

# Xiankai Sun

Associate Professor, Department of Electronic Engineering  
Associate Director, Center of Optical Sciences  
The Chinese University of Hong Kong  
Shatin, New Territories, Hong Kong SAR, China

Tel: (852) 3943 8264, Email: [xksun@cuhk.edu.hk](mailto:xksun@cuhk.edu.hk), Homepage: <http://www.ee.cuhk.edu.hk/~xksun>

## **RESEARCH INTEREST AND EXPERTISE**

integrated optics, optoelectronics, nanophotonics, nanofabrication, optomechanics, optoacoustics, nanomechanics, micro- and nanoelectromechanics, photonic nanostructures, semiconductor lasers, photonic/phononic crystals, nonlinear photonics, topological photonics, optical communication, optical sensing and signal processing

## **APPOINTMENTS**

08/2021–present Associate Director, Center of Optical Sciences, The Chinese University of Hong Kong  
08/2020–present Associate Professor, Electronic Engineering, The Chinese University of Hong Kong  
08/2014–07/2020 Assistant Professor, Electronic Engineering, The Chinese University of Hong Kong  
06/2012–07/2014 Associate Research Scientist, Electrical Engineering, Yale University, USA  
07/2010–05/2012 Postdoctoral Research Associate, Electrical Engineering, Yale University, USA

## **EDUCATION**

2010 Ph.D., Applied Physics, California Institute of Technology (Caltech), USA GPA: 4.2/4.3  
Advisor: Prof. Amnon Yariv. Thesis: Supermode Si/III–V lasers and circular Bragg lasers  
2006 M.S., Applied Physics, California Institute of Technology (Caltech), USA GPA: 4.2/4.3  
2004 B.S., Physics, University of Science and Technology of China (USTC), China GPA: 3.9/4.0

## **HONORS AND AWARDS**

2015 Early Career Award, Research Grants Council of Hong Kong  
2013 Finalist, Blavatnik Awards for Young Scientists, New York Academy of Sciences  
2010 Bor-Uei Chen Memorial Scholarship Award, Photonics Society of Chinese-Americans  
2009 IEEE Photonics Society Student Travel Grant Award  
SPIE Scholarship in Optical Science and Engineering  
2008 IEEE Photonics Society Graduate Student Fellowship Award  
Li Ming Scholarship Award, Caltech  
Chinese Government Award for Outstanding Overseas Students  
2007 Phi Tau Phi Scholarship, Phi Tau Phi Scholastic Honor Society of America  
2006 CESASC Scholarship, Chinese-American Engineers and Scientists Association of Southern California  
2004 Outstanding College Graduate of Anhui Province, China  
Outstanding College Graduate of USTC  
Outstanding Bachelor Thesis Award, USTC  
Outstanding College Student of Anhui Province, China  
2001–2003 First-Tier Outstanding Student Scholarship of USTC, every year  
2000 Zhang Zongzhi Sci-Tech Scholarship, USTC

## **PROFESSIONAL ACTIVITIES**

### ◆ Journal editorship

- Associate Editor of *Optica*, 09/2022–present

- Associate Editor of *Journal of Lightwave Technology*, 12/2021–present
- Lead Guest Editor of *Journal of the Optical Society of America B* for Feature Issue on Integrated Lithium Niobate Photonics, 2022–2023
- Editorial Board Member of *Optical and Quantum Electronics*, 01/2022–12/2024
- Editorial Board Member of *Scientific Reports*, 06/2018–06/2022
- Associate Editor of *Optics Express*, 08/2016–08/2022

◆ **Conference organization**

- steering committee member of *Workshop on Optomechanics and Brillouin Scattering (WOMBAT)*, 2022–present
- symposium chair for *S6: Optoelectronic Devices and Applications* at *2022 IEEE the 7th Optoelectronics Global Conference (OGC 2022)*, Shenzhen, China, 09/2022
- organizer for session *SC3: Integrated Lithium Niobate Photonics* at the *2021 Photonics and Electromagnetics Research Symposium (PIERS 2021)*, Hangzhou, China, 11/2021
- technical committee member of *S&I 9: Photonic Integration* at the *2022 Conference on Lasers and Electro-Optics (CLEO 2022)*, San Jose, CA, USA, 05/2022
- technical committee member of *Topic 7: Optoelectronic Devices and Integration* at the *10th Applied Optics and Photonics China (AOPC 2021)*, Beijing, China, 06/2021
- technical committee member of *S&I 9: Photonic Integration* at the *2021 Conference on Lasers and Electro-Optics (CLEO 2021)*, San Jose, CA, USA, 05/2021
- technical committee member of *Track 6: Micro-, Nano-, and Quantum Photonics: Science and Applications* at the *2020 Asia Communications and Photonics Conference (ACP 2020)*, Beijing, China, 10/2020
- technical committee member of *S&I 9: Photonic Integration* at the *2020 Conference on Lasers and Electro-Optics (CLEO 2020)*, San Jose, CA, USA, 05/2020
- technical committee member of *Track 4: Optoelectronic Integration and Devices* at the *2019 International Conference on Optical Communications and Networks (ICOON 2019)*, Huangshan, China, 08/2019
- co-chair for topical session *Optofluidics & Optical Devices* at the *2019 International Multidisciplinary Conference on Optofluidics (IMCO 2019)*, Hong Kong, 06/2019
- technical committee member of *Track 4: Optoelectronic Devices and Integration* at the *2018 Asia Communications and Photonics Conference (ACP 2018)*, Hangzhou, China, 10/2018
- co-chair for topical session *Optical Microcavity: From Sensing to Lasing* at the *2018 International Multidisciplinary Conference on Optofluidics (IMCO 2018)*, Shanghai, China, 08/2018
- organizer and chair for session *SC3&2: Optical Forces and Optomechanics* at the *2016 Progress In Electromagnetic Research Symposium (PIERS 2016)*, Shanghai, China, 08/2016

◆ **External reviewer/evaluator**

- grant proposals for the Israel Science Foundation, 2021
- grant proposals for the European Research Council, 2020
- graduate courses for The Chinese University of Hong Kong, Shenzhen, 2021, 2022
- MPhil and PhD theses for The Chinese University of Hong Kong, Shenzhen, 2019, 2020, 2022
- PhD theses for University of Science and Technology of China, 2017
- grant proposals for the French National Research Agency, 2017
- research and professional activities of the Institutes of the Czech Academy of Sciences, 2015, 2020

◆ **Journal reviewer (more than 200 times in total)**

**[Optics and Photonics]**

- *Nature Photonics*
- *Light: Science & Applications*
- *Laser & Photonics Reviews*
- *Advanced Optical Materials*

**[Physics, Applied Physics, and Materials]**

- *Nature Nanotechnology*
- *Nature Communications*
- *Science Advances*
- *Advanced Materials*

- *Advanced Photonics Research*
- *Nanophotonics*
- *ACS Photonics*
- *APL Photonics*
- *Optics and Laser Technology*
- *Optics Letters*
- *Optics Express*
- *Journal of the Optical Society of America B*
- *Journal of Lightwave Technology*
- *IEEE Journal of Selected Topics in Quantum Electronics*
- *IEEE Journal of Quantum Electronics*
- *IEEE Photonics Journal*
- *IEEE Photonics Technology Letters*
- *Optics Communications*
- *Journal of Optics*
- *Optical Fiber Technology*
- *IET Optoelectronics*
- *Optical and Quantum Electronics*
- *Journal of Nanophotonics*
- *Optical Engineering*
- *Optical Review*
- *Fiber and Integrated Optics*
- *Advanced Science*
- *Advanced Functional Materials*
- *Advanced Materials Interfaces*
- *Advanced Quantum Technologies*
- *Annalen der Physik*
- *Physical Review Letters*
- *Physical Review Applied*
- *Physical Review A*
- *Physical Review B*
- *Physical Review Materials*
- *Physical Review Research*
- *Applied Physics Reviews*
- *Applied Physics Letters*
- *Journal of Applied Physics*
- *ACS Applied Nano Materials*
- *Science China Physics, Mechanics & Astronomy*
- *Science China Information Sciences*
- *Scientific Reports*
- *IEEE Access*
- *Nanomaterials*
- *Molecules*
- *Sensors*
- *Materials*
- *Entropy*
- *Applied Sciences*
- *Micromachines*
- *Applied Physics Express*
- *Journal of Physics B*
- *Applied Physics B*
- *AIP Advances*

