

Centre for Quantum Technologies, Singapore -Information for Potential Research Staff-



Research Centres of Excellence

Singapore is striving to become an international hub for research and development in Asia and to facilitate this, the Singapore government is establishing a number of Research Centres of Excellence (RCE) in the universities. The vision is for the RCEs to conduct investigator-led research that will be globally recognized as world-class. The RCEs will serve to attract top academic research talent and catalyze the development of research intensive universities in Singapore.

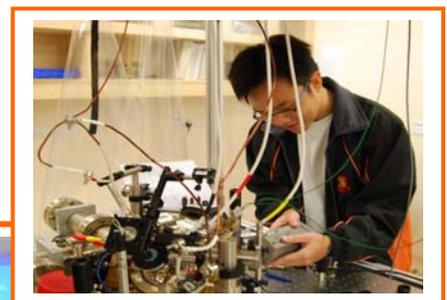
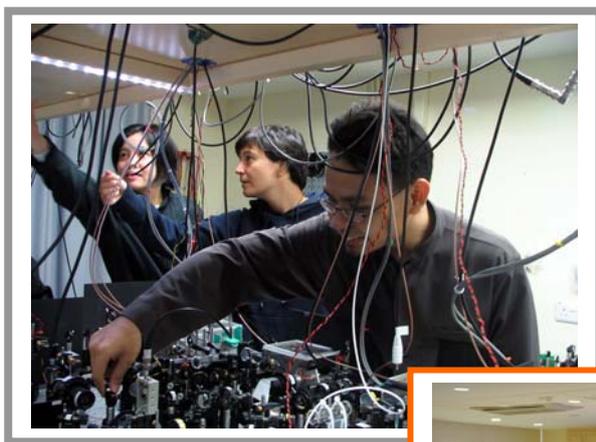
The Centre for Quantum Technologies (CQT) is the first such centre to be established as an autonomous research centre of the National University of Singapore (NUS). Singapore, over the last ten years, has become one of the leading countries in information technology in Asia. It has a thriving data-storage and communication industry, a good track record in mathematics of coding and cryptography, and a good engineering base for the development of cutting-edge information technology.

The Centre's mission, among other things, is to position the university¹ (NUS) as a centre of excellence in Quantum Information Science (QIS). The Centre aims to be one of the world's top 5 centres in QIS at the end of 10 years.

Centre for Quantum Technologies

Centre for Quantum Technologies (CQT) is led by Professor Artur Ekert, Professor of Quantum Physics at Oxford University, Lee Kong Chian Centennial Professor at NUS and the co-inventor of Quantum Cryptography. CQT was launched on 7 December 2007 and is currently occupying some 3,000 sq m in the Faculty of Science.

CQT began its operations in earnest in January 08 with the launch of 21 projects. These range from theoretical studies of quantum entanglement in complex systems to cooling atoms to almost zero Kelvin in the labs. On the experimental front, the Centre already has its quantum optics and cold atoms facilities operational. The Centre is currently in the process of establishing a foothold in a new emerging area of atom-chip quantum information processing.



¹ NUS ranks 33rd in the world and 4th in Asia in the [Times Higher Education Supplement-Quacquarelli Symonds \(THES-QS\) University Rankings 2007](http://www.topuniversities.com/worlduniversityrankings/results/2007/overall_rankings/top_100_universities/) (http://www.topuniversities.com/worlduniversityrankings/results/2007/overall_rankings/top_100_universities/)

Remuneration package

- Remuneration is based on the University's annual based salary ranges.
- Research staff will be eligible for Individual Performance Bonus (PB)

Other University benefits that Research staff will enjoy are:

Medical Benefits

- Research staff will be placed on the *2007 Medical Benefits Scheme* which is an insurance-based plan that takes care of their outpatient and hospitalization (inpatient) expenses. They will receive:
 - (a) 24-hour coverage including accidental / emergency medical treatment overseas;
 - (b) Free coverage for staff; and
 - (c) Optional coverage for dependants - staff co-pay the annual premium for their dependants' coverage in the Plan.
- For Outpatient care, for example, Research staff need only to co-pay S\$5 per visit to a GP on the list of Panel Doctors (for non-Panel Doctors, he/she will co-pay S\$5, and be reimbursed up to S\$25)
- Research staff will receive an overall limit of S\$5,000 per policy year per insured person.

Special Payment for Foreign Staff on expatriate terms

- Research staff who are eligible will receive a monthly payment, which is calculated at 125% of the prevailing employers CPF² contribution rates times the monthly gross salary (capped at S\$4,500 per month)

Travel Assistance

- Research staff who join CQT as Research Professors, Research Associate Professors or Senior Research Fellows and who are recruited from overseas, will be reimbursed for the cost of air travel. This will include airfares for the research staff and his/her dependants (up to a maximum of five adult airfares).
- They will also receive a relocation allowance to offset the expenses they incur in re-locating to Singapore (e.g. charges for packing, transportation and insurance of personal and professional effects.)
- Research staff who join CQT as Research Fellow (A) will receive a travel subsidy (payable once only) of S\$2000. For contracts of 1 year, travel subsidy is given for both the appointee & spouse. For contracts exceeding 1 year, travel subsidy (S\$1000 each) will also be given for up to 3 eligible children (≤ 18 years of age).

