CURRICULUM VITAE of Yating Wan

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Personal Particulars

Yating Wan received Ph.D. (2017) in the Department of Electrical and Computer Engineering from Hong Kong University of Science and Technology and was **selected as the winner of the School of Engineering PhD Research Excellence Award 2016**. After being a visiting scholar and Postdoctoral fellow in **Prof. John Bowers'** group at of University of California, Santa Barbara for six years, she joined **KAUST as an Assistant Professor** in 2022. Her current research interests are in Silicon Photonics with special emphasis on integration of on-chip light sources that can be applied for data communications, biosensors/bioimaging, energy harvesting, machine vision, and quantum information processing. She has published more than 60 peer-reviewed research papers, including **36 first-author/corresponding author journal (24)/conference(12) papers. For her first author publications, there are 9 prestigious covers (Optica, Laser & Photonics Review(4), Applied Physics Letter, Photonics Research, ACS photonics), 6 invited talks (2018 CLEO, 2018 PIERS, 2018 ACP, 2021 OGC, 2022 PIERS, 2022 CLEO), 2 postdeadline conference paper, and 1 book chapter (selected as the cover of 《Future Directions in Silicon Photonics》).** She served as a referee for more than 40 peer-reviewed journals in IEEE, OSA, and the Nature Publishing Group. For her pioneering work in integration of long wavelength quantum dot devices on Si (**Google Scholar citation: 1825, h-index: 22**), she received 2016-17 School of Engineering **PhD Research Excellence Award in HKUST**, **2021 CLEO Tingye Li Innovation Prize**, **2018 PIERS Young Scientist Award, 2018 Rising Stars Women in Engineering Asia, 2020 Rising Stars 2020 Women in EECS, 2021 OGC Best Young Scientist Award**.

Academic qualifications

1. **Hong Kong University of Science and Technology, Hong Kong** 09/2012—11/2017
   PhD in Electronic and Computer engineering, GPA: 3.94/4.0, Thesis Advisor: **Prof. Kei May LAU (eekmlau@ust.hk)**.
   Co-supervised by **Prof. Evelyn Hu from Harvard University (ehu@seas.harvard.edu)**
   Dissertation: "Monolithic Integration of InAs Quantum Dot Lasers on Silicon Substrates"
   - **PhD Research Excellence Award (2 awardees in the School of Engineering).**
2. **Zhejiang University, China** 09/2008-06/2012
   Bachelor in Optical Engineering, GPA: 3.97/4.0

Current and past employment history

1. **University of California, Santa Barbara, CA** 09/2016—03/2017
   Visiting Scholar at the Optoelectronics Research Group, Advisor: **Prof. John Bowers (bowers@ece.ucsb.edu)**
   Topic: "Sub-mA threshold 1.3 μm CW lasing from electrically pumped micro-lasers grown on (001) Si"
2. **University of California, Santa Barbara, CA** 07/2017—08/2017
   Junior specialist, in the Department of Institute of Energy Efficiency, Santa Barbra campus, Advisor: **Prof. John Bowers (bowers@ece.ucsb.edu)**
   Topic: "Integrating optics and electronics on the same Si chip"
3. **University of California, Santa Barbara, CA** 08/2017—06/2022
   Postdoctoral Scholar, in the Department of Institute of Energy Efficiency, Santa Barbra campus, Advisor: **Prof. John Bowers (bowers@ece.ucsb.edu)**
   Topic: "Integrating optics and electronics on the same Si chip"

4. **King Abdullah University of Science and Technology** 06/2022—now
   Assistant Professor, in the department of Electrical and Computer Engineering

Academic awards

1. **PhD Research Excellence Award** from Hong Kong University of Science and Technology (two awardees in the school of Engineering). 2017
2. Student & Young Professionals/Women in Photonics Travel Grantees in IPC winner 2018
3. **Young Scientist Award** in PIERS 2018 2018
4. **The Rising Stars Women in Engineering award by the Asian Dean's Forum** 2018
5. **The Rising Stars 2020 Academic Career award for Women in EECS** 2020
6. Selected by the CLEO Program Chairs for the **2021 CLEO Tingye Li Innovation Prize** (1 out of over 2000 technical presentations). 2021
7. Selected by the OGC Program Chairs for the **2021 OGC Best Young Scientist Award** (1 out of over 300 technical presentations). 2021
8. The 2020 Corning Travel Grants for Women (OFC) winner. 2020
9. Overseas Research Award from HKUST 2016
10. Outstanding graduates of Zhejiang University 2012
11. Excellent student awards in Zhejiang University 2008-2011

Interview and column reports:

1. The feature story was reported by a biannual online PG Newsletter in HKUST
   https://pgnews.ust.hk/feb-2018-feature-stories-part-2
2. The research was reported by Celebrating All Members (CAM) in Optical Society (OSA)
   https://www.osa.org/en-us/100/osa_stories/searchresultsvideo/?id=5818666754001

Academic service

Invited Reviewer of *Light: Science & Applications, Optica*, *Applied Physics Letters, Journal of Applied Physics, Scientific Reports – Nature, Journal of Lightwave Technology, Optics Express*, *Optical Materials Express, Optics Letters, Photonics, Electronics Express (ELEX), Journal of Materials Chemistry C, Laser Physics Letters* for **over 40 times**

Reviewer Board of *Photonics (ISSN 2304-6732):* *https://www.mdpi.com/journal/photonics/submission_reviewers*

Editor service

Associate Guest Editor for JSTQE - Photonic Electronic Co-Integration and Advanced Transfer Printing
Guest editor for Photonics on a Special Issue - Emerging Frontiers in Silicon Photonics
Topical Advisory Panel in Biosensors

Mentoring and advising

- Closely mentored two graduate students as a senior PhD student at HKUST
- Closely mentored three graduate students and one intern as a postdoctoral fellow at UCSB
- In supervision of three Ph.D students and one postdoc in KAUST

Teaching

1. Year 2015-2016: Teaching Assistant of "Introduction to Electro-Robot Design" at HKUST
2. Year 2013-2014: Teaching Assistant of "Digital Circuit and Systems" at HKUST

