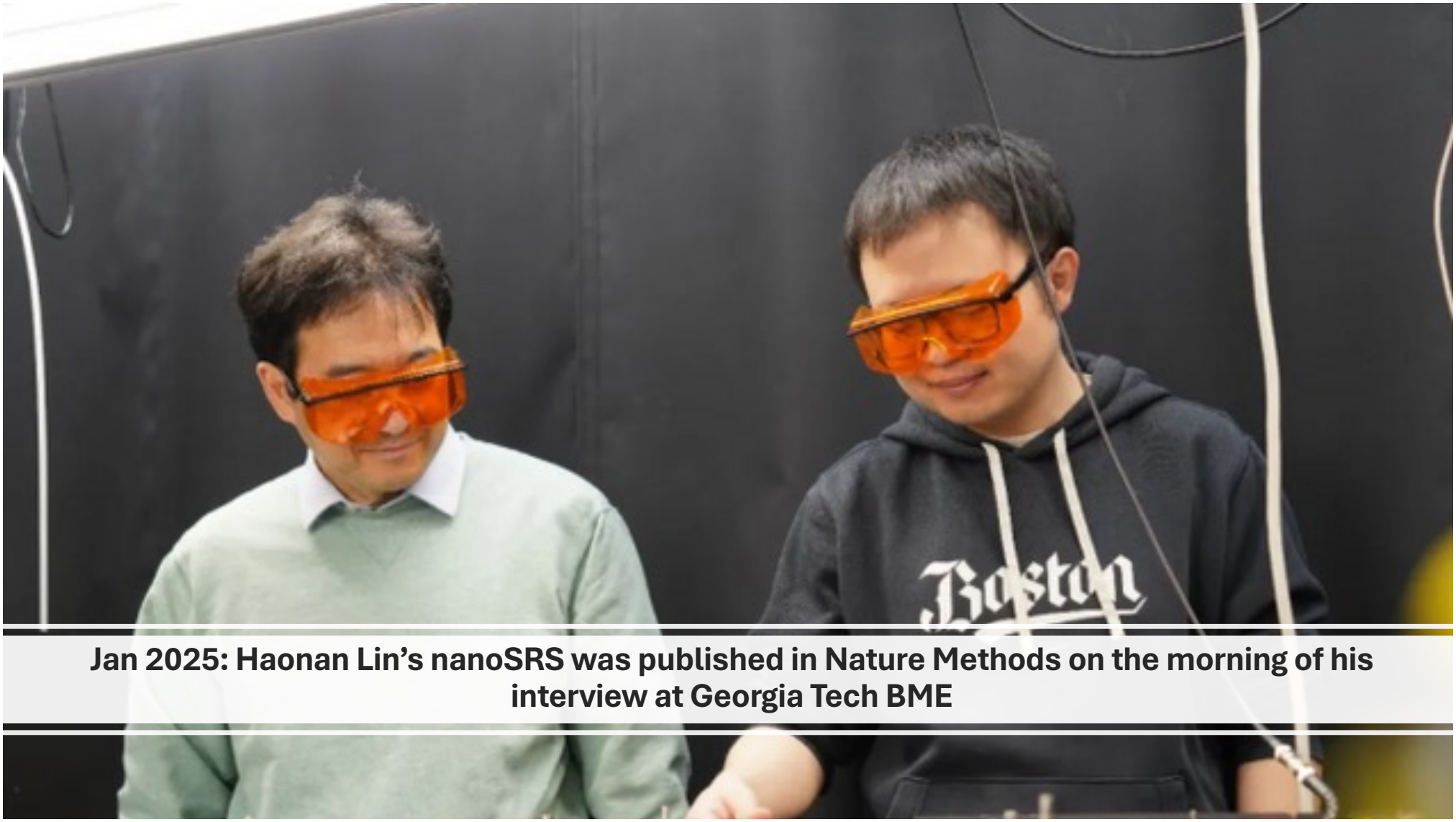
Progress in 2025

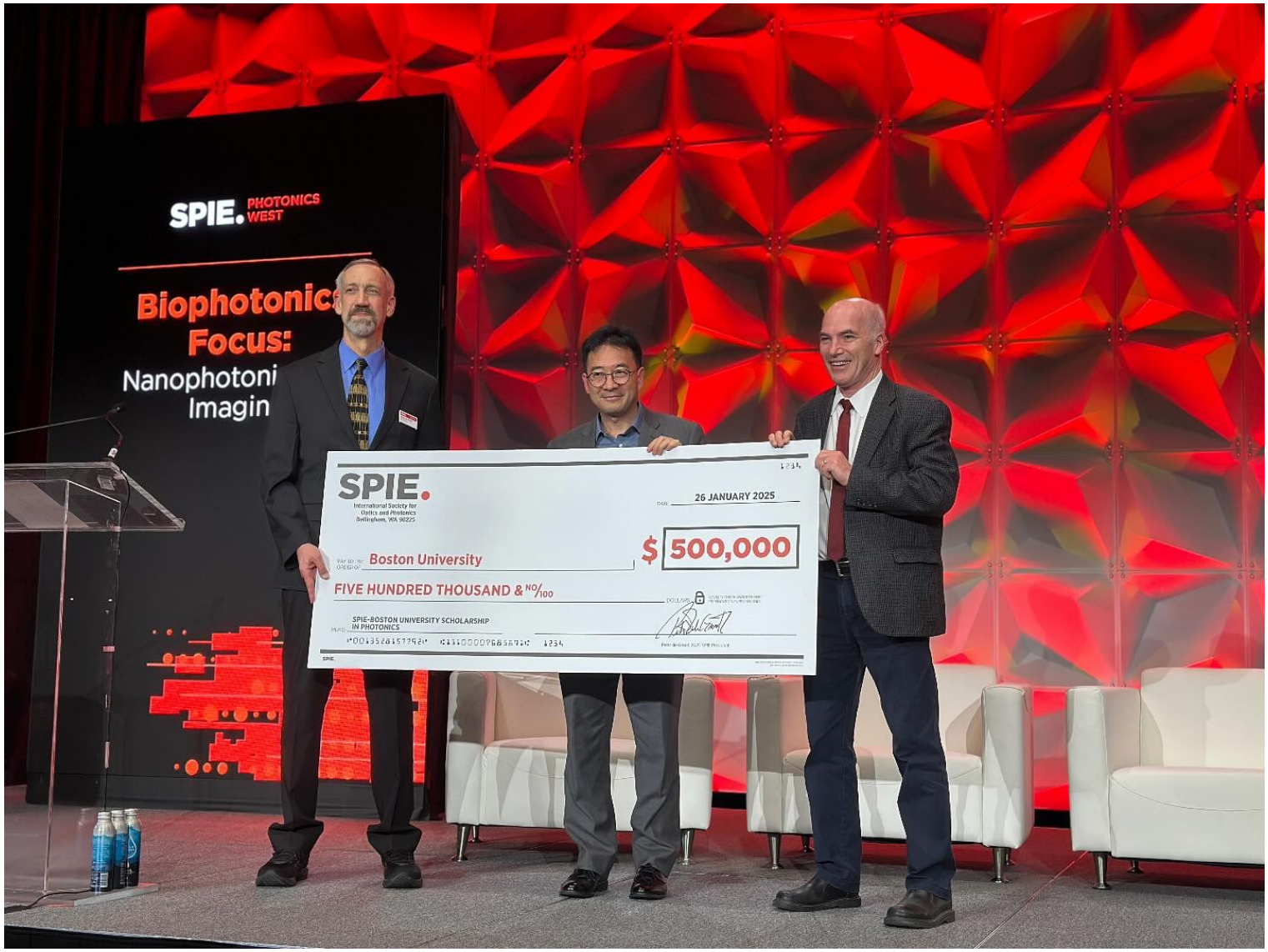
Ji-Xin Cheng Group

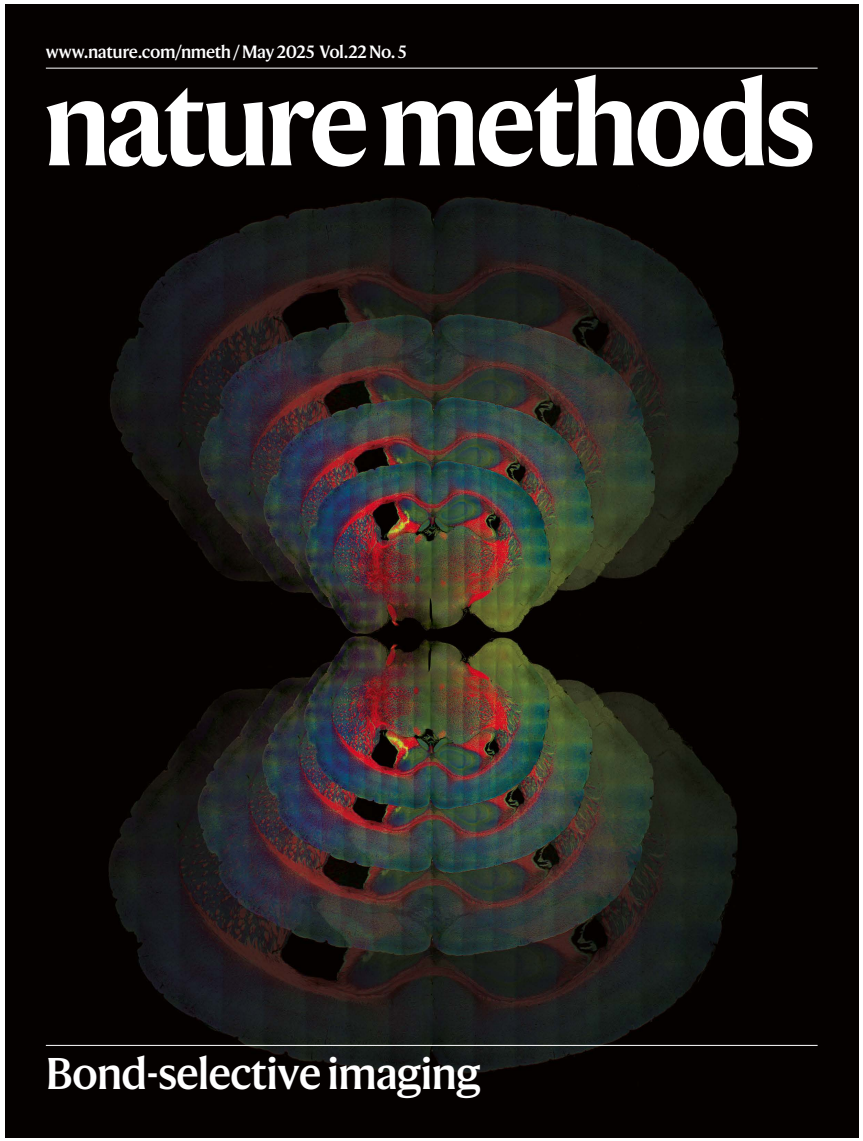
December 21, 2025



Jan 2025: Haonan Lin's nanoSRS was published in Nature Methods on the morning of his interview at Georgia Tech BME

Jan 2025: Photonics Center Receives $500,000 from SPIE to establish a PhD student fellowship





May 2025

Review article

https://doi.org/10.1038/s41592-025-02655-w

Advanced vibrational microscopes for life science

Received: 7 July 2024

Accepted: 4 March 2025

Ji-Xin Cheng[1,2,3,4] ✉, Yuhao Yuan[1], Hongli Ni[1], Jianpeng Ao[1], Qing Xia[1], Rylie Bolarinho[3] & Xiaowei Ge[1]

25 years of 3D coherent Raman imaging for biomedicine

It has been 25 years since the first 3D coherent Raman microscope was reported. Owing to the contributions of many researchers worldwide, coherent Raman microscopy has blossomed as a field of its own and found wide applications in chemical, material, environmental, biological and medical applications. Here I highlight the emergence of nonlinear optical spectroscopy and microscopy and their key technical milestones that led to the rapid expansion and wide use of this imaging modality for biomedicine.

Xiaoliang Sunney Xie

Focus: Focus on bond-selective imaging

Comment | 13 May 2025

A 20-year journey on the invention of vibrational photothermal microscopy

Vibrational microscopy opens a new window onto understanding life at the molecular level. Yet the vibrational signals from chemical bonds are weaker than the fluorescence signal from a dye by many orders of magnitude. Detecting such weak signal from a tight focus under a microscope is extremely challenging. I have devoted my career to overcoming such a daunting barrier through the development of advanced chemical microscopes over the past 25 years. In this historical Comment, I am honored to share my journey of serendipity-driven innovation and entrepreneurship in the growing field of chemical imaging, with a focus on the invention of vibrational photothermal microscopy.

