

## Juliet T. Gopinath

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| <b>EDUCATION</b>                | <b>Massachusetts Institute of Technology</b><br>Ph.D. in Electrical Engineering and Computer Science<br>S.M. in Electrical Engineering and Computer Science   | 2005<br>2000                                  |
|                                 | <b>University of Minnesota</b><br>B.S. in Electrical Engineering  | 1998  |
| <b>EMPLOYMENT</b>               | <b>University of Colorado Boulder</b><br>Professor<br><i>Alfred T. and Betty E. Look Endowed Professor</i><br>Associate Professor<br>Assistant Professor  | 2021-<br>2019 -<br>2017 - 2021<br>2009 - 2017 |
|                                 | <b>MIT Lincoln Laboratory, Laser Technology and Applications</b><br>Technical Staff Member  | 2005 - 2009                                   |
| <b>AWARDS<br/>AND HONORS</b>    | Optica (formerly OSA) Fellow<br>University of Colorado Boulder Provost Achievement<br>Award<br>R&D 100 Award : Wavelength Beam Combining<br>Fiber-Coupled Diode Laser<br>IEEE Senior Member<br>National Science Foundation Graduate Fellowship                                      | 2021<br>2016<br>2012<br>2011<br>1998 - 2001   |
| <b>PROFESSIONAL<br/>SERVICE</b> | <b>Service to Journals</b><br>Associate Editor, Optica<br>IEEE Publications Council<br>IEEE Photonics Society Journal, Associate Editor   | 2020 -<br>2018<br>2011 - 2017                 |
|                                 | <b>Service to Funding Agencies</b><br>Reviewer for grant agencies: NSF, AFOSR, ONR, NIH<br>Reviewer for CINT, Center for Integrated Nanotechnologies<br>Panelist for NSF and NIH  |   |
|                                 | <b>Leadership in the Academic Community</b><br>Member-at-large, APS Division of Laser Science<br>Photonics Society Rep., IEEE Nanotechnology Council  | 2021 –<br>2020 – 2021                         |

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| Division of Laser Science/APS Nominating Committee | 2019        |
| OSA Charles Hard Townes Award Committee            | 2019 - 2021 |
| Chair & committee member                           |             |

### Conference Organization

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| Optica Biophotonics Conference, Subcomm. Member                          | 2022 - 2023     |
| Advanced Solid State Lasers (ASSL), Subcomm. Member                      | 2022            |
| Hilton Head Workshop 2022, Subcommittee Member                           | 2021 - 2022     |
| Ultrafast Optics Conf. 2023, Subcommittee Member                         | 2022 - 2023     |
| International Semiconductor Laser Conf., Subcomm Mem.                    | 2022            |
| Advanced Photonics Congress 2022, Subcomm. Member                        | 2021 - 2022     |
| Frontiers in Optics 2021, Subcommittee Member                            | 2021            |
| General Co-Chair for the Joint Symposium on<br>Optics (OSA/OSK/OSJ)      | 2021            |
| OSA/OSK/OSJ Symposium Committee  | 2019            |
| CLEO 2023, Subcommittee Chair  | 2022-2023       |
| CLEO 2014-16, 2019-22, Subcommittee Member                               | 2014-16/19 - 22 |
| CLEO Steering Committee APS DLS Representative                           | 2021-ongoing    |
| Ultrafast Optics, Program Committee                                      | 2017            |
| Colorado Photonics Industry Association Annual<br>Meeting, Program Chair | 2014 - 2017     |
| OECC/ACOFT 2014, Program Committee,                                      | 2013 - 2014     |
| OSA Optical Sensors Topical Meeting, Program Comm.                       | 2012            |

### University Service

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| CUbit, Associate Director                          | 2019        |
| Quantum Interdisciplinary Research Theme, Director | 2018 - 2019 |

### ONLINE TEACHING

|   |                |
|---|----------------|
| <a href="#">Active Optical Devices Specialization</a>                         | 2020 - ongoing |
| Coursera MOOC   |                |
| <i>Online course on semiconductor light sources, detectors &amp; displays</i> |                |

### OUTREACH

|  |               |
|--|---------------|
| CU Boulder Women in ECEE, founder and faculty advisor                      | 2011- ongoing |
| <i>Student group for women in electrical engineering</i>                   |               |
| Science Discovery Summer Electromagnetics Course                           | 2011- ongoing |
| <i>EM course for under-represented high school students</i>                |               |
| Chair, CU ECEE Diversity, Equity and Inclusion (DEI)                       | 2020 - 2022   |
| <i>Committee for DEI in ECEE department</i>                                |               |
| MIT EECS Rising Stars Workshop, panelist                                   | 2021          |
| <i>Two-day career workshop for diverse postdocs</i>                        |               |
| APS Conf. for Undergrad. Women in Physics (CUWiP)                          | 2017          |
| <i>Workshop for undergraduate women in physics: panelist &amp; speaker</i> |               |