Research project

- **High Efficiency Quantum-Dot Photonic Integrated Circuit Technology Epitaxially Grown on Silicon** (ARPA-E DE-AR0000672 Period 4/1/2016 to 6/30/2019, budget; $2,037,285);
- **FRESCO: Frequency Stabilized Coherent Optical Low-Energy WDM DC Interconnects** (ARPA-E DE-AR0001042) (Period: 4/16/2019 to 04/16/2022, budget; $ 6,666,667).
- **ULTRALIT: Ultra-Energy-Efficient Integrated DWDM Optical Interconnect (**ARPA-E DE-AR0001039) (Period: 4/1/2020 to 03/31/2023, budget; $ 6,666,667).
- **Heterogeneously Integrated Quantum Dot Lasers on Silicon** (**Intel** CG #62148533) (Period: 11/1/2020 to 10/31/2021, budget; $ 119,000)
- **III-V Compound Devices on Si by MOCVD for Silicon Photonics Applications (614312)** (Period 1/1/2013 to 12/31/2015, budget 700,000 HKD);
- **Long Wavelength Quantum Dot Lasers Grown on Silicon Substrate (16212115)** (Period 1/1/2016 to 12/31/2018, budget 692,029 HKD);
- **A Photonic Manufacturing Platform for Energy-Efficient, High-Performance Computing and Communications** (ITS/273/16FP) (Period: 4/1/2017 to 03/31/2019, budget; 12,300,000 HKD).

Skills set

- 10 years of cleanroom experience specialized in integrated photonics process.
- In-depth knowledge of optoelectronics, material characterization, lasers, micro-cavities etc.
- Hand-on experimental experiences of material characterization and data, Optical and electrical device characterization.
- Proficient skills of device designs using simulation tools.
- Strong technical knowledge in semiconductor physics including superlattices and semiconductor quantum structures, photonic devices such as lasers, modulators, and detectors, wafer fabrication within cleanroom environments, and the physical and chemical basis of micro- and nanofabrication techniques.
- Ability to develop advanced optical characterization testbeds, integrate novel photonic devices into larger system demonstrations.

Book Chapters

Y. Wan, J. Norman, and J. E. Bowers, "Quantum dot microcavity lasers". Future Directions in Silicon Photonics (2019): 305. **(selected as the cover of the book:** Future Directions in Silicon Photonics).

Patents

J. E. Bowers, A. Gossard, D. Jung, J. Norman, C. Shang, **Y. Wan**, (2021). Monolithic integrated quantum dot photonic integrated circuits, US Patent App. 17/058,057.

Published journals

I. First author/contributed equally first author/corresponding author

1. **Y. Wan**, Q. Li, Y. Geng, B. Shi, and K. M. Lau*, "InAs/GaAs quantum dots on GaAs-on-V-grooved-Si substrate with high optical quality in the 1.3-um band", *Applied Physics Letters*, 107 (8), 081106 (2015).
2. **Y. Wan,** Q. Li, A. Y. Liu, A. C. Gossard, J. E. Bowers, E. L. Hu, and K. M. Lau*, "Optically pumped 1.3 μm room-temperature InAs quantum-dot micro-disk lasers directly grown on (001) silicon," *Optics Letters*, 41(7), 1664-1667 (2016). (**Featured by OSA as a Spotlight, by Semiconductor Today as a spotlight, listed as the 15 most cited articles published in *Optics Letters* between 2016 and 2018.**)
3. **Y. Wan**, Q. Li, A. Y. Liu, W. W. Chow A. C. Gossard, J. E. Bowers, E. L. Hu, K. M. Lau*, "Sub-wavelength InAs quantum dot micro-disk lasers epitaxially grown on exact Si (001) substrates" *Applied Physics Letters*, 108 (22), 221101 (2016). **(Selected as cover and most highly read paper of 2016 by *Applied Physics Letter*, featured by API**

Publishing, Semiconductor Today, Science Prism, Next Big Future, EE Times, Science Daily, Electronics-Lab, and Electronics Infoline, etc, reported by over 10 world-wide media coverage).

