

# Curriculum Vitae

Ite A. Yu

余怡德

## Education

Ph.D. in Physics, Massachusetts Institute of Technology (1993).

B.S. in Physics, National Tsing Hua University (1984).

## Employment

2018/8-present Tsing Hua Chair Professor, National Tsing Hua University.

2005/8-present Professor, National Tsing Hua University.

2015/8-2018/7 Distinguished Professor, National Tsing Hua University.

2000/8-2005/7 Associate Professor, National Tsing Hua University.

1995/8-2000/7 Associate Professor A (tenure track), National Tsing Hua University.

1993/11-1995/7 Postdoctoral Researcher, Harvard-Smithsonian Center for Astrophysics.

## Honors and Awards

- Fellow of the Optical Society of America (OSA) since 2018.
- Fellow of the Taiwan Physical Society since 2014.
- Outstanding Research Award, Ministry of Science and Technology (2016).
- Outstanding Research Award, National Science Council (2012).
- Outstanding Scholar Award, Foundation for the Advancement of Outstanding Scholarship (2016).
- Outstanding Scholar Award, Foundation for the Advancement of Outstanding Scholarship (2013).
- Chief Principle Investigator, the Project of Academic Summit Program – “Manipulation of Quantum Information with Flying Qubits”, Ministry of Science and Technology (2018/8–2023/7).
- Chief Principle Investigator, the Project of Science Vanguard Research Program–“Applications of EIT-based Photonic Storage in Quantum Information Manipulation”, Ministry of Science and Technology (2014/8-2018/7).
- Chief Principle Investigator, the Project of Science Vanguard Research Program–“Frontier Study on Quantum Information Science”, National Science Council (2008/8-2012/7).
- Tsing Hua Chair Professor, National Tsing Hua University since 2018.
- Distinguished Professor, National Tsing Hua University since 2015.
- National Tsing Hua University Outstanding Mentor Award (2009).

## Professional Service

- Chairman of Department of Physics and Director of Institute of Astronomy, National Tsing Hua University (2017/8-2020/7).
- Co-PI, Center for Quantum Technology, funded by the Ministry of Education and the Ministry of Science and Technology, (2018/1-present).
- Editor, Chinese Journal of Physics (2006/1-2018/12).
- Executive Editor, Chinese Journal of Physics (2016/1-2016/12).
- Director of the Division of Academy, the Physical Society of R. O. C. Taiwan (2014/2-2016/1).
- Executive Board Member, the Physical Society of R. O. C. Taiwan (2014/2-2016/1).
- Convener of the Physics Panel, the Ministry of Science and Technology, Taiwan (2011/1~2013/12).
- Physics Panel Member, the Ministry of Science and Technology, Taiwan (2008/1-2010/12).
- Director of the Division of International and Continuing Education, National Tsing Hua University (2006/3-2007/8).

## Research Interests

Quantum optics, quantum information manipulation, electromagnetically induced transparency (EIT), slow light, stored light, low-light-level nonlinear optics, quantum memory, and cold atoms.

## Representative Publications (\*: corresponding author)

- [1] C.-Y. Hsu, Y.-S. Wang, J.-M. Chen, F.-C. Huang, Y.-T. Ke, E. K. Huang, W. Hung, K.-L. Chao, S.-S. Hsiao, Y.-H. Chen, C.-S. Chuu, Y.-C. Chen, Y.-F. Chen, I. A. Yu,\* “Generation of sub-MHz and spectrally-bright biphotons from hot atomic vapors with a phase mismatch-free scheme,” *Opt. Express* 29, 4632 (2021). **Editors’ Pick.**
- [2] Y. F. Hsiao, P. J. Tsai, H. S. Chen, S. X. Lin, C. C. Hung, C. H. Lee, Y. H. Chen, Y. F. Chen, I. A. Yu,\* and Y. C. Chen,\* “Highly Efficient Coherent Optical Memory Based on Electromagnetically Induced Transparency,” *Phys. Rev. Lett.* 120, 183602 (2018). **Highly Cited Paper in the Web of Science.**
- [3] Z. Y. Liu, Y. H. Chen, Y. C. Chen, H. Y. Lo, P. J. Tsai, I. A. Yu,\* Y. C. Chen, and Y. F. Chen,\* “Large Cross-Phase Modulations at the Few-Photon Level,” *Phys. Rev. Lett.* 117, 203601 (2016). **Editors’ Suggestion; Selected for a Viewpoint in *Physics*.**
- [4] M. J. Lee, J. Ruseckas, C. Y. Lee, V. Kudriašov, K. F. Chang, H. W. Cho, G. Juzeliūnas, and I. A. Yu,\* “Experimental demonstration of spinor slow light,” *Nature Commun.* 5, 5542 (2014).
- [5] Y. H. Chen, M. J. Lee, I. C. Wang, S. Du, Y. F. Chen, Y. C. Chen, and I. A. Yu,\* “Coherent Optical Memory with High Storage Efficiency and Large Fractional Delay” *Phys. Rev. Lett.* 110, 083601 (2013). **The 2013 May issue of Aisa Pacific Physics Newsletter reports this work in *research highlights*.**
- [6] Y. H. Chen, M. J. Lee, W. Hung, Y. C. Chen, Y. F. Chen, and I. A. Yu,\* “Demonstration of the