1. M. Grayson, G. Krueper, B. Xu, M. Zohrabi, D. Hjelme, J. T. Gopinath, and W. Park, "On-chip mid-infrared optical sensing with GeSbSe waveguides and resonators," *Opt. Express* **31**, 877- 889 (2023)
2. T. Shanavas, M. Grayson, B. Xu, M. Zohrabi, W. Park, and J. T. Gopinath, "Cascaded forward Brillouin lasing in a chalcogenide whispering gallery mode microresonator," *APL Photonics* 116108 (2022) <https://doi.org/10.1063/5.0112847>.
3. D. J. Park, O. D. Supekar, A. Greenberg, **J. T. Gopinath** and V. M. Bright, "In-situ monitoring of calcium carbonate scale progression on reverse osmosis membranes using Raman spectroscopy," *Desalination and Water Treatment* **273**, 92–103 (2022).
4. M. Grayson, B. Xu, T. Shanavas, M. Zohrabi, K. Bae, **J. T. Gopinath** and W. Park, "Fabrication and Characterization of High Quality GeSbSe Reflowed and Etched Ring Resonators," *Optics Express* **30**, 31107 - 31121 (2022).
5. A. Q. Anderson, E. F. Strong, S. C. Coburn, G. B. Rieker, and **J. T. Gopinath**, "Orbital Angular Momentum-Based Dual-Comb Interferometer for Ranging and Rotation Sensing," *Optics Express* **30**, 21195-21210 (2022).
6. O.D. Supekar, A. Sias, S.R. Hansen, G. Martinez, G.C. Peet, X. Peng, V.M. Bright, E.G. Hughes, D. Restrepo, D.P. Shepherd, C.G. Welle, **J.T. Gopinath**, and E.A. Gibson, "Miniature Structured Illumination Microscope for in vivo 3D Imaging of Brain Structures with Optical Sectioning", *Biomedical Optics Express* **13**, 2530-2541 (2022).
7. G. Krueper, C. Yu, S. B. Libby, R. Mellors, L. Cohen, and **J. T. Gopinath**, "Realistic Model of Entanglement-Enhanced Sensing in Optical Fiber," *Optics Express* **30**, 8652-8666 (2022).
8. B. Heffernan, P. Riley, O. Supekar, S. Meyer, D. Restrepo, M. Siemens, E. A. Gibson, and **J. T. Gopinath**, "Two-photon fiber-coupled super-resolution microscope for biological imaging," *APL Photonics* **7**, 036102 (2022), DOI: 10.1063/5.0075012.
9. W. Y. Lim, M. Zohrabi, J. Zhu, T. Socco, T. Carmon, **J. T. Gopinath** and V. M. Bright, "Spectrally tunable liquid resonator based on electrowetting," *Optics Express* **30**, 18949-18965 (2022).
10. Y. L. Simmons, K. J. Underwood, O. D. Supekar, B. M. Heffernan, T. A. Welton, E. A. Gibson, and **J. T. Gopinath**, "Femtosecond diode-based time lens laser for multiphoton microscopy," *Biomed. Opt. Express* **12**, 6269-6276 (2021)
11. B. Xu, B. M. Heffernan, K. Bae, M. Siemens, **J. T. Gopinath** and W. Park, "Selective excitation of plasmon resonances with cylindrical vector beams," *Optics Express* **29**, 13071 (2021).
12. E. F. Strong, A. Q. Anderson, M. P. Brenner, B. M. Heffernan, N. Hoghooghi, **J. T. Gopinath** and G. B. Rieker, "Angular velocimetry for fluid flows: an optical sensor using structured light and machine learning," *Optics Express* **29**, 9960 (2021).
13. A. Q. Anderson, E. F. Strong, B. M. Heffernan, M. E. Siemens, G. B. Rieker and **J. T. Gopinath**, "Observation of the Rotational Doppler Shift in Spatially Incoherent Light," *Optics Express* **29**, 4058-4066 (2021).
14. J. Zhu, T. M. Horning, M. Zohrabi, W. Park and **J. T. Gopinath**, "Photo-induced writing and erasing of gratings in As<sub>2</sub>S<sub>3</sub> chalcogenide microresonators," *Optica* **7**, 1645-1648 (2020).
15. D. Park, O. D. Supekar, A. R. Greenberg, **J. T. Gopinath** and V. M. Bright, "Real-time monitoring of calcium sulfate scale removal from RO desalination membranes using Raman spectroscopy," 497, 114736 (2021).
16. K. Bae, J. Zhu, C. Wolenski, A. Das, T. M. Horning, S. Pampel, M. Grayson, M. Zohrabi, **J. T. Gopinath** and Won, Park, "Indium Tin Oxide Nanoparticle-Coated Silica Microsphere with Large Optical Nonlinearity and High Quality Factor," *ACS Photonics*, <https://pubs.acs.org/doi/10.1021/acsp Photonics.0c01079> (2020).