4. **Y. Wan**, Q. Li, A. Y. Liu, A. C. Gossard, J. E. Bowers, E. L. Hu, K. M. Lau*, "Temperature characteristics of epitaxially grown InAs quantum dot micro-disk lasers on silicon for on-chip light sources" *Applied Physics Letters*, 109 (1), 011104 (2016).
5. Q. Li#, **Y. Wan#,** A. Y. Liu, A. C. Gossard, J. E. Bowers, E. L. Hu, K. M. Lau*, "1.3-um InAs quantum-dot micro-disk lasers on V-groove patterned and unpatterned (001) silicon" *Optics Express*, 24 (18), 21038-21045, 2016. **(#Equally contributing authors)**
6. **Y. Wan**, J. Norman, Q. Li, MJ. Kennedy, D. Liang, C. Zhang, D. Huang, Z. Zhang, A. Y. Liu, A. Torres, D. Jung, A. C. Gossard, E. L. Hu, K. M. Lau, and J. E. Bowers*, "1.3 μm submilliamp threshold quantum dot micro-lasers on Si", *Optica,* 4(8), 940-944 (2017). **(Impact: 9.263, selected as the Cover of the *Optica*, and featured by Eurekalert, Semiconductor Today, LaserFocusWorld, Science Daily, eeNews, Compound Semiconductor, PHYSORG, Photonics.com)**
7. **Y. Wan**, D. Jung, J. Norman, C. Shang, I. Macfarlane, Q. Li, MJ. Kennedy, Z. Zhang, A. C. Gossard, E. L. Hu, K. M. Lau, and J. E. Bowers*, "O-band electrically injected InAs quantum-dot micro-ring lasers on V-groove patterned and unpatterned (001) silicon", *Optics Express,* 25(22), 26853-26860 (2017).
8. **Y. Wan**, Z. Zhang, R. Chao, J. Norman, D. Jung, C. Shang, Q. Li, MJ. Kennedy, D. Liang, C. Zhang, J. Shi, A. C. Gossard, E. L. Hu, K. M. Lau, and J. E. Bowers*, "Monolithically Integrated InAs/InGaAs Quantum Dot Photodetectors on Silicon Substrates", *Optics Express,* 25(22), 27715-27723 (2017). (**Featured by Semiconductor Today as a spotlight).**
9. **Y. Wan**, D. Innoue, D. Jung, J. Norman, C. Shang, A. C. Gossard, and J. E. Bowers*, "Directly modulated quantum dot lasers on Si with milliamp threshold and high temperature stability", *Photonics Research,* 6(8), 776-781 (2018). **(Impact: 6.099, selected as the Cover of the Photonics Research, and top 10 cited articles on Integrated Optics published in 2018)**
10. D. Innoue#, **Y. Wan*,#,** D. Jung, J. Norman, C. Shang, N. Nishyama, S. Arai, A. C. Gossard, and J. E. Bowers, "Low-dark current 10 Gbit/s operation of InAs/InGaAs quantum dot p-i-n photodiode grown on on-axis (001) GaP/Si", *Applied Physics Letters,* 113(9), 093506 (2018). **(#Equally contributing authors, *corresponding author).**
11. **Y. Wan,** D. Jung, C. Shang, N. Collins, I. Macfarlane, J. Norman, M. Dumont, A. C. Gossard, and J. E. Bowers*, "Low-threshold continuous-wave operation of electrically-pumped 1.55 μm InAs quantum dash microring lasers", *ACS Photonics*, 6 (2), pp 279–285 (2019). **(Impact: 7.29).**
12. J. Huang#, **Y. Wan#,** D. Jung, J. Norman, C. Shang, Q. Li, K. M. Lau, A. C. Gossard, J. E. Bowers, and B. Chen, "Defect characterization of InAs/InGaAs quantum dot pin photodetector grown on GaAs-on-V-grooved-Si substrate", *ACS Photonics, 6(5),* 1100-1105. 2019 **(#Equally contributing authors). (Impact: 7.29).**
13. C. Shang#, **Y. Wan#,** J. Norman, N Collins, I MacFarlane, M Dumont, S Liu, Q. Li, K. M. Lau, A. C. Gossard, and J. E. Bowers*, "Low-Threshold Epitaxially Grown 1.3-μm InAs Quantum Dot Lasers on Patterned (001) Si", *IEEE Journal of Selected Topics in Quantum Electronics* 25 (6), 1-7 (2019) **(#Equally contributing authors).**
14. **Y. Wan,** S. Zhang, J. Norman, MJ Kennedy, W. He, S. Liu, C. Xiang, C. Shang, J. He, A. C. Gossard, and J. E. Bowers*, "Tunable quantum dot lasers directly grown on Si", *Optica,* 6(11), 1394-1400 (2019). **(Impact: 9.263).**
15. **Y. Wan,** C. Shang, J. Norman, B. Shi, Q. Li, N Collins, M Dumont, K. M. Lau, A. C. Gossard, and J. E. Bowers*, "Low threshold quantum dot lasers directly grown on planar (001) Si", *IEEE Journal of Selected Topics in Quantum Electronics.* 26, 1-9, 2020.
16. **Y. Wan,** S. Zhang, J. Norman, MJ Kennedy, W. He, Y. Tong, C. Shang, J. He, H. K. Tsang, A. C. Gossard, and J. E. Bowers*, "Directly modulated single-mode tunable quantum dot lasers at 1.3 μm", *Laser & Photonics Reviews.* 14(3), 1900348, 2020 **(Impact: 10.0655, selected as back cover of the issue).**
17. B. Chen#, **Y. Wan#,** Z. Xie, J. Huang, C. Shang, J. Norman, Q. Li, Y. Tong, K. M. Lau, A. C. Gossard, and J. E. Bowers, "Low-dark current high gain InAs quantum dot avalanche photodetectors monolithically grown on Si", *ACS Photonics* , 7(2), 528-533, 2020. **(#Equally contributing authors) (Impact: 7.29).**

18. **Y. Wan,** C. Shang, J. Huang, Z. Xie, A. Jain, D. Inoue, B. Chen, J. Norman, A. C. Gossard, and J. E. Bowers*, "Low-dark current 1.55 μm InAs quantum dash waveguide photodiodes", *ACS nano* 14(3), 3519-3527, 2020. **(Impact: 14.588, featured by X-MOL).**
19. **Y. Wan,** J. Norman, Y. Tong, MJ Kennedy, W. He, J. Selvidge, C. Shang, M. Dumont, A. Malik, H. K. Tsang, A. C. Gossard, and J. E. Bowers*, "1.3 μm quantum-dot distributed feedback lasers directly grown on (001) Si", *Laser & Photonics Reviews.* 14 (7), 2070042, 2020. **(Impact: 10.0655, selected as back cover of the issue).**
20. **Y. Wan,** J. Norman, S. Liu, and J. E. Bowers*, "Quantum-dot lasers and amplifiers on Si", *IEEE Nanotechnology Magazine.* 15(2), 8-22, 2021 **(Invited review).**
21. **Y. Wan,** C. Xiang, J. Guo, R. Koscica, MJ Kennedy, J. Selvidge, Z. Zhang, L. Chang, W. Xie, D.Huang, A. C. Gossard, and J. E. Bowers*, "High speed evanescent quantum-dot lasers on Si", *Laser & Photonics Reviews* 2100057, 2021 **(Impact: 10.0655, selected as front cover of the issue).**
22. C. Shang#, E. Hugues#, **Y. Wan#**, M. Dumont, R. Koscica, J. Selvidge, R. Herrick, A. C. Gossard, K. Mukherjee, and J. E. Bowers*, "High-temperature reliable quantum-dot lasers on Si with misfit and threading dislocation filters", *Optica* 8(5), 749-754, 2021. **(#Equally contributing authors).**
23. C. Shang#, **Y. Wan#**, J. Selvidge, E. Hugues, R. Herrick, K. Mukherjee, J. Duan, F. Grillot, W. W. Chow, A. C. Gossard, and J. E. Bowers*, "Perspectives on advances in quantum dot lasers and integration with Si photonic integrated circuits", *ACS Photonics* 8 (9), 2555-2566 **(#Equally contributing authors). (Invited, Impact: 7.29)**.
24. W. W. Chow, **Y. Wan*,** J. E. Bowers, F. Grillot, "Analysis of the spontaneous emission limited linewidth of an integrated III-V/SiN laser". *Laser & Photonics Review*, 16(6), 2270026, 2022. (***corresponding author). (Impact: 10.0655, selected as front cover of the issue)**

