CHEE WEI WONG

Fang Lu Mesoscopic Optics and Quantum Electronics Laboratory,
Electrical and Computer Engineering, The Henry Samueli School of Engineering and Applied Science,
University of California, Los Angeles
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SCIENTIFIC APPOINTMENTS

July 2018 – current **Tannas Professor of Engineering**, Fang Lu Mesoscopic Optics and Quantum Electronics Laboratory**,** Department of Electrical & Computer Engineering
University of California Los Angeles, CA

July 2016 – June 2018 **Professor**, Fang Lu Mesoscopic Optics and Quantum Electronics Laboratory
Department of Electrical & Computer Engineering
University of California Los Angeles, CA

July 2014 – June 2016 **Associate Professor** (tenured**)**
Department of Electrical Engineering
University of California Los Angeles, CA

Jan. 2009 – June 2014 **Associate Professor** (tenured; July'11**)**
Center for Integrated Science and Engineering, Solid-State Science and Engineering, Department of Mechanical Engineering
Columbia University, New York, NY

Jan. 2004 – Dec. 2008 **Assistant Professor** (tenure-track)
Center for Integrated Science and Engineering, Solid-State Science and Engineering, Department of Mechanical Engineering
Columbia University, New York, NY

Aug. 2003 – Dec. 2003 **Postdoctoral Research Associate**
MIT Microphotonics Center
Massachusetts Institute of Technology, Cambridge, MA

EDUCATION

Jan. 2001 – Aug. 2003 **Massachusetts Institute of Technology, Cambridge, MA**
Doctor of Science with specialization in Optical Nanotechnology

Aug. 1999 – Jan. 2001 **Massachusetts Institute of Technology, Cambridge, MA**
Masters of Science (general)

Aug. 1996 – Aug. 1999 **University of California, Berkeley, CA**
Bachelor of Science: *Highest Distinction; summa cum laude*
Bachelor of Arts: *Highest Distinction; summa cum laude*

AWARDS AND HONORS

2024 Fellow of the American Association for the Advancement of Science
2020 Fellow of the National Academy of Inventors
2020 Fellow of the American Physical Society
2019 Global Foundries Visiting Professorship, National University of Singapore
2019 UCLA Innovation Fund Award

2018 National Institutes of Health Early Scientist Trailblazer Award
2018 Fellow of SPIE, the International Society for Optics and Photonics
2018 Fellow of Institute of Electrical and Electronics Engineers
2017 Visiting Professorship, Chinese Academy of Sciences
2016 Google Faculty Research Award
2016 Qualcomm Innovation Award finalist
2016 CLEO Maiman Award finalist
2016 Visiting Professorship, Nanyang Technological University
2015 Qualcomm Innovation Award finalist
2014 Fellow of American Society of Mechanical Engineers
2013 Fellow of Optical Society of America
2009 3M Faculty Award
2008 NSF CAREER Award
2007 DARPA Young Faculty Award
2002 National Science International Fellowship Award (Singapore)

RESEARCH INTERESTS

Recent important advances in subwavelength nanostructures offer extraordinary control over the properties of light. We can now manipulate the propagation, storage, and generation of light, as well as practically prescribe its matter interaction properties based on first-principles. These unprecedented innovations at the nanoscale offer opportunities in theoretical and numerical simulations, device nanofabrication, and quantum physical measurements, focused towards fundamental studies of optics at the nanoscale and photonic applications in the industry.

Our efforts focus on controlling photons in mesoscopic systems in four main themes: **ultrafast**, **nonlinear**, **quantum** and **precision** measurements. Example current topics include photon disorder localization and diffusive transport, graphene optoelectronics and ultrafast spectroscopy, ultrafast exciton dynamics for next-generation photovoltaics, chip-scale laser cooling and cavity optomechanics, ultrafast optical solitons for femtosecond compression on-chip; entanglement and large Hilbert spaces on-chip for quantum information processing, compact ultrastable lasers and frequency combs for quantum and precision measurements. These efforts are supported by device nanofabrication and materials device physics, along with numerical modeling and theoretical efforts.

RECENT SELECTED PUBLICATIONS

1. B.-C. Yao, W.-T. Wang, Z.-D. Xie, Q. Zhou, T. Tan, H. Zhou, G.-C. Guo, S.-N. Zhu, N.-H. Zhu, and C. W. Wong, Interdisciplinary advances in microcombs: bridging physics and information technology, *eLight* **4**, 19 (2024).
2. F. Hu, A. K. Vinod, W.-T. Wang, H.-H. Chin, J. F. McMillan, Z. Zhan, Y. Meng, M. Gong, and C. W. Wong, Spatio-temporal breather dynamics in microcomb soliton crystals, *Nature Light: Science & Applications* **13**, 251 (2024).
3. K.-C. Chang, X. Cheng, M. C. Sarihan, and C. W. Wong, Time-reversible and fully time-resolved ultra-narrowband biphoton frequency combs, *Appl. Phys. Lett. Quantum* **1**, 016106 (2024).
4. W. Wang, A. Aldhafeeri, H. Zhou, T. Melton, X. Jiang, A. K. Vinod, M. Yu, G.-Q. Lo, D.-L. Kwong, and C. W. Wong, Polarization-diverse soliton transitions and deterministic switching dynamics in strongly-coupled and self-stabilized microresonator frequency combs, *Nature Comms. Phys.* **7**, 279 (2024).
5. M. C. Sarihan, A. Govdeli, Y. B. Yilmaz, M. Erdil, M. S. Aras, M. Rechtsman, C. Yanik, C. W. Wong, and S. Kocaman, Isotropic gap formation, localization, and waveguiding in mesoscale Yukawa-potential amorphous structures, *Nature Comms. Phys.* **7**, 45 (2024).