Interaction between Two Stopped Light Pulses,” **Phys. Rev. Lett.** 108, 173603 (2012). **The 2012 April issue of Nature Physics reports this work in *research highlights* with the title of “Frozen light switch”.**

- [7] C. Belthangady,\* C. S. Chuu, I. A. Yu, G. Y. Yin, J. M. Kahn, and S. E. Harris, “Hiding Single Photons with Spread Spectrum Technology,” **Phys. Rev. Lett.** 104, 223601 (2010). **The 2010 June issue of Nature Physics reports this work in *research highlights* with the title of “Photon in a haystack”.**
- [8] Y. W. Lin, W. T. Liao, T. Peters, H. C. Chou, J. S. Wang, H. W. Cho, P. C. Kuan, and I. A. Yu,\* “Stationary Light Pulses in Cold Atomic Media and without Bragg Gratings,” **Phys. Rev. Lett.** 102, 213601 (2009).
- [9] Y. F. Chen, C. Y. Wang, S. H. Wang, and I. A. Yu,\* “Low-Light-Level Cross-Phase-Modulation Based on Stored Light Pulses,” **Phys. Rev. Lett.** 96, 043603 (2006).

### **Invited Talks in International Conferences since 2014**

- The 8th International Symposium on Cold Atom Physics, Wuhan, (2018/6).
- SPIE Photonic West 2016, San Francisco, U. S. A. (2016/2).
- The 11th Conference on Lasers and Electro-Optics Pacific Rim (CLEO-PR), Busan, Korea (2015/8).
- The 8th Asia-Pacific Conference and Workshop on Quantum Information Sciences (APCWQIS 8), Tainan, Taiwan (2014/12).
- The 11th Asian International Conference on Atomic and Molecular Sciences (AISAMP 11), Sendai, Japan (2014/10).
- SPIE Photonic West 2014, San Francisco, U. S. A. (2014/2).

### **Services for Major International Conferences since 2014**

- The Conference on Lasers and Electro-Optics (CLEO) 2017, FS 1: Quantum Optics of Atoms, Molecules and Solids, San Jose, U. S. A. (2017/5). [Program Committee Member].
- CLEO 2017: Special Symposium on Sources of Nonclassical Light and their Scalability, San Jose, U. S. A. (2017/5). [Organizer]
- The 16th Asian Quantum Information Science Conference (AQIS), Taipei, Taiwan (2016/8). [Organizing Committee Member]
- The Conference on Lasers and Electro-Optics (CLEO) 2016, FS 1: Quantum Optics of Atoms, Molecules and Solids, San Jose, U. S. A. (2016/6). [Program Committee Member]
- The 11th Conference on Lasers and Electro-Optics Pacific Rim (CLEO-PR), Busan, Korea (2015/8). [Short Course Lecturer of “Slow, Stored, and Stationary Light in Cold Atoms”]
- The Conference on Lasers and Electro-Optics (CLEO) 2015, FS 1: Quantum Optics of Atoms, Molecules and Solids, San Jose, U. S. A. (2015/6). [Program Committee Member]

## Publications since 2016 (\*: corresponding author)

1. K.-T. Chen, B. Kim, C.-C. Su, S.-S. Hsiao, S.-J. Huang, W. T. Laio, and I. A. Yu,\* “Accumulation phenomenon of dipole-dipole interaction induced by dark Rydberg atoms,” arXiv:2110.06600.
2. J.-M. Chen, C.-Y. Hsu, W.-K. Huang, S.-S. Hsiao, F.-C. Huang, Y.-H. Chen, C.-S. Chuu, Y.-C. Chen, Y.-F. Chen, and I. A. Yu,\* “Room-temperature entangled-photon source with a spectral brightness near the ultimate limit,” arXiv:2109.09062.
3. B. Kim, K.-T. Chen, S.-S. Hsiao, S.-Y. Wang, K.-B. Li, J. Ruseckas, G. Juzeliūnas, T. Kirova, M. Auzinsh, Y.-C. Chen, Y.-F. Chen, and I. A. Yu,\* “A weakly-interacting many-body system of Rydberg polaritons based on electromagnetically induced transparency,” **Commun. Phys.** 4, 110 (2021).
4. C.-Y. Hsu, Y.-S. Wang, J.-M. Chen, F.-C. Huang, Y.-T. Ke, E. K. Huang, W. Hung, K.-L. Chao, S.-S. Hsiao, Y.-H. Chen, C.-S. Chuu, Y.-C. Chen, Y.-F. Chen, I. A. Yu,\* “Generation of sub-MHz and spectrally-bright biphotons from hot atomic vapors with a phase mismatch-free scheme,” **Opt. Express** 29, 4632 (2021). **Editors’ Pick.**
5. C.-Y. Cheng, Z.-Y. Liu, P.-S. Hu, T.-N. Wang, C.-Y. Chien, J.-S. Shiu, I. A. Yu, Y.-C. Chen, and Y.-F. Chen,\* “Efficient frequency conversion based on electromagnetically induced transparency,” **Opt. Lett.** 46, 681 (2021).
6. Y.-L. Chuang, R.-K. Lee,\* and I. A. Yu, “Generation of quantum entanglement based on electromagnetically induced transparency media,” **Opt. Express** 28, 28414 (2021).
7. K.-F. Chang, T.-P. Wang, C.-Y. Chen, Y.-H. Chen, Y.-S. Wang, Y.-F. Chen,\* Y.-C. Chen, and I. A. Yu,\* “Low-loss high-fidelity frequency beam splitter with tunable split ratio based on electromagnetically induced transparency,” **Phys. Rev. Research** 3, 013096 (2021).
8. S.-S. Hsiao, K.-T. Chen, and I. A. Yu,\* “Mean field theory of weakly-interacting Rydberg polaritons in the EIT system based on the nearest-neighbor distribution,” **Opt. Express** 28, 28414 (2020).
9. R. Chinnarasu, C.-Y. Liu, Y.-F. Ding, C.-Y. Lee, T.-H. Hsieh, I. A. Yu, and C.-S. Chuu,\* “Efficient generation of subnatural-linewidth biphotons by controlled quantum interference,” **Phys. Rev. A** 101, 063837 (2020).
10. B. Kim, K.-T. Chen, C.-Y. Hsu, S.-S. Hsiao, Y.-C. Tseng, C.-Y. Lee, S.-L. Liang, Y.-H. Lai, J. Ruseckas, G. Juzeliūnas, and I. A. Yu,\* “Effect of laser frequency fluctuation on the decay rate of Rydberg coherence,” **Phys. Rev. A** 100, 013815 (2019).
11. J. Ruseckas,\* V. Kudriašov, A. Mekys, T. Andrijauskas, I. A. Yu, and G. Juzeliūnas, “Nonlinear quantum optics for spinor slow light,” **Phys. Rev. A** 98, 013846 (2018).
12. J. Y. Juo, J. K. Lin, C. Y. Cheng, Z. Y. Liu, I. A. Yu, and Y. F. Chen,\* “Demonstration of spatial-light-modulation-based four-wave mixing in cold atoms,” **Phys. Rev. A** 97, 053815 (2018).

13. G. Wang, Y. S. Wang, E. K. Huang, W. Hung, K. L. Chao, P. Y. Wu, Y. H. Chen,\* and I. A. Yu, “Ultrannarrow-bandwidth filter based on a thermal EIT medium,” **Sci. Rep.** 8, 7959 (2018).
14. Y. F. Hsiao, P. J. Tsai, H. S. Chen, S. X. Lin, C. C. Hung, C. H. Lee, Y. H. Chen, Y. F. Chen, I. A. Yu,\* and Y. C. Chen,\* “Highly Efficient Coherent Optical Memory Based on Electromagnetically Induced Transparency,” **Phys. Rev. Lett.** 120, 183602 (2018). **Highly Cited Paper in the Web of Science.**
15. Y. L. Chuang, R. K. Lee,\* and I. A. Yu,\* “Optical density-enhanced squeezed light generation without optical cavities,” **Phys. Rev. A** 96, 053818 (2017).
16. S. C. Gou, S. W. Su, and I. A. Yu, “Reply to Comment on ‘Dynamics of slow light and light storage in a Doppler-broadened electromagnetically-induced-transparency medium: A numerical approach’,” **Phys. Rev. A** 96, 047801 (2017).
17. B. H. Wu, Y. W. Chuang, Y. H. Chen,\* J. C. Yu, M. S. Chang, and I. A. Yu,\* “Enhanced spectral profile in the study of Doppler-broadened Rydberg ensembles,” **Sci. Rep.** 7, 9726 (2017).
18. S. W. Su, S. C. Gou, L. Y. Chew, Y. Y. Chang, I. A. Yu, A. Kalachev, and W. T. Liao,\* “Setting a disordered password on a photonic memory,” **Phys. Rev. A** 95, 061805(R) (2017).
19. J. Ruseckas, I. A. Yu, and G. Juzeliūnas, “Creation of two-photon states via interaction between Rydberg atoms during the light storage,” **Phys. Rev. A** 95, 023807 (2017). **Editors’ Suggestion.**
20. Z. Y. Liu, Y. H. Chen, Y. C. Chen, H. Y. Lo, P. J. Tsai, I. A. Yu,\* Y. C. Chen, and Y. F. Chen,\* “Large Cross-Phase Modulations at the Few-Photon Level,” **Phys. Rev. Lett.** 117, 203601 (2016). **Editors’ Suggestion; Selected for a Viewpoint in Physics.**
21. C. Y. Lee, B. H. Wu, G. Wang, Y. F. Chen, Y. C. Chen, and I. A. Yu,\* “High conversion efficiency in resonant four-wave mixing processes,” **Opt. Express** 24, 1008 (2016).

## **Talks in Colloquia, Seminars, or Workshops of Universities or Institutes since 2016**

1. 2021/08 NCTS Workshop on Quantum Science & Technology
2. 2021/05 ASIAA, CCMS, IAMS, LeCosPA, NTU-Phys, and NTNU-Phys Joint Colloquium, Department of Physics, National Taiwan University
3. 2021/02 NCTS Annual Theory Meeting 2021: Quantum Physics, Quantum Information, and Quantum Technologies
4. 2019/12 ASIAA, CCMS, IAMS, LeCosPA, NTU-Phys, and NTNU-Phys Joint Colloquium, Department of Physics, National Taiwan University
5. 2019/11 Workshop of Taiwan Quantum Technology Consortium, National Tsing Hua University
6. 2019/08 AMO Summer School, National Central University
7. 2018/10 Workshop on From Quantum Technology to Quantum Metrology, Center for Measurement Standards, Industrial Technology Research Institute
8. 2018/10 Condensed Matter Physics Seminar, National Tsing Hua University

9. 2018/05 International Day of Light Seminar, Tsing Hua Optoelectronics Research Interdisciplinary Center
10. 2018/03 Workshop on Quantum Optics and Quantum Measurement, National Center for Theoretical Sciences, Taiwan
11. 2017/07 Workshop on Quantum and Nonlinear Optics with Rydberg-State Atoms Vilnius University, Lithuania
12. 2017/05 Colloquium, Graduate Institute of Applied Physics, National Chengchi University
13. 2017/07 ASIAA, CCMS, IAMS, LeCosPA, NTU-Phys, and NTNU-Phys Joint Colloquium Department of Physics, National Taiwan University
14. 2017/04 Colloquium, Department of Physics, National Chung Cheng University
15. 2017/03 Quantum Information Seminar, National Cheng Kung University
16. 2016/12 Colloquium, Department of Electrophysics, National Chiao Tung University
17. 2016/11 Workshop on Quantum and Nonlinear Optics with Rydberg-State Atoms, University of Latvia, Latvia
18. 2016/10 Colloquium, Department of Physics, Tunghai University
19. 2016/06 Colloquium, National Center for Theoretical Sciences
20. 2016/05 Frontier Physics Undergraduate Seminar, National Tsing Hua University