## **RESEARCH PROJECTS AND EXPERIENCE**

**The Chinese University of Hong Kong**

08/2014–present

**Role as Project Coordinator (PC), Principal Investigator (PI), or Co-Principal Investigator (Co-PI):**

- ◆ Photonic integrated devices and circuits for telecommunication and quantum applications  
[PI, period: 1 Feb 2022 – 31 Jan 2023]
- ◆ A sub-10-nm resolution electron-beam lithography system for cross-disciplinary nanomaterial and nanodevice research  
[PC, period: 30 Jun 2022 – 29 Jun 2025]
- ◆ Investigation of anti-PT symmetry on an integrated photonic platform  
[PI, period: 1 Oct 2021 – 30 Sep 2024]
- ◆ An integrated measurement system for quantum information and quantum materials research under extreme conditions  
[Co-PI, period: 30 Jun 2021 – 29 Jun 2024]
- ◆ A high-accuracy wafer polisher and bonders for heterogeneous integration  
[Co-PI, period: 1 Jun 2021 – 31 May 2024]
- ◆ On-chip topological lasers with cavities of arbitrary shapes  
[PI, period: 1 Jan 2020 – 30 Jun 2023]
- ◆ Investigation of photonic bound states in the continuum in photonic integrated circuits

[PI, period: 1 Jan 2019 – 30 Jun 2022]

- ◆ Experimental investigation of nanoscale *PT*-symmetric acoustics with cavity optomechanical systems  
[PI, period: 1 Jan 2018 – 30 Jun 2021]
- ◆ Visible-light optomechanical integrated circuits based on III-nitride semiconductors  
[PI, period: 1 Jan 2016 – 31 Dec 2019]
- ◆ Investigation of the force law of classical electrodynamics with nanoscale optomechanical systems  
[PI, period: 1 Jan 2016 – 30 Jun 2019]
- ◆ Developing optomechanical devices based on layered nanomaterials for single-biomolecule mass spectrometry  
[PI, period: 1 Jul 2015 – 30 Jun 2017]
- ◆ Nano-optomechanical devices based on novel two-dimensional nanomaterials  
[PI, period: 1 Jan 2015 – 30 Jun 2017]

**Role as Co-Investigator (Co-I):**

- ◆ Hybrid Integration of Layered Group Ten Transition Metal Dichalcogenides on Planar Waveguides for Long Wavelength Optical Communications  
[Co-I, period: 1 Jan 2022 – 31 Dec 2025]
- ◆ Ultra-high  $Q$  silicon micro-resonators for integrated quantum photonics  
[Co-I, period: 1 Oct 2017 – 31 Mar 2021]

**Yale University**

07/2010–07/2014

*Yale Nanodevices Laboratory, Electrical Engineering* (supervisor: *Prof. Hong Tang*)

- ◆ Cavity nano-optomechanics
- ◆ Nonlinear photonics
- ◆ Applications of photonic crystals in cavity optomechanics
- ◆ Micro/nanoelectromechanical systems (MEMS/NEMS)
- ◆ Cryogenic nanophotonics and nano-optomechanics

**California Institute of Technology**

09/2004–06/2010

*Optical and Quantum Electronics Laboratory, Applied Physics* (advisor: *Prof. Amnon Yariv*)

- ◆ Hybrid Si/III–V integrated optoelectronic devices and circuits
- ◆ Electrically pumped, large-area, single-mode, two-dimensional photonic crystal Bragg lasers
- ◆ Theoretical analysis and calculation of surface-emitting chirped circular grating lasers
- ◆ Ultralow-loss integrated photonic delay

**University of Science and Technology of China**

09/2002–07/2004

*ZnO Lab Group, Department of Physics* (advisor: *Prof. Zhuxi Fu*)

- ◆ Growth, characterization, and device fabrication of heteroepitaxial ZnO films on Si substrates

**TEACHING EXPERIENCE**

**The Chinese University of Hong Kong, as an instructor**

08/2014–present

- ENGG1100 (*Introduction to Engineering Design*)
- ENGG1310, ESTR1003, ESTR2006 (*Engineering Physics*)
- BMEG4410 (*BioMEMS*)
- ELEG5550 (*Micro- and Nano-Fabrication Laboratory*)

**California Institute of Technology, as a teaching assistant**

09/2004–06/2010

- APh17c (*Thermodynamics*)
- APh/EE131 (*Optical Wave Propagation*)
- APh/EE132 (*Optoelectronic Materials and Devices*)
- EE151 (*Electromagnetic Engineering*)

## **INVITED CONFERENCE TALKS**

- (1) “Etchless lithium niobate integrated photonic circuits and devices,” Asia Communications and Photonics Conference 2022 workshop “Active Devices on Thin-film Lithium Niobate Platform,” Shenzhen, China, Nov. 2022.
- (2) “Integrated lithium niobate photonics on an etchless platform,” 2022 IEEE Region 10 Conference (TENCON 2022), Hong Kong, Nov. 2022.
- (3) “Room-temperature continuous-wave topological lasers on silicon,” The 13th International Conference on Information Optics and Photonics (CIOP 2022), Xi’an, China, Aug. 2022.
- (4) “Experimental realization of topological parametric phonon lasers,” CLEO 2022, San Jose, CA, USA, May 2022.
- (5) “Etchless lithium niobate integrated photonics,” The First International Symposium on Lithium Niobate Optoelectronics (ISLNO 2021), Shanghai, China, Oct. 2021.
- (6) “Inverse-designed optical devices and modules for advanced photonic integration,” The 26th Optoelectronics and Communications Conference (OECC 2021), Hong Kong, Jul. 2021.
- (7) “Rotation sensing with PT-symmetric circular Bragg lasers,” SPIE Photonics West 2021, San Francisco, CA, USA, Mar. 2021.
- (8) “Inverse design of photonic components for large-scale and high-density integration,” SPIE Photonics West 2021, San Francisco, CA, USA, Mar. 2021.
- (9) “Photonic integrated circuits with bound states in the continuum: principle and applications,” Asia Communications and Photonics Conference 2020, Beijing, China, Oct. 2020.
- (10) “Experimental investigation of the topological charge of optical force in a solid dielectric,” SPIE Optics + Photonics 2020, San Diego, CA, USA, Aug. 2020.
- (11) “Graphene metallization of integrated electro-optomechanical resonators,” The 42nd Photonics & Electromagnetics Research Symposium (PIERS 2019 in Xiamen), Xiamen, China, Dec. 2019.
- (12) “Broadband and narrowband optical absorbers for photonic and optoelectronic applications,” The 9th International Multidisciplinary Conference on Optofluidics (IMCO 2019), Hong Kong, Jun. 2019.
- (13) “Inverse design in integrated photonic structures, devices, and circuits,” The 17th International Conference on Optical Communications and Networks (ICOON 2018), Zhuhai, China, Nov. 2018.
- (14) “Optomechanical devices at the nanoscale: an overview and recent developments,” The 8th International Multidisciplinary Conference on Optofluidics (IMCO 2018), Shanghai, China, Aug. 2018.
- (15) “Recent progress in nano-optomechanical devices at microwave frequencies,” SPIE Photonics West 2018, San Francisco, CA, USA, Jan. 2018.
- (16) “Integrated optical isolators with hybrid graphene/silicon photonics technology,” Asia Communications and Photonics Conference Workshop 6: 2D Material on Waveguide Devices and Applications, Wuhan, China, Nov. 2016.
- (17) “Photonics meets mechanics in the nanoworld,” Asia Communications and Photonics Conference Workshop 9: On-chip Light-matter Interaction: Physics and Devices, Wuhan, China, Nov. 2016.
- (18) “High-frequency nano-optomechanics: an exploration at the boundary between photonics, mechanics, and microwaves,” SPIE Optics + Photonics 2013, San Diego, CA, USA, Aug. 2013.