Ji-Xin Cheng

Focus: Focus on bond-selective imaging

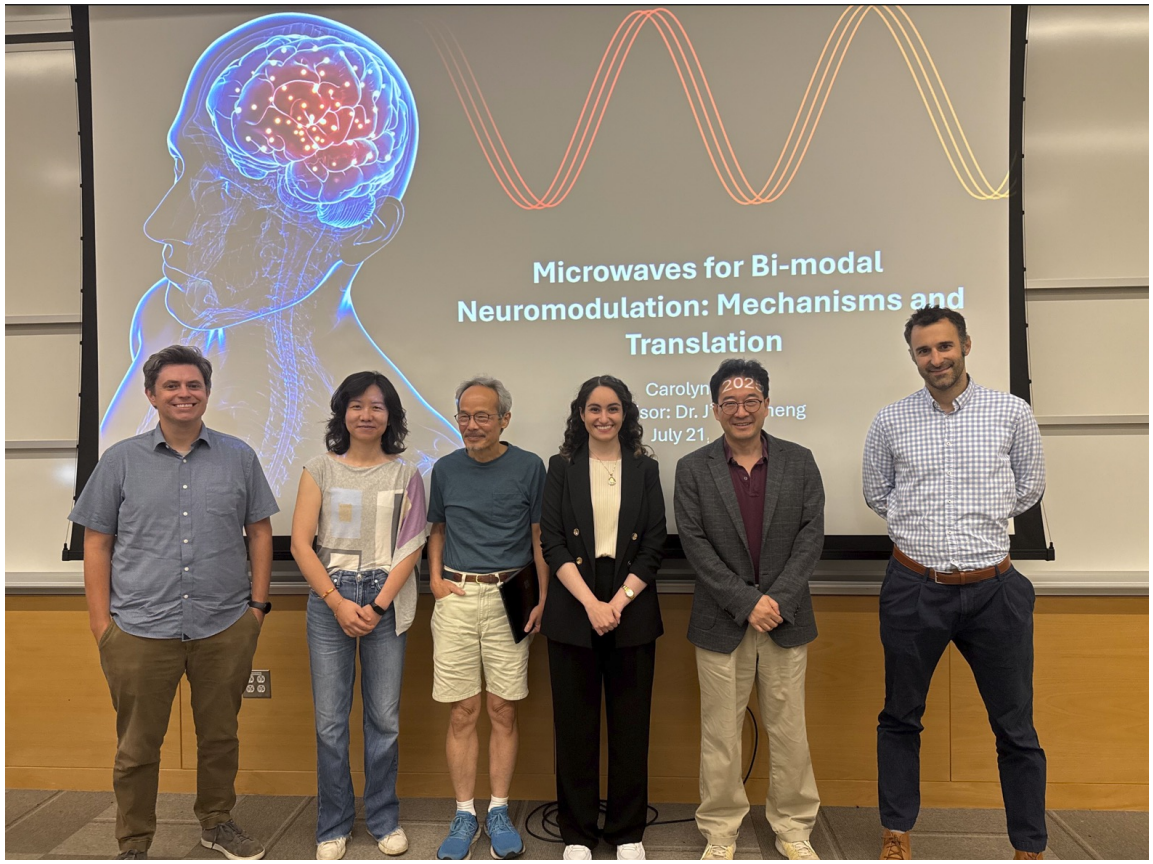
Comment | 13 May 2025

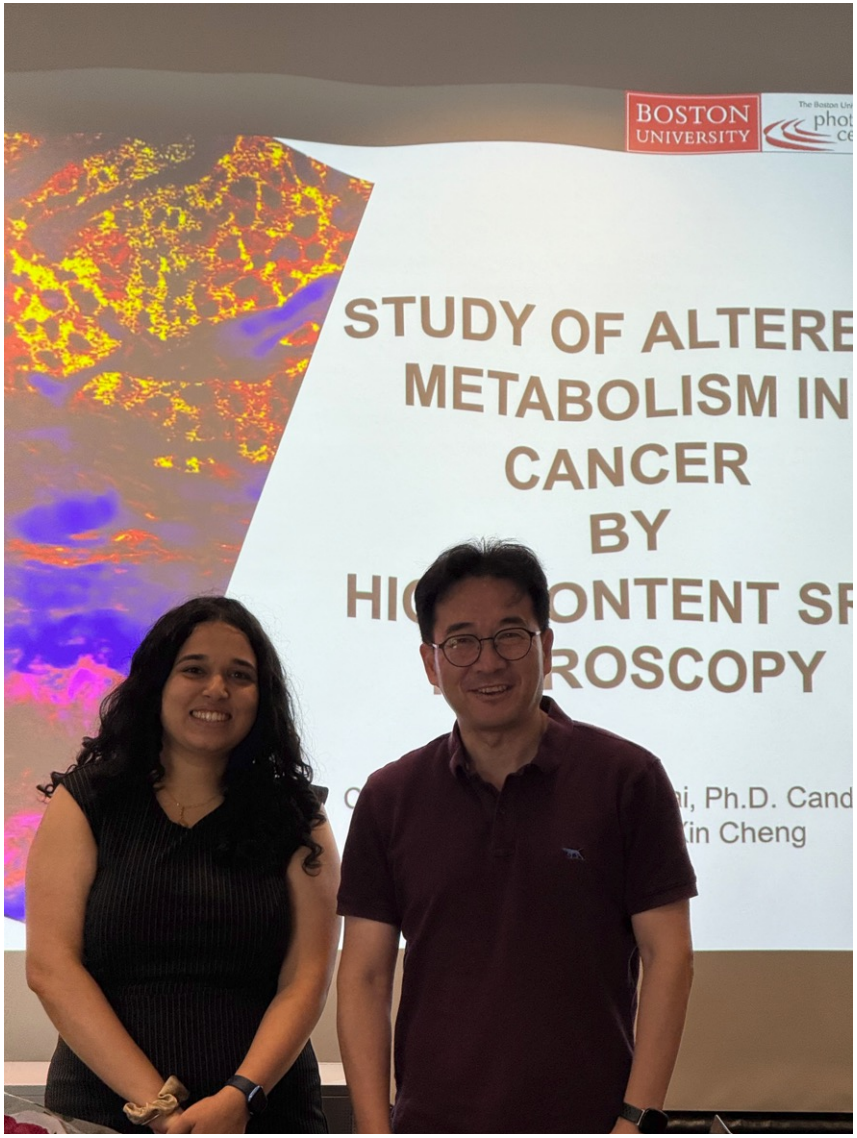
June 17-18 2025: Chemical Imaging Summer School