17. E. L. Strong, A. Anderson, **J. T. Gopinath** and G. Rieker, "Centering a beam of light to the axis of rotation of a planar object", *Review of Scientific Instruments* **91**, 105101 (2020).
18. S. Pampel, K. Bae, M. Zohrabi, M. Grayson, T. M. Horning, W. Park and **J. T. Gopinath**, "Third-Harmonic Generation Enhancement in an ITO Nanoparticle-Coated Microresonator," **28**, 30004 *Optics Express* (2020).
19. K. J. Underwood, A. F. Briggs, S. D. Sifferman, V. B. Verma, N. Sirica, R. P. Prasankumar, S. -W. Nam, K. L. Silverman, S. R. Bank and **J. T. Gopinath**, "Strain dependence of Auger recombination in 3 mm GaInAsSb/GaSb type-I active regions," *Applied Physics Letters* **116**, 262103 (2020).
20. A. Q. Anderson, E. F. Strong, B. M. Heffernan, M. E. Siemens, G. B. Rieker, and **J. T. Gopinath**, "Detection Technique Effect on Rotational Doppler Measurements," *Optics Letters* **45**, 2636-2639 (2020).
21. M. Zohrabi, W. Y. Lim, V. M. Bright and **J. T. Gopinath**, "High extinction ratio, low insertion loss, optical switch based on an electrowetting prism," *Optics Express* **28**, 5991-6001 (2020).
22. W. Y. Lim, M. Zohrabi, **J. T. Gopinath**, and V. M. Bright, "Calibration and characteristics of an electrowetting laser scanner," *IEEE Sensors* **20**, 3496-3503 (2020).
23. O. D. Supekar, D. J. Park, A. R. Greenberg, **J. T. Gopinath**, and V. M. Bright, "Real-Time Detection of Early-Stage Calcium Sulfate and Calcium Carbonate Scaling Using Raman Spectroscopy," *Journal of Membrane Science* **596**, 117603 1-9 (2020).
24. M. Grayson, M. Zohrabi, K. Bae, J. Zhu, **J. T. Gopinath** and W. Park, "Enhancement of third-order nonlinearity of thermally evaporated GeSbSe waveguides through annealing," *Optics Express* **27**, 33606-33620 (2019).
25. J. Chiles, N. Nader, E. J. Stanton, D. Herman, G. Moody, J. Zhu, C. Skehan, B. Guha, A. Kowligy, **J. T. Gopinath**, K. Srinivasan, S. A. Diddams, I. Coddington, N. R. Newbury, J. M. Shainline, S. W. Nam, and R. Mirin, "Multi-functional integrated photonics in the mid-infrared with suspended AlGaAs on silicon," *Optica* **6**, 1246-1254 (2019).
26. B. M. Heffernan, S. A. Meyer, D. Restrepo, M. E. Siemens, E. A. Gibson and **J. T. Gopinath**, "A fiber-coupled stimulated emission depletion microscope for bend-insensitive through-fiber imaging," *Scientific Reports* **9**, 11137 (2019).
27. J. Zhu, M. Zohrabi, K. Bae, T. M. Horning, M. B. Grayson, W. Park, and **J. T. Gopinath**, "Nonlinear characterization of silica and chalcogenide microresonators," *Optica* **6**, 716-722 (2019).
28. M. Zohrabi, W. Y. Lim, R. H. Cormack, O. D. Supekar, V. M. Bright, and **J. T. Gopinath**, "Lidar system with nonmechanical electrowetting-based wide-angle beam steering," *Optics Express* **27**, 4404-4415 (2019).
29. J. M. Anderson, S. N. Alperin, A. A. Voitiv, W. G. Holtzmann, **J. T. Gopinath** and M. E. Siemens, "Characterizing vortex beams from a spatial light modulator with collinear phase shifting holography," *Applied Optics* **58**, 404-409 (2019).
30. W. Y. Lim, O. D. Supekar, M. Zohrabi, **J. T. Gopinath** and V. M. Bright, "Liquid combination with high refractive index contrast and fast scanning speeds for electrowetting adaptive optics," *Langmuir* **34** DOI: 10.1021/acs.langmuir.8b02849, 14511-14518 (2018).
31. O. D. Supekar, J. Brown, A. R. Greenberg, **J. T. Gopinath** and V. M. Bright, "Real-time detection of reverse-osmosis membrane scaling via Raman spectroscopy," *Industrial and Engineering Chemistry Research*, DOI: 10.1021/acs.iecr.8b01272 (2018)
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- J. T. Gopinath, "Wavefront aberration correction using multielectrode electrowetting-based devices," *Optics Express* **25** 31451-31461 (2017).
35. B. M. Heffernan, R. D. Niederriter, M. E. Siemens, and **J. T. Gopinath**, "Tunable higher-order angular momentum using polarization maintaining fiber," *Optics Letters* **42**, 2683-2686 (2017).
  36. G. Kang, M. R. Krogstad, M. Grayson, D.-G. Kim, H. Lee, **J. T. Gopinath** and W. Park, "High quality chalcogenide-silica hybrid wedge resonator," *Optics Express* **25**, 15581-15589 (2017).
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  38. R. D. Niederriter, B. N. Ozbay, G. L. Futia, E. A. Gibson, and **J. T. Gopinath**, "Compact diode-laser-based pulse source for multiphoton biological imaging," *Biomedical Optics Express* **8**, 315-322 (2016).
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  40. K. Underwood and **J. T. Gopinath**, "Control of the state of a mode-locked fiber laser using an intracavity Martinez compressor," *Optics Letters* **41**, 5393-5396 (2016).
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  44. R. D. Niederriter, M. E. Siemens, and **J. T. Gopinath**, "Continuously tunable orbital angular momentum generation in polarization maintaining fiber," *Optics Letters* **41**, 3213 (2016).
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  49. B. N. Ozbay, J. T. Losacco, R. Cormack, R. Weir, V. M. Bright, **J. T. Gopinath**, D. Restrepo, and E. A. Gibson, "Miniaturized fiber-coupled confocal microscope with a continuously moving focus using no moving parts," *Opt. Lett.* **40**, 2553-2556 (2015). *Also appears in Virtual Journal for Biomedical Optics (2015).*
  50. M. R. Krogstad, S. Ahn, W. Park, and **J. T. Gopinath**, "Nonlinear characterization of Ge<sub>28</sub>Sb<sub>12</sub>Se<sub>60</sub> bulk and waveguide devices," *Opt. Exp.* **23**, 7877(2015).
  51. A. M. Jones and **J. T. Gopinath**, "Fast-to-slow axis mode imaging for brightness enhancement of a broad-area laser diode array," *Opt. Exp.* **21**, 17912-17919(2013).
  52. R. D. Niederriter, A. M. Watson, R. N. Zahreddine, C. J. Cogswell, R. H. Cormack, V. M. Bright, and **J. T. Gopinath**, "Electrowetting lenses for compensating phase and curvature distortion in arrayed laser systems," *Appl. Opt.* **52**, 3172 (2013).
  53. R. D. Niederriter, **J. T. Gopinath** and M. E. Siemens, "Measurement of the M2 beam propagation factor using a focus-tunable liquid lens," *Applied Optics* **52**, 1591-1598(2013).