## **INVITED SEMINARS**

- (1) “Novel Nanophotonic Structures, Devices, and Circuits for Enhanced Light–Matter Interaction”
  - University of Science and Technology of China, Hefei, China, Dec. 2018
- (2) “Optomechanics: From LIGO to Nano”
  - Tsinghua University, Beijing, China, Dec. 2018
  - Huazhong University of Science and Technology, Wuhan, China, Mar. 2018

- (3) “Novel Nanophotonic and Nano-Optomechanical Devices”
  - University of Science and Technology of China, Hefei, China, Dec. 2017
- (4) “Novel Nanophotonic Devices: Harnessing Light–Matter Interaction at the Nanoscale”
  - Huazhong University of Science and Technology, Wuhan, China, Apr. 2017
  - University of Science and Technology of China, Hefei, China, Apr. 2017
  - Zhejiang University, Hangzhou, China, Apr. 2017
- (5) “Photonics Meets Mechanics in the Nanoworld”
  - Xi’an Jiao Tong University, Xi’an, China, Mar. 2017
  - Hong Kong University of Science and Technology, Hong Kong, Nov. 2016
  - Huazhong University of Science and Technology, Wuhan, China, Apr. 2016
  - Tianjin University, Tianjin, China, Apr. 2016
  - Nankai University, Tianjin, China, Apr. 2016
  - Tsinghua University, Beijing, China, Apr. 2016
  - Beihang University, Beijing, China, Apr. 2016
  - Peking University, Beijing, China, Apr. 2016
  - Beijing University of Posts and Telecommunications, Beijing, China, Apr. 2016
- (6) “Nano-Optomechanics in the High Frequency Regime: Exploration at the Boundary Between Photonics, Mechanics, and Microwaves”
  - University of New Mexico, NM, USA, Mar. 2014
  - University of Arizona, AZ, USA, Mar. 2014
  - The Chinese University of Hong Kong, Hong Kong, Mar. 2014
  - Shanghai Jiao Tong University, Shanghai, China, Feb. 2014
  - Zhejiang University, Hangzhou, China, Feb. 2014
  - Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, China, Feb. 2014
  - University of Science and Technology of China, Hefei, China, Feb. 2014
  - Nanjing University, Nanjing, China, Feb. 2014
  - Tsinghua University, Beijing, China, Feb. 2014
  - Peking University, Beijing, China, Feb. 2014
  - University of California, Los Angeles, CA, USA, Sep. 2013
  - University of Southern California, CA, USA, Sep. 2013
  - University of California, San Diego, CA, USA, Aug. 2013
- (7) “Circular Bragg Lasers and Supermode Si/III–V Lasers: From Theory to Devices”
  - University of California, Santa Barbara, CA, USA, Apr. 2010
- (8) “Circular Bragg Lasers and Supermode Si/III–V Lasers: The Ideal On-Chip Integrable Light Sources for Next-Generation Optical Communication”
  - Yale University, New Haven, CT, USA, Feb. 2010
- (9) “Circular Bragg Microresonators and Microlasers: From Theory to Devices”
  - Shanghai Jiao Tong University, Shanghai, China, Sep. 2009
- (10) “Circular Bragg Resonator Lasers: Theoretical Analysis and Optimal Design”
  - University of Science and Technology of China, Hefei, China, Sep. 2006

## **PUBLICATIONS**

- ◆ Overall profile: 89 refereed journal papers, 64 refereed conference papers, 18 invited conference talks, 1 book, 3 book chapters
- ◆ Google Scholar homepage: <http://scholar.google.com.hk/citations?user=Z8CHWjsAAAAJ&hl=en>
- ◆ Total citations: 2775, *h*-index: 31 (as of Dec. 2022)

### ***Journal Papers (under review)***

- (1) Ziyao Feng, Yang Liu, Xiang Xi, Lai Wang, and **Xiankai Sun**, “Gigahertz phononic integrated circuits based on overlay slot waveguides,” 2022. (submitted)
- (2) Yue Yu and **Xiankai Sun**, “Surface acoustic microwave photonic filters on etchless lithium niobate integrated platform,” 2022. (submitted)
- (3) Ziyao Feng and **Xiankai Sun**, “Experimental observation of dissipatively coupled bound states in the continuum on an integrated photonic platform,” 2022. (submitted)
- (4) Xiang Xi, Jingwen Ma, and **Xiankai Sun**, “A topological parametric phonon laser,” 2021. (submitted)
- (5) Jingwen Ma, Taojie Zhou, Mingchu Tang, Haochuan Li, Zhan Zhang, Xiang Xi, Mickael Martin, Thierry Baron, Huiyun Liu, Zhaoyu Zhang, Siming Chen, and **Xiankai Sun**, “Room-temperature continuous-wave Dirac-vortex topological lasers on silicon,” 2021. (submitted)

### ***Journal Papers (published/accepted)***

- (1) Yuan Li, Zunyue Zhang, Yi Wang, Yue Yu, Xuetong Zhou, Hon Ki Tsang, and **Xiankai Sun**, “Inverse-designed linear coherent photonic networks for high-resolution spectral reconstruction,” *ACS Photonics*, 2022. (accepted)
- (2) Ziyao Feng and **Xiankai Sun**, “Harnessing dynamical encircling of an exceptional point in anti-*PT*-symmetric integrated photonic systems,” *Physical Review Letters*, 2022. (accepted)
- (3) Taojie Zhou, Jingwen Ma, Mingchu Tang, Haochuan Li, Mickael Martin, Thierry Baron, Huiyun Liu, Siming Chen, **Xiankai Sun**, and Zhaoyu Zhang, “Monolithically integrated ultralow threshold topological corner state nanolasers on silicon,” *ACS Photonics*, 2022. <https://doi.org/10.1021/acsp Photonics.2c00711>
- (4) Mingzeng Peng, Jiadong Cheng, Xinhe Zheng, Jingwen Ma, Ziyao Feng, and **Xiankai Sun**, “2D-materials-integrated optoelectromechanics: recent progress and future perspectives,” *Reports on Progress in Physics*, 2022. <https://doi.org/10.1088/1361-6633/ac953e>
- (5) Jiawei Zhang, Ziyao Feng, and **Xiankai Sun**, “Realization of bound states in the continuum in anti-*PT*-symmetric optical systems: a proposal and analysis,” *Laser & Photonics Reviews* **16**: 2200079, 2022. <https://doi.org/10.1002/lpor.202200079>
- (6) Yue Yu, Xiang Xi, and **Xiankai Sun**, “Observation of mechanical bound states in the continuum in an optomechanical microresonator,” *Light: Science & Applications* **11**: 328, Nov. 2022.
- (7) Xiang Xi, Chang-Ling Zou, Chun-Hua Dong, and **Xiankai Sun**, “Highly tunable broadband coherent wavelength conversion with a fiber-based optomechanical system,” *Advanced Photonics* **4** (5): 056003, Sep. 2022. [featured as cover article]
- (8) Yue Yu, Zejie Yu, Zunyue Zhang, Hon Ki Tsang, and **Xiankai Sun**, “Wavelength-division multiplexing on an etchless lithium niobate integrated platform,” *ACS Photonics* **9** (10): 3253–3259, Oct. 2022.
- (9) Huade Mao, Yue Yu, Yu-Xuan Ren, Ka Yan Chan, Jiqiang Kang, **Xiankai Sun**, Edmund Y. Lam, and Kenneth K. Y. Wong, “Neural optimizer for inverse design of complex-modulated hologram implemented by plasmonic metasurfaces,” *Advanced Photonics Research* **3**: 2200085, 2022. <https://doi.org/10.1002/adpr.202200085>