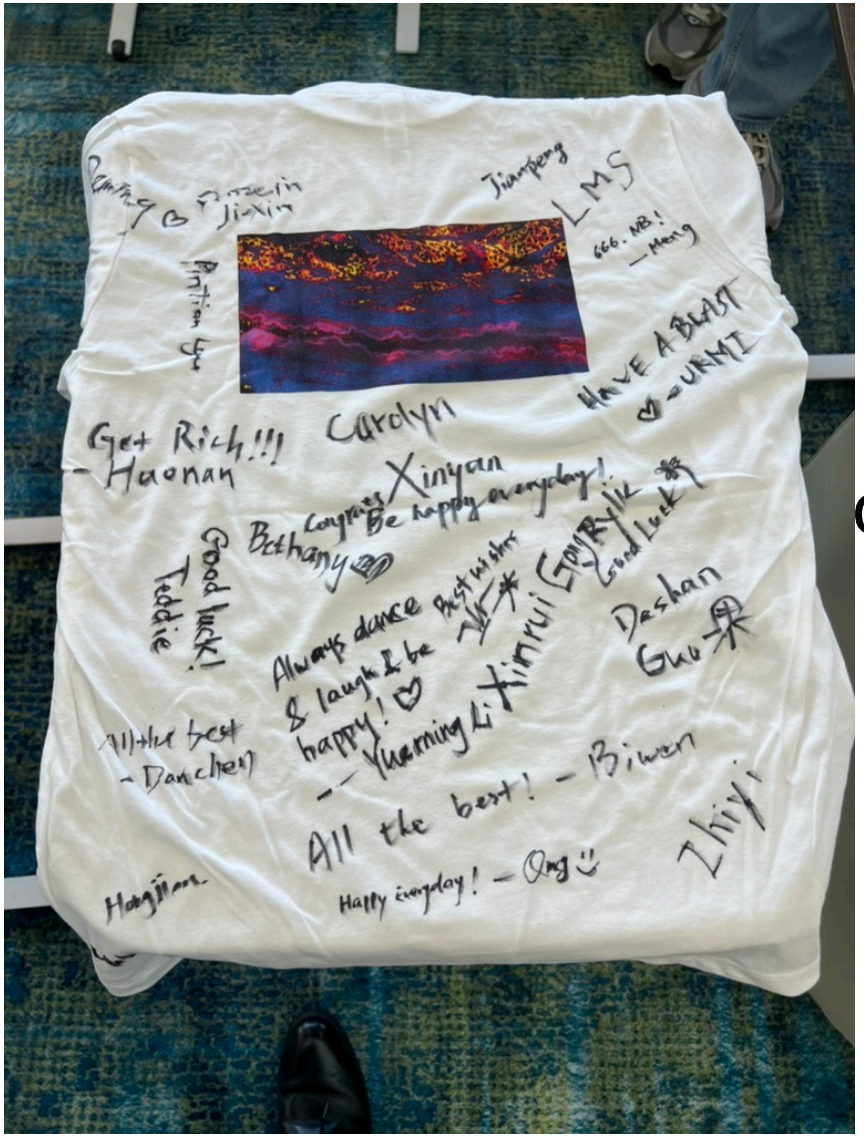
~140 attendees from Harvard, MIT, Yale, Princeton, BU…