6. A. Aldhafeeri, H.-H. Chin, T. Melton, D.-I. Lee, A. Chu, W.-T. Wang, M. Yu, P. G.-Q. Lo, D.-L. Kwong, and C. W. Wong, Low phase noise K-band signal generation using polarization diverse single-soliton integrated microcombs, *Photonics Research* **12**, 1175 (2024).
7. X. Cheng*, Z. Xie*, K.-C. Chang*, M. C. Sarihan, Y. S. Lee, Y. Li, X. Xu, A. K. Vinod, S. Kocaman, M. Yu, P. G.-Q. Lo, D.-L. Kwong, J. H. Shapiro, F. N. C. Wong, and C. W. Wong, A chip-scale polarization-spatial-momentum quantum SWAP gate in silicon nanophotonics, *Nature Photonics* **17**, 656 (2023). * equal contribution.
8. J. Huang, W. Liu, M. C. Sarihan, A. Miranda, B. Dwir, A. Rudra, E. Kapon, and C. W. Wong, Exciton-photon dynamics of single site-controlled quantum dot-nanocavity in the coexisting strong-weak coupling regime, *New J. Phys.* **25**, 033015 (2023).
9. X. Cheng*, K.-C. Chang*, M. C. Sarihan, F. N. C. Wong, J. H. Shapiro, A. Faraon, and C. W. Wong, High-dimensional time-frequency entanglement in singly-resonant biphoton frequency comb, *Nature Comms. Phys.* **6**, 278 (2023).
10. H. Liu, W. Wang, J. Yang, M. Yu, D.-L. Kwong, and C. W. Wong, Observation of deterministic double dissipative-Kerr-soliton generation with avoided mode crossing, *Phys. Rev. Res.* **5**, 013172 (2023).
11. H. Zhang, T. Tan, H.-J. Chen, Y. Yu, W. Wang, B. Chang, Y. Liang, Y. Guo, H. Zhou, H. Xia, Q. Gong, C. W. Wong, Y. Rao, Y.-F. Xiao, and B. Yao, Soliton microcombs multiplexing using intracavity-stimulated Brillouin lasers, *Phys. Rev. Lett.* **130**, 153802 (2023).
12. J. G. Flor Flores, T. Yerebakan, W. Wang, M. Yu, D.-L. Kwong, A. Matsko, and C. W. Wong, Parametric-driven inertial sensing in chip-scale optomechanical cavities at the thermodynamical limits with extended dynamic range, *Laser & Photonic Rev.* **17**, 2200827 (2023).
13. K.-C. Chang, X. Cheng, M. C. Sarihan, and C. W. Wong, Towards optimum Franson interference recurrence in mode-locked singly-filtered biphoton frequency combs, *Photonics Res.* **11**, 1175 (2023).
14. X. Guo, X. Ji, B. Yao, T. Tan, A. Chu, O. Westreich, A. Dutt, C. Wong, and Y. Su, Ultra-wideband integrated photonic devices on silicon platform: from visible to mid-IR, *Nanophotonics* **12**, 167 (2023).
15. W. Wang, P.-K. Lu, A. K. Vinod, D. Turan, J. F. McMillan, H. Liu, M. Yu, D.-L. Kwong, M. Jarrahi, and C. W. Wong, Coherent terahertz radiation with 2.8-octave tunability through chip-scale photomixed microresonator optical parametric oscillation, *Nature Comms.* **13**, 5123 (2022).
16. Y. S. Jang, J. Lim, W. Wang, S. W. Kim, A. Savchenkov, A. B. Matsko, and C. W. Wong, Measurement of sub-fm/$Hz^{1/2}$ displacement spectral densities in ultrahigh-Q single-crystal microcavities with hertz-level lasers, *Photon. Res.* **10**, 1202 (2022).
17. Y. Cho, J. H. Kang, L. Liang, M. Taylor, X. Kong, S. Ghosh, F. Kargar, C. Hu, A. A. Balandin, A. A. Puretzky, N. Ni, and C. W. Wong, Phonon modes and Raman signatures of $MnBi_{2n}Te_{3n+1}$ (n = 1,2,3,4) magnetic topological heterostructures, *Phys. Rev. Res.* **4**, 013108 (2022).
18. H. Boo, Y. S. Lee, H. Yang, B. Matthews, T. G. Lee, and C. W. Wong, Metasurface wavefront control for high-performance user-natural augmented reality waveguide glasses, *Scientific Reports* **12**, 5832 (2022).
19. L.-Y. Chen, A. K. Vinod, J. F. McMillan, H. Yang, C. W. Wong, and C.-K. K. Yang, A pulsed-coherent lidar with sub-10 μm precision, *IEEE J. Solid-State Circuits* **57**, 2486 (2022).
20. K.-C. Chang, X. Cheng, M. C. Sarihan, A. Kumar, Y. S. Lee, T. Zhong, Y.-X. Gong, Z. Xie, J. H. Shapiro, F. N. C. Wong, and C. W. Wong, 648 Hilbert-space dimensionality in a biphoton frequency comb: entanglement of formation and Schmidt mode decomposition, *npj Quantum Information* **7**, 48 (2021).
21. Y. S. Jang, H. Liu, J. Yang, M. Yu, D.-L. Kwong, and C. W. Wong, Nanometric precision distance metrology via hybrid spectrally-resolved and homodyne interferometry in a single soliton frequency microcomb, *Phys. Rev. Lett.* **126**, 023903 (2021).
22. A. K. Vinod, S.-W. Huang, J. Yang, M. Yu, D.-L. Kwong, and C. W. Wong, Frequency microcomb stabilization via dual-microwave control, *Nature Comm. Phys.* **4**, 81 (2021).
23. O. Spitz, A. Herdt, J. Wu, G. Maisons, M. Carras, C. W. Wong, W. Elsaber, and F. Grillot, Private communications with quanutm cascade laser photonic chaos, *Nature Comms.* **12**, 3327 (2021).

24. K. Cai, P. Prarajuli, G. Long, C. W. Wong, and L. Tian, Robust preparation of many-body ground states in Jaynes-Cummings lattices, *npj Quantum Information* **7**, 96 (2021).
25. J. Huang, W. Liu, and C. W. Wong, Hydrodynamical self-interference of a scattered polariton quanta, *Nature - Light: Science & Applications* **9**, 154 (2020; News & Views).
26. J. Yang, S.-W. Huang, Z. Xie, M. Yu, D.-L. Kwong, and C. W. Wong, Coherent satellites in multi-spectral regenerative frequency microcombs, *Nature Communications Physics* **3**, 27 (2020).
27. Y. Li, S.-W. Huang, B. Li, H. Liu, J. Yang, A. K. Vinod, K. Wang, M. Yu, D.-L. Kwong, H. Wang, K. K.-Y. Wong, and C. W. Wong, Real-time transition dynamics and stability of chip-scale dispersion-managed frequency microcombs, *Nature - Light: Science & Applications* **9**, 52 (2020).
28. Y. Huang, J. G. Flor Flores, Y. Li, W. Wang, D. Wang, N. Goldberg, J. Zheng, M. Yu, M. Lu, M. Kutzer, D. Rogers, D.-L. Kwong, L. Churchill, and C. W. Wong, A chip-scale oscillation-mode optomechanical inertial sensor near the thermodynamical limits, *Laser & Photonics Review*s **14**, 1800329 (2020).
29. H. Zhou, Y. Geng, W. Cui, S.-W. Huang, Q. Zhou, K. Qiu, and C. W. Wong, Soliton bursts and deterministic dissipative Kerr soliton generation in auxiliary-assisted microcavities, *Nature - Light: Science & Applications* **8**, 50 (2019).
30. J. Lim, W. Liang, A. B. Matsko, L. Maleki, and C. W. Wong, Probing 10 microKelvin stability and residual drifts in cross-polarized dual-mode stabilization of single-crystal ultrahigh-*Q* optical cavities, *Nature - Light: Science & Applications* **8**, 1 (2019).
31. B. C. Yao, S. W. Huang, Y. Liu, A. K. Vinod, C. Choi, M. Hoff, Y. N. Li, M. Yu, D. L. Kwong, Y. Huang, Y. J. Rao, X. F. Duan, and C. W. Wong, Gate-tunable frequency combs in graphene-nitride microresonators, *Nature* **558**, 410 (2018).
32. B. C. Yao, Y. Liu, S.-W. Huang, C. Choi, Z. Xie, J. Flor Flores, Y. Wu, M. Yu, D.-L. Kwong, Y. Huang, Y. J. Rao, X. F. Duan, and C. W. Wong, Broadband gate-tunable THz plasmons in graphene heterostructures, *Nature Photonics* **12**, 22 (2018).
33. C. Choi, H.-C. Cheng, H. Kim, A. K. Vinod, S. Bae, J. Chae, Y. Kim, S.-W. Huang, X. Duan, T. Low, and C. W. Wong, Enhanced interlayer neutral excitons and trions in trilayer van der Waals heterostructures, *Nature: 2D Materials and Applications* **2**, 30 (2018).
34. T. Li, D. Mao, N. W. Petrone, R. Grassi. H. Hu, Y. Ding, Z. Huang, G.-Q. Lo, J. Hone, T. Low, C. W. Wong, and T. Gu, Spatially controlled electrostatic doping in graphene *p-i-n* junction for hybrid silicon photodiode, *Nature: 2D Materials and Applications* **2**, 36 (2018).
35. J. Lim, A. A. Savchenkov, E. Dale, W. Liang, D. Eliyahu, V. Ilchenko, A. B. Matsko, L. Maleki, and C. W. Wong, Chasing the thermodynamical noise limit in microresonators for ultrastable laser frequency stabilization, *Nature Communications* **8**, 8 (2017).
36. H. Zhou, S.-W. Huang, X. Li, J. F. McMillan, C. Zhang, K. K. Y. Wong, M. Yu, G.-Q. Lo, D.-L. Kwong, K. Qiu, and C. W. Wong, Real-time dynamics and cross-correlation gating spectroscopy of free-carrier Drude solitons, *Nature - Light: Science & Applications* **6**, e17008 (2017).
37. J. Wu, S.-W. Huang, Y. Huang, H. Zhou, J. Yang, J.-M. Liu, M. Yu, G. Lo, D.-L. Kwong, S. Duan, and C. W. Wong, Mesoscopic chaos mediated by Drude electron-hole plasma in silicon optomechanical oscillators, *Nature Communications* **8**, 15570 (2017).
38. B. Li, S.-W. Huang, Y. Li, C. W. Wong and K. Y. Wong, Panoramic reconstruction temporal imaging for seamless measurements of slowly-evolved femtosecond pulse dynamics, *Nature Communications* **8**, 61 (2017).
39. S.-W. Huang, J. Yang, S.-H. Yang, M. Yu, D.-L. Kwong, T. Zelevinsky, M. Jarrahi, and C. W. Wong, Globally stable microresonator Turing pattern formation for coherent high-power THz radiation on-chip, *Physical Review X* **7**, 041002 (2017).
40. S.-W. Huang, J. Yang, M. Yu, B. H. McGuyer, D.-L. Kwong, T. Zelevinsky, and C. W. Wong, *A broadband chip-scale optical frequency synthesizer at 2.7×10^{-16} relative inaccuracy*, *Science Advances* **2**, e1501489 (2016).
41. Z. Xie, T. Zhong, X. Xu, J. Liang, Y.-X. Gong, J. H. Shapiro, F. N. C. Wong, and C. W. Wong, Harnessing high-dimensional hyperentanglement through a biphoton frequency comb, *Nature Photonics* **9**, 536 (2015).

42. P. Hsieh, C. Chung, J. F. McMillan, M. Tsai, M. Lu, N. C. Panoiu, and C. W. Wong, Photon transport and localization in optical superlattices, *Nature Physics* **11**, 268 (2015).
43. S.-W. Huang, J. F. McMillan, J. Yang, A. Matsko, H. Zhou, M. Yu, D.-L. Kwong, L. Maleki, C. W. Wong, Mode-locking ultrashort pulse generation from on-chip normal dispersion microresonators, *Phys. Rev. Lett.* **114**, 053901 (2015).
44. Y.-C. Liu, X. Luan, H.-K. Li, Q. Gong, C. W. Wong, and Y.-F. Xiao, Coherent polariton dynamics in coupled highly-dissipative cavity quantum electrodynamics, *Phys. Rev. Lett.* **112**, 213602 (2014).
45. I. Sarpkaya, Z. Zhang, W. Walden-Newman, X. Wang, J. Hone, C. W. Wong, and S. Strauf, Prolonged spontaneous emission and dephasing of localized excitons in air-bridged carbon nanotubes, *Nature Communications* **4**, 2152 (2013).
46. Y.-C. Liu, X. Luan, Y.-F. Xiao, and C. W. Wong, Dynamic dissipative cooling of a mechanical oscillator in strong-coupling quantum optomechanics, *Phys. Rev. Lett.* **110**, 153606 (2013).
47. T. Gu, N. Petrone, J. F. McMillan, A. van der Zande, M. Yu, G. Q. Lo, D. L. Kwong, J. Hone, and C. W. Wong, Regenerative oscillation and four-wave mixing in graphene optoelectronics, *Nature Photonics* **6**, 554 (2012).
48. F. Gesuele, M. Y. Sfeir, W.-K. Koh, C. B. Murray, T. F. Heinz, and C. W. Wong, Ultrafast supercontinuum spectroscopy of carrier multiplication and biexcitonic effects in excited state PbS quantum dots, *Nano Letters* **12**, 2658 (2012).
49. S. Kocaman, M.S. Aras, P. Hsieh, J. F. McMillan, C. G. Biris, N. C. Panoiu, M. B. Yu, D. L. Kwong, A. Stein, and C. W. Wong, Zero phase delay in negative-index photonic crystal superlattices, *Nature Photonics* **5**, 499 (2011).
50. P. Colman, C. A. Husko, S. Combrié, I. Sagnes, C. W. Wong*, and A. De Rossi*, Temporal solitons and pulse compression in photonic crystal waveguides, *Nature Photonics* **4**, 862 (2010).
51. J. Y. Lee, B. H. Hong, W. Y. Kim, S. K. Min, Y. Kim, M. V. Jouravlev, R. Bose, L. J. Kaufman, C. W. Wong, P. Kim, and K. S. Kim, Near-field focusing and magnification through self-assembled nanoscale spherical lenses, *Nature* **460**, 498 (2009).
52. X. Yang, M. Yu, D.-L. Kwong, and C. W. Wong, All-optical analogue to electromagnetically induced transparency in multiple coupled photonic crystal cavities, *Phys. Rev. Lett.* **102**, 173902 (2009).
53. S. Kocaman, R. Chatterjee, N.-C. Panoiu, R. M. Osgood, M. Yu, D.-L. Kwong, and C. W. Wong, Observation of zero-*n* band gaps in photonic crystal superlattices, *Phys. Rev. Lett.* **102**, 203905 (2009).
54. R. Chatterjee, N.-C. Panoiu, K. Liu, Z. Dios, M. B. Yu, M. T. Doan, L. Kaufman, R. M. Osgood, and C. W. Wong, Achieving sub-diffraction imaging through bound surface states in negative refraction photonic crystals in the near-infrared range, *Phys. Rev. Lett.* **100**, 187401 (2008).

PROFESSIONAL ACTIVITIES

1. Organizing committees of various leading international optics and optoelectronics conferences (2004 – current): SPIE Optics and Photonics; Conference on Lasers and Optoelectronics and International Quantum Electronics Conference (CLEO/QELS); International Union of Radio Science (URSI) Commission D on Electronics and Photonics; 2D Materials and Optoelectronics; IEEE Photonics Conference; Energy Materials and Nanotechnology Meetings on Ultrafast, Quantum Information, and Nanomaterials; Integrated Photonics and Nanophotonics Research and Applications (IPNRA), Asia-Pacific Optical Communications; International Conference on Materials for Advanced Technologies (ICMAT), various other optoelectronics and communications conferences.
2. Led NSF workshop on quantum communications (ACQUIRE program; 2019). Co-led NSF workshop on wireless communications (SpecEES program; 2020).

3. Topical editor and editorial board for various journals and books: Nature Scientific Reports, Optics and Photonics Letters; Advances in Optics, Nanoscience and Nanotechnology Letters. Books: Electromagnetism and metamaterials; Nonlinear fiber optics and communications, amongst others.
4. Reviewer for lead journals (2004 – current): Nature series such as Nature, Nature Physics, Nature Photonics, Nature Materials, Nature Communications, Nature Light: Science & Applications, Scientific Reports etc; Science series including Science Advances; Physical Review Letters and Phys. Rev. series, Applied Physics series, Nanoscience and Nanotechnology series, and others including physical chemistry, microelectromechanical systems, and applied mathematics.
5. Reviewer in various international and domestic research funding panels (2004 – current).
6. Global Foundries Visiting Professor, National University of Singapore, (2018 – present).

UCLA Physical & Wave Electronics Area Director (2024 – present).
UCLA Quantum Innovation Hub Co-Director (2024 – present).
UCLA Electrical Engineering, Faculty Search Committee (2023 – present; 2016 - 2022).
UCLA Academic Senate - Legislative Assembly (2021 – present).
UCLA Electrical Engineering, Undergraduate Fast Track Committee (2016 - present).
Faculty Executive Committee, UCLA Henry Samueli School of Engineering (2015 – 2018).
Co-Chair, UCLA Electrical Engineering, Annual Research Review (2016 – 2017).
UCLA Electrical Engineering, New Curriculum Committee jointly with Materials Science (2018 – 2019).
Columbia Fu Foundation School of Engineering, Dean's Faculty Advisory Committee (2009 – 2012).

POST-DOCTORAL, GRADUATE AND UNDERGRADUATE STUDENT ADVISING

Research scientists and post-doctoral research associates (current):
1. Dr. Kai-Chi Chang (Ph.D. Optics 2022)
2. Dr. Xiang Cheng (Ph.D. Physics 2019)
3. Dr. Hyunpil Boo (Ph.D. Optical nanomaterials 2023)
4. Dr. Jin Ho Kang (Ph.D. Optics 2024)

Ph.D students (current):
1. Kemal Enes Akyuz (Ph.D. candidate)
2. Alwaleed Aldhafeeri (Ph.D. candidate Kuwaiti Fellowship)
3. Yujie Chen (Ph.D. candidate)
4. Hsiao-Hsuan Chin (Ph.D. candidate Physics; NSF-UCLA Quantum Fellowship)
5. Cody S. Fan (Ph.D. candidate; NSF GRFP and NRT Fellowships)
6. Wei-Che Hsu (Ph.D. candidate)
7. Renjie Kang (Ph.D. candidate)
8. Chia-Yi Lee (Ph.D. candidate)
9. Dong-IL Lee (Ph.D. candidate)
10. Andrew Hao-Che Lin (Ph.D. candidate; NSF NRT Fellowship)
11. Wenzheng Liu (Ph.D. candidate)
12. Tristan Melton (Ph.D. candidate; SMART Fellowship)
13. Alexiy Samoylov (Ph.D. candidate; NSF-UCLA Quantum Fellowship)
14. Sophi C. Song, (Ph.D. candidate; NSF NRT Fellowship)
15. Ningning Wang (Ph.D. candidate)
16. Talha Yerebakan (Ph.D. candidate)

M.S. students (current):
1. Cennet Tugce Duran (M.S. candidate 2024; Fulbright Fellowship).
2. Rita Gimelshein (M.S. candidate 2024)

3. Qiyu Leo Liu (M.S. candidate 2024)

Post-doctoral research associates (alumni):

1. Dr. Hangbo Yang (Ph.D. Optics 2017). Position: **Research Associate Professor**, University of Florida, 2023.
2. Dr. Jaime Gonzalo Flor Flores (Ph.D. Optics 2022). Position: Senior engineer, Bay Area.
3. Dr. Wenting Wang (Ph.D. Ultrafast Optics 2017). Position: Associate group leader, Optoelectronics, Chinese Academy of Sciences, Beijing, China, August 2022.
4. Dr. James F. McMillan (Ph.D Optics 2019). Position: Chief Architect Office, Rockley Photonics, August 2021.
5. Dr. Yujin Cho (Ph.D. Physics 2019). Position: Research Scientist, Lawrence Livermore National Laboratory, 2021.
6. Dr. Wei Liu (Ph.D. Physics 2019). Position: Research Scientist, Lawrence Berkeley National Laboratory, 2021.
7. Dr. Yoo Seung Lee (Ph.D. Electrical Engineering 2011). Position: Senior Engineer, Samsung Electronics, Korea.
8. Dr. Jinghui Yang (Ph.D. E.E. & Optics 2017). Position: photonics startup company in Bay Area, CA. Prior: Research Scientist, National Institute of Science and Technology, Gaithersburg, MD.
9. Dr. Yoon-Soo Jang (Ph.D. Optics 2017). Position: Senior Research Scientist, Korea Institute of Science and Technology.
10. Dr. Jinkang Lim (Ph.D. Optics 2011). Position: Senior Research Scientist, LGS Innovations.
11. Prof. Shu-Wei Huang (Ph.D. Optics 2012), Air Force Young Investigator Award (2015). Position: **Assistant Professor**, Electrical, Computer and Energy Engineering, University of Colorado at Boulder.
12. Prof. Yongnan Li (Ph.D.Physics 2007). Position: **Professor of Optics**, School of Physics, Nankai University.
13. Prof. Zhenda Xie (Ph.D. Physics 2011). Position: **Professor**, Schools of Electrical Engineering and Physics, Nanjing University.
14. Prof. Jiagui Wu (Ph.D. Optics 2013). Position: **Professor**, School of Physics, Southwest University.
15. Prof. Junbo Yang (Ph.D. Optics 2008). Position: **Professor**, National University of Defense Technology and Peking University.
16. Prof. Felice Gesuele (Ph.D. Applied Physics 2009). Position: **Associate Professor**, Physics, University of Naples Federico II.
17. Dr. Jiangjun Zheng (Ph.D. Optics 2009). Position: Amazon. Prior: Senior Scientist, Brion Technologies.
18. Dr. Junlin Liang (Ph.D. Physics 2012).
19. Prof. Xiujian Li (Ph.D Optics Engineering 2007), Position: **Professor**, Applied Physics, Institute of Tech-Physics, National University of Defense Technology, China.
20. Dr. Andrzej Veitia (Ph.D. Physics 2010), Position: Psi Quantum. Prior: Post-doctoral Research Scientist: UC Riverside, California and University of Oregon.
21. Prof. Fangwen Sun (Ph.D. Physics 2007), Position: **Professor**, Physics, University of Science and Technology, China.
22. Prof. Yunfeng Xiao (Ph.D. Physics 2007), Position: **Professor**, Physics, Peking University, China.
23. Prof. Jing Shu (Ph.D. Physics 2007), Position: **Associate Professor**, Optoelectronic Materials and Devices, Nanjing University of Science and Technology, China.
24. Dr. Kai Liu (Ph.D. Physics 2005). Optical – terahertz spectroscopy.

Visiting faculty and scientists (alumni):

1. Prof. Serge Massar (Ph.D. Physics 1995), currently: Professor, Université libre de Bruxelles, Belgium, visiting period: October 2022.
2. Dr. Aveek Chandra (Ph.D. Physics 2017), currently: Research Scientist, National University of Singapore, visiting period: September 2022 – June 2023.

3. Prof. Guangjun Wen (Ph.D. Electrical Engineering 1998), currently: Professor, University of Electronic Science and Technology of China, visiting period: April - May 2015.

Ph.D. students (alumni):

1. Dr. Murat Can Sarihan (Ph.D. E.C.E 2024; Fulbright and Dean's Fellowship; Departmental Prize), Building blocks for a high-dimensional quantum network. Position: research scientist, Google Quantum AI.
2. Dr. Jiahui Huang (Ph.D. E.C.E. 2024) Exciton-polariton complexes in chip-scale cavity quantum electrodynamics: localized single-site arrays and color centers. Position: research scientist, Xi'An National Laboratory, China.
3. Dr. Jaime Gonzalo Flor Flores (Ph.D. E.C.E. 2022; Fulbright Fellowship), Resolving atto-Newton forces and femtometer motional displacement in chip-scale cavity optomechanics. Position: postdoctoral research scientist, UCLA Mesoscopic Optics and Quantum Electronics Laboratory.
4. Dr. Kai-Chi Chang (Ph.D. E.C.E. 2022; Taiwan Ministry of Education Fellowship), High-dimensional quantum information processing with time-frequency qudits. Position: postdoctoral research scientist, UCLA Mesoscopic Optics and Quantum Electronics Laboratory.
5. Dr. Hao Liu (Ph.D. E.E. 2022; CSC Fellowship), Frequency comb generation in dispersion engineered Si_3N_4 microresonators and their applications. Position: research scientist, Huawei Research, Dongguan, China.
6. Dr. Abhinav Kumar Vinod (Ph.D. E.E. 2022; Guru Krupa Fellowship), Stabilization, control and ultrafast dynamics of microresonator optical frequency combs. Position: research scientist, Intel Chief Technology Office, Santa Clara, CA.
7. Dr. James F. McMillan (Ph.D. E.E. 2019; Columbia University), Investigations of nonlinear optical phenomenon and dispersion in integrated photonic devices. Position: Chief Architect Office, Rockley Photonics, August 2021. Prior: postdoctoral research scientist, UCLA Mesoscopic Optics and Quantum Electronics Laboratory.
8. Dr. Jinghui Yang (Ph.D. E.E. 2017; Distinguished PhD Dissertation Award, UCLA; SPIE Scholarship; Samueli Foundation Fellowship; CESASC Scholarship), Chip-scale architectures for precise optical frequency synthesis. Position: photonics startup company in Bay Area, CA. Prior: research scientist, National Institute of Science and Technology, Gaithersburg, MD. Lab Manager, UCLA Mesoscopic Optics and Quantum Electronics Laboratory.
9. Dr. Obafunso Demi Ajayi (Ph.D. M.E. 2016; NSF and IGERT Fellowship; co-advised), Optical studies of excitonic effects at two-dimensional nanostructure interfaces. Position: Columbia Technology Ventures.
10. Dr. Ying Li (Ph.D. M.E. 2016; co-advised), Silicon photonic devices and their applications. Position: Google Inc. Formerly: Bloomberg LP.
11. Prof. Tingyi Gu (Ph.D. E.E. 2014; IEEE and SPIE Fellowships), Chip-scale low-dimensional materials: optoelectronics and nonlinear optics. Position: **Assistant Professor**, Electrical & Computer Engineering, University of Delaware, Prior: Postdoctoral research scientist, Princeton University and HP Labs.
12. Dr. Pin-Chun Hsieh (Ph.D. M.E. 2014), Photon transport in disordered photonic crystals. Position: Quantumstone Research, Taiwan.
13. Prof. Serdar Kocaman (Ph.D. E.E. 2011), On-chip group and phase velocity control for classical and quantum optical devices. Position: **Associate Professor**, Electrical and Electronics Engineering, Middle East Technical University, Turkey. Prior: Adjunct Professor, Columbia University.
14. Prof. Jie Gao (Ph.D. Appl. Phys. and Appl. Math. 2011), Chip-scale photonic devices for light-matter interactions and quantum information processing. Position: **Associate Professor**, Stony Brook University, Long Island, New York, USA. Prior: Assistant Professor, Mechanical and Aerospace Engineering, Missouri University of Science and Technology, USA.
15. Dr. Charlton J. Chen (Ph.D. Appl. Phys. and Appl. Math. 2011), Precision Tuning of Silicon Nanophotonic Devices through Post-Fabrication Processes.

16. Dr. Chad A. Husko (Ph.D. Appl. Phys. and Appl. Math. 2010), Ultrafast nonlinear optics in III-V photonic crystals. Currently: Founder of startup company. Position: Founder, Iris Light Technologies. Prior: Staff Scientist and Abrikosov Fellow, Argonne National Laboratory; Postdoctoral Fellow, University of Sydney, Physics and Centre for Ultrahigh bandwidth Devices for Optical Systems.
17. Dr. Ranojoy Bose (Ph.D. M.E. 2009; IEEE Fellowship), Solution-process colloidal lead sulfide quantum dots for near-infrared quantum information processing applications. Position: Apple. Prior: Staff Scientist, Hewlett-Packard Laboratories, Palo Alto, CA; Assistant Research Scientist, Joint Quantum Institute / Electrical Engineering, University of Maryland at College Park.
18. Dr. Rohit Chatterjee (Ph.D. M.E. 2008; with distinction), Micro- and nano-scale optical devices for high density photonic integrated circuits at near-infrared wavelengths. Position: Keystone Strategy. Prior: Associate, McKinsey & Company.
19. Prof. Xiaodong Yang (Ph.D. M.E. 2008; with distinction; Intel Fellowship), Controlling light with high-*Q* silicon photonic crystal nanocavities: photon confinement, nonlinearity and coherence. Position: **Associate Professor**, Mechanical and Aerospace Engineering, Missouri University of Science and Technology, USA.

Ph.D. students (alumni; exchange program):

1. Dr. Futai Hu (Ph.D. Ultrafast Optics; Tsinghua University, Beijing, China)
2. Dr. Qingsong Bai (Ph.D. Optics, University of Electronic Science and Technology of China).
3. Dr. Xuan Cui (Ph.D. Physics, Harbin Institute of Technology).
4. Dr. Olivier Spitz (Ph.D. Optics, Télécom Paris Tech).
5. Dr. Martin Romme Henriksen (Ph.D. Quantum Optics, Niels Bohr Institute).
6. Dr. Baicheng Yao (Ph.D. E.E., University of Electronic Science and Technology of China). Currently: **Professor**, Electrical Engineering, University of Electronic Science and Technology of China & Research Associate, Cambridge Graphene Center.
7. Bowen Li (Ph.D. E.E., University of Hong Kong).
8. Dr. Yongjun Huang (Ph.D. E.E., University of Electronic Science and Technology of China). Currently: **Associate Professor**, Electrical Engineering, University of Electronic Science and Technology of China.
9. Prof. Hao Zhou (Ph.D. E.E. 2015; Sichuan University). Currently: **Associate Professor**, Electrical Engineering, Sichuan University.
10. Prof. Heng Zhou (Ph.D. E.E 2013, University of Electronic Science and Technology of China). Currently: **Associate Professor**, Electrical Engineering, University of Electronic Science and Technology of China.
11. Yong-Chun Liu (Ph.D. Physics, Peking University). Currently: **Associate Professor**, Electrical Engineering, Tsinghua University.

SELECTED JOURNAL PUBLICATIONS AND BOOK CHAPTERS

1. B.-C. Yao, W.-T. Wang, Z.-D. Xie, Q. Zhou, T. Tan, H. Zhou, G.-C. Guo, S.-N. Zhu, N.-H. Zhu, and C. W. Wong, Interdisciplinary advances in microcombs: bridging physics and information technology, *eLight* **4**, 19 (2024).
2. F. Hu, A. K. Vinod, W.-T. Wang, H.-H. Chin, J. F. McMillan, Z. Zhan, Y. Meng, M. Gong, and C. W. Wong, Spatio-temporal breather dynamics in microcomb soliton crystals, *Nature Light: Science & Applications* **13**, 251 (2024).
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6. A. Aldhafeeri, H.-H. Chin, T. Melton, D.-I. Lee, A. Chu, W.-T. Wang, M. Yu, P. G.-Q. Lo, D.-L. Kwong, and C. W. Wong, Low phase noise K-band signal generation using polarization diverse single-soliton integrated microcombs, *Photonics Research* **12**, 1175 (2024).
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8. J. Huang, W. Liu, M. C. Sarihan, A. Miranda, B. Dwir, A. Rudra, E. Kapon, and C. W. Wong, Exciton-photon dynamics of single site-controlled quantum dot-nanocavity in the coexisting strong-weak coupling regime, *New J. Phys.* **25**, 033015 (2023).
9. X. Cheng*, K.-C. Chang*, M. C. Sarihan, F. N. C. Wong, J. H. Shapiro, A. Faraon, and C. W. Wong, High-dimensional time-frequency entanglement in singly-resonant biphoton frequency comb, *Nature Comms. Phys.* **6**, 278 (2023).
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SELECTED INVITED TALKS AND PAPERS

1. C. W. Wong, *Fundamentals and applications in laser frequency microcombs*, Photonics West Conference, San Francisco, CA, January 2023 (invited).
2. A. B. Matsko, J. Flor Flores, T. Yerabakan, and C. W. Wong, *Nanophotonic accelerometer for a compact PNT module*, JPL CubeSat Forum, Pasadena, CA, December 2022 (invited).
3. C. W. Wong, *Ultrafast precision measurements in laser frequency microcombs: romance in the precision of time*, IEEE Photonics Conference, Vancouver, Canada, November 2022 (invited).

4. Jin Ho Kang, Madeline Taylor, Yujin Cho, Abhinav Vinod, Futai Hu, and Chee Wei Wong, *Heterogeneous layered atomic materials for nonlinear nanophotonics*, 2nd global summit and expo on graphene and 2D materials (2D Mat 2022), Edinburgh, Scotland, August 2022 (invited).
5. Chee Wei Wong, Kai-Chi Chang, Xiang Cheng, Murat C. Sarihan, *648-Hilbert space dimensionality in biphoton frequency combs for quantum-secure communications and networks*, *SPIE Photonics West*, San Francisco, CA, January 2022 (invited).
6. C. W. Wong, *Ultrafast nonlinearities and dispersion control for signal processing*, Lawrence Livermore National Laboratory, Livermore, CA, October 2021 (invited).
7. C. W. Wong, *Microcavity frequency combs: precision ultrafast measurements and stabilization*, Asia Communications and Photonics Conference, Shanghai, China (online), October 2021.
8. C. W. Wong, J. Flor Flores, T. Yerebakan, J. F. McMillan, and A. Matsko, Chip-scale optomechanics for precision navigation, *Proceedings of Conference of Lasers and Electro-Optics*, San Jose, CA (online), May 2021.
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16. C. W. Wong, High-dimensional frequency combs and stabilization, *California Institute for Quantum Entanglement annual meeting*, Berkeley, CA, March 2020 (invited).
17. O. Spitz, A. Herdt, J. Wu, G. Maisons, M. Carras, C.-W. Wong, W. E. Elsässer, and F. Grillot, Peculiarities and predictions of rogue waves in mid-infrared quantum cascade lasers under conventional optical feedback, *Photonics West (Quantum Cascade Lasers I)*, San Francisco, CA, February 2020 (invited).
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20. Jiagui Wu and C. W. Wong, Dynamical chaos in silicon micro-cavity optomechanics for physically-enhanced information processing, *Photonics West (Ultrafast phenomena and nanophotonics)*, San Francisco, CA, February 2020 (invited).
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24. C. W. Wong, Ultrafast solitons and frequency combs in graphene-nitride heterostructures, *2D Materials*, Sochi, Russia, September 2019 (keynote speaker).
25. C. W. Wong, Ultrafast mode-locking and high-dimensional entanglement in mesoscale frequency combs, *National University of Singapore*, Singapore, Singapore, August 2019.
26. C. W. Wong, Quantum Science and Engineering: Measurements at the Precision Frontiers, *Singapore Global Submit*, Singapore, Singapore, August 2019.
27. C. W. Wong, J. Yang, and H. Liu, Chip-scale generation of coherent THz frequency combs and radiation, *IEEE Research and Applications of Photonics in Defense*, Florida, USA, August 2019 (invited).
28. C. W. Wong, Ultrafast dynamics in chip-scale laser frequency combs, *IEEE Summer Topical Meeting*, Florida, USA, July 2019 (keynote speaker).
29. C. W. Wong, Mesoscopic frequency combs: ultrafast precision clocks and quantum communications, *Nanyang Technological University*, Singapore, Singapore, June 2019.
30. C. W. Wong, A. K. Vinod, J. Yang, Y. Li, S.-W. Huang, H. Liu, W. Wang, B. Li, and K. K. Y. Wong, Dynamical evolution in Kerr frequency combs, International Union of Radio Science - Asia Pacific Radio Science Meeting, New Delhi, India, March 2019 (invited).
31. C. W. Wong, Stepping up to the surface: graphene gate-tunable frequency combs and THz generation, *Photonics West (2D Photonic Materials and Devices II)*, San Francisco, CA, January 2019 (invited).
32. C. W. Wong, Ultrafast solitons and soliton crystals in 2D hybrids, *Nanophotonics of 2D materials*, Shanghai, China, January 2019 (invited).
33. C. W. Wong, Understanding pattern formation and ultrafast dynamics in chip-scale nonlinear oscillators, *International Conference on Applications in Nonlinear Dynamics*, Maui, HI, August 2018 (invited).
34. J. Lim, A. A. Savchenkov, W. Liang, A. Matsko, L. Maleki, and C. W. Wong, Measurements of thermodynamical noise and drift in mesoscale cavities with quality factors in excess of 1 billion, *Proc. of Conf. on Lasers and Electro-Optics*, San Jose, CA, May 2018 (invited).
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42. C. W. Wong, Optoelectronics and excitons in two-dimensional heterostructures, *Nanophotonics of 2D materials*, San Sebastián, Spain, August 2017 (invited).
43. A. K. Vinod, S.-W. Huang, J. Yang, J. Lim, and C. W. Wong, Precision measurements and ultrafast optics in microcavity frequency combs, *XXXII URSI General Assembly and Scientific Symposium*, Montreal, Canada, August 2017 (invited).
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71. C. W. Wong, T. Gu, N. Shi, S.-W. Huang, Hao Zhou, F. Gesuele, J. F. McMillan and O. Ajayi, Graphene optoelectronics and photonics, *SPIE Optics and Photonics Congress*, San Diego, CA, August 2013 (invited).
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75. C. W. Wong, J. Gao, and O. A. Ajayi, Individual quantum dot spectroscopy: slow-light polaritons and energy transfer dynamics, *Single Molecule Microscopy Tools for Materials Science and Life Sciences, 2013 Brookhaven NSLS/CFN workshop*, Stony Brook, NY, May 2013 (invited).
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80. C. W. Wong, Ultrafast dynamics of graphene and nanomaterials, Joint workshop on nanoscience and nanotechnology opportunities for academia and high tech industry, *Brookhaven National Laboratory*, Upton, NY, January 2013 (invited).
81. C. W. Wong, Controlling photons on-chip: ultrafast, nonlinear, quantum and precision measurements, *Texas Tech University, Electrical and Computer Engineering*, Lubbock, TX, November 2012 (invited).
82. C. W. Wong, Nonlinear and cavity quantum electrodynamics in mesoscopic photonic crystals, *International Conference of Young Researchers on Advanced Materials*, *Materials Research Society,* Singapore, July 2012 (invited; keynote talk).
83. C. W. Wong, J. F. McMillan, T. Gu, M. Marko, X. Li, P. Hsieh, and S. Kocaman, Ultrafast nonlinearities and dispersion in slow-light photonic crystal lattices, *Integrated Photonics Research, Silicon and Nano Photonics*, Colorado Springs, CO, June 2012 (invited).
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86. C. W. Wong, Controlling photons in mesoscopic nanostructures, *University of Science and Technology of China, Department of Physics,* Hefei, China, May 2012 (invited).
87. C. W. Wong, T. Gu, P. Hsieh, J. F. McMillan, A. Dadgar, Y. Li, X. Li, M. Marko, N. Shi, A. Veitia, Z. Xie, X. Xu, J. Yang, and J. Zheng, Nonlinear and quantum optics in mesoscopic photonic nanostructures, *The 6th International Conference on Nanophotonics,* Beijing, China, May 2012 (invited).
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91. C. W. Wong, J. Zheng, J. Shu, Y. Li, and J. Gao, Cavity optomechanics in photonic crystals, *Phononics 2011: The First International Conference on Phononic Crystals, Metamaterials and Optomechanics*, Santa Fe, New Mexico, May 2011 (invited).
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95. C. W. Wong, Controlling light in photonic crystal nanostructures, *Department of Physics and Engineering Physics, Stevens Institute of Technology*, Hoboken, NJ, November 2010 (invited).
96. C. W. Wong, Controlling light in photonic crystals, *Bell Labs, Alcatel – Lucent*, Crawford Hill, NJ, May 2010 (invited).

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106. C. W. Wong, Controlling Light with Photonic Crystal Nanostructures: Dispersion, Nonlinear and Nonclassical Optics, *Yale University, Solid-State and Optics seminar series,* New Haven, CT, January 2009 (invited).
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109. C. W. Wong, Engineering photons for nonlinear dynamics, *Rutgers Distinguished Lecture Series*, Rutgers University, Piscataway, New Jersey, November 2008 (invited).
110. C. W. Wong, Controlling light with silicon nanostructures: dispersion, nonlinear and nonclassical optics, *Quantum Information/Bose-Einstein Condensation seminar series*, Joint Quantum Institute (National Institute of Standards and Technology / Laboratory for Physical Sciences / University of Maryland), Gaithersburg, Maryland, August 2008 (invited).
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127. G. Barbastathis, G. Nielson, and C. W. Wong, Three-dimensional Optics, in *Proceedings of International Display Workshops and Asia Display 2005,* Takamatsu, Japan, December 2005 (invited).
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SELECTED CONFERENCE PULICATIONS

1. M. Taylor, K. Yu, M. C. Sarihan, J. H. Kang, A. Banerjee, C. S. Fan, D. Lidar, and C. W. Wong, Universally robust control sequences for high-dimensional superconducting qubits, *American Physical Society March meeting*, paper N71.00009, Las Vegas, NV, March 2023.
2. K. Yu, M. C. Sarihan, M. Taylor, J. H. Kang, A. Banerjee, C. S. Fan, J. DuBois, Y. Rosen, and C. W. Wong, Modeling decoherence processes in high-dimensional superconducting circuits using master equations and quantum trajectory approach, *American Physical Society March meeting*, paper T75.00003, Las Vegas, NV, March 2023.
3. M. C. Sarihan, K. Yu, M. Taylor, A. Banerjee, J. H. Kang, C. S. Fan, and C. W. Wong, Planar multi-mode superconducting circuit design for high-dimensional computation, *American Physical Society March meeting*, paper D75.00011, Las Vegas, NV, March 2023.
4. J. H. Kang, M. C. Sarihan, K. Yu, M. Taylor, A. Banerjee, C. S. Fan, and C. W. Wong, Decoherence mitigation via logical qubits encoded over multi-mode superconducting qubits, *American Physical Society March meeting*, paper Q73.00004, Las Vegas, NV, March 2023.
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PATENTS AND PATENT APPLICATIONS

26 awarded and 7 provisional patents on optics in mesoscopic systems: ultrafast, nonlinear, quantum and precision measurements.