- (10) Fan Ye and **Xiankai Sun**, “Hofstadter butterfly and topological edge states in a quasiperiodic photonic crystal cavity array,” *Optics Express* **30** (15): 26620–26627, Jul. 2022.
- (11) Xudong Liu, Jialiang Huang, Hao Chen, Zhengfang Qian, Jingwen Ma, **Xiankai Sun**, Shuting Fan, and Yiwen Sun, “Terahertz topological photonic waveguide switch for on-chip communication,” *Photonics Research* **10** (4): 1090–1096, Apr. 2022.
- (12) Fan Ye, Yue Yu, Xiang Xi, and **Xiankai Sun**, “Second-harmonic generation in etchless lithium niobate nanophotonic waveguides with bound states in the continuum,” *Laser & Photonics Reviews* **16** (3): 2100429, Mar. 2022.
- (13) Yuan Li and **Xiankai Sun**, “Anisotropic Dirac cone and slow edge states in a photonic Floquet lattice,” *Physical Review B* **105** (1): 014306, Jan. 2022.
- (14) Xiang Xi, Jingwen Ma, Zhong-Hao Zhou, Xin-Xin Hu, Yuan Chen, Chang-Ling Zou, Chun-Hua Dong, and **Xiankai Sun**, “Experimental investigation of the angular symmetry of optical force in a solid dielectric,” *Optica* **8** (11): 1435–1441, Nov. 2021.
- (15) Yue Yu, Lai Wang, and **Xiankai Sun**, “Demonstration of on-chip gigahertz acousto-optic modulation at near-visible wavelengths,” *Nanophotonics* **10** (17): 4323–4329, Dec. 2021.  
[included in Special Issue on *Nonradiating Photonics with Resonant Dielectric Nanostructures*]
- (16) Zunyue Zhang, Yuan Li, Yi Wang, Zejie Yu, **Xiankai Sun**, and Hon Ki Tsang, “Compact high resolution speckle spectrometer by using linear coherent integrated network on silicon nitride platform at 776 nm,” *Laser & Photonics Reviews* **15** (11): 2100039, Nov. 2021.
- (17) Yue Yu, Zejie Yu, Lai Wang, and **Xiankai Sun**, “Ultralow-loss etchless lithium niobate integrated photonics at near-visible wavelengths,” *Advanced Optical Materials* **9** (19): 2100060, Oct. 2021.
- (18) Huade Mao, Yu-Xuan Ren, Yue Yu, Zejie Yu, **Xiankai Sun**, Shuang Zhang, and Kenneth K. Y. Wong, “Broadband meta-converters for multiple Laguerre-Gaussian modes,” *Photonics Research* **9** (9): 1689–1698, Sep. 2021.
- (19) Jingwen Ma, Xiang Xi, Yuan Li, and **Xiankai Sun**, “Nanomechanical topological insulators with an auxiliary orbital degree of freedom,” *Nature Nanotechnology* **16** (5): 576–583, May 2021.  
[reported in News & Views: “Topological vortices for sound and light,” *Nature Nanotechnology* **16** (5): 487–489, May 2021]
- (20) Yang Liu, Lai Wang, Yuantao Zhang, Xin Dong, **Xiankai Sun**, Zhibiao Hao, Yi Luo, Changzheng Sun, Yanjun Han, Bing Xiong, Jian Wang, and Hongtao Li, “Demonstration of n-Ga<sub>2</sub>O<sub>3</sub>/p-GaN diodes by wet-etching lift-off and transfer-print technique,” *IEEE Electron Device Letters* **42** (4): 509–512, Apr. 2021.
- (21) Zejie Yu and **Xiankai Sun**, “Gigahertz acousto-optic modulation and frequency shifting on etchless lithium niobate integrated platform,” *ACS Photonics* **8** (3): 798–803, Mar. 2021.
- (22) Yi Wang, Zejie Yu, Zunyue Zhang, **Xiankai Sun**, and Hon Ki Tsang, “Fabrication-tolerant and low-loss hybrid plasmonic slot waveguide mode converter,” *Journal of Lightwave Technology* **39** (7): 2106–2112, Apr. 2021.
- (23) Jingwen Ma, Xiang Xi, and **Xiankai Sun**, “Experimental demonstration of dual-band nano-electromechanical valley-Hall topological metamaterials,” *Advanced Materials* **33** (10): 2006521, Mar. 2021.
- (24) Xiang Xi, Jingwen Ma, Shuai Wan, Chun-Hua Dong, and **Xiankai Sun**, “Observation of chiral edge states in gapped nanomechanical graphene,” *Science Advances* **7** (2): eabe1398, Jan. 2021.
- (25) Zejie Yu and **Xiankai Sun**, “Inverse-designed photonic jumpers with ultracompact size and ultralow loss,” *Journal of Lightwave Technology* **38** (23): 6623–6628, Dec. 2020.
- (26) Yue Yu, Zejie Yu, and **Xiankai Sun**, “Nonmetallic broadband visible-light absorbers with polarization and incident angle insensitivity,” *IEEE Photonics Journal* **12** (6): 2200807, Dec. 2020.



- (27) Yi Wang, Zejie Yu, Zunyue Zhang, Beilei Sun, Yeyu Tong, Jian-Bin Xu, **Xiankai Sun**, and Hon Ki Tsang, “Bound-states-in-continuum hybrid integration of 2D platinum diselenide on silicon nitride for high-speed photodetectors,” *ACS Photonics* **7** (10): 2643–2649, Oct. 2020.
- (28) Taojie Zhou, Kar Wei Ng, **Xiankai Sun**, and Zhaoyu Zhang, “Ultra-thin curved visible microdisk lasers with three-dimensional whispering gallery modes,” *Nanophotonics* **9** (9): 2997–3002, Jul. 2020.
- (29) Ziyao Feng and **Xiankai Sun**, “Giant enhancement of rotation sensing with *PT*-symmetric circular Bragg lasers,” *Physical Review Applied* **13** (5): 054078, May 2020.
- (30) Yi Wang, Zejie Yu, Yeyu Tong, Beilei Sun, Zunyue Zhang, Jian-Bin Xu, **Xiankai Sun**, and Hon Ki Tsang, “High-speed infrared two-dimensional platinum diselenide photodetectors,” *Applied Physics Letters* **116** (21): 211101, May 2020. [selected as Editor’s Pick]
- (31) Zejie Yu, Yeyu Tong, Hon Ki Tsang, and **Xiankai Sun**, “High-dimensional communication on etchless lithium niobate platform with photonic bound states in the continuum,” *Nature Communications* **11**: 2602, May 2020.
- (32) Xiang Xi, Zefeng Chen, Jian-Bin Xu, and **Xiankai Sun**, “Graphene-assisted electro-optomechanical integration on a silicon-on-insulator platform,” *Optics Express* **28** (10): 14386–14395, May 2020.
- (33) Zejie Yu and **Xiankai Sun**, “Acousto-optic modulation of photonic bound state in the continuum,” *Light: Science & Applications* **9**: 1, Jan. 2020.
- (34) Jingwen Ma, Ziyao Feng, Yuan Li, and **Xiankai Sun**, “Optically controlled topologically protected acoustic wave amplification,” *IEEE Journal of Selected Topics in Quantum Electronics* **26** (5): 7600410, Sep./Oct. 2020. [invited]
- (35) Aosong Feng, Zejie Yu, and **Xiankai Sun**, “Giant enhancement of nonlinear optical processes with split-ring resonators for THz applications,” *IEEE Photonics Technology Letters* **31** (21): 1681–1684, Nov. 2019.
- (36) Wen Zhou, Yeyu Tong, **Xiankai Sun**, and Hon Ki Tsang, “Ultra-broadband hyperuniform disordered silicon photonic polarizers,” *IEEE Journal of Selected Topics in Quantum Electronics* **26** (2): 8201109, Mar./Apr. 2020.
- (37) Jingwen Ma, Xiang Xi, and **Xiankai Sun**, “Topological photonic integrated circuits based on valley kink states,” *Laser & Photonics Reviews* **13** (12): 1900087, Dec. 2019. [featured as cover article]
- (38) Zejie Yu, Yi Wang, Beilei Sun, Yeyu Tong, Jian-Bin Xu, Hon Ki Tsang, and **Xiankai Sun**, “Hybrid 2D-material photonics with bound states in the continuum,” *Advanced Optical Materials* **7** (24): 1901306, Dec. 2019.
- (39) Zejie Yu, Xiang Xi, Jingwen Ma, Hon Ki Tsang, Chang-Ling Zou, and **Xiankai Sun**, “Photonic integrated circuits with bound states in the continuum,” *Optica* **6** (10): 1342–1348, Oct. 2019.
- (40) Wen Zhou, Yeyu Tong, **Xiankai Sun**, and Hon Ki Tsang, “Hyperuniform disordered photonic bandgap polarizers,” *Journal of Applied Physics* **126** (11): 113106, Sep. 2019.
- (41) Xiang Xi, Jingwen Ma, and **Xiankai Sun**, “Carrier-mediated cavity optomechanics in a semiconductor laser,” *Physical Review A* **99** (5): 053837, May 2019.
- (42) Wen Zhou, Zhenzhou Cheng, Xia Chen, Ke Xu, **Xiankai Sun**, and Hon Ki Tsang, “Subwavelength engineering in silicon photonic devices,” *IEEE Journal of Selected Topics in Quantum Electronics* **25** (3): 2900113, May/June. 2019. [invited]
- (43) Zejie Yu, Aosong Feng, Xiang Xi, and **Xiankai Sun**, “Inverse-designed low-loss and wideband polarization-insensitive silicon waveguide crossing,” *Optics Letters* **44** (1): 77–80, Jan. 2019. [selected as Editor’s Pick]
- (44) Aosong Feng, Zejie Yu, and **Xiankai Sun**, “Ultracompact band metagrating absorbers for sensing and modulation,” *Optics Express* **26** (22): 28197–28205, Oct. 2018.