July 19, 2025, Potluck Party

July 2025, Graduation of Carolyn and Chinmayee





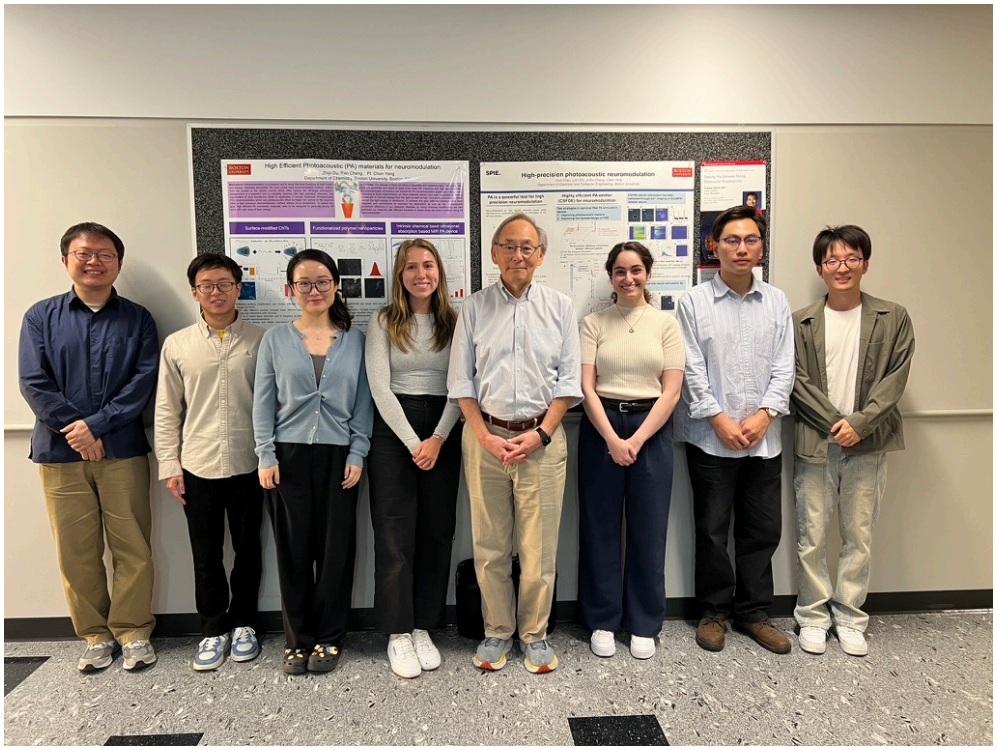


Sept 19
2025

celebrate
Carolyn
and Chin