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55. P. W. Juodawlkis, J. J. Plant, W. Loh, L. Missaggia, F. O'Donnell, D. C. Oakley, A. Napoleone, J. Klamkin, **J. T. Gopinath**, D. J. Ripin, S. Gee, P. J. Delfyett, and J. P. Donnelly, "High-Power, Low-Noise 1.5- $\mu\text{m}$  Slab-Coupled Optical Waveguide (SCOW) Emitters: Physics, Devices, and Applications," *IEEE J. of Sel. Top. in Quant. Electron.* **17**, 1698-1714 (2011).
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59. **J. T. Gopinath**, B. Chann, R. K. Huang, C. Harris, J. J. Plant, L. Missaggia, J. P. Donnelly, P. W. Juodawlkis, and D. J. Ripin, "980-nm monolithic passively modelocked diode lasers with 62 pJ of pulse energy," *IEEE Photonics Technology Letters* **19**, 937-939 (2007).
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62. F. J. Grawert, S. Akiyama, **J. T. Gopinath**, F. O. Ilday, H. M. Shen, J. Liu, K. Wada, L. C. Kimerling, E. P. Ippen, and F. X. Kaertner, "220 fs Er-Yb:glass laser mode-locked by a broadband low-loss Si/Ge saturable absorber," *Optics Letters* **30**, 329-331 (2005).
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65. **J. T. Gopinath**, M. Soljačić, E. P. Ippen, V. N. Fuflyigin, W. A. King, and M. Shurgalin, "Third-order nonlinearities in Ge-As-Se-based glasses for telecommunications applications," *Journal of Applied Physics* **96**, 6931-6933 (2004). *Also appeared as an Invited Paper in Virtual Journal of Ultrafast Science December 2004.*
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69. R. P. Prasankumar, I. Hartl, **J. T. Gopinath**, E. P. Ippen, J. G. Fujimoto, P. Mak and M. F. Ruane, "Design and characterization of semiconductor-doped silica film saturable

- absorbers,” *Journal of the Optical Society of America B (Optical Physics)* **21**, 851-857 (2004).
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## CONFERENCE PRESENTATIONS

1. **J. T. Gopinath**, B. Heffernan, S. A. Meyer, D. Restrepo, M. E. Siemens, and E. A. Gibson, "A window into the brain: Advances in super-resolution microscopy," *Invited presentation, Conference on Optics Photonics and Quantum Optics 2022* (2022).
2. S. D. Gilinsky, M. Zohrabi, O. D. Supekar, W. Y. Lim, V. M. Bright, and **J. T. Gopinath**, "Two-Dimensional Individual Addressable Electrowetting Micro-Lens Array," *Presented at the IEEE Photonics Society Annual Meeting* (2022).
3. E. J. Miscles, W. Y. Lim, O. D. Supekar, M. Zohrabi, **J. T. Gopinath** and V. M. Bright, "Vibration suppression in an electrowetting lens," *Presented at the IEEE Photonics Society Annual Meeting* (2022).
4. **J. T. Gopinath**, "From water filtration to autonomous navigation: Using photonics to enable new sensing modalities", *Plenary, Optical Sensors and Sensing Congress (2022)*.

5. M. Grayson, G. Krueper, B. Xu, D. Hjelme, **J. T. Gopinath** and W. Park, "GeSbSe Devices for Mid-Infrared Optical Sensing," *Accepted for presentation at the Optical Sensors and Sensing Congress* (2022).
6. O. Supekar, A. Sias, S. Hansen, G. Martinez, G. Peet, X. Peng, V. Bright, E. Hughes, D. Shepherd, C. Welle, **J. Gopinath** and E. Gibson, "SIMscope3D: A structured illumination miniature microscope for high resolution brain imaging," *Presented at the 2022 Biophotonics Congress: Biomedical Optics* (2022).
7. O. D. Supekar, Y. Lange Simmons, V. M. Bright, and **J. T. Gopinath**, "Narrow linewidth picosecond source at 760 nm generating 50 nJ pulses using four-wave mixing," *Presented at the 2022 Conference on Lasers and Electro-Optics (CLEO)* (2022).
8. T. Shanavas, M. B. Grayson, M. Zohrabi, W. Park, and **J. T. Gopinath**, "Cascaded Forward Brillouin Scattering in a Chalcogenide Microsphere," *Presented at the 2022 Conference on Lasers and Electro-Optics (CLEO)* (2022).
9. A. Q. Anderson, E. F. Strong, S. C. Coburn, G. Rieker, and **J. T. Gopinath**, "Dual Comb Ranging and Rotation Sensing with Orbital Angular Momentum," *Presented at the 2022 Conference on Lasers and Electro-Optics (CLEO)* (2022).
10. E. F. Strong, S. C. Coburn, A. Q. Anderson, R. Cole, **J. T. Gopinath**, S. Becker, and G. Rieker, "Broadband hyperspectral spectroscopy imaging using dual frequency comb spectroscopy and compressive sensing," *Presented at the 2022 Conference on Lasers and Electro-Optics (CLEO)* (2022).
11. Y. Wang, B. M. Heffernan, M. Zohrabi, J. Farrell, M. E. Siemens, and **J. T. Gopinath**, "Fiber sensing using higher-order spatial modes and the orbital angular momentum of light," *Presented at the 2022 Conference on Lasers and Electro-Optics (CLEO)* (2022).
12. E. F. Strong, A. Q. Anderson, B. M. Heffernan, M. P. Brenner, N. Hoghooghi, **J. T. Gopinath** and G. B. Rieker, "Sensing angular velocity with optical orbital angular momentum and machine learning," *Presented at OSA Imaging and Applied Optics Congress* (2021).
13. S. A. Meyer, M. E. Siemens, **J. T. Gopinath**, D. Restrepo, and E. A. Gibson, "OpenSTED: Inexpensive and open-source implementation of Dynamic Intensity Minimum (DyMIN) for Stimulated Emission Depletion (STED) microscopy," *Presented at the OSA Biophotonics Congress* (2021).
14. G. R. Krueper, R. Mellors, C. Yu, S. B. Libby, M. Messerly, and **J. T. Gopinath**, "Entangled-enhanced interferometry in optical fiber," *Presented at the Conference on Lasers and Electro-Optics* (2021).
15. B. M. Heffernan, P. Riley, O. D. Supekar, S. A. Meyer, N. M. George, D. Restrepo, M. E. Siemens, E. A. Gibson, and **J. T. Gopinath**, "Two-photon fiber STED microscopy using polarization maintaining fiber," *Presented at the Conference on Lasers and Electro-Optics* (2021).
16. A. Q. Anderson, E. F. Strong, B. M. Heffernan, M. E. Siemens, G. B. Rieker, and **J. T. Gopinath**, "Rotation measurement using spatially incoherent light and the rotational Doppler shift," *Presented at the Conference on Lasers and Electro-Optics* (2021).
17. B. M. Heffernan, B. Xu, K. Bae, M. E. Siemens, W. Park and **J. T. Gopinath**, "Tailoring the multipole content at tight focus using cylindrical vector beams with orbital angular momentum," *Presented at the Conference on Lasers and Electro-Optics* (2021).
18. B. Xu, B. M. Heffernan, K. Bae, M. Siemens, **J. T. Gopinath** and W. Park, "Group theory guided symmetry coupling between cylindrical vector beams and localized surface plasmon resonances," *Presented at the Conference on Lasers and Electro-Optics* (2021).
19. W. Y. Lim, M. Zohrabi, J. Zhu, **J. T. Gopinath** and V. M. Bright, "Electrowetting-based tunable liquid droplet microresonator," *Presented at the IEEE MEMS Conference* (2021).
20. D. Park, O. Supekar, A. Greenberg, **J. T. Gopinath** and V. M. Bright, "Novel Sensors for Real-time Detection of Membrane Fouling in RO Desalination Systems," *Presented at the AGU Fall Meeting* (2020).