- (45) Zejie Yu, Yang Ma, and **Xiankai Sun**, “Photonic welding points for arbitrary on-chip optical interconnects,” *Nanophotonics* **7** (10): 1679–1686, Oct. 2018.
- (46) Ziyao Feng, Jingwen Ma, and **Xiankai Sun**, “Parity–time-symmetric mechanical systems by the cavity optomechanical effect,” *Optics Letters* **43** (17): 4088–4091, Sep. 2018.
- (47) Wen Zhou, Zhenzhou Cheng, **Xiankai Sun**, and Hon Ki Tsang, “Tailorable dual-wavelength-band coupling in a transverse-electric-mode focusing subwavelength grating coupler,” *Optics Letters* **43** (12): 2985–2988, Jun. 2018.
- (48) Ziyao Feng, Jingwen Ma, Zejie Yu, and **Xiankai Sun**, “Circular Bragg lasers with radial PT symmetry: design and analysis with a coupled-mode approach,” *Photonics Research* **6** (5): A38–A42, May 2018.  
[included in Virtual Feature Issue on *Non-Hermitian Photonics in Complex Media: PT-symmetry and beyond*]
- (49) Wen Zhou, Zhenzhou Cheng, Xinru Wu, **Xiankai Sun**, and Hon Ki Tsang, “Fully suspended slot waveguide platform,” *Journal of Applied Physics* **123** (6): 063103, Feb. 2018.
- (50) Zejie Yu and **Xiankai Sun**, “Giant enhancement of stimulated Brillouin scattering with engineered phoxonic crystal waveguides,” *Optics Express* **26** (2): 1255–1267, Jan. 2018.
- (51) Zejie Yu, Haoran Cui, and **Xiankai Sun**, “Genetically optimized on-chip wideband ultracompact reflectors and Fabry–Perot cavities,” *Photonics Research* **5** (6): B15–B19, Dec. 2017.  
[included in Virtual Feature Issue on *Optical Microcavities*]
- (52) Zejie Yu, Haoran Cui, and **Xiankai Sun**, “Genetic-algorithm-optimized wideband on-chip polarization rotator with an ultrasmall footprint,” *Optics Letters* **42** (16): 3093–3096, Aug. 2017.
- (53) Yun Gao, Wen Zhou, **Xiankai Sun**, Hon Ki Tsang, and Chester Shu, “Cavity-enhanced thermo-optic bistability and hysteresis in a graphene-on-Si<sub>3</sub>N<sub>4</sub> ring resonator,” *Optics Letters* **42** (10): 1950–1953, May 2017.
- (54) Wen Zhou, Zhenzhou Cheng, Xinru Wu, Bingqing Zhu, **Xiankai Sun**, and Hon Ki Tsang, “Fully suspended slot waveguides for high refractive index sensitivity,” *Optics Letters* **42** (7): 1245–1248, Apr. 2017.
- (55) Jiahua Gu, Xiang Xi, Jingwen Ma, Zejie Yu, and **Xiankai Sun**, “Parity–time-symmetric circular Bragg lasers: a proposal and analysis,” *Scientific Reports* **6**: 37688, Nov. 2016.
- (56) Wen Zhou, Zejie Yu, Jingwen Ma, Bingqing Zhu, Hon Ki Tsang, and **Xiankai Sun**, “Ultraviolet optomechanical crystal cavities with ultrasmall modal mass and high optomechanical coupling rate,” *Scientific Reports* **6**: 37134, Nov. 2016.
- (57) Wen Zhou, Zhenzhou Cheng, Bingqing Zhu, **Xiankai Sun**, and Hon Ki Tsang, “Hyperuniform disordered network polarizers,” *IEEE Journal of Selected Topics in Quantum Electronics* **22** (6): 4901307, Nov./Dec. 2016.
- (58) Jingwen Ma, Xiang Xi, Zejie Yu, and **Xiankai Sun**, “Hybrid graphene/silicon integrated optical isolators with photonic spin–orbit interaction,” *Applied Physics Letters* **108** (15): 151103, Apr. 2016.  
[featured as cover article and selected as Editor’s Pick]
- (59) **Xiankai Sun**, Ke Xu, and Hong X. Tang, “Monolithically integrated, ultrahigh-frequency cavity nano-optoelectromechanical system with on-chip germanium waveguide photodetector,” *Optics Letters* **39** (8): 2514–2517, Apr. 2014.
- (60) Linran Fan, **Xiankai Sun**, Chi Xiong, Carsten Schuck, and Hong X. Tang, “Aluminum nitride piezo-acousto-photonic crystal nanocavity with high quality factors,” *Applied Physics Letters* **102** (15): 153507, Apr. 2013.

- (61) **Xiankai Sun**, Xufeng Zhang, Carsten Schuck, and Hong X. Tang, “Nonlinear optical effects of ultrahigh- $Q$  silicon photonic nanocavities immersed in superfluid helium,” *Scientific Reports* **3**: 1436, Mar. 2013.
- (62) Chi Xiong, Linran Fan, **Xiankai Sun**, and Hong X. Tang, “Cavity piezooptomechanics: piezoelectrically excited, optically transduced optomechanical resonators,” *Applied Physics Letters* **102** (2): 021110, Jan. 2013.
- (63) **Xiankai Sun**, Xufeng Zhang, Menno Poot, Chi Xiong, and Hong X. Tang, “A superhigh-frequency optoelectromechanical system based on a slotted photonic crystal cavity,” *Applied Physics Letters* **101** (22): 221116, Nov. 2012.
- (64) Jiangjun Zheng\*, **Xiankai Sun**\*, Ying Li, Menno Poot, Ali Dadgar, Norman Nan Shi, Wolfram H. P. Pernice, Hong X. Tang, and Chee Wei Wong, “Femtogram dispersive L3-nanobeam optomechanical cavities: design and experimental comparison,” *Optics Express* **20** (24): 26486–26498, Nov. 2012. [featured as cover article] (\* equal contribution)
- (65) Chi Xiong, Wolfram H. P. Pernice, **Xiankai Sun**, Carsten Schuck, King Y. Fong, and Hong X. Tang, “Aluminum nitride as a new material for chip-scale optomechanics and nonlinear optics,” *New Journal of Physics* **14** (9): 095014, Sep. 2012. [included in Focus Issue on *Optomechanics*]
- (66) Xufeng Zhang, **Xiankai Sun**, and Hong X. Tang, “A 1.16- $\mu\text{m}$ -radius disk cavity in a sunflower-type circular photonic crystal with ultrahigh quality factor,” *Optics Letters* **37** (15): 3195–3197, Aug. 2012.
- (67) **Xiankai Sun**, Jiangjun Zheng, Menno Poot, Chee Wei Wong, and Hong X. Tang, “Femtogram doubly clamped nanomechanical resonators embedded in a high- $Q$  two-dimensional photonic crystal nanocavity,” *Nano Letters* **12** (5): 2299–2305, May 2012.
- (68) **Xiankai Sun**, Xufeng Zhang, and Hong X. Tang, “High- $Q$  silicon optomechanical microdisk resonators at gigahertz frequencies,” *Applied Physics Letters* **100** (17): 173116, Apr. 2012.
- (69) Chi Xiong, **Xiankai Sun**, King Y. Fong, and Hong X. Tang, “Integrated high frequency aluminum nitride optomechanical resonators,” *Applied Physics Letters* **100** (17): 171111, Apr. 2012.
- (70) **Xiankai Sun**, King Y. Fong, Chi Xiong, Wolfram H. P. Pernice, and Hong X. Tang, “GHz optomechanical resonators with high mechanical  $Q$  factor in air,” *Optics Express* **19** (22): 22316–22321, Oct. 2011. [included in Virtual Focus Issue on *Collective Phenomena*]
- (71) Michael Shearn, Kenneth Diest, **Xiankai Sun**, Avi Zadok, Harry Atwater, Amnon Yariv, and Axel Scherer, “Advanced silicon processing for active planar photonic devices,” *Journal of Vacuum Science & Technology B* **27** (6): 3180–3182, Nov./Dec. 2009.
- (72) **Xiankai Sun** and Amnon Yariv, “Surface-emitting circular DFB, disk-, and ring- Bragg resonator lasers with chirped gratings. III: gain saturation effects and above-threshold analysis,” *Optics Express* **17** (12): 10119–10125, Jun. 2009.
- (73) **Xiankai Sun**, Avi Zadok, Michael J. Shearn, Kenneth A. Diest, Alireza Ghaffari, Harry A. Atwater, Axel Scherer, and Amnon Yariv, “Electrically pumped hybrid evanescent Si/InGaAsP lasers,” *Optics Letters* **34** (9): 1345–1347, May 2009.
- (74) **Xiankai Sun**, Hsi-Chun Liu, and Amnon Yariv, “Adiabaticity criterion and the shortest adiabatic mode transformer in a coupled-waveguide system,” *Optics Letters* **34** (3): 280–282, Feb. 2009.
- (75) **Xiankai Sun** and Amnon Yariv, “Surface-emitting circular DFB, disk-, and ring- Bragg resonator lasers with chirped gratings. II: nonuniform pumping and far-field patterns,” *Optics Express* **17** (1): 1–6, Jan. 2009.
- (76) **Xiankai Sun** and Amnon Yariv, “Surface-emitting circular DFB, disk-, and ring- Bragg resonator lasers with chirped gratings: a unified theory and comparative study,” *Optics Express* **16** (12): 9155–9164, Jun. 2008.