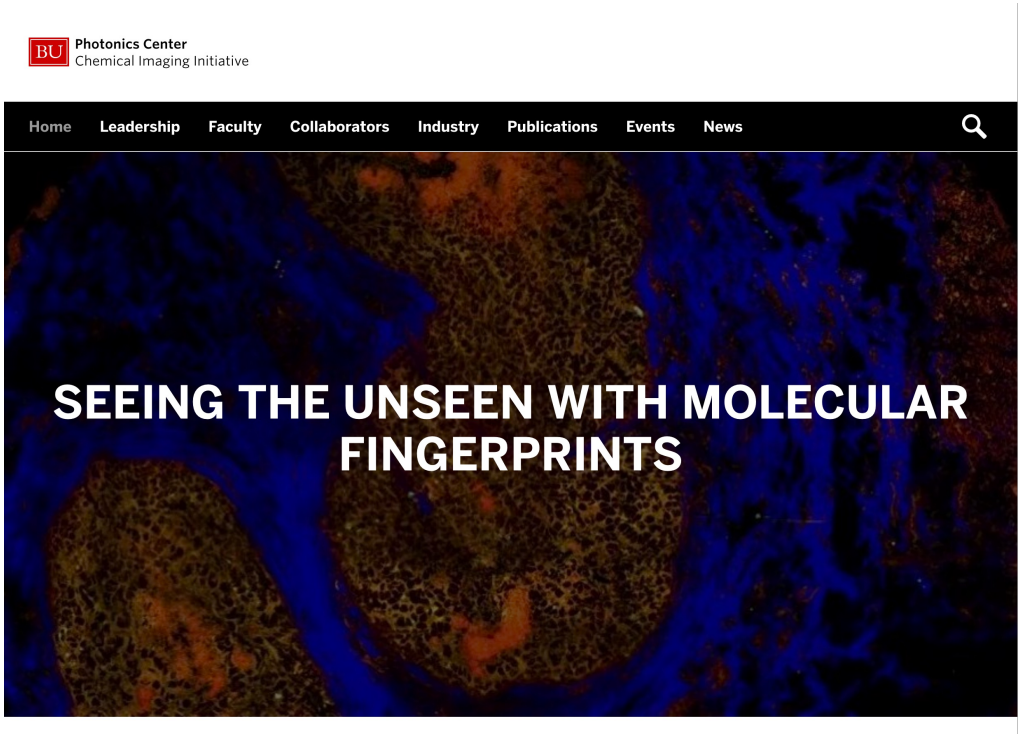
Celebrating Chin and Carolyn, 9.19.2025

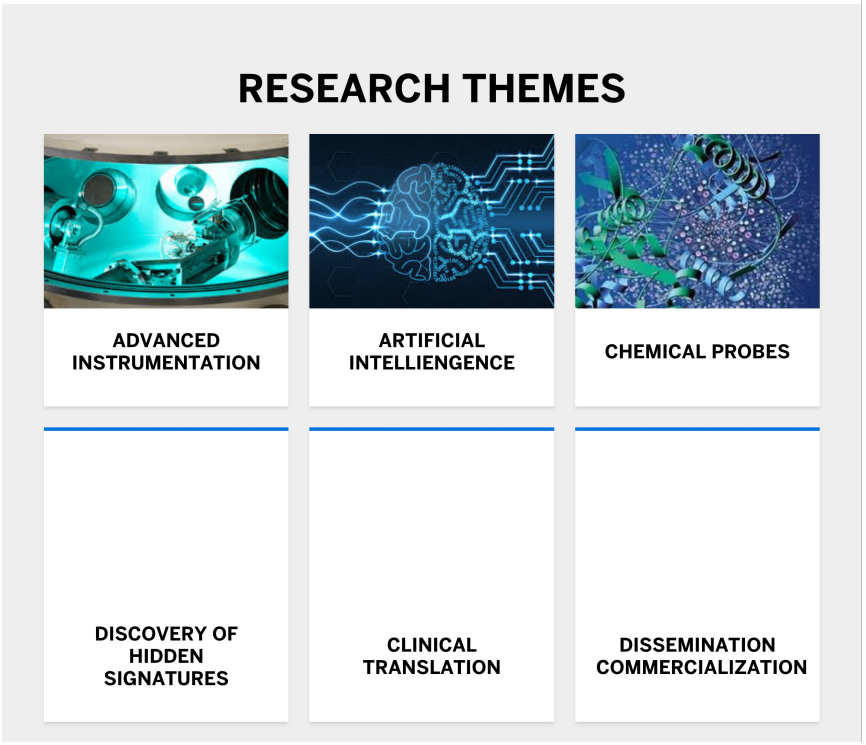
Sept 18, 2025, Cheng Group hosted Steve Chu's Distinguished Photonics Seminar



