (MBB 5-14057-63686-1), deposit slip with names of participants must be emailed to Secretariat as proof of payment.
Closing date:	21 JULY 2023
Enquiries:	Ms Mary Low / Ms Jocelyn Khoo/ Mr Ila Tel: 603-7118 2064/66 Email: tansriong@yahoo.com minds.secretariat@gmail.com

SPEAKERS



Prof Kok-Gan Chan is a Commonwealth Scholar with a rare combination of expertise in law and science. He has published >480 articles (>90% WoS-indexed, mostly in Q1 journals) and authored several book chapters and one book. He regularly publishes in some of the world's top journals including *Nature* (articles selected as cover story), *Nature Communications*, *eLife*, *Biotechnology Advances*, *Evolution*, *Nucleic Acids Research*, *Environmental Microbiology*, just to name a few.

In a span of 16 years, his h-index is 68, with citation > 17,710. He is well known for his work on bacterial quorum quenching & genome biology.

He has been recently named as one of the World's Top 2% Scientists for publication in microbiology by Stanford University.

Prof Chan was elected as Fellow of the Academy of Sciences Malaysia in 2017 and he has been elected as fellows in several other learned academies nationally and globally.

He has won many international awards including Commonwealth Scholarship, The UK Prime Minister's Initiative II Award (UK PMI2 Award), JSPS Young Scientist Award (Japan), FAOBMB and IUBMB Young Scientist Award, and >12 French Government Fellowships for consecutive 10 years.

In 2016, Prof Chan was awarded the Malaysia Toray Science Foundation Science & Technology Award in recognition of his excellent work in microbiology and genome biology.



Prof Dr Raymond Ooi has 25 years of research experience, has produced more than 120 publications in WoS (mainly Q1 journals) on a range of topics in quantum optics, nonlinear optics, plasmonics and laser interactions. He is a Fellow of the Academy of Sciences Malaysia (ASM). In 2013, he won the Malaysian Toray Science Foundation (MTSF) Science & Technology Award. Raymond Ooi obtained his Dr.rer.nat (PhD) from Universitaet Konstanz, Germany. He spent 3 years as a postdoc at Texas A&M University and was a regular Visiting Scientist at Princeton University and Max-Planck Institut fuer Quantenoptik. He conducted research at KAIST and taught at Korea University before joining Universiti Malaya, and initiated "Quantum and Laser Science" research equipped with femtosecond laser optics facility under the High Impact Research grant.

Prof Raymond was the first to propose superconducting-dielectric photonic crystals and a versatile technique of direct laser cooling scheme for molecular gas using a few lasers. His research on quantum nonlinear optics incorporates plasmonics and photonic structures using advanced quantum optics theory to study nonclassical properties of light. Many of his papers contain detailed calculations that were presented elegantly and furnished with 3D plots that provide insightful visualizations.

Raymond successfully secured significant amount of national research grants as Principal Investigator on quantum communication, has 2 patents and has been invited/plenary speaker at more than 25 international conferences. In 2018 he initiated and chaired the first international conference on Quantum and Nonlinear Optics(QNO2018) that was attended by pioneers in the field and secured three international funds to run the conference. Currently he is the Editorial Board member for the prestigious journal Philosophical Transactions of the Royal Society A as well as the Academy of Sciences Malaysia (ASM) Science Journal, and has written several articles in the media, connecting science to recent topics like green energy and climate change.

ABSTRACT FROM PROFESSOR CHAN KOK GAN

Who is the very first human being and how are we related to the pre-existed human being? Mankind has been searching for our origin since time immemorial. How much similarity and dissimilarity, between the modern human being, or *Homo sapiens*, to other hominins? One approach that may provide a glimpse to the answers is via genome sequencing of the ancient human relics. Svante Pääbo, the winner of the 2022 Nobel Prize in Physiology or Medicine, is the first to sequence the Neanderthal genome, an extinct relative of present-day humans. He also sequenced the hominin Denisova from a 40,000-year-old relic bone that was discovered in the Denisova cave in Siberia. Pääbo's also showed that the most recent common ancestor of Neanderthals and *Homo sapiens* lived around 800,000 years ago, that the Neanderthals were more similar to contemporary humans originating from Europe or Asia than to contemporary humans originating from Africa. His work suggests that Neanderthals and *Homo sapiens* did interbreed. The modern European or Asian descent, 1-4% of the genomes originated from the Neanderthals. Pääbo has shown that gene flow had occurred between Denisova and *Homo sapiens*; and this relationship was first seen in human populations in Melanesia and South East Asia, where individuals carry up to 6% Denisova DNA. Evidence suggests that Neanderthals lived in western Eurasia and Denisovans inhabited the eastern parts of the continent. During the exodus of *Homo sapiens* out of Africa and their migration towards east, they encountered and interbred with both Neanderthals and Denisovans. In this paper, Chan will discuss how Pääbo's has formed a new discipline called paleogenomics and the technology behind how his discovery

ABSTRACT FROM PROFESSOR RAYMOND OOI

Some concepts of quantum physics defy conventional wisdom and are hard to be understood by many. In this talk, he will show that quantum concepts can be understood better and they can be easier than expected. He will explain the puzzling nature of quantum entanglement and correlations in the quantum world, the theme behind the 2022 Nobel prize in physics and show how these fundamental resources have been used to develop quantum technology. Recent progress around the world in using the spooking concepts of quantum physics is creating new capabilities, interesting prospects and new threats. In particular, quantum communication is already enhancing cyber security through secure encryption and we are closer to having sufficiently powerful quantum computers that can solve difficult problems and break all existing encryptions. Besides, precision measurement through quantum metrology, ultrasensitive quantum sensing will also be discussed.

PROGRAMME

08:30 **Registration**

09:00 **WELCOME ADDRESS**

Tan Sri Dr Augustine Ong, President of MINDS

09:15 **Lost and Found: In search of archaic human genome and the human origin**

Professor Chan Kok Gan

10:00 **Break with light refreshments**

10:30 **Quantum Science: From Demystifying Spooky Entanglement to Disruptive Technology**

Professor Raymond Ooi

11:15 **Panel Discussion**

Moderator

Dato' V L Kandan

Trustee, Yayasan Reka Cipta Malaysia

Trustee, Tan Sri Dr Augustine Ong Fellowship Trust

12:00 **End**