- (77) **Xiankai Sun** and Amnon Yariv, “Engineering supermode silicon/III–V hybrid waveguides for laser oscillation,” *Journal of the Optical Society of America B* **25** (6): 923–926, Jun. 2008.
- (78) Lin Zhu, **Xiankai Sun**, Guy A. DeRose, Axel Scherer, and Amnon Yariv, “Room temperature continuous wave operation of single-mode, edge-emitting photonic crystal Bragg lasers,” *Optics Express* **16** (2): 502–506, Jan. 2008.
- (79) **Xiankai Sun** and Amnon Yariv, “Modal properties and modal control in vertically emitting annular Bragg lasers,” *Optics Express* **15** (25): 17323–17333, Dec. 2007.  
[included in Virtual Focus Issue on *Physics and Applications of Microresonators*]
- (80) Lin Zhu, **Xiankai Sun**, Guy A. DeRose, Axel Scherer, and Amnon Yariv, “Spatial modal control of two dimensional photonic crystal Bragg lasers,” *Optics Letters* **32** (16): 2273–2275, Aug. 2007.
- (81) Amnon Yariv and **Xiankai Sun**, “Supermode Si/III-V hybrid lasers, optical amplifiers and modulators: a proposal and analysis,” *Optics Express* **15** (15): 9147–9151, Jul. 2007.
- (82) Lin Zhu, **Xiankai Sun**, Guy A. DeRose, Axel Scherer, and Amnon Yariv, “Continuous-wave operation of electrically-pumped, single-mode, edge-emitting photonic crystal lasers,” *Applied Physics Letters* **90** (26): 261116, Jun. 2007.
- (83) **Xiankai Sun**, Jacob Scheuer, and Amnon Yariv, “Optimal design and reduced threshold in vertically emitting circular Bragg disk resonator lasers,” *IEEE Journal of Selected Topics in Quantum Electronics* **13** (2): 359–366, Mar./Apr. 2007.
- (84) Meng Xiang-dong, Lin Bi-xia, Hong Liang, Zhu Jun-jie, **Sun Xian-kai**, Xu Jin, and Fu Zhu-xi, “Photoluminescence properties for ZnO films grown by two-step CVD,” *Chinese Journal of Luminescence* **27** (5): 792–796, Oct. 2006.
- (85) Fu Zhuxi, **Sun Xiankai**, Zhu Junjie, and Lin Bixia, “Effect of lattice mismatch on luminescence of ZnO/Si hetero-structure,” *Journal of Semiconductors* **27** (2): 239–244, Feb. 2006.
- (86) **Sun Xian-Kai**, Lin Bi-Xia, Zhu Jun-Jie, Zhang Yang, and Fu Zhu-Xi, “Studies on the strain and its effect on defects in heteroepitaxial ZnO films prepared by LP-MOCVD method,” *Acta Physica Sinica* **54** (6): 2899–2903, Jun. 2005.
- (87) Junjie Zhu, Bixia Lin, **Xiankai Sun**, Ran Yao, Chaoshu Shi, and Zhuxi Fu, “Heteroepitaxy of ZnO film on Si (111) substrate using a 3C–SiC buffer layer,” *Thin Solid Films* **478** (1–2): 218–222, May 2005.
- (88) Yang Zhang, Bixia Lin, **Xiankai Sun**, and Zhuxi Fu, “Temperature-dependent photoluminescence of nanocrystalline ZnO thin films grown on Si (100) substrates by the sol–gel process,” *Applied Physics Letters* **86** (13): 131910, Mar. 2005.
- (89) Zhu Jun-jie, Lin Bi-xia, **Sun Xian-kai**, Zheng Hai-wu, Yao Ran, and Fu Zhu-xi, “Studies of the heteroepitaxial SiC films on the Si substrates,” *Journal of Synthetic Crystals* **33** (4): 545–548, Aug. 2004.

### Conference Papers

- (1) Yuan Li, Zunyue Zhang, Yi Wang, Yue Yu, Xuotong Zhou, Hon Ki Tsang, and **Xiankai Sun**, “Inverse-designed linear coherent photonic networks for high-resolution spectral reconstruction,” *CLEO 2023*, San Jose, CA, USA, May 2023. (submitted)
- (2) Yue Yu and **Xiankai Sun**, “Surface acoustic microwave photonic filters on etchless lithium niobate integrated platform,” *CLEO 2023*, San Jose, CA, USA, May 2023. (submitted)
- (3) Ziyao Feng and **Xiankai Sun**, “Dynamical encircling of an exceptional point in anti-*PT*-symmetric integrated photonic systems,” *CLEO 2023*, San Jose, CA, USA, May 2023. (submitted)
- (4) Jiawei Zhang, Ziyao Feng, and **Xiankai Sun**, “Realization of bound states in the continuum in anti-*PT*-symmetric optical systems: a proposal and analysis,” *CLEO 2023*, San Jose, CA, USA, May 2023. (submitted)