21. **J. T. Gopinath**, “Nonlinear chalcogenide photonic devices,” *Invited presentation at the IEEE Photonics Society Conference (2020)*.
22. S. Pampel, T. M. Horning, K. Bae, M. Zohrabi, M. Grayson, W. Park and **J. T. Gopinath**, “Enhanced Nonlinearity in a Functionalized Whispering Gallery Mode Microcavity,” *Presented at the Frontiers in Optics Conference (2020)*.
23. **J. T. Gopinath**, “Fiber-Coupled Stimulated Emission Depletion Microscopy (STED),” *Invited presentation at OSA Imaging and Sensing Congress (2020)*.
24. A. F. Briggs, S. D. Sifferman, K. J. Underwood, L. J. Nordin, **J. T. Gopinath** and S. R. Bank, “Auger Recombination in Strained GaInAsSb Quantum Well Membranes,” *Presented at EMC (2020)*.
25. G. Martinez Sanchez, O. D. Supekar, G. L. Futia, B. N. Ozbay, C. Welle, V. M. Bright, **J. T. Gopinath**, D. Restrepo, D. Shepherd, and E. A. Gibson, “Widefield fluorescence optical sectioning microscopy in a miniature fiber-coupled microscope with active axial scanning” *Presented at Conference on Lasers and Electro-Optics (2020)*.
26. A. Q. Anderson, E. F. Strong, B. M. Heffernan, M. E. Siemens, G. B. Rieker, and **J. T. Gopinath**, “Detection strategies for measuring rotation with the rotational Doppler effect” *Presented at Conference on Lasers and Electro-Optics (2020)*.
27. E. F. Strong, A. Q. Anderson, B. M. Heffernan, M. P. Brenner, **J. T. Gopinath**, and G. B. Rieker, “An angular velocity sensor using machine learning and optical orbital angular momentum” *Presented at Conference on Lasers and Electro-Optics (2020)*.
28. K. Bae, T. M. Horning, S. Pampel, M. Zohrabi, M. B. Grayson, **J. T. Gopinath**, and W. Park, “On-chip high-quality Ge<sub>23</sub>Sb<sub>7</sub>S<sub>70</sub> round-wedge resonators for broadband dispersion engineering,” *Presented at Conference on Lasers and Electro-Optics (2020)*.
29. K. J. Underwood, A. F. Briggs, S. D. Sifferman, V. Verma, N. Sirica, R. Prasankumar, S. W. Nam, K. L. Silverman, S. Bank, and **J. T. Gopinath**, “Auger Recombination in Strained Mid-Infrared Quantum Wells,” *Presented at Conference on Lasers and Electro-Optics (2020)*.
30. Y. L. Simmons, K. J. Underwood, B. M. Heffernan, O. Supekar, E. A. Gibson, and **J. T. Gopinath**, “Near-infrared Femtosecond Time Lens Diode Laser with kW Peak Powers for Two-Photon Microscopy,” *Presented at Conference on Lasers and Electro-Optics (2020)*.
31. M. Grayson, M. Zohrabi, K. Bae, J. Zhu, **J. T. Gopinath**, and W. Park, “Enhancement of third-order nonlinearity of thermally evaporated GeSbSe waveguides through annealing,” *Presented at SPIE Photonics West, Proceedings Volume 11283, Integrated Optics: Devices, Materials, and Technologies XXIV; 1128319 (2020)*
32. J. Zhu, K. Bae, M. Zohrabi, T. M. Horning, M. B. Grayson, W. Park, and **J. T. Gopinath**, “In situ, nonlinear characterization of microresonators,” *Presented at the Conference on Nonlinear Optics, Postdeadline (2019)*.
33. K. Bae, J. Zhu, M. B. Grayson, M. Zohrabi, C. Wolenski, T. M. Horning, **J. T. Gopinath** and W. Park, “High-quality factor, nonlinear indium tin oxide nanoparticle-coated silica microsphere,” *Presented at the Conference on Nonlinear Optics (2019)*.
34. J. Zhu, M. Zohrabi, T. M. Horning, W. Park, and **J. T. Gopinath**, “Photosensitive Writing and Erasing of Gratings in an As<sub>2</sub>S<sub>3</sub> Chalcogenide Microresonator,” *Presented at the Conference on Nonlinear Optics (2019)*.
35. **J. T. Gopinath**, M. Zohrabi, O. D. Supekar, W. Y. Lim, B. N. Ozbay, G. L. Futia, D. Restrepo, E. A. Gibson, and V. M. Bright, “Electrowetting adaptive optical devices for LIDAR,” *Invited presentation, Applied Industrial Optics (2019)*.
36. A. F. Briggs, S. D. Sifferman, K. J. Underwood, L. J. Nordin, **J. T. Gopinath** and S. R. Bank, “Externally applied strain on GaSb-based GaInAsSb quantum well membranes,” *Presented at EMC (2019)*.
37. **J. T. Gopinath**, B. M. Heffernan, S. A. Meyer, D. Restrepo, M. E. Siemens, and E. A. Gibson, “Imaging of HeLa cells with fiber stimulated emission depletion microscopy (STED),” *Presented at the International Conference on Orbital Angular Momentum*