Transit Accommodation Scheme

- CQT will arrange for the new Research staff (applicable to Research Professors and Research Associate Professors) to stay at a hotel of his/her choice or the Visitors' Lodge for a period of up to 14 days, upon his/her arrival in Singapore. CQT will bear the costs of the room charge. This interim arrangement will allow the Research staff to source for an accommodation.

² CPF is a social security savings plans for employees who are Singapore Citizens and Permanent Residents

University Housing or Housing Allowance Scheme

- Research staff who join CQT as Research Professors or Research Associate Professors will be eligible for partially-furnished housing.³
- All other staff will be eligible for housing allowance.⁴

Leave Benefits

- Vacation leave of 28 days in a calendar, pro-rated to the number of days actually served.

³ This is for a maximum period of nine (9) years from the start of their appointment.

⁴ For Senior Research Fellows - This also carries a maximum nine-year period from the start of the appointment. (There will be changes to this benefit provided for Senior Research Fellows, after 30 June 2011 but changes will only be announced closer to that date.)

For Research Fellows (A) – This carries a maximum period of up to six (6) years in aggregate from the start of the appointment.

Cost of Living in Singapore⁵:

	<u>S\$ average per month</u>
1. Accommodation ⁶	1,500 to 4,000
• Rental of Condominium – 1200 sq/ft, 3 bedrooms, full facilities	(depends on location)
2. Utilities – Water, Gas and Electricity	200
3. Food	
• Lunch at Hawker Centre	5 (average per meal)
• Big Mac value meal	6.40 per set
• Meal at a good restaurant	30 (average per pax)
4. Transport	
• Bus / MRT	1.20 (average per trip)
• Taxi – 20 mins	12 (average per ride)
• Car – mid class (Honda Civic, Nissan Sunny) including road tax, insurance, petrol, parking, 100% financing loan over 10 years	1,300 onwards
5. Telecommunications	
• Mobile Phone – depends on subscription plan	30 to 150
• Broadband Access	50
• Cable TV – depends on package	50 to 150
6. Selected Personal Expenses	
• Male Haircut at barber shop	8 to 10 per visit
• Female Haircut at saloon	30 per visit
• Movie Ticket	10 (average)
• Six-pack Beer from supermarket	15 (average)
• Cigarettes (Marlboro)	11.80 for 20 sticks
• Medical Consultation – GP	25 to 50 per visit
7. International School	
Annual Fees range from S\$4,600 to S\$14,000 for lower grades and S\$6,000 to S\$18,000 for upper grades. For information on Education in Singapore, please visit: http://www.singaporeexpats.com/guides-for-expats/international-schools.htm#International	

⁵ References from www.xpatxperience.com and www.singaporeedu.gov.sg

⁶ Staff members who are not Singapore citizens and whose terms of appointment include eligibility for housing benefits by the University, may be provided subsidised housing or housing allowances.

Singapore Tax Rates⁷:

Chargeable Income	Rate (%)	Gross Tax Payable (\$)
First \$20,000 Next \$10,000	0 3.50	0 350
First \$30,000 Next \$10,000	- 5.50	350 550
First \$40,000 Next \$40,000	- 8.50	900 3 400
First \$80,000 Next \$80,000	- 14	4 300 11 200
First \$160,000 Next \$160,000	- 17	15 500 27 200
First \$320,000 Next \$320,000	- 20	42 700

⁷ Data from Inland Revenue Authority of Singapore (IRAS) www.iras.gov.sg

ABOUT SINGAPORE

Singapore is an island republic situated between the countries Malaysia and Indonesia. Located at one of the crossroads of the world, Singapore's strategic position has helped it grow into a major centre for trade, communications and tourism. With English as the language of administration, business, and technology, foreign professionals find it easy to work and live in Singapore. In addition, the city offers a safe environment, low personal taxation and quality standard of living. Foreigners form a significant percentage of the city-state's total employment pool, contributing to city's industries as well as enriching her cultural offerings.



📍 Geography & Climate



Singapore is located 136.8 km north of the equator, between longitudes 103 degrees 38' E and 104 degrees 06' E. It consists of one main island (617.1 sq km) and some 63 offshore islands, with about 50% of the land used for residential, commercial and industrial purposes.

Singapore has an equatorial climate, which is warm and humid all year round. Only slight variations between the average maximum of 31 degrees Celsius (88°F) and minimum of 23 degrees Celsius (73°F). Rain falls throughout the year, with more consistent rain coming during the monsoon season from November to January.

📍 Demographics

Singapore is one of the most densely populated country in the world, with a total population of about 4.5 million. It is a multi-racial, multi-religious and multi-lingual society. Literacy rate is at a high 90% with English being widely spoken and understood.