- (5) Yue Yu, Xiang Xi, and **Xiankai Sun**, “Observation of mechanical bound states in the continuum in an optomechanical microresonator,” *Frontiers in Optics 2022*, Rochester, NY, USA, Oct. 2022. **[postdeadline]**
- (6) Yue Yu, Zejie Yu, Zunyue Zhang, Hon Ki Tsang, and **Xiankai Sun**, “Wavelength-division multiplexing on etchless lithium niobate integrated platform,” *Frontiers in Optics 2022*, Rochester, NY, USA, Oct. 2022.
- (7) Xiang Xi, Jingwen Ma, and **Xiankai Sun**, “Experimental realization of topological parametric phonon lasers,” *CLEO 2022*, San Jose, CA, USA, May 2022. **[invited]**
- (8) Yue Yu, Zejie Yu, Lai Wang, and **Xiankai Sun**, “Ultralow-loss etchless lithium niobate integrated photonics at near-visible wavelengths,” *CLEO 2022*, San Jose, CA, USA, May 2022.
- (9) Fan Ye, Yue Yu, Xiang Xi, and **Xiankai Sun**, “Second-harmonic generation in etchless lithium niobate nanophotonic waveguides with bound states in the continuum,” *CLEO 2022*, San Jose, CA, USA, May 2022.
- (10) Yuan Li and **Xiankai Sun**, “Anisotropic Dirac cone and slow edge states in a photonic Floquet lattice,” *CLEO 2022*, San Jose, CA, USA, May 2022.
- (11) Yue Yu, Zejie Yu, and **Xiankai Sun**, “Etchless lithium niobate integrated photonics,” *International Symposium on Lithium Niobate Optoelectronics 2021*, Shanghai, China, Oct. 2021. **[invited]**
- (12) **Xiankai Sun**, “Inverse-designed optical devices and modules for high-density photonic integration,” *Optoelectronic and Communications Conference 2021*, Hong Kong, Jul. 2021. **[invited]**
- (13) Zhan Zhang, Haochuan Li, Taojie Zhou, Karwei Ng, **Xiankai Sun**, and Zhaoyu Zhang, “Ultra-thin curved microdisk lasers with high quality factor,” *Optoelectronic and Communications Conference 2021*, Hong Kong, Jul. 2021.
- (14) Ziyao Feng, Yang Liu, Lai Wang, and **Xiankai Sun**, “Phononic integrated circuitry with an etchless fabrication process,” *CLEO 2021*, San Jose, CA, USA, May 2021.
- (15) Yue Yu, Zejie Yu, and **Xiankai Sun**, “Nonmetallic broadband visible-light absorbers with polarization and incident angle insensitivity,” *CLEO 2021*, San Jose, CA, USA, May 2021.
- (16) Yue Yu, Lai Wang, and **Xiankai Sun**, “Demonstration of on-chip gigahertz acousto-optic modulation at near-visible wavelengths,” *CLEO 2021*, San Jose, CA, USA, May 2021.
- (17) Ziyao Feng and **Xiankai Sun**, “Rotation sensing with PT-symmetric circular Bragg lasers,” *SPIE Photonics West 2021*, San Francisco, CA, USA, Mar. 2021. **[invited]**
- (18) Zejie Yu and **Xiankai Sun**, “Inverse design of photonic components for large-scale and high-density integration,” *SPIE Photonics West 2021*, San Francisco, CA, USA, Mar. 2021. **[invited]**
- (19) **Xiankai Sun**, “Photonic integrated circuits with bound states in the continuum: principle and applications,” *Asia Communications and Photonics Conference 2020*, Beijing, China, Oct. 2020. **[invited]**
- (20) Zejie Yu, Yeyu Tong, Hon Ki Tsang, and **Xiankai Sun**, “High-dimensional communication on etchless lithium niobate platform with photonic bound states in the continuum,” *CLEO Pacific Rim 2020*, Online Only, Australia, Aug. 2020. **[postdeadline]**
- (21) Xiang Xi, Jingwen Ma, Zhong-Hao Zhou, Xin-Xin Hu, Yuan Chen, Chang-Ling Zou, Chun-Hua Dong, and **Xiankai Sun**, “Experimental investigation of the topological charge of optical force in a solid dielectric,” *SPIE Optics + Photonics 2020*, San Diego, CA, USA, Aug. 2020. **[invited]**
- (22) Yi Wang, Zejie Yu, Beilei Sun, Yeyu Tong, Jian-Bin Xu, **Xiankai Sun**, and Hon Ki Tsang, “Graphene–silicon nitride photodetector with bound state in the continuum,” *CLEO 2020*, San Jose, CA, USA, May 2020.

- (23) Zejie Yu, Yi Wang, Beilei Sun, Yeyu Tong, Jian-Bin Xu, Hon Ki Tsang, and Xiankai Sun, “Hybrid two-dimensional-material photonics with bound states in the continuum,” *CLEO 2020*, San Jose, CA, USA, May 2020.
- (24) Zejie Yu, Xiang Xi, Jingwen Ma, Hon-Ki Tsang, Chang-Ling Zou, and Xiankai Sun, “Photonic integrated circuits with bound states in the continuum,” *CLEO 2020*, San Jose, CA, USA, May 2020.
- (25) Zejie Yu and Xiankai Sun, “Acousto-optic modulation of photonic bound state in the continuum,” *CLEO 2020*, San Jose, CA, USA, May 2020.
- (26) Jingwen Ma, Ziyao Feng, Yuan Li, and Xiankai Sun, “Topologically protected acoustic wave amplification in an optomechanical array,” *CLEO 2020*, San Jose, CA, USA, May 2020.
- (27) Jingwen Ma, Xiang Xi, and Xiankai Sun, “Topological nanophotonic circuits based on valley kink states,” *CLEO 2020*, San Jose, CA, USA, May 2020.
- (28) Xiang Xi, Zefeng Chen, Jian-Bin Xu, and Xiankai Sun, “Graphene-assisted electro-optomechanical integration on a silicon-on-insulator platform,” *CLEO 2020*, San Jose, CA, USA, May 2020.
- (29) Hon Ki Tsang, Yi Wang, Rakesh R. Kumar, Zejie Yu, Xiankai Sun, Marina Raevskaia, Vadim Pogoretskii, and Yuqing Jiao, “Bound states in the continuum for photonic integration and InP membranes for heralded single photon generation,” *SPIE Photonics Europe 2020*, Online Only, France, Apr. 2020.
- (30) Xiang Xi, Zefeng Chen, Jian-Bin Xu, and Xiankai Sun, “Graphene metallization of integrated electro-optomechanical resonators,” *PIERS 2019 in Xiamen*, Xiamen, China, Dec. 2019. [invited]
- (31) Ziyao Feng, Jingwen Ma, and Xiankai Sun, “Parity–time-symmetric mechanical array with the cavity optomechanical effect,” *Frontiers in Optics 2019*, Washington, DC, USA, Sep. 2019.
- (32) Ziyao Feng, Jingwen Ma, Zejie Yu, and Xiankai Sun, “Parity–time-symmetric circular Bragg lasers: enhanced modal discrimination between azimuthal modes,” *Frontiers in Optics 2019*, Washington, DC, USA, Sep. 2019.
- (33) Aosong Feng, Zejie Yu, and Xiankai Sun, “Ultrarrow-band metagrating absorbers for sensing and modulation,” *CLEO 2019*, San Jose, CA, USA, May 2019.
- (34) Zejie Yu, Aosong Feng, Xiang Xi, and Xiankai Sun, “Inverse-designed low-loss and wideband polarization-insensitive waveguide crossing,” *European Conference on Integrated Optics 2019*, Ghent, Belgium, Apr. 2019.
- (35) Zejie Yu, Yang Ma, and Xiankai Sun, “Photonic welding points for arbitrary on-chip optical interconnects,” *European Conference on Integrated Optics 2019*, Ghent, Belgium, Apr. 2019.
- (36) Zejie Yu, Haoran Cui, and Xiankai Sun, “Genetic-algorithm-optimized wideband on-chip polarization rotator with an ultrasmall footprint,” *CLEO Pacific Rim 2018*, Hong Kong, Jul. 2018.
- (37) Zejie Yu, Haoran Cui, and Xiankai Sun, “Genetically optimized on-chip wideband ultracompact reflectors and Fabry–Pérot cavities,” *CLEO 2018*, San Jose, CA, USA, May 2018.
- (38) Xiang Xi, Zefeng Chen, Jingwen Ma, Jian-Bin Xu, and Xiankai Sun, “Graphene nano-optomechanical resonators on an integrated photonic platform,” *CLEO 2018*, San Jose, CA, USA, May 2018.
- (39) Zejie Yu, Wen Zhou, Hon Ki Tsang, and Xiankai Sun, “Recent progress in nano-optomechanical devices at microwave frequencies,” *SPIE Photonics West 2018*, San Francisco, CA, USA, Jan. 2018. [invited]
- (40) Wen Zhou, Zhenzhou Cheng, Xinru Wu, Ming Feng, Xiankai Sun, and Hon Ki Tsang, “Fully suspended nanophotonic waveguide resonators with high quality factor and tailorable operational bandwidth,” *Asia Communications and Photonics Conference 2017*, Guangzhou, China, Nov. 2017.