- (ICOAM)(2019).
38. B. M. Heffernan, S. A. Meyer, D. Restrepo, M. E. Siemens, E. A. Gibson, and **J. T. Gopinath**, "Bend-insensitive, through-fiber stimulated emission depletion (STED) imaging of HeLa cells," *Presented at the Conference on Lasers and Electro-Optics (CLEO)* (2019).
  39. S. D. Sifferman, M. Motyka, A. F. Brights, K. J. Underwood, K. M. McNichoas, R. Kudrawiec, **J. T. Gopinath** and S. R. Bank, "Dilute-Bismide Alloys for GaSb-based Mid-Infrared Semiconductor Lasers" *Presented at the Conference on Lasers and Electro-Optics (CLEO)*, 2018.
  40. O. D. Supekar, B. N. Ozbay, M. Zohrabi, P. D. Nystrom, G. L. Futia, D. Restrepo, E. A. Gibson, **J. T. Gopinath**, and V. M. Bright, "Electrowetting prism for scanning in two-photon microscopy," *Presented at the Conference on Lasers and Electro-Optics (CLEO)*, 2018.
  41. O. D. Supekar, J. J. Brown, A. R. Greenberg, **J. T. Gopinath**, and V. M. Bright, "Real-time detection of scaling on reverse osmosis membranes with Raman spectroscopy," *Presented at Conference on Lasers and Electro-Optics (CLEO)*, 2018.
  42. B. M. Heffernan, S. A. Meyer, M. E. Siemens, D. Restrepo, E. A. Gibson, and **J. T. Gopinath**, "Stimulated emission depletion microscopy with polarization-maintaining fiber," *Presented at the Conference on Lasers and Electro-Optics (CLEO)*, 2018.
  43. K. Underwood, A. F. Briggs, S. D. Sifferman, S. R. Bank, and **J. T. Gopinath**, "Auger Recombination in Mid-Infrared Active Regions," *Presented at the Conference on Lasers and Electro-Optics (CLEO)*, 2018.
  44. S. Alperin, B. Heffernan, R. D. Niederriter, M. E. Siemens, and **J. T. Gopinath**, "Generation and detection of tunable orbital angular momentum in optical fiber," Presented at *ICOAM (International Conference on Orbital Angular Momentum)*, Capri, Italy (2017).
  45. **J. T. Gopinath**, "Nonlinear chalcogenide materials and devices," *Invited presentation at Progress in Electromagnetic Research Symposium (PIERS)* (2017).
  46. M. Zohrabi, R. H. Cormack, and **J. T. Gopinath**, "Nonmechanical beam steering using tunable lenses," *Presented at Conference on Lasers and Electro-Optics, SW4L.2* (2017).
  47. O. D. Supekar, M. Zohrabi, J. J. Brown, **J. T. Gopinath** and V. M. Bright, "Enhancing the response time of electrowetting lenses using voltage shaping," *Presented at Conference on Lasers and Electro-Optics, SM4C.7* (2017).
  48. B. M. Heffernan, R. D. Niederriter, M. E. Siemens, and **J. T. Gopinath**, "Generation of higher-order orbital angular momentum in polarization-maintaining fiber," *Presented at Conference on Lasers and Electro-Optics, STu4K.3* (2017).
  49. G. Kang, S. Cho, M. R. Krogstad, **J. T. Gopinath**, and W. Park, "Design and fabrication of high-Q chalcogenide glass micro-disk resonators," *SPIE Photonics West*, Paper 10106-8 (2017).
  50. R. D. Niederriter, M. E. Siemens, and **J. T. Gopinath**, "Generation of tunable orbital angular momentum in polarization maintaining fiber," *Presented at Frontiers in Optics FTh5B.2* (2016).
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  52. R. D. Niederriter, B. N. Ozbay, G. L. Futia, D. Restrepo, E. A. Gibson, and **J. T. Gopinath**, "Miniature picosecond diode laser system for two-photon fluorescence imaging of the mouse brain," *Presented at the Society for Neuroscience Meeting (SFN) Poster 365.04/MMM37* (2016).
  53. K. Underwood, R. D. Montoya, S. Terrab, A. M. Watson, V. M. Bright and **J. T. Gopinath**, "Large Extinction Ratio Electrowetting Optical Shutter", *Conference on Lasers and Electro-Optics (CLEO)*, JW2A.144 (2016).
  54. K. Underwood and **J. T. Gopinath**, "Intracavity Martinez Compressor for Simultaneous Dispersion Compensation and Tunable Spectral Filtering," *Conference on Lasers and*