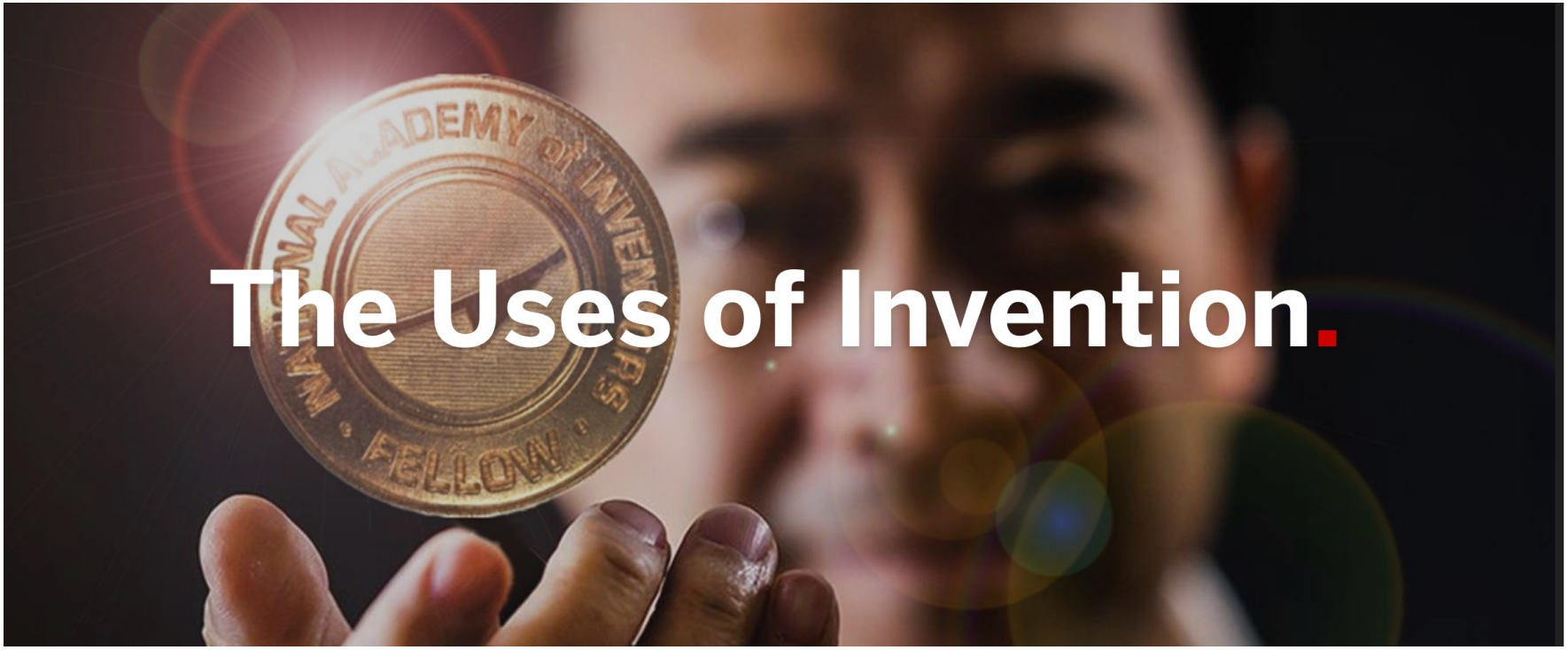
October 19th, BBQ, Cheng & Yang Group

Nov 2025: Cheng is appointed as Photonics Center Associate Director of Strategic Initiatives to Lead a Chemical Imaging Initiative





Dec 2025: Cheng Elected to National Academy of Inventors



Publications in 2025

1. **Nature Communications**, Yueming Li et al, retinal stimulation, in press
2. **JPC Letters**, George Abul-Aqel et al, VREF,
3. **Applied Physics Reviews**, Zhongyue Guo et al
4. **Science Advances**, Sanjun Fan et al, SE-CARS, in press
5. **Advanced Science**, Meng Zhang et al, SIP SRS
6. **PhotoniX**, Xiaowei Ge et al. Fiber OPO SRP
7. **Optica** (minireview), Jiaze Yin et al, vibrational photothermal microscopy
8. **Nature Photonics** (review), Wei Min, Cheng, Yasuyuki Ozeki, SRS
9. **Newton (Cell Press)**, Guangrui Ding et al, SPEND
10. **Advanced Photonics (SPIE)**, Danchen Jia et al, MEIP

Publications in 2025

11. **Nature Communications**, Mingsheng Li et al, Oblique MIP
12. **Science Advances**, Guo Chen et al., SOPPI
13. **Nature Methods**, Cheng group, advanced vibrational microscopes
14. **Advanced Health Materials**, Hongjian He et al.
15. **Analytical Chemistry**, Rylie Bolarinho et al.
16. **Physical Review Letters**, Jiaze Yin et al, MIRED spectroscopy
17. **Nature Methods**, Haonan Lin et al, nanoSRS
18. **Cancer Communications**, Zhicong Chen et al.

New Book: Photothermal Spectroscopy and Microscopy

- Invited by Springer Nature
- Chapters due 3/31/2026
- Editors: Ji-Xin Cheng, Craig Prater, Subhasis Adhikari

New Grants Received in 2025

- **Ignition Award for 2025 to 2026**, IR-AMES led by Qing Xia
- **R35 MIRA Award Renewal** (PI: Cheng), funded for 2025-2029

Career advancement

- **Haonan Lin**, Assistant Professor at Gorgia Tech BME, start in Jan 2026
- **Yuhao Yuan**, Senior Scientist at PSC, started in June 2025
- **Jiaze Yin**, Principal Scientist, VibroniX USA, started in Sept 2025
- **Brittani Bungart**, Assistant Prof, Vanderbilt University, summer 2025
- **Hongjian He**, Faculty in Tongji University, start in Fall 2026
- **Pu-ting Dong**, Assistant Professor, Stony Brook BME, start in Jan 2026
- **Qing Xia,** promoted to Research Assistant Professor, started Nov 2025
- **Yueming Li,** promoted to Research Assistant Professor, started Nov 2025.