- (41) Wen Zhou, Zhenzhou Cheng, Xinru Wu, Bofang Zheng, **Xiankai Sun**, and Hon Ki Tsang, “Fully suspended mid-infrared racetrack resonator with subwavelength grating cladding,” *Group IV Photonics Conference 2017*, Berlin, Germany, Aug. 2017.
- (42) Wen Zhou, Zhenzhou Cheng, Yun Gao, Xinru Wu, **Xiankai Sun**, and Hon Ki Tsang, “Fully suspended slot waveguide racetrack resonators,” *European Conference on Integrated Optics 2017*, Eindhoven, The Netherlands, Apr. 2017.
- (43) Jingwen Ma, Xiang Xi, Zejie Yu, and **Xiankai Sun**, “Hybrid graphene/silicon integrated optical isolators with photonic spin-orbit interaction,” *IEEE Photonics Conference 2016*, Waikoloa, HI, USA, Oct. 2016.
- (44) Jingwen Ma, Xiang Xi, Zejie Yu, and **Xiankai Sun**, “Spin-orbit interaction of light in photonic nanowaveguides: a proposal of graphene-based optical isolators,” *PIERS 2016 in Shanghai*, Shanghai, China, Aug. 2016.
- (45) **Xiankai Sun** and Hong X. Tang, “High-frequency nano-optomechanics: an exploration at the boundary between photonics, mechanics, and microwaves,” *SPIE Optics + Photonics 2013*, San Diego, CA, USA, Aug. 2013. [invited]
- (46) **Xiankai Sun**, Xufeng Zhang, Carsten Schuck, and Hong X. Tang, “Nonlinear optical effects of ultrahigh- $Q$  wavelength-sized silicon disk cavities immersed in superfluid helium,” *CLEO 2013*, San Jose, CA, USA, Jun. 2013.
- (47) **Xiankai Sun**, Xufeng Zhang, Menno Poot, Chi Xiong, and Hong X. Tang, “A superhigh-frequency optoelectromechanical system based on a slotted photonic crystal cavity,” *CLEO 2013*, San Jose, CA, USA, Jun. 2013.
- (48) Linran Fan, **Xiankai Sun**, Chi Xiong, Carsten Schuck, and Hong X. Tang, “Aluminum nitride piezo-optomechanical nanobeam cavity,” *CLEO 2013*, San Jose, CA, USA, Jun. 2013.
- (49) **Xiankai Sun**, Xufeng Zhang, and Hong X. Tang, “Optomechanical transduction of nanocantilevers by high- $Q$  bandedge states of a dispersion-engineered photonic crystal waveguide,” *Frontiers in Optics 2012*, Rochester, NY, USA, Oct. 2012.
- (50) Xufeng Zhang, **Xiankai Sun**, and Hong X. Tang, “A 1.16- $\mu\text{m}$ -radius disk cavity embedded in a sunflower-type circular photonic crystal with ultrahigh  $Q$ ,” *Frontiers in Optics 2012*, Rochester, NY, USA, Oct. 2012.
- (51) Jiangjun Zheng, **Xiankai Sun**, Menno Poot, Ying Li, Ali Dadgar, Hong X. Tang, and Chee Wei Wong, “Dispersive coupling and optimization of femtogram L3-nanobeam optomechanical cavities,” *Frontiers in Optics 2012*, Rochester, NY, USA, Oct. 2012.
- (52) Chi Xiong, **Xiankai Sun**, King Y. Fong, and Hong X. Tang, “GHz aluminum nitride optomechanical wheel resonators,” *2012 IEEE International Frequency Control Symposium*, Baltimore, MD, USA, May 2012.
- (53) **Xiankai Sun**, Xufeng Zhang, and Hong X. Tang, “Wavelength-sized optomechanical disk resonator embedded in a sunflower circular photonic crystal,” *CLEO 2012*, San Jose, CA, USA, May 2012. [postdeadline]
- (54) **Xiankai Sun**, Jiangjun Zheng, Menno Poot, Chee Wei Wong, and Hong X. Tang, “Femtogram doubly-clamped nanomechanical resonator embedded in a high- $Q$  two-dimensional photonic crystal nanocavity,” *CLEO 2012*, San Jose, CA, USA, May 2012.
- (55) **Xiankai Sun**, Xufeng Zhang, King Y. Fong, Chi Xiong, Wolfram H. P. Pernice, and Hong X. Tang, “GHz optomechanical wheel and disk resonators with high mechanical  $Q$  factors in air,” *CLEO 2012*, San Jose, CA, USA, May 2012.
- (56) **Xiankai Sun**, Michael J. Shearn, Avi Zadok, Marina S. Leite, Scott T. Steger, Harry A. Atwater, Axel Scherer, and Amnon Yariv, “Electrically pumped supermode Si/InGaAsP hybrid lasers,” *CLEO/QELS 2010*, San Jose, CA, USA, May 2010.

- (57) **Xiankai Sun** and Amnon Yariv, "Above-threshold analysis of large-area, high-power, vertically emitting circular Bragg lasers," *Frontiers in Optics 2009*, San Jose, CA, USA, Oct. 2009.
- (58) **Xiankai Sun** and Amnon Yariv, "A comparative study of modal properties of surface-emitting circular Bragg micro-lasers," *CLEO/Pacific Rim 2009*, Shanghai, China, Aug. 2009.
- (59) **Xiankai Sun** and Amnon Yariv, "Supermode control in integrated hybrid Si/III–V optoelectronic circuits for modal gain enhancement," *CLEO/Pacific Rim 2009*, Shanghai, China, Aug. 2009.
- (60) **Xiankai Sun**, Hsi-Chun Liu, and Amnon Yariv, "How short can an adiabatic mode transformer be in a coupled waveguide system?" *CLEO/IQEC 2009*, Baltimore, MD, USA, May 2009.
- (61) Michael Shearn, Kenneth Diest, **Xiankai Sun**, Avi Zadok, Amnon Yariv, Axel Scherer, "Advanced silicon processing for active integrated photonic devices," *EIPBN 2009*, Marco Island, FL, USA, May 2009.
- (62) **Xiankai Sun**, Avi Zadok, Michael J. Shearn, Kenneth A. Diest, Alireza Ghaffari, Harry A. Atwater, Axel Scherer, and Amnon Yariv, "Hybrid electrically pumped evanescent Si/InGaAsP lasers," *OFC/NFOEC 2009*, San Diego, CA, USA, Mar. 2009.
- (63) **Xiankai Sun** and Amnon Yariv, "A unified theory for surface emitting chirped circular grating lasers," *SPIE Photonics West 2009*, San Jose, CA, USA, Jan. 2009.
- (64) **Xiankai Sun** and Amnon Yariv, "Engineering surface-emitting annular Bragg lasers for single-mode, high-efficiency, high-power applications," *LEOS Annual Meeting 2008*, Newport Beach, CA, USA, Nov. 2008.
- (65) **Xiankai Sun** and Amnon Yariv, "Designing large-area, high-efficiency, single-defect-mode vertically emitting annular Bragg lasers," *Frontiers in Optics 2008*, Rochester, NY, USA, Oct. 2008.
- (66) Lin Zhu, **Xiankai Sun**, Guy DeRose, Axel Scherer, and Amnon Yariv, "Room temperature continuous wave operation of single-mode, edge-emitting photonic crystal Bragg lasers," *CLEO/QELS 2008*, San Jose, CA, USA, May 2008.
- (67) **Xiankai Sun**, Jacob Scheuer, and Amnon Yariv, "Optimal design of vertically emitting circular Bragg disk resonator lasers," *SPIE Photonics West 2008*, San Jose, CA, USA, Jan. 2008.
- (68) Zhuxi Fu, Junjie Zhu, Bixia Lin, **Xiankai Sun**, and Ran Yao, "Preparation and characterization of ZnO film on Si(111) substrate with SiC buffer layer deposited by MOCVD," *Proceedings – Electrochemical Society*, **4**: 443–448, 2005.

### **Book Chapters**

- (1) **Xiankai Sun** and Amnon Yariv, "Surface-emitting circular Bragg lasers – a promising next-generation on-chip light source for optical communications," in *Frontiers in Guided Wave Optics and Optoelectronics*, Bishnu Pal (ed.), Intech, 2010. ISBN: 978-953-7619-82-4.
- (2) Michael Shearn, **Xiankai Sun**, M. David Henry, Amnon Yariv, and Axel Scherer, "Advanced plasma processing: etching, deposition, and wafer bonding techniques for semiconductor applications," in *Semiconductor Technologies*, Jan Grym (ed.), Intech, 2010. ISBN: 978-953-307-080-3.
- (3) Jacob Scheuer and **Xiankai Sun**, "Radial Bragg resonators," in *Photonic Microresonator Research and Applications*, Ioannis Chremmos, Otto Schwelb, and Nikolaos Uzunoglu (eds.), Springer, 2010. ISBN: 978-1-4419-1743-0.

### **Theses**

- (1) **Xiankai Sun**, "Supermode Si/III–V lasers and circular Bragg lasers," Ph.D. thesis, California Institute of Technology, Apr. 2010.
- (2) **Xiankai Sun**, "Studies on the strain and optical properties of heteroepitaxial ZnO films prepared by low-pressure MOCVD," Bachelor thesis, University of Science and Technology of China, Jun. 2004.



### ***Magazine Articles***

- (1) Jingwen Ma, Xiang Xi, Zejie Yu, and Xiankai Sun, “Hybrid graphene/silicon integrated optical isolators,” *Optics & Photonics News* **27** (12): 49, Dec. 2016.  
[selected as one of the world’s 30 most clearly communicated breakthroughs in optics in 2016]