- Electro- Optics (CLEO)*, STu3.P.2 (2016).
55. M. R. Krogstad, S. Ahn, W. Park, and **J. T. Gopinath**, “Linear and Nonlinear Properties of Ge-Sb-Se Waveguides at Telecom Wavelengths,” *Conference on Lasers and Electro-Optics (CLEO)*, SF.1P.2 (2016).
  56. S. Terrab, A. M. Watson, K. M. Dease, **J. T. Gopinath** and V. M. Bright, “Electrowetting-Based Variable Tuning Prism,” *Presented at 2015 Conference on Lasers and Electro-Optics (CLEO)*, AW4K.4 (2015).
  57. M. R. Krogstad, S. Ahn, W. Park, and **J. T. Gopinath**, “Characterization of Ge<sub>28</sub>Se<sub>12</sub>Sb<sub>60</sub> waveguides,” *Presented at 2015 Conference on Lasers and Electro-Optics (CLEO)*, STh1G.7 (2015).
  58. K. J. Underwood, A. M. Jones and **J. T. Gopinath**, “Synthesis of coherent optical pulses using a field-programmable gate array (FPGA)-based gradient descent phase locking algorithm with three semiconductor lasers,” *Presented at 2015 Conference on Lasers and Electro-Optics (CLEO)*, SM3F.3 (2015).
  59. S. N. Alperin, M. E. Siemens, R. D. Niederriter, and **J. T. Gopinath**, “Measuring orbital angular momentum of light with a single, stationary lens ,” *Presented at 2015 Conference on Lasers and Electro-Optics (CLEO)*.
  60. R. D. Niederriter, M. E. Siemens, and **J. T. Gopinath**, “Fiber Optic Sensors Based on Orbital Angular Momentum,” *Presented at 2015 Conference on Lasers and Electro-Optics (CLEO)*, SM1L.5 (2015).
  61. A. M. Jones and **J. T. Gopinath**, “Beam quality improvement of broad-area laser diodes by fast-to-slow axis mode imaging,” *Presented at Conference on Lasers and Electro-Optics (CLEO) (June 2013)*, JW1J.3.
  62. R. D. Niederriter, **J. T. Gopinath**, and M. E. Siemens, “Variable-focus method for characterizing general astigmatic laser beams,” *Presented at Conference on Lasers and Electro-Optics (CLEO) (June 2013)*, CTu3D.
  63. M. R. Krogstad, E. Rengnath, W. Park, and **J. T. Gopinath**, “Third-order nonlinearities of Ge<sub>28</sub>Sb<sub>12</sub>Se<sub>60</sub> for waveguide devices,” *Presented at Conference on Lasers and Electro-Optics (CLEO) (June 2013)*, JW2A.
  64. **J. T. Gopinath**, “Ultrafast and Ultrabright Lasers,” Presented at New Laser Scientists Conference (October 2010).
  65. K.-H. Hong, **J. Gopinath**, D. Rand, A. Siddiqui, S.-W. Huang, E. Li, B. Eggleton, J. Hybl, T. Y. Fan, and F. X. Kaertner, High-Energy, “Picosecond, Cryogenic Yb:YAG Chirped-Pulse Amplifier at kHz Repetition Rates for OPCPA Pumping,” *Presented at 2010 Conference on Lasers and Electro-Optics (CLEO) (June 2010)*, JThD2.
  66. **J. T. Gopinath**, K. F. Wall, J. Hybl, P. F. Moulton, and T.Y. Fan, “High-Power, Actively Modelocked Cryogenic Yb:YAG Laser,” *Presented at 2010 Advanced Solid-State Photonics(ASSP)* (Feb. 2010), AWB22.
  67. K. H. Hong, **J. T. Gopinath**, D. Rand, A. Siddiqui, J. Moses, J.-C. Lai, J. Hybl, T. Y. Fan, and F. X. Kaertner “Generation of 2-kHz, 40-mJ picosecond pulses from a cryogenic Yb:YAG chirped-pulse amplifier for OPCPA pumping,” *Presented at 2010 Advanced Solid- State Photonics* (Feb 2010), Postdeadline paper.
  68. K. H. Hong, **J. T. Gopinath**, A. Siddiqui, J. Moses, J. –C. Lai, J. Hybl, T. Y. Fan, “High-average-power cryogenically-cooled picoseconds Yb:YAG amplifier seeded by a fiber CPA system,” *Presented at 2009 Conference on Lasers and Electro-Optics (CLEO) (June 2009)*, CThJ4.
  69. T. Y. Fan, D. J. Ripin, J. D. Hybl, **J. T. Gopinath**, A. K. Goyal, D. A. Rand, S. J. Augst, and J. R. Ochoa, “Cryogenically cooled solid-state lasers: recent developments and future prospects,” *Presented at 2009 Conference on Lasers & Electro-Optics Europe & 11th European Quantum Electronics Conference (CLEO/EQEC)*(Feb. 2009), p. 1 .
  70. **J. T. Gopinath**, J. Hybl, D. Ripin, J. Ochoa, T. Y. Fan, K. Hong, A. Siddiqui, J. Moses, and

- F. X. Kaertner, "Cryogenically cooled Yb:YAG amplifier with 287-W output power in 5.5-ps pulses," *Presented at Directed Energy Professional Society Ultrashort Pulse Laser Workshop (DEPS)* (Sept. 2008).
71. D. Pudo, H. Byun, **J. T. Gopinath**, G. S. Petrich, E. P. Ippen, F. X. Kärtner, and L. A. Kolodziejski, "Nonlinear phase response of a saturable Bragg reflector for modulation depth control," *Presented at Conference on Lasers and Electro-Optics (CLEO)* (May 2008), CWA2.
  72. J. D. Hybl, **J. T. Gopinath**, R. L. Aggarwal, S. J. Augst, B. Chann, P. Foti, J. R. Ochoa, D. Rand, D. J. Ripin, and T.Y. Fan, "Ultrashort-pulse cryogenic Yb lasers," *Presented at Directed Energy Professional Society Meeting (DEPS)* (Oct. 2007).
  73. **J. T. Gopinath**, B. Chann, T. Y. Fan, and A. Sanchez-Rubio, "High brightness wavelength- beam-combined eyesafe diode laser stacks," *Presented at 2007 Conference on Lasers and Electro-Optics (CLEO)* (June 2007), CThEE1.
  74. **J. T. Gopinath**, J. J. Plant, B. Chann, R. K. Huang, C. Harris, L. Missaggia, J. P. Donnelly, P. W. Juodawlkis, and D. J. Ripin, "High power monolithic passively mode-locked slab-coupled optical waveguide lasers," *Invited talk presented at the 2006 Conference on Lasers and Electro-Optics (CLEO)* (May 2006), CThH5.
  75. H. Sotobayashi, **J. T. Gopinath**, H. M. Shen, J. W. Sickler, P. W. Rakich, and E. P. Ippen, "Supercontinuum generation and its applications," *Presented at 2005 SPIE, Passive Optical Components for WDM Communications V (SPIE)* (October 2005), 6014-30.
  76. P.T. Rakich, H.Sotobayashi, **J. T. Gopinath**, J. W. Sickler, C. W. Wong, M. Qi, S. G. Johnson, E. Lidorikis, J. D. Joannopoulos, H. I. Smith ,and E. P. Ippen, "Broadband studies of 1D and 3D photonic crystals (invited paper)," *SPIE Optics East* (October 2005), 6017-02.
  77. H. Sotobayashi, **J. T. Gopinath**, J. W. Sickler, and E. P. Ippen, "Broadband fiber lasers using bismuth oxide-based erbium-doped fiber amplifiers (invited)," *Presented at SPIE International Symposium on Information Technology and Communications (ITCom)* (October 2004), 5595-03.
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  81. H. Sotobayashi, **J. T. Gopinath**, J. W. Sickler, and E. P. Ippen, "Novel fiber laser technologies using broadband bismuth oxide-based erbium-doped fiber amplifiers (invited)," *Presented at the 9th European Conference on Networks & Optical Communications (ECOC)* (June 2004), paper 5.
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  92. T. R. Schibli, J. Kim, O. Kuzucu, **J. T. Gopinath**, S. N. Tandon, G. S. Petrich, L. A. Koldziejski, J. G. Fujimoto, E. P. Ippen, and F. X. Kaertner, "Attosecond active synchronization of passively modelocked lasers using balanced cross-correlation". *Presented at Advanced Solid-State Photonics 2003 (ASSL)* (Feb. 2003), Postdeadline paper.
  93. K. S. Abedin, **J. T. Gopinath**, L. A. Jiang, M. E. Grein, H. A. Haus, and E. P. Ippen, "Self-organization of harmonic pulses in a passively modelocked stretched pulse Erbium fiber ring laser," *Presented at 2002 IEEE Lasers and Electro-Optics Annual Meeting (LEOS)* (November 2002), pp. 465-466.
  94. K. S. Abedin, **J. T. Gopinath**, E. P. Ippen, C. E. Kerbage, R. S. Windeler, and B. J. Eggleton, "Efficient highly nondegenerate four-wave mixing with tapered microstructure fiber," *Presented at Nonlinear Optics OSA Topical Meeting (NLO)* (August 2002), pp. 415-417.
  95. D. J. Ripin, **J. T. Gopinath**, H. M. Shen, F. X. Kaertner, E. P. Ippen, A. A. Erchak, G. S. Petrich, L. A. Kolodziejski and U. Morgner, "A few-cycle  $\text{Cr}^{4+}$ :YAG laser," *Presented at Conference on Lasers and Electro-Optics (CLEO)* (June 2002), pp. 24.
  96. A. A. Erchak, D. J. Ripin, **J. T. Gopinath**, H. M. Shen, F. X. Kaertner, G. S. Petrich, L. A. Kolodziejski, and E. P. Ippen, "Large scale oxidation of AlAs layers for broadband saturable Bragg reflectors," *Presented at Conference on Lasers and Electro-Optics (CLEO)* (June 2002), pp. 225.
  97. **J. T. Gopinath**, E. R. Thoen, E. M. Koontz, M. E. Grein, L. A. Kolodziejski, E. P. Ippen, and J. P. Donnelly, "Ultrafast recovery times in implanted semiconductor saturable absorber mirrors at 1.5  $\mu\text{m}$ ," *Presented at Conference on Lasers and Electro-Optics (CLEO)* (June 2001), appears in Errata Section of Postconference Edition, pp. CWI4-1 to CWI4-3.
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**ISSUED  
PATENTS**

**J. Gopinath**, V.M. Bright, A. Jones, “An Electrowetting-Actuated Optical Switch Based on Total Internal Reflection,” Issued 3/24/20 (US 10,598,919 B2).

**J. Gopinath**, V.M. Bright, A. M. Jones, “Optical Shutters Having Offset Liquid Lenses,” Application No. 16/789, 704 “Electrowetting-Actuated Optical Shutters,” Issued 8/2/22 (US patent 11,402,624 B2).

**J. Gopinath**, E. Gibson, V.M. Bright, R. Weir, D. Restrepo and B. Ozbay, “Optical Imaging Devices and Variable-Focus Lens Elements, and Methods for Using Them,” Issued on 08/19/19 (European Patent 3, 097,443 B1); Issued 4/28/20 (US patent 10,634,899).

J.J. Brown, O. Supekar, V.M. Bright, **J. T. Gopinath**, A.R. Greenberg, “Methods and Devices for Real-Time Detection of Fouling Chemistry,” Issued on 7/20/21 (US patent 11,067,511 B2)

**J. T. Gopinath** and R. D. Niederriter, “Miniature short-pulsed diode laser system” Issued on 11/9/21 (US patent 11,171,467).

**J. T. Gopinath**, V. M. Bright, M. Zohrabi, and R. H. Cormack, “Wide-Angle Beam Steering,” Issued on 1/11/22 (US patent 11,221,435)

**J. T. Gopinath**, V.M. Bright, M. Zohrabi, O.D. Supekar, R.H. Cormack, and Wei Yang Lim, “Enhanced Response Time of Tunable Electrowetting Elements with Shaped Input Voltage Functions,” Issued on 11/8/22 (US patent number 11,493,749).

**J. T. Gopinath**, V.M. Bright, O. Supekar, W.Y. Lim, M. Zohrabi, “Electrowetting Prism for Scanning in High Resolution Fluorescence Microscopy,” Issued 1/18/22 (US patent 11,226,479).

**INVITED  
PRESENTATIONS**

Columbia University and CUNY ASRC Seminar (2022)

MNIT Jaipur, IEEