

Curriculum Vitae of Dimitris G. Angelakis BSc, MSc, MA, PhD, DIC (Imperial College).

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EDUCATION & QUALIFICATIONS

September, 1998 –October 2001: PhD, Theoretical Quantum Optics, Imperial College, Supervisor: Prof. Sir P.L. Knight, FRS

September, 1997 - August, 1998: M.Sc., Theoretical Physics with specialization in Atomic and Molecular Physics, University of Crete. Supervisor of MSc thesis: Prof. Peter Lambropoulos

September, 1993 -September, 1997: B.Sc. Physics, University of Crete.

RESEARCH INTERESTS

Quantum optics, quantum information, implementations of quantum simulation and quantum computation, nano- and quantum-photonics, quantum engineering technologies

EMPLOYMENT HISTORY

- Jan 2009-present: Principal Investigator and visiting Research Associate Professor, Centre for Quantum Technologies, National University of Singapore.
- December 2007 - present: Lecturer, Assistant Professor and now tenured Associate Professor, Electrical and Computer Engineering School, Technical University of Crete*
- October 2001 – November 2007: Research Associate to 2004 and Senior Research Associate 2004-07, Department of Applied Mathematics and Theoretical Physics, University of Cambridge
- October 2002-November 2007: Research associate of the Centre for Quantum Computation, University of Cambridge
- October, 2001 – September 2004: Junior Research Fellow, St Catharine’s College, University of Cambridge. Undergraduate teaching and tutoring Part I and Part II Physics of the Cambridge NS Tripos .

Visiting professor positions

- 5/10/2015-18/12/2015, Kavli Institute of Theoretical Physics (KITP), University of California in Santa Barbara, Invited professor and “key participant” in “Many-body physics with light” program (2 months).
- 2004-2009 Quantum Information Group, Physics Department and Centre for Quantum Technologies, National University of Singapore (2 months a year)
- December 2017, Physics and Astronomy Department, Macquarie University, Sydney Australia

* Part time appointment since 2012.

SCHOLARSHIPS & AWARDS

- Greek Ministry of Defense, Distinguished Young Greek Scientist Award 2004.
- Institute of Physics UK, Quantum Electronics and Photonics Thesis Prize 2002: First prize for all theses examined in 2001-2002 in the UK in the field of Quantum Electronics and Photonics.
- St Catharine's College Cambridge, University of Cambridge. Stipendiary Junior Research Fellowship in Physics 2001-2004 (selected among 200 candidates).
- Valerie Myescrough PhD Prize 2000 (second year in PhD): Awarded from the University of London to PhD students who show outstanding ability and potential for original work in Astronomy, Mathematics or Physics. One award per year throughout the University
- Greek State Graduate Scholarship for PhD studies abroad, 1998-2001: Position 1st at the corresponding national scholarship exams at the field "Lasers and Applications".
- Foundation of Research and Technology Hellas (F.O.R.T.H.) Graduate Scholarship 1997-1998.
- University of Crete and Greek State Scholarship Foundation (SSF) for graduating 2nd in a class of 100 students in 1997
- 3 undergraduate SSF scholarship awards for being in the top three students of the year for 1993, 1994 and 1996 (1st, 2nd and 4th year of studies).
- University Entry Exams National Scholarship Award 1993, for securing the highest overall grade, among all the applicants nationally (a few thousand) at the Physics Department, University of Crete.

RESEARCH GRANTS

1. **Centre for Quantum Technologies core funding for project « Many-body physics and quantum simulations with light».** Ministry of Education Singapore, 2010-present. Leading PI, total funds awarded so far ~S\$ 2.5M
2. **Ministry of Education Singapore Tier 3 Competitive Funding** for project « **Random Numbers from Quantum Processes**» 2013-2018, total budget 10M S\$. Participating PI with personal budget 425K S\$, project is led by CQT PI Prof. V. Scarani
3. **Ministry of Education, Greece, Funding for Greek-Russia Bilateral Collaboration in Quantum Technologies.** Participating PI with personal budget 56K Euros, total proposal budget 496K Euros.
4. **EU COST Action “Nanoscale Quantum Optics”.** National representative, member of the core and management committee for Greece and deputy WG4 leader for 2015-2018. Receiving travel support and conference organizing support. Total budget allocated ~150K Euros per year, ~30K for a conference to be organized by in Crete, June 4-11, 2016. Website: <http://www.cost-nqo.eu/>
5. **Support of postdoctoral researchers, EU and National Greek Funding Program** 2010-13, Euros 150K towards hosting a postdoc coming from abroad in TUC (awarded but not taken up by the postdoctoral researcher due to salary cuts imposed by financial crisis).
6. **NATO Science for Peace and Security Program, 2005.** Principal applicant and administrator of a grant towards the organization of two week NATO Advanced Study Institute in Quantum Information and Quantum Computation in Crete, May 2-13, 2006. Grant size 55K Euros
7. **European Union, SIQS-EU Integrated Project on “Simulators and Interfaces with Quantum Systems”** 2013-2016, external partner representing CQT Singapore (total budget ~10M Euro)
8. **Technical University of Crete starting grants** for newly appointed faculty, scholarship for PhD student 5K.
9. Herakleitos program in Quantum Computing (**Greek Secretariat for Research 2003-06**), co-PI. PI was the Physics Department, Aristotelian University of Greece. External collaborator. Total grant size: 30K Euros.
10. Interdisciplinary Research Collaboration in Quantum Information Processing UK: **UK EPSRC funded research** and travel support. Cambridge node member and administrator for the node in 2005-07. Grant size 200K GBP.
11. **The Cambridge-MIT Institute** program on Quantum Information. Cambridge node member and co Scalable Quantum Information Processing and Computing. EU funded research support. Cambridge node member 2005-07. Research (support of my RF salary) and travel support for 2005-07.
12. **Resources for Quantum Information (RESQ).** Cambridge node member. Research and travel support for 2003-06

PUBLIC & PROFESSIONAL SERVICE

Referee and editorial service:

- Referee for research proposals submitted to: the EU ERC Starting Grant scheme, the EU ERC Consolidator Grant scheme, the European Young Investigators Award Scheme, the Netherlands Organization for Scientific Research, Swiss Research Council, Polish Research Council, Austrian Research Council, the FET open Proactive Call H2020
- Member of the editorial board of European Physical Journal: Quantum Technology, since 2014
- Main guest editor of two special issues on “Many-body physics with light” for New Journal of Physics, IOP, 2017 and on “Quantum Simulations” for European Physical Journal: Quantum Technology, 2015
- Member of EU Quantum Network for the European Flagship in Quantum Technologies, representing Greece (one scientist per EU country).
- Member of the Management Committee, the Core group and WG4 deputy leader for the EU COST Action "Nanoscale Quantum Optics", 2014-2018
- Referee for scientific papers at: Science, Nature, Nature Physics, Nature Communications, Phys. Rev Let., Phys. Rev. A., New Jour. of Phys., Jour. of Opt. Soc. Amer. B, Journ. of Opt. Phys. A, Phys. Let. A, Opt. Comm., J. Mod. Opt., Eur. Phys. Let and Eur. Phys. Journ. D.
- Assistant coordinator and administrator of the Cambridge node on EPSRC funded UK network “QIP IRC” (2005-07) and UK funded Cambridge-MIT Institute program on Quantum Information (2001-03).
- Assistant Books Review Editor (1998-2001) for the journal of Contemporary Physics.
- Served in various academic committees regarding hiring, promotional, administrative and teaching decision making in St Catharine’s College Cambridge, Centre for Quantum Computation Cambridge, Science and ECE Departments Technical University of Crete, Centre for Quantum Technologies Singapore
- Member of APS, OSA and IOP.

RESEARCH HIGHLIGHTS AND MEDIA COVERAGE

1. My work **has attracted the interest of world leading experimental groups and high-tech companies in Europe and US**. The most recent ones include:

- i) Collaboration with **Quantum Lab of Google, John Martinis** group. Joint publication in **PRL November 2016** on “Topological pumping with interacting photons”, and in **Science December 2017** on “Spectral signatures of many-body localization with interacting photons in superconducting qubits”(see publications). The work was highlighted in numerous science news articles and in TV interviews in Singapore (the [Straits Times](#)), Greece ([SKY Greece](#), [Crete TV](#)) and worldwide including [Eurekalert](#), [Sciencedaily](#), [tech2.org](#), [tuc.gr](#), [asian scientist](#), [technology networks](#), [nanowerk](#), [alphagalileo](#), [mgonline](#) and others.

We continue the collaboration with Google on quantum simulations of a range of different problems from physics, engineering and material science. We are also in discussions to take the collaboration to the next level with Google supporting directly our group in Singapore. Also exploring possibilities to use the near term devices with 50 qubits to solve problems in econometrics and financial sector too.

- ii) **Institute of Optics, Jena and the Rostock University in Germany, Prof. A. Szameit** group. Joint works (Optica 2015) on using integrated photonic chips for quantum simulations of exotic physics like the Majorana equation. Highlight focus article in **Optics & Photonics News (OPN)** [“Using light to simulate unphysical particles!”](#). It has also appeared in the Science Section, [International Business Times](#), as well as [phys.org](#) and [sciencedaily](#)

Continuing the collaboration in building topologically robust photonic chips for optical communications and computing

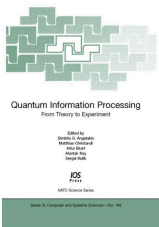
- iii) **Stony Brook, USA**. Collaboration with the quantum optics group of E. Figureoa to implement quantum simulations and **quantum memories in room temperature** using light-matter interfaces developed by them. One publication under review with Nature entitled “Relativistic and topological physics with slow light polaritons in room temperature”, arXiv: 1711.09346

- iv) Ongoing collaboration with University of **Innsbruck, Austria** Dr Keil/Prof G. Weihs’ photonics group on studying aspects of exotic Kibble-Zurek mechanism for defect formation with photons in photonic chips.

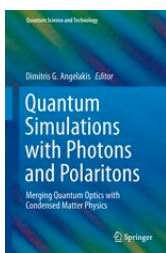
2. **Other International collaborations** (only projects that have led to joint publications already) include groups at the University of Oxford, Cambridge, Stony Brook, Imperial College, University College London, Technical University of Berlin, Korea Advanced Study Institute, Institute of Photonic Sciences Barcelona, University of California in Santa Barbara, Seoul National University, C. N. Yang Institute for Theoretical Physics (US). See publications section.

--- Selected research highlights

- 1) My 2007 publication on “Photon blockade induced Mott transitions and XY spin models in coupled cavity arrays” is widely regornized as **the founding work** in the field of **Quantum Simulators and Many-Body Physics with Light**, and on has received **more than 500 citations** to date since 2007. Among others it was interviewed for an article in **New Scientist** by science journalist Mark Buchanan, Issue 2586, 11 January 2007 entitled “*Engaging photons in light conversation*”
- 2) Publication “Weaving light matter qubits in into one way quantum computer”, New Journal Physics 2008) was selected by **Sciencewatch.com as one of the top 20 papers** with most citations in the years 2008 and 2009 **in the field of quantum computing**. Link here: <http://sciencewatch.com/ana/st/quantum/papers2yr/>
- 3) Our work "Simulating neutrino oscillations in trapped ions" published at NJP 14 033028 (2012) has been selected for the "**New Journal of Physics Highlights for 2012**" and was covered in the following science media: Phys.org "*Dance like a neutrino: Quantum scheme to simulate neutrino oscillations*". Science news line, SPACEDAILY, Eurekalert, Fermilab .
- 4) **Two invited books published by Springer**



“**Quantum Computing: From theory to experiments**” 2006 and 2017. **D.G. Angelakis**, M. Christandl, A. Ekert, A. Kay and S. Kulik (Editors). “Quantum Information Processing From Theory to Experiment” Volume 199 2006. NATO Science Series: Computer & Systems Sciences, Kluwer 2006, ISBN 1-58603-611-4



“**Quantum Simulators with Photons and Polaritons: Merging Quantum Optics with Condensed Matter Physics**” **D. G. Angelakis**, (edited volume invited by *Springer*), 2017. Series on Quantum Science and Technology.). Also [CQT research highlight “Book presents global perspective in quantum simulations”](#)

3. Special issues edited

---“Quantum simulations”. *European Physical Journal: Quantum Technology*, 2014. DGA as lead editor with D. Jacksh, A. Aspuru-Guzik, E. Solano as co-editors.

---“Many-body physics with photons and polaritons”, *New Journal of Physics*, IOP 2017. DGA as lead

editor with C. Ciuti (Paris), Pedram Roushan (UCSB/Google), A. Szameit (Rostock) as co-editors.

2. **Invited Review** C. Noh and D.G. Angelakis “Many-body physics and quantum simulations with light” *Report of Progress in Physics*, 80, 016401 (2016). CQT highlight [“Review marks 10 years of research in quantum simulators”](#)
3. Our November 2016 work in Physical Review Letters “Topological pumping with photons in nonlinear resonator arrays”, theory collaboration with **Google**, has been covered in in [EurekaAlert](#)” [An Archimedes' screw for groups of quantum particles](#), **Phys.org**, **Health Medicinet**, **Nanowerk**, **Nanotechnology Now**, **Sky Nightly**, and **Space Daily**. It was also CQT research highlight [“Topological Scheme inspired by Nobel winner’s work ”](#)
4. Our December 2016 PRL “Driven open quantum systems and Floquet stroboscopic dynamics”. Physical Review Letters, December 2016, was a [CQT research highlight “Shaking Schrodinger’s cat may protect from the environment”](#)
5. Our 2015 work in Optica with Prof. Szameit experimental group in Germany on “*Forbidden physics has been seen in an experiment – sort of. CQT researchers and collaborators in Germany, Austria and India simulated with light the behaviour of an impossible particle known as a Majoranon...*” *Read more from CQT highlight for non specialists, “Light mimics forbidden particle ”*
6. Our 2013 work in PRL “*Mimicking interacting relativistic theories with light*” [Centre for Quantum Technologies research highlights](#)
7. Our work “*Luttinger liquid of photons and spin-charge separation in hollow-core fibers*” PRL 2011 was selected as an “**Editors Suggestion**” by Physical Review Letters and was the theme of a **Viewpoint article in Physics** entitled “In a tight spot spin and charge separate” in [Physics 4. 30 20111 by G. A Flete](#)
8. **Research Highlight in Nature**: “*Optical Physics: A liquid of photons*”, **Nature**, **472**, **262 (2011)** related to our work on spin charge separation with light.
9. News story in “**Physics and Physicists**”, “Luttinger Liquid Behavior For Photons In 1D” Link:<http://physicsandphysicists.blogspot.com/2011/04/luttinger-liquid-behaviorforphotons.html>
10. **Invited review article (cover story) in the Innovation Magazine**, on a focus issue on Quantum Technology, on my contributions in the filed of light-matter interactions and quantum simulations. Title: “Shedding light into the secrets of matter” http://www.innovationmagazine.com/volumes/v9n2/preserved-docs/18_21.pdf
11. ‘Interview and article Greece’s most esteem Sundays published national newspaper **TO BIMA**, Science section by Tasos Kafantaris, Science section, Sunday 8 May 2011 “**Liquid photons: A la Grec**” (in Greek).

12. **Focus article** at Phys.Org_“*Could light and matter coupling lead to quantum computation? October 11, 2010*”_by Miranda Marquit on our publication “Photon blockade induced Mott transitions and XY spin models in coupled cavity arrays”

OUTREACH AND PUBLIC SERVICE

I have delivered several talks and written articles on quantum physics and quantum information to non-specialist audiences including: the **Amateur Astronomical Society of Greece**, several **secondary and high schools in UK and Greece** including the **historic “Rugby School”** in Warwickshire UK, and the **Hills Road High School** in Cambridge UK.

I have also participated in several **outreach events** representing CQC Cambridge, CQT Singapore, TUC Crete including the Annual Science Fair in Singapore, the NUS Open day, the TUC Open day and others.

Delivered interviews and written articles in **Straits Times, Innovation Magazine, Crete TV, New Scientist, SKY Greece, CNN Greece** and others.

INTERNATIONAL CONFERENCE & ADVANCED PHYSICS SCHOOLS ORGANIZING

1. Program committee, The Nanoscale Quantum Optics Workshop, Prague February 2017. <http://www.cost-nqo.eu/event/nanoscale-quantum-optics-conference-mc-meeting-prague-czech-republik/>
2. Program committee, International Workshop on “Strongly correlated fluids of light and matter” held in Corsica, France, 8-12 May 2017. <http://qflm2017.org/>
3. Main organizer and chairman of the program committee of International School and Workshop on “Many-body physics and quantum simulations with light”, Chania, Crete June 4-11, 2016 <http://qlightcrete2016.org>
4. Program committee member, “International Conference on Quantum Computation, Communication and Measurement (QCMC2016), to be held in CQT/NUS, Singapore, 4-8 July 2016. <https://qcmc.quantumlah.org/>
5. Organizer of the symposium on “Many body quantum optics: Merging condensed matter with AMO physics” within the 9th International Conference on Computational Physics (ICCP9), Singapore January 7-11, 2015. <http://www.physics.nus.edu.sg/iccp9/iccp9/minisym.htm#C13>
6. Chairman of the organizing and program committees of the NATO Advanced Study Institute in Quantum Computation and Quantum Information, Chania, Crete, Greece 2-13 May 2005. http://www.qi.damtp.cam.ac.uk/crete_2005/
7. Chairman of the organizing committee of the 4th meeting of the CMI (Cambridge-Massachusetts Institute of Technology Insitute) in Quantum Information, Cambridge UK, July 2002
8. Member of the organizing committee of the 3rd meeting of the CMI (Cambridge-Massachusetts Institute of Technology Insitute) in Quantum Infomation, Cambridge USA, January 2002.

INVITED TALKS in INTERNATIONAL CONFERENCES (40 in total)

1. "From Mott transitions to many-body localization with interacting photons: An old story and a recent experiment" Conference on Hybrid Photonics and Materials, Mykonos, September 2017
2. "From Mott transitions to many-body localization with interacting photons: An old story and a recent experiment" in conference: The many facets of non-equilibrium physics: from many body theory to quantum thermodynamics, Sicily, September 2017
3. "Spectral Signatures of Many-Body Localization with Interacting Photons: An experiment", International ICTP Workshop in Quantum Science and Technology, ICTP Trieste, September 2017
4. "Spectral Signatures of Many-Body Localization with Interacting Photons", CCPQ Workshop on Dynamics of Complex Quantum Systems, Royal Society- Cumberland Lodge, UK, August 2017
5. "Probing Many-Body Physics with Light", Symposium on Quantum Matter, International Conference on Statistical Physics, $\Sigma\Phi 2017$, Corfu, Greece, July 2017
6. "Quantum simulations and many-body physics with light", Thai-Singapore Scholars Workshop in Quantum Technologies, Thailand, January 2017 (Keynote)
7. "Topological and gauge fields with photons", Quantum and Topological Nanophotonics Workshop, Nanyang Technological University, Singapore, December 2016.
8. "Quantum simulations with strongly interacting photons", International workshop on quantum technologies and metamaterials, Spetses, Greece June 2016.
9. "Many-body physics with light", *Workshop $SU(N)$, gauge fields and cold atoms*, 18-20 January 2016, MajuLab, CNRS-UMJ collaboration, NUS, January 2016, Singapore
10. "Engineering and probing many-body states of light in driven-dissipative arrays", *Program on Many body physics with light program* run by the Kavli Institute of Theoretical Physics, UCSB November 2016, California, USA.
11. "Driven dissipative many body physics with light" *Control of Quantum Dynamics of Atoms, Molecules and Ensembles by Light Workshop* 2014, Bourgas, Bulgaria, June 2015
12. "Strongly interacting photons" International Winter School and Workshop on *Strongly correlated fluids of light and matter*, European Centre for Theoretical Studies in Nuclear Physics and related areas (ECT), Trento, Italy January 12th-23rd 2015
13. "Quantum simulations of exotic physics with photonic chips" *The Benasque Workshop on Quantum Simulators*, Benasque, Spain, February 22nd-27th 2015
14. "Quantum simulations of condensed matter and exotic phenomena with strongly correlated photons and polaritons" *Advanced Workshop on Landau-Zener Interferometry and Quantum Control in Condensed Matter*, ICTP workshop, Smyrna, Turkey, October 2014
15. "Proposals for realization of topological states of interacting and non-interacting photon" META'14, *the 5th International Conference on Metamaterials, Photonic Crystals and Plasmonics*, Singapore, May 2014.

16. "Many body quantum optics" *Control of Quantum Dynamics of Atoms, Molecules and Ensembles by Light Workshop 2014*, Bourgas, Bulgaria, June 2014
17. "Emulating strongly correlated models with photons in driven atom-waveguide interfaces" *META'14, the 5th International Conference on Metamaterials, Photonic Crystals and Plasmonics*, Singapore, May 2014.
18. "Quantum simulations with photons and polaritons: The path from the early theory to the first experiments" *23rd Annual International Laser Physics Workshop, Sofia, Bulgaria July 2014*
19. "From the Jaynes-Cummings-Hubbard model to interacting relativistic theories with photons", *Advanced many-body physics and statistical methods in mesoscopic systems II*, Sept. 1-5, 2014, Bucharest Romania
20. "Quantum simulation of condensed matter physics and QFTs with light". *Quantum Simulators Workshop, Benasque, Spain, October 2013*
21. Quantum simulations with photons: The path from Mott transitions to interacting relativistic theories with light, *22nd International Laser Physics Workshop, Prague, July 2013*
22. "From Mott transitions to interacting relativistic theories with photons: A brief history of photonic quantum simulations", *APS March meeting 2013, Invited session on Photonic Quantum Simulations*, Baltimore USA, March 2013.
23. "Photonic Quantum Simulators", *AMOP 2012*, Indian Institute of Science Education and Research Kolkata (IISER-K), December 2012
24. "Luttinger Liquid of photons". *SFP-IPS Workshop at the Nanyang Executive Center (NTU)*, Singapore, January 2012
25. "From Mott transitions to interacting relativistic theories with light", *21st International Laser Physics Workshop, Calgary, July 2012*
26. "Photonic quantum simulators". *Quantum Simulators Workshop, Benasque, Spain, March 2011.*
27. "Spin-charge separation with photons", *Workshop for the 75 years of Quantum Entanglement*, Kolkata India, January 2011
28. "Quantum simulators with light". *Quantum Communication Workshop, Vico Equense, Napoli, Italy , October 2009*
29. "Quantum simulations and quantum information processing with photons". *Quantum Information and Quantum Computation conference, Benasque Spain, June 2009*
30. "Photonic Quantum Phase Transitions and QIP in Coupled Cavity Array"s. *18th International Laser Physics Workshop, Barcelona, July 2009*
31. "Quantum simulations and quantum information processing with hybrid light matter qubits". *5th Central European Quantum Information Processing Workshop June 2008, Telč, Czech Republic, June 2008.*
32. "Mott transitions, spin models and cluster quantum computation in coupled cavity arrays". *International Workshop on Strong atom-light interactions: theory, experiment and applications, Imperial College May 2007.*