II. co-authors

1. B. Shi, Q. Li, **Y. Wan**, K. W. Ng, X. Zou, C. W. Tang, and K. M. Lau*, "InAlGaAs/InAlAs MQWs on Si Substrate", *Photonics Technology Letters*, 27 (7), 748-751 (2015).
2. B. Shi, S. Zhu, Q. Li, **Y. Wan**, E. L. Hu, K. M. Lau*, "Continuous-wave optically pumped 1.55 um InAs/InAlGaAs quantum dot microdisk lasers epitaxially grown on silicon" *ACS photonics*, 4(2), 204-210 (2017).
3. S. Zhu, B. Shi, **Y. Wan**, E. L. Hu, K. M. Lau*, "1.55 um band low threshold, continuous wave lasing from InAs/InAlGaAs quantum dot microdisks" *Optics Letters*, 42 (4), 679-682 (2017).
4. J. Norman, M. J. Kennedy, J. Selvidgea, Q. Li, **Y. Wan**, A. Y. Liu, K. M. Lau, A. C. Gossard, J. E. Bowers*, "Electrically pumped continuous wave quantum dot lasers epitaxially grown on patterned, on-axis (001) Si," *Optics Express*, 25 (4), 3927-3934 (2017).
5. B. Shi, S. Zhu, Q. Li, C. W. Tang, **Y. Wan**, E. Hu, K. M. Lau*, "1.55 μm room-temperature lasing from subwavelength quantum-dot microdisks directly grown on (001) Si." *Applied Physics Letters*, 110 (12), 121109 (2017). (**Featured by Semiconductor Today as a spotlight)**
6. D. Jung, J. Norman, MJ Kennedy, C. Shang, B. Shin, **Y. Wan**, A. C. Gossard, J. E. Bowers*, "High efficiency low threshold current 1.3 μm InAs quantum dot lasers on on-axis (001) GaP/Si" *Appl. Phys. Lett.* 111(12), 122107 (2017).
7. S. Zhu, B. Shi, Q. Li, **Y. Wan**, E. L. Hu, K. M. Lau*, "Parametric study of high-performance 1.55 μm InAs quantum dot microdisk lasers on Si", *Optics Express*, 25 (25), 31281-31293 (2017).
8. D. Jung, Z. Zhang, J. Norman, R. Herrick, MJ Kennedy, P. Patel, K. Turnlund, C. Jan, **Y. Wan**, A. C. Gossard, J. E. Bowers*, "Highly reliable low threshold InAs quantum dot lasers on on-axis (001) Si with 87% injection efficiency", *ACS photonics*, 5(3), 1094-1100, 2017.
9. J. Norman, D. Jung, **Y. Wan**, J. E. Bowers*, "Perspective: The future of quantum dot photonic integrated circuits", *APL Photonics* 3(3), 030901 (2018). **(Invited and selected as cover).**
10. D. Innoue, D. Jung, J. Norman, **Y. Wan**, N. Nishyama, S. Arai, A. C. Gossard, J. E. Bowers*, "Directly modulated 1.3 μm quantum dot lasers epitaxially grown on silicon", *Optics Express*, 26(6), 7022-7033 (2018).

11. D. Jung, J. Norman, **Y. Wan**, S. Liu, R. Herrick, J. Selvidge, K. Mukherjee, A. C. Gossard, J. E. Bowers*, "Recent Advances in InAs Quantum Dot Lasers Grown on On - Axis (001) Silicon by Molecular Beam Epitaxy", *physica status solidi (a)*, 216(1), 1800602 (2019).
12. J. Norman, D. Jung, Z. Zhang, **Y. Wan**, S. Liu, C. Shang, R. W. Herrick, W. W. Chow, A. C. Gossard, J. E. Bowers*, "A Review of High-Performance Quantum Dot Lasers on Silicon.", *IEEE Journal of Quantum Electronics* 55(2), 1-11(2019). **(Invited)**.
13. B. Dong, J. Duan, C. Shang, H. Huang, A. B. Sawadogo, D. Jung, **Y. Wan**, J. E. Bowers, and F. Grillot, "Influence of the polarization anisotropy on the linewidth enhancement factor and reflection sensitivity of 1.55-μm InP-based InAs quantum dash lasers", *Appl. Phys. Lett.* 115, 091101 (2019).
14. C. Xiang, W. Jin, D. Huang, M. Tran, J. Guo, **Y. Wan**, W. Xie, G. Kurczveil, A.Netherton, D. Liang, H. Rong, J. E. Bowers, "High-performance silicon photonics using heterogeneous integration", *IEEE Journal of Quantum Electronics*, 2021.
15. C. Shang, K. Feng, E. T. Hughes, A. Clark, M. Debnath, R. Koscica, G. Leake, J. Herman, D. Harame, P.Ludewig, **Y.Wan**, and J. E. Bowers, submitted to *Light: Science & Applications.*

Conference proceedings

I. First author/contributed equally first author/corresponding author

1. **Y. Wan**, Q. Li, A. Y. Liu, A. C. Gossard, J. E. Bowers, E. L. Hu, K. M. Lau*, "Room Temperature CW 1.3 um Single Mode Lasing of InAs Quantum Dot Micro-disk Lasers Grown on (001) Si," in 2016 *Conference on Lasers and Electro-Optics (CLEO)* (pp. 1-2). IEEE.
2. **Y. Wan**, Q. Li, A. Y. Liu, W. W. Chow A. C. Gossard, J. E. Bowers, E. L. Hu, K. M. Lau*, "Quantum dot lasers grown on (001) Si substrate for integration with amorphous Si waveguides", in 2017 *Optical Fiber Communications Conference and Exhibition (OFC)* (pp. 1-3). IEEE.
3. **Y. Wan**, J. Norman, Q. Li, M. J. Kennedy, D. Liang, C. Zhang, D. Huang, A. Y. Liu, A. Torres, D. Jung, A. C. Gossard, J. E. Bowers, E. L. Hu, K. M. Lau*, "Sub-mA threshold 1.3 μm CW lasing from electrically pumped micro-lasers grown on (001) Si", in 2017 *Conference on Lasers and Electro-Optics (CLEO)* (pp. 1-2). IEEE (**Post-deadline Paper**).
4. **Y. Wan**, D. Jung, J. Norman, K. Feng, A. Dagli, A. C. Gossard, and J. E. Bowers*, "Quadruple reduction of threshold current density for microring quantum dot lasers epitaxially grown on (001) Si," *in 2018 CLEO: Science and Innovations*, pp. SW3Q-3. Optical Society of America. **(Invited).**
5. C. Shang[+], **Y. Wan[+],** D. Jung, J. Norman, MJ Kennedy, D. Liang, C. Zhang, A. C. Gossard, J. E. Bowers*, "Quantum dot micro-lasers integrated with photodetectors and optical amplifiers on (001) Si via waveguide coupling," in 2018 *Conference on Lasers and Electro-Optics (CLEO)* (pp. 1-2). IEEE. **([+]Equally contributing authors).**
6. **Y. Wan***, D. Jung, D. Innoue, J. Norman, C. Shang, A. C. Gossard, and J. E. Bowers, "On-chip detection from directly modulated quantum dot microring lasers on Si", In *2018 Progress in Electromagnetics Research Symposium (PIERS-Toyama)* (pp. 249-253). IEEE. **(Invited)**
7. **Y. Wan,** D. Jung, C. Shang, N. Collins, I. Macfarlane, J. Norman, M. Dumont, A. C. Gossard, and J. E. Bowers*, "Low threshold 1.55 μm Quantum dash microring lasers", *in 2019 CLEO: Science and Innovations*, pp. STu4J.3. Optical Society of America.
8. C. Shang, **Y. Wan*,** J. Norman, D. Jung, Q. Li, K. M. Lau, A. C. Gossard, and J. E. Bowers*, "Triple reduction of threshold current for 1.3 μm InAs quantum dot lasers on patterned, on-axis (001) Si", *in 2019 CLEO: Science and Innovations*, pp. STu3N.1Optical Society of America. **(* corresponding author)**
9. **Y. Wan,** S. Zhang, J. Norman, MJ Kennedy, W. He, Y. Tong, C. Shang, J. He, H. K. Tsang, A. C. Gossard, and J. E. Bowers*, "1.3 μm tunable quantum dot lasers", *CLEO: Science and Innovations,* SF2E. 1, 2020.

10. **Y. Wan,** J. Norman, Y. Tong, MJ Kennedy, W. He, J. Selvidge, C. Shang, M. Dumont, A. Malik, H. K. Tsang, A. C. Gossard, and J. E. Bowers*, "1.3 μm regrown quantum-dot distributed feedback lasers on Si: a pathway to scale towards 1 Tbit/s", in 2021 *Conference on Lasers and Electro-Optics (CLEO)*, SM1H.6 **(Tingye Li Innovation Prize).**
11. R. Koscica, **Y. Wan***, C. Shang, A. C. Gossard, J. E. Bowers, "1.3 μm High Performance Regrown Distributed Feedback Lasers Epitaxially Grown on Si. In *IEEE Photonics Conference (IPC)* (pp. 1-2), 2021. **(*corresponding author).**
12. **Y. Wan,** C. Xiang, R. Koscica, MJ Kennedy, D. Huang, A. C. Gossard, and J. E. Bowers*, "1.3 μm High speed heterogeneous quantum-dot lasers on Si", in 2021 *Conference on Lasers and Electro-Optics (CLEO)*, SM2P.1. **(Invited)**

II. co-authors

1. K. M. Lau*, **Y. Wan**, Q. Li, A. Y. Liu, W. W. Chow, A. C. Gossard, J. E. Bowers, E. L. Hu, "1-μm InAs quantum dot micro-disk lasers directly grown on exact (001) Si," In 2016 *International Semiconductor Laser Conference (ISLC)* (pp. 1-2). IEEE. (**Invited**).
2. K. M. Lau, B. Shi, **Y. Wan**, A. Y. Liu, Q. Li, W. W. Chow A. C. Gossard, J. E. Bowers*, E. L. Hu, "InAs quantum dot Micro-disk lasers grown on (001) Si emitting at communication wavelengths," in *Novel In-Plane Semiconductor Lasers XVI*, vol. 10123, pp. 101230J-1. International Society for Optics and Photonics, 2017. (**Invited**).
3. B. Shi, S. Zhu, Q. Li, **Y. Wan**, E. Hu, K. M. Lau*, "InAs/InAlGaAs Quantum Dot-on-Silicon Microdisk Lasers Operating at 1.55 μm" in 2017 *Conference on Lasers and Electro-Optics (CLEO)* (pp. 1-2). IEEE.
4. S. Zhu, B. Shi, Q. Li, **Y. Wan**, K. M. Lau*, "Room temperature 1.55 μm lasing of sub-wavelength quantum-dot lasers epitaxially grown on (001) silicon," in 2017 *European Conference on Optical Communication (ECOC)* (pp. 1-3). IEEE.
5. D. Jung, R. Herrick, J. Norman, C. Jan, N. Caranto, A. Torres, **Y. Wan**, A. C. Gossard, and J. E. Bowers*, "Highly Improved Reliability of Low Threshold 1.3 μm III/V Quantum Dot Laser Epitaxially Grown on On-axis Si", in 2018 *Conference on Lasers and Electro-Optics (CLEO),* pp. 1-2. IEEE, 2018.
6. J. E. Bowers*, A. C. Gossard, D. Jung, J. Norman, **Y. Wan**, "Quantum Dot Photonic Integrated Circuits on Silicon", in 2018 CLEO: Science and Innovations (pp. SW3B-1). Optical Society of America. **(Invited).**
7. J. Norman, Z. Zhang, D. Jung, **Y. Wan**, MJ. Kennedy, A. Torres, R. W. Herrick, A. C. Gossard, J. E. Bowers*, "High Performance Quantum Dot Lasers Epitaxially Integrated on Si", In *Quantum Communications and Quantum Imaging XVI* (Vol. 10771, p. 107710D). International Society for Optics and Photonics, 2018.
8. D. Innoue, D. Jung, J. Norman, **Y. Wan**, N. Nishyama, S. Arai, A. C. Gossard, J. E. Bowers*, "NRZ and PAM-4 direct modulation of 1.3 μm quantum dot lasers directly grown on on-axis (001) Si", in 2018 *European Conference on Optical Communication (ECOC)* (pp. 1-3).
9. D. Jung, J. Norman, S. Liu, C. Shang, **Y. Wan**, A. Gossard, J. E. Bowers, "Growth of Broadband Gain Quantum Dot Mode-Locked Laser on Si with Varied InGaAs Well Thickness", in *International Conference on Optical MEMS and Nanophotonics (OMN),* 24-25, 2019
10. J. E. Bowers, D. Huang, D. Jung, J. Norman, M. A. Tran, **Y. Wan,** W. Xie, Z. Zhang. "Realities and challenges of III-V/Si integration technologies". In *Optical Fiber Communication Conference* (pp. Tu3E-1). Optical Society of America (2019). (**Invited**).
11. S. Liu, X. Wu, J. Norman, D. Jung, M. Dumont, C. Shang, **Y. Wan**, MJ Kennedy, B. Dong, D. Auth, S. Breuer, F. Grillot, W. Chow, A. C. Gossard, J. E. Bowers, "High-performance mode-locked lasers on silicon", in *Physics and Simulation of Optoelectronic Devices XXVIII* 11274, 112741K, 2020.
12. J. C. Norman, S. Liu, **Y. Wan,** Z. Zhang, C. Shang, J. G. Selvidge, M. Dumont, MJ Kennedy, D. Jung, J. Duan, H. Huang, R. W. Herrick, F. Grillot, A. C. Gossard, J. E. Bowers, "Epitaxial integration of high-performance quantum-dot lasers on silicon", in *Silicon Photonics XV* 11285, 1128504, 2020.
13. B. Chen, **Y. Wan,** Z. Xie, J. Huang, C. Shang, J. Norman, Q. Li, Y. Tong, K. M. Lau, A. C. Gossard, and J. E. Bowers, "Quantum Dot Avalanche Photodetector on Si Substrate", *CLEO: Science and Innovations,* SM3R. 2, 2020.

14. C. Shang, E. Hughes, **Y. Wan**, M. Dumont, R. Koscica, J. Selvidge, R. Herrick, A. C. Gossard, K. Mukherjee, and J. E. Bowers, "High Temperature reliable epitaxially grown quantum dot lasers on (001) Si with record performance", in 2021 *Conference on Lasers and Electro-Optics (CLEO)*, SF1B.7 **(Postdeadline Paper)**

Invited talk in conferences

1. **Y. Wan,** "On-chip detection from directly modulated quantum dot microring lasers on Si," invited talk at *Asia Communications and Photonics Conference (**ACP**)* - silicon photonics workshop, 2018.
2. **Y. Wan**, "Quadruple reduction of threshold current density for microring quantum dot lasers epitaxially grown on (001) Si," invited talk at *2018 **CLEO**: Science and Innovations*, pp. SW3Q-3. Optical Society of America.
3. **Y. Wan**, "Directly modulated quantum dot micro-ring lasers at 1.3 μm on (001) GaP/Si with low-threshold current", invited talk at *2018 Progress in Electromagnetics Research Symposium (**PIERS**-Toyama)* (pp. 249-253). IEEE.
4. **Y. Wan,** "On-Chip Detection From Directly Modulated Quantum Dot Microring Lasers on Si", invited talk in ASME 2019 **InterPACK**: International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems.
5. **Y. Wan,** "Quantum dot lasers and integration with Si photonic integrated circuits", invited talk at *Optoelectronics Global Conference (**OGC**),* 2021
6. **Y. Wan**, "Quantum dot lasers and integration with Si photonic integrated circuits", invited talk at *2022 Progress in Electromagnetics Research Symposium (**PIERS**).*
7. **Y. Wan,** "1.3 μm High Speed Heterogeneous Quantum-Dot Lasers on Si" invited talk at *2022 **CLEO**: Science and Innovations*, Optical Society of America.
8. **Y. Wan,** "Quantum dot lasers", invited talk in 2022 International Symposium on Silicon Based Optoelectronics (**ISSBO**).
9. **Y. Wan,** "The perspective and applications of quantum dot lasers", invited talk at *Optoelectronics Global Conference (**OGC**),* 2022

Invited talks in Seminars

1. **Y. Wan**, "Directly modulated quantum dot micro-ring lasers at 1.3 μm on (001) GaP/Si with low-threshold current.", Fudan-Guanghua International Forum for Young Scholars, in Fudan University, 2017.
2. **Y. Wan**, "Directly modulated quantum dot micro-ring lasers at 1.3 μm on (001) GaP/Si with low-threshold current.", the 6th East Lake International Forum for Outstanding Overseas Young Scholars, in Huazhong University of Science and Technology, 2017.
3. **Y. Wan**, "Monolithic Integration of InAs Quantum Dot Lasers on Si Substrates for On-chip Optical Interconnects.", National University of Singapore (NUS), Electrical and Computer engineering department, 2018
4. **Y. Wan**, "Sub-mA threshold 1.3 μm CW lasing from electrically pumped micro-lasers grown on (001) Si," Shanghai Institute of Microsystem and Information Technology (SIMIT), Chinese Academy of Sciences (CAS), 2018
5. **Y. Wan**, "Directly modulated quantum dot micro-ring lasers at 1.3 μm on (001) GaP/Si with low-threshold current.", the 1st Peking University Youth Forum on the next generation electronics engineering and computer science, in Peking University, 2018
6. **Y. Wan**, "InAs Quantum Dot Lasers on Si Substrates for On-chip Optical Interconnects.", Department of Optical Engineering, Zhejiang University, S2018
7. **Y. Wan**, "Directly modulated quantum dot micro-ring lasers at 1.3 μm on (001) GaP/Si with low-threshold current.", Institute of Semiconductors, Chinese Academy of Sciences (CAS), 2018
8. **Y. Wan**, "Directly modulated quantum dot micro-ring lasers at 1.3 μm on (001) GaP/Si with low-threshold current.", Institute of Physics, Chinese Academy of Sciences (CAS), 2018
9. **Y. Wan**, "Directly modulated quantum dot micro-ring lasers at 1.3 μm on (001) GaP/Si with low-threshold current.", University of Electronic Science and Technology of China (UESTC), School of Optoelectronic Science and Engineering, 2018

10. **Y. Wan,** "Monolithic Integration Quantum Lasers on si substrates", King Abdullah University of Science and Technology (KAUST), CEMSE ECE Seminar, 2020 (https://cemse.kaust.edu.sa/ece/events/event/monolithic-integration-inas-quantum-dot-lasers-si-substrates)
11. **Y. Wan**, "Integration of InAs Quantum Dot Lasers on Si Substrates", department seminar in Southern University of Science and Technology (SUST), 2021.
12. **Y. Wan**, "Advances in quantum dot lasers and integration with Si photonic integrated circuits", seminar talk in Hong Kong University of Science and Technology (HKUST), guangzhou campus, 2022. (https://calendar.hkust.edu.hk/events/public-research-seminar-microelectronics-thrust-advances-quantum-dot-lasers-and-integration)
13. **Y. Wan,** "Quantum dot lasers and integration with Si photonic integrated circuits", the first KSA Future of Semiconductors Forum, held in Riyadh March 30 –31, 2022, an event organized by King Abdullah University of Science and Technology (KAUST), King Abdulaziz City for Science and Technology (KACST)

Oral presentations

1. **Y. Wan,** Q. Li, Y. Geng, K. M. Lau*, "1.3 μm photoluminescence from InAs/GaAs quantum dots on CMOS-compatible (001) silicon by metal-organic chemical vapor deposition," in International Conference on Solid State Devices and Materials (SSDM), 2015.
2. J. Norman, A. Y. Liu, **Y. Wan**, Q. Li, E. L. Hu, K. M. Lau, A. C. Gossard, J. E. Bowers. 1.3 μm quantum-dot micro-disk lasers directly grown on (001) silicon. International Conference on Molecular Beam Epitaxy (ICMBE), Montpellier, France, September, 2016.
3. D. Jung, A. Y. Liu, J. Norman, **Y. Wan**, K. M. Lau, A. C. Gossard, J. E. Bowers*, "InAs Quantum Dot Laser Diodes Grown on on-axis Silicon," International Symposium on Photonics and Electronics Convergence (ISPEC), 2016. (**Invited**).
4. D. Jung, J. Norman, M. J. Kennedy, C. Shang, B. Shin, **Y. Wan**, A. C. Gossard, and J. E. Bowers*, "High efficiency low threshold current InAs/GaAs quantum dot lasers on on-axis (001) GaP/Si," in International Conference on Molecular Beam Epitaxy (ICMBE), 2017.
5. J. E. Bowers*, A. Y. Liu, D. Jung, J. Norman, A. C. Gossard, **Y. Wan**, Q. Li, K. M. Lau, and M. L. Lee, "InAs/GaAs quantum dot lasers on exact GaP/Si (001) and other templates", 2017 International Conference on Compound Semiconductor Manufacturing Technology.
6. J. Norman, D. Jung, Z. Zhang, M. J. Kennedy, K. Turnlund, C. Shang, **Y. Wan**, A. C. Gossard, and J. E. Bowers*, "The impact of threading dislocation density in InAs/GaAs quantum dot lasers grown on (001) silicon," North American Conference on Molecular Beam Epitaxy, Galveston, Texas, 2017
7. J. Norman, D. Jung, P. Pintus, **Y. Wan**, Q. Li, P. Bhasker, Z. Zhang, C. Shang, M. J. Kennedy, N. Dagli, K. M. Lau, A. C. Gossard, and J. E. Bowers*, "InAs Quantum Dot Devices for Epitaxial Photonic Integrated Circuits on Silicon," 20th International Conference on Molecular Beam Epitaxy (ICMBE), Shanghai, China, 2018
8. D. Innoue, D. Jung, J. Norman, **Y. Wan**, N. Nishyama, S. Arai, A. C. Gossard, J. E. Bowers*, "High-speed direct modulation of 1.3 μm InAs quantum dot laser grown on on-axis (001) Si substrate", JSAP (2018).
9. C. Shang, D. Jung, **Y. Wan,** J. Norman, A. C. Gossard, J. E. Bowers*, "InP-based quantum dash lasers emitting at 1.55 m with low threshold current density," Electronic Materials Conference (EMC), 2018.
10. D. Jung, R. Herrick, J. Norman, **Y. Wan**, A. C. Gossard, and J. E. Bowers*, "High performance and reliable 1.3 μm InAs quantum dot lasers epitaxially grown on Si", The 23rd Opto-Electronics and Communications Conference (OECC 2018). **(Best Paper Award)**
11. J. Norman, Z. Zhang, D. Jung, **Y. Wan**, M. J. Kennedy, A. Torres, R. W. Herrick, A. C. Gossard, and J. E. Bowers*, "High performance quantum dot lasers epitaxially integrated on Si." Quantum Communications and Quantum Imaging XVI, San Diego, California, 2018.
12. J. Norman, Z. Zhang, D. Jung, **Y. Wan**, S. Liu, C. Shang, R. W. Herrick, A. C. Gossard, and J. E. Bowers*, " Reliable, Feedback Insensitive p-Modulation Doped Quantum Dot Lasers Epitaxially Grown on CMOS Compatible Silicon Substrates" ISPEC, 2018. (**Invited**)

13. D. Jung, J. Norman, **Y. Wan**, S. Liu, R. Herrick, A. C. Gossard, and J. E. Bowers*, "InAs Quantum dot Lasers Epitaxially Grown on On-Axis (001) Silicon." 2018 IEEE 15th International Conference on Group IV Photonics (GFP). IEEE, 2018.

Grant proposal writing

1. 09/2015: HKUST "Long wavelength quantum dot lasers on silicon substrates"
2. 02/2016: HKUST "Nanoelectronic and nanophotonic integration on Si"

Media coverage

- My work of "**1.3 μm submilliamp threshold quantum dot micro-lasers on Si**" was reported by the following media. **(first author)**

  1. EurekAlert with a spotlight summary titled "Scientists demonstrated 1.3 μm submilliamp threshold quantum dot micro-lasers on Si":

  https://www.eurekalert.org/pub_releases/2017-09/hkuo-sd1091817.php

  2. *Semiconductor Today* with a spotlight summary titled "HKUST/UCSB team demonstrates record 1.3μm CW submilliamp-threshold quantum dot micro-lasers on silicon".

  http://www.semiconductor-today.com/news_items/2017/sep/hkust-ucsb_200917.shtml

  3. *LaserFocusWorld* with a spotlight summary titled "Electrically pumped quantum-dot near-IR microlaser on silicon has submilliamp threshold"

  http://www.laserfocusworld.com/articles/2017/09/electrically-pumped-quantum-dot-near-ir-microlaser-on-silicon-has-submilliamp-threshold.html

  4. *Science Daily* with a spotlight summary titled "Tiny electrically pumped micro-lasers epitaxially grown on industry standard silicon substrates"

  https://www.sciencedaily.com/releases/2017/09/170918093346.htm

  1. *eeNews* with a spotlight summary titled "Grown on silicon: QD-based micro-ring GaAs lasers operate from 0.6mA"

  http://www.eenewseurope.com/news/grown-silicon-qd-based-micro-ring-gaas-lasers-operate-06ma

  2. *PHYSORG* with a spotlight summary titled "Scientists demonstrated 1.3μm submilliamp threshold quantum dot micro-lasers on Si"

  https://phys.org/news/2017-09-scientists-956m-submilliamp-threshold-quantum.html

  3. *Compound Semiconductor* with a spot light summary titled "Scientists Integrate Quantum Dot Micro-lasers On Silicon"

  https://compoundsemiconductor.net/article/102539/Scientists_Integrate_Quantum_Dot_Micro-lasers_On_Silicon

  8. *Photonics.com* with a spotlight summary titled "QD Lasers Could Be Smallest to Date"

  https://www.photonics.com/Article.aspx?AID=62546

- My work of "**1.3-um room-temperature InAs quantum-dot micro-disk lasers directly grown on (001) silicon**" was reported by the following media. **(first author)**

  1. *OSA publishing* with a spotlight summary titled "Optically pumped 1.3 μm room-temperature InAs quantum-dot micro-disk lasers directly grown on (001) silicon": https://www.osapublishing.org/spotlight/summary.cfm?id=338700
  2. *Semiconductor Today* with a spotlight summary titled "Gallium arsenide on V-groove silicon template for photonics and electronics"

http://www.semiconductor-today.com/news_items/2016/apr/hkust_130416.shtml

3. Listed as the 15 most cited articles published in *Optics Letters* between 2016 and 2018. http://emessaging.vertexcommunication.com/hostedemail/email.htm?CID=33091803187&ch=891E05BED8A07C003AE6EA7AC2B24381&h=d77bb085b595d5d523bdd30126681088&ei=JI93mwCND&schema=echo7

- My work of **"Sub-wavelength InAs quantum dot micro-disk lasers epitaxially grown on exact Si (001) substrates"** was reported by the following professional communities **(first author)**

1. *AIP publishing* with a spotlight summary titled "Silicon Sees the Light: Tiny Lasers Enable Next-Gen Microprocessors to Run Faster, Less Power-Hungry"

   https://www.aip.org/publishing/journal-highlights/silicon-sees-light-tiny-lasers-enable-next-gen-microprocessors-run

2. *Semiconductor Today* with a spotlight summary titled "Subwavelength micro-disk lasers on exact (001) silicon substrate"

   http://www.semiconductor-today.com/news_items/2016/jun/ucsb_200616.shtml

3. *Semiconductor Today* with a spotlight summary titled "Direct growth of InAs quantum dots on Si" http://www.semiconductor-today.com/features/PDF/semiconductor-today-june-july2016-Direct-growth.pdf

4. *HKUST School of Engineering* with a spotlight summary titled "Breakthrough by Prof Kei May Lau and Collaborators to Make Microprocessors Faster and Less Power-Hungry"

   http://www.seng.ust.hk/web/eng/news_detail.php?id=972

5. *Science Prism* with a spotlight summary titled "Tiny Lasers Will Speed up Computers" http://www.scienceprism.com/2016/06/09/tiny-lasers/

6. *Science Daily* with a spotlight summary titled "Tiny lasers enable next-gen microprocessors to run faster, less power-hungry" https://www.sciencedaily.com/releases/2016/06/160602122027.htm

7. *Next Big Future* with a spotlight summary titled "Micron sized on chip quantum dot lasers will enable faster communication and computing"

   http://www.nextbigfuture.com/2016/07/micron-sized-onchip-quantum-dot-lasers.html

8. *EE Times, Electronics-Lab, and Electronics Infoline* with a spotlight summary titled "Quantum dots shrink on-chip lasers to 1μm", respectively. http://www.electronics-eetimes.com/news/quantum-dots-shrink-chip-lasers-1mm

   http://www.electronics-lab.com/quantum-dots-shrink-on-chip-lasers-to-1%CE%BCm/

   http://www.electronicsinfoline.com/pin/33676/s

9. *Press release* in *HKUST* http://www.ust.hk/about-hkust/media-relations/press-releases/hkust-develops-tiny-lasers-open-new-era-light-based-computing-3/

   The work has also been reported by the following social media

   1. Opli – HKUST Develops Tiny Lasers that Opens New Era for Light-based Computing

   http://opli.net/opli_magazine/eo/2016/hkust-develops-tiny-lasers-that-opens-new-era-for-light-based-computing-aug-news/

   2. World News – HKUST Develops Tiny Lasers that Opens New Era for Light-based Computing https://article.wn.com/view/2016/08/22/HKUST_Develops_Tiny_Lasers_that_Opens_New_Era_for_Lightbased/

   3. Public Now–HKUST Develops Tiny Lasers That Opens New Era For Light-Based Computing

http://www.publicnow.com/view/4E00F682B97F67728B2546FEE7F0451EF34E47FF?2016-08-22-05:31:22+01:00-xxx7661

東方日報- 加快數據傳輸 科大研「矽」微型激光器
http://orientaldaily.on.cc/cnt/news/20160823/00176_060.html
星島日報- 科大學者研製節能微型激光器
http://std.stheadline.com/daily/news-content.php?id=1466361&target=2
文匯報- 科大製微米激光器助電腦提速
http://paper.wenweipo.com/2016/08/23/HK1608230056.htm
大公報- 香港科技大學研 "硅" 激光器 省電加快數據傳輸
http://news.takungpao.com.hk/hkol/headline/2016-08/3360360.html
Xinhua – HK scientist develops small lasers that enhance light-based computing
http://news.xinhuanet.com/english/2016-08/22/c_135624779.htm
香港科大成功研製硅襯底微型鐳射器
新華網- http://news.xinhuanet.com/gangao/2016-08/22/c_1119434657.htm
人民日報海外版- http://paper.people.com.cn/rmrbhwb/html/2016-08/23/content_1706364.htm
國際日報 - http://www.chinesetoday.com/big/article/1131701
亞太日報-http://zh.apdnews.com/china/hongkong/473606.html
鳳凰網-http://news.ifeng.com/a/20160823/49823002_0.shtml

- My work of **"Monolithically Integrated InAs/InGaAs Quantum Dot Photodetectors on Silicon Substrates"** was reported by the following professional communities **(first author)**
  Semiconductor Today with a spotlight summary titled "Monolithic indium arsenide quantum dots on silicon optoelectronics"
  http://www.semiconductor-today.com/news_items/2017/nov/ucsb_221117.shtml

- My contributed work of **"1.55 μm room-temperature lasing from subwavelength quantum-dot microdisks directly grown on (001) Si ""** was reported by the following professional community
  Semiconductor Today with a spotlight summary titled "Direct growth of III-V material on silicon for 1.55μm quantum dot lasers"
  http://www.semiconductor-today.com/news_items/2017/apr/hkust_060417.shtml