33. "Quantum phase transitions and quantum computation in coupled cavity arrays". *Many body systems and quantum computation conference*, Pisa, Italy, March 2007.
34. "Quantum phase transitions of light:.. *The fifteenth annual International Laser Physics Workshop-Symposium on Quantum Information* L'Ecole Polytechnique Fédérale de Lausanne, July 2006.
35. "Optical quantum gates in coupled cavity waveguides". *QIP IRC meeting*, St Anne's College, Oxford, September 2005.
36. "Quantum computation in Photonic Crystals", *International Workshop in Quantum Computation and Quantum Information*, Benasque, Spain, 12-30 June 2005.
37. "Optical Quantum Computing in Photonic Crystals", *The fourteenth annual International Laser Physics Workshop*, Kyoto Japan, 4-8 July 2005.
38. "Bell Inequalities and Quantum Computation". *Quantum Probability and Information workshop*. Patras, Greece 2005.
39. "Direct distance estimation between unknown quantum transformations". Invited presentation at *Cambridge-MIT workshop on QI*, Cambridge, UK, January 2003.
40. "Testing Bell Inequalities in Photonic Crystals". *Young Researchers Meeting of the TMR Network on Microlasers and Cavity QED*, Durham, UK July 2000

Lectures in International Physics Schools

- 1 *Quantum Information Transfer between Light and Matter in Photonic Crystals*. Quantum Information Processing Interdisciplinary Research Collaboration Summer School. Sheringham UK, June, 2005.
- 2 "Strongly interacting photons" International Winter School and Workshop on *Strongly correlated fluids of light and matter*, European Centre for Theoretical Studies in Nuclear Physics and related areas (ECT), Trento, Italy January 12th-23rd 2015
- 3 "Strongly interacting photons for quantum simulations" International School of Physics "E. Fermi" - Nanoscale Quantum Optics, , Italy July 2018.

TEACHING EXPERIENCE

- **Technical University of Crete, Greece, 2008-2017:** Lecturer 2008-2012, and then Assistant and now tenure Associate Professor with teaching duties of 4 courses per year on average (two undergraduate and two graduate level). Since 2012 parts of two courses per year (part time appointment). Teaching duties include planning and setting up the course material, preparing lectures notes, delivering between 3 to 5 hours of lectures per course per week for 13 weeks, setting up laboratory demonstration experiments and selecting and supervising teaching assistants for the laboratory part of the courses. Number of students trained ~200 per semester per undergraduate course. During 2008-2012 full teaching load of minimum 2 undergraduate courses per year plus one or two graduate ones, 2012 onwards part time duties of one undergraduate and one graduate course per year.

Courses taught:

Winter semester, every year during 2008 -2014: Physics 1 (Mechanics-Thermodynamics), undergraduate year 1

Spring semester: Physics 2 (Electromagnetism-Optics-Modern Physics) 2008, 2009, 2010, 2011, 2016, 2017, undergraduate year 2

Postgraduate lecture courses: Advanced Quantum Physics (2009-10-11-12,13), Introduction to Quantum Optics and Quantum Information (2010), Special topics in Laser-Mater Interactions (2008, 2009), Introduction to Quantum Information and Quantum Technologies (2014-2017)

- **Cambridge University, UK. 2001-2008.** Academic and personal tutor (junior research fellow St Catharine's College) as well as project supervision in Relativity, Optics, Mechanics, Waves (1st year). Small group teaching, two hours per week per group.
- **Imperial College, UK 1998-2001-**Teaching assistant as PhD student for the courses: Quantum Mechanics (2nd year), Relativity (2nd year), Optics (1st year), Mechanics(1st year), Waves (1st year), Electromagnetism (2nd year), Solid State physics Thermodynamics(3rd year)
- **University of Crete, Greece 1994-1998-** Laboratory demonstrator as undergraduate student (top of my year) for the laboratory courses: Mechanics (1st year), Optics (2nd year), Modern Physics (3rd year). Teaching assistant as an MSc student for Classical Mechanics (3rd year), Thermodynamics(3rd year)

GRADUATE STUDENTS & POSTDOCTORAL RESEARCHERS SUPERVISION

Centre for Quantum Technologies, Singapore

Postdoctoral researchers supervision:

Past

Dr Blas Manuel Rodriguez-Lara (now faculty in Mexico), 2+ years, 2009-2011

Dr John Goold (now faculty in Ireland), one year, 2010

Dr Priyam Das (now Lecturer India), 3 years, 2012-15

Dr Amit Rai (now Lecturer India), 3+ years, 2011-15

Dr Ping Na Ma (now CEO and founder of "Yotcopi Technologies" also working in parallel the banking sector), 1 year, 2014-15

Dr Changyoun Lee (now senior researcher Karlsruhe Institute of Technology, Germany) 3 years, 2012-15

Dr Changsuk Noh, (now faculty in Korea Institute of Advanced Studies), 5 years, 2010-15

Current

Dr Victor Bastidas, joined December 2015 from TU Berlin

Dr Wing Chi Yu, joined September 2017 from NUS, Singapore

PhD students supervision

1. Mingxia Huo, (PhD, supervised jointly with Kwek LC) Quantum simulations with atoms and photons, successfully defended July 2013, now postdoctoral researcher at University of Oxford, Physics department, D. Jaksch group
2. In progress
Jirawat Tangapatinanon, (PhD), started August 2014, graduate of Cavendish laboratory, Cambridge UK. "Quantum simulations with driven-dissipative photonic lattices: Implementations in Circuit QED"
3. Tian Feng See (PhD), started August 2014, graduate of DAMTP, Cambridge UK
"Scattering and multiphoton transport in many-body photonic systems:"
4. Hariphon Philathong, to start September 2017, MSc graduate of Imperial College, "Many-body physics with driven-dissipative light-matter systems"

Membership in PhD and MSc committees

1. External examiner of Kwan Mun Kit, Nanyang Technological University Singapore MSc thesis entitled "Berry's Phase in Dyshalonskii-Mariya Interaction", Singapore, 2008
2. Internal examiner of Wang Guangquan PhD thesis entitled, "Strongly correlated phases in the anisotropic honey-comb lattice", National University Singapore February 2013
3. Committee member for NUS physics graduate student Tang Ho Kin's and examiner of QE3 oral exam on "Quantum Monte Carlo study of correlation effects in graphene", supervised by Dr. S. Adam, NUS
4. Internal examiner of Jian Bu You PhD thesis entitled, " Title: Majorana fermion in topological superconductor and Mott-superfluid transition in circuit-QED system", National University of Singapore August 2015
5. Examiner of MSc thesis by Navneeth Ramakrishnan, ""The effects of marcoscopin disorder in a condensed matter system", National University of Singapore October 2016
6. Diploma thesis committee for ECE student G. Devetzakis, «Ebits at a Distance: Quantum Algorithms and Circuits for Teleportation of Quantum Resources», October 2016.
7. External examiner of RADITYA WEDA BOMANTARA, National University Singapore PhD thesis entitled " EMERGENCE AND CONSTRUCTION OF NOVEL GAPLESS TOPOLOGICAL PHASES", Singapore, September 2017

Technical University of Crete (PhD students supervision)

Nikos Schetakis, (MSc), defended July 2012

Michail Kalogerakis, (MSc), defended 2013

Markela Tsafantaki (MSc), defended March 2017

In progress PhDs

Nikos Schetakis, (PhD), started 2013

Michail Kalogerakis, (PhD), started 2014

PUBLICATIONS

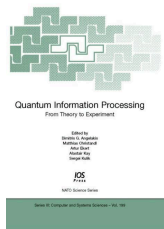
51 publications with 1850/ 1250 citations (Google Scholar/Web of Science-10/1/2018). **H index 21/17, i-10 index 35/34**,. Since 2012: 1100 citations, **5 PRLs, 1 Science, two special issues edited (EPJ QT and NJP), two invited books for Springer, one review for Reports Progress in Physics**. Several scientific media articles [Straits Times](#), [Sky Greece](#), [New Scientist](#), [Nature Research Highlights](#), [The Innovation Magazine](#), [Physics World](#) and [BIMA Science](#) (see previous section on highlights)

Theses:

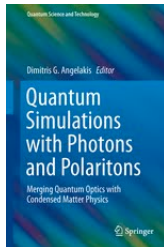
- D.G. Angelakis. “Atom-Photon Interactions in Structured Reservoirs”, PhD thesis, Imperial College, 2002. Supervised by Prof. Sir Peter Knight FRS
- D.G. Angelakis. “The quantum jump approach in quantum optics”, MSc Thesis, University of Crete, 1998. Supervised by Prof. Peter Lambropoulos

Books

- 1 D.G. Angelakis, M. Christandl, A. Ekert, A. Kay and S. Kulik (Editors). “Quantum Information Processing From Theory to Experiment” Volume 199 2006. NATO Science Series: Computer & Systems Sciences, Kluwer 2006, ISBN 1-58603-611-4



- 2 D. G. Angelakis, editor “Quantum Simulators with Photons and Polaritons: Merging Quantum Optics with Condensed Matter Physics” (edited volume invited by *Springer*), 2017. Series on Quantum Science and Technology.



Special issues edited

“Quantum simulations”. *European Physical Journal: Quantum Technology*, 2014. DGA as lead editor with D. Jacksh, A. Aspuru-Guzik, E. Solano as co-editors.

“Many-body physics with photons and polaritons”, *New Journal of Physics*, 2017. DGA as lead editor with C. Ciuti (Paris), Pedram Roushan (UCSB/Google), A. Szameit (Rostock) as co-editors.

Invited Reviews

C. Noh and D.G. Angelakis “Many-body physics and quantum simulations with light” *Report of Progress in Physics*, 80, 016401 (2016)

Book chapters

C. Noh, S. Clark, D. Jacksh and D.G. Angelakis “Out-of-equilibrium physics in driven dissipative coupled resonator arrays” in “Quantum Simulators with Photons and Polaritons: Merging Quantum Optics with Condensed Matter Physics” (*Springer*), 2017. Series on Quantum Science and Technology.

Journal publications

Submitted

1. V. M. Bastidas, T.H. Kyaw, J. Tangpanitanon, G. Romero, L.C. Kwek, D.G. Angelakis “Floquet stroboscopic divisibility: coherence preservation in non-Markovian dynamics” arXiv:1707.04423
2. M. Namazi, B. Jordaan, C. Noh, D. G. Angelakis, E. Figueroa “Realizing topological relativistic dynamics with slow light polaritons at room temperature” arXiv:1711.09346

(Published - 51 in total, * corresponding author)

1. P. Roushan, C. Neill, J. Tangpanitanon, V.M. Bastidas, A. Megrant, R. Barends, Y. Chen, Z. Chen, B. Chiaro, A. Dunsworth, A. Fowler, B. Foxen, M. Giustina, E. Jeffrey, J. Kelly, E. Lucero, J. Mutus, M. Neeley, C. Quintana, D. Sank, A. Vainsencher, J. Wenner, T. White, H. Neven, **D. G. Angelakis***, J. Martinis, “Spectral signatures of many-body localization with interacting photons” **in Science, 01 Dec 2017**: Vol. 358, Issue 6367, 2017
2. TF See, C Noh, D.G. Angelakis, “A diagrammatic Diagrammatic Approach to Multiphoton Scattering”, Phys. Rev. A 95, 053845 (2017)
3. E. Compagno, G. De Chiara, **D. G. Angelakis**, and G. M. Palma, “Tunable Polarons in Bose Einstein Condensates”, Scientific Reports 7, 2355 (2017)
4. J. Tangpatinanon, V. M. Bastidas, P. Roushan, S. Assam, D. Jaksch, **D. G. Angelakis***, “Topological pumping with photons in nonlinear resonator arrays”, arXiv: 1607.04050, Physical Review Letters, 117, 213603 (2017).
5. Sebastian Restrepo, Javier Cerrillo,, V. M. Bastidas, **D. G. Angelakis**, T. Brandes, “Driven open quantum systems and Floquet stroboscopic dynamics”. Phys Rev. Let. 117, 250401 2016.
6. C. Koke, C. Noh, **D. G. Angelakis***, “Dirac equation in 2-dimensional curved spacetime, particle creation, and coupled waveguide arrays”, Annals of Physics 374, 162 (2016).
7. J. J. Mendoza-Arenas, S. R. Clark, S. Felicetti, G. Romero, E. Solano, **D. G. Angelakis**, and D. Jaksch “Beyond mean-field bistability in driven-dissipative lattices: Bunching-antibunching transition and quantum simulation”, Phys. Rev. A **93**, 023821 (2016).
8. A. V. Sorokin, M. Aparicio Alcalde, V. M. Bastidas, G. Engelhardt, **D. G. Angelakis**, T. Brandes, “Semiclassical bifurcations and topological phase transitions in a one-dimensional lattice of coupled Lipkin-Meshkov-Glick models”, arXiv: 1604.08023, Phys Rev. E. 94, 0321123 (2016)
9. D.G. **Angelakis*** and C. Noh “Many-body physics and quantum simulations with light”

Report of Progress in Physics, 80 016401 (2016)

10. C. Lee, C. Noh, N. Schetakis, D. G. **Angelakis*** " Few-photon transport in many-body photonic systems: A scattering approach", *Phys. Rev. A* **92**, 063817 (2015)
11. G. W. Hanson, S. A. H. Gangaraj, C. Lee, D. G. **Angelakis**, M. Tame "Quantum plasmonic excitation in graphene and robust-to-loss propagation", [Phys. Rev. 92, 013828 \(2015\)](#)
12. R. Keil, C. Noh, A. Rai, S. Stutzer, S. Nolte, **D. G. Angelakis***, A. Szameit "Experimental simulation of charge conservation violation and Majorana dynamics", *Optica* 2,454 (2015)
13. Changyoun Lee, Amit Rai, Changsuk Noh, **Dimitris G. Angelakis***. " Photonic lattice simulation of dissipation-induced correlations in bosonic systems", in *Nature Scientific Reports* 5, 8438 (2015).
14. Hyunseok Jeong, Changsuk Noh, Seunglee Bae, **Dimitris G. Angelakis**, Timothy C. Ralph, "Detecting the degree of macroscopic quantumness using an overlap measurement", *Jour. of Opt. Soc. Of America B*, Vol. 31, Issue 12, pp. 3057-3066 (2014)
15. Peter A. Ivanov, Naoum I. Karchev, Nikolay V. Vitanov, **Dimitris G. Angelakis**, "Quantum simulation of superexchange magnetism in linear ion crystals",
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16. Changyoun Lee, Amit Rai, Changsuk Noh, **Dimitris G. Angelakis***. "Probing the effects of interaction in Anderson localization using linear photonic lattices"
[arXiv:1310:8208](#), *Physical Review A* 89, 023823 (2014).
17. Priyam Das, Changsuk Noh, **Dimitris G. Angelakis*** "Realizing the driven non-linear Schrodinger equation with stationary light", [arXiv:1208.0313](#) *Europhysics Lett.* 103 34001 (2013).
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19. N. Schetakis, Tom Gruzic, Stephen R. Clark, Dieter Jacksh **Dimitris G. Angelakis***. "Frozen photons in coupled cavity arrays", [arXiv:1305.6576](#), *J. Phys. B: At. Mol. Opt. Phys.* 46 (2013) 224025
20. J. Ryu, C. Lee, Y. Zhi, R. Rahaman, **D. G. Angelakis**, J. Lee, M. Żukowski. "Multi-setting Greenberger-Horne-Zeilinger theorem", [arXiv:1303.7222](#), *Phys. Rev. A* 89, 024103 (2014)
21. Changyoun Lee, Mark Tame, Changsuk Noh, James Lim, Stefan A. Maier, Jinhyoung Lee, **Dimitris G. Angelakis***. "Robust-to-loss entanglement generation using a quantum plasmonic nanoparticle array" [arXiv:1303.5092](#), *New J. Phys.* **15** 083017 (2013)
22. **Dimitris G. Angelakis***, C. Noh. "Towards topological effects with coupled QED cavity arrays". [arXiv:1306.2179](#), *Int. J. Mod. Phys. B* 28, 1441003 (2014).
23. Tom Gruzic, Stephen R. Clark, Dieter Jacksh **Dimitris G. Angelakis*** "Repulsively induced photon super-bunching in driven resonator arrays " [arXiv:1205:0994](#), *Phys. Rev. A.* 87 053846 (2013)
24. Changsuk Noh, Blas M. Rodriguez **Dimitris G. Angelakis*** "The Majoranon and how to realize it in

a table-top experiment", [arXiv:1210.5060](https://arxiv.org/abs/1210.5060), [PRA\(R\) 87 0401102](https://doi.org/10.1103/PhysRevA.87.0401102)

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28. Amit Rai, **Dimitris G. Angelakis*** "Dynamics of quantum light in integrated nonlinear waveguide arrays and generation of robust continuous variable entanglement" [arXiv:1201.4303](https://arxiv.org/abs/1201.4303) [Phys. Rev. A 85, 052330](https://doi.org/10.1103/PhysRevA.85.052330)
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33. **D. G. Angelakis***, M. Huo, E. Kyoseva, LC Kwek, "A photonic Luttinger liquid and spin-charge separation in a quantum optical system". ([arXiv:1006.1644](https://arxiv.org/abs/1006.1644)) [Phys. Rev. Lett. 106, 153601 \(2011\)](https://doi.org/10.1103/PhysRevLett.106.153601)
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INVITED SEMINARS AND COLLOQUIA IN UNIVERSITIES AND INSTITUTIONS (only selected items)

1. “Quantum simulations with interacting photons in superconducting qubits”, Physics Department, University of Melbourne, Melbourne, December 2017
2. “Quantum simulations with interacting photons: Spectral Signatures of Many-Body Localization with Interacting Photons”, Physics Department, University of New South Wales, Sydney December 2017
3. “Spectral Signatures of Many-Body Localization with Interacting Photons”, Physics and Astronomy Department, Macquarie University, Sydney, December 2017
4. “Spectral Signatures of Many-Body Localization with Interacting Photons”, Physics Department,

University College London, August 2017

5. "Quantum Simulations with Strongly Interacting Photons: Merging Condensed Matter Physics with Quantum Optics", Colloquium of the Centre for Quantum Technologies, National University of Singapore, July 2017
6. "Quantum Simulations with Light", Physics Department, University of Queensland Australia, Brisbane, November 2016
7. "Topological pumping with photons", Physics Department, Macquarie University, Sydney, November 2016
8. "Many-body physics with light: From Mott transition to topological pumping with photons", Physics Department, University College London, September 2016
9. "From Mott transition to topological pumping with photons", Physics Department, University of Oxford, September 2016
10. "*Probing the topological properties of the Jackiw-Rebbi model with light*", Physics Department and CN Yang Institute for Theoretical Physics, State University of New York, NY USA January 2016
11. "Engineering and probing many-body states of light in driven-dissipative arrays", Kavli Institute of Theoretical Physics, California, USA, November 2015
12. "*Quantum simulations with photons and polaritons*", Physics Department, NTU, May 2014
13. "*Mott transitions and interacting relativistic theories with cavity arrays*", Walter Meissner Institute, Munich, October 2013
14. "*From Mott transitions to the Thirring model with light*", CN Yang Institute for Theoretical Physics, State University of New York, NY USA March 2013
15. "*Mimicking condensed matter and high energy physics with light*", Colloquium, Physics Department, University of Crete, Heraklion November 2012
16. "*Quantum with strongly correlated photons*", Colloquium, Bristol Centre for Quantum Photonics, Bristol UK, November 2012
17. "*Quantum simulations with photons*", QOLS group, Physics Department, Imperial College, October 2012
18. "*Photonic quantum simulators*", Quantum Information and AMO group, Physics Department, University College London, October 2012
19. "*Quantum simulation with coupled cavity arrays*", Clarendon Laboratory, University of Oxford, November 2010.
20. "*Photonic quantum simulators: Mimicking condensed matter physics with photons*", Cavendish Laboratory, University of Cambridge, November 2010.
21. "*Mott transitions and Fractional Hall effect with photons*", Physics Department, Imperial College, October 2010
22. "*Luttinger liquid and spin-charge separation in nonlinear fibers*", Physics Department, University of Nottingham, October 2010
23. "*Quantum simulations in strongly coupled atom-cavity systems*". Slovak Academy of Sciences, June

2008.

24. *Photonic phase transitions, spin models, and QIP in coupled cavity arrays*, IESL Foundation of Research and Technology, Greece, January 2007.
25. *Many body effects and quantum computation in strongly coupled atom-cavity systems*. Physics Department, University College London, 2006.
26. *Photonic quantum phase transitions in coupled cavity arrays*. Physics Department, National University of Singapore, August 2006.
27. *Light-Matter Interactions in Photonic Crystals*, Science Department, Technical University of Crete, Chania, January 2005.
28. *Optical Quantum Computing in Photonic Crystals*, Physics Department, National University of Singapore, August 2004.
29. *From light localization and optical circuitry to single photon switches and more*, Physics Department, Imperial College London, July 2003.
30. *Light localization and spontaneous emission in photonic crystals*, Physics Department, National University of Singapore, August 2003.
31. *Quantum Nonlocality and Quantum Computation in photonic crystals*. Physics Department, Aristotelian University of Greece, Thessaloniki, December 2002.
32. *Bell Inequalities and Quantum Computation in Photonic Crystals*. Physics Department, University of Crete, Crete, April 2001.
33. *Testing Bell Inequalities in Photonic Band Gap Materials*. Centre of Quantum Computation, University of Oxford, February 2001.
34. *Transparency Effects in Photonic Crystals* Physics Department. University of Rochester, USA, October 2000.
35. *Creating Entanglement in Photonic Crystals* Physics Department. University of Toronto, Canada, October 2000.

REGULAR CONTRIBUTIONS IN INTERNATIONAL MEETINGS (SELECTED ITEMS ONLY)

1. *Quantum nano-photonics for quantum simulations*, FOMO2014, Kolymbari, Chania Greece, October 2014
2. *Quantum simulations in strongly coupled atom-cavity systems*, ICAP, Cairns Australia, August 2010
3. *Quantum simulation with photonic systems*. International Workshop in Quantum Computation Simulators, Physicszentrum, Bad Honeeff, Germany, 12-15 October 2009.
4. *Quantum simulations and quantum computation with strongly correlated photonic systems*. International Workshop in Quantum Computation and Quantum Information, Benasque, Spain, 10-29 June 2007.

5. *Photonic phase transitions spin models, and QIP in coupled cavity arrays*. CLEO-IQEC 2007, Munich, June, 2007.
6. *Cluster state quantum computing with hybrid light matter qubits*. International workshop in Measurement Based Quantum Computing, Oxford, March 2007.
7. *Mott transitions and quantum computing in coupled cavities*. American Physical Society March meeting, Denver, USA 2007.
8. *Direct distance estimation between unknown quantum transformations*. Advances in Quantum Information Processing Conference: From Theory to Experiment, Sicily, Italy, March 2003.
9. *Direct distance estimation between unknown quantum gates and quantum error correction*. Cambridge -MIT workshop, Cambridge, Boston, USA, January 2003.
10. *Testing Bell Inequalities in Photonic Crystals*. International Quantum Electronics Conference 2000, Nice, France, September 2000.
11. *Entangled States in Photonic Crystals. Bell Inequalities Testing*. QUICK-Quantum Interference and Cryptographic Keys: Novel Physics and Advancing Technologies Conference. Cargese, Corsica, France, April 2001.
12. *Coherent phenomena in Photonic Crystals*. Photonic Crystals and Light Localization, NATO Advanced Study Institute, Crete, Greece, June 2000.
13. *Reservoir Engineering*. 14th Quantum Electronics Conference, Manchester, UK, September 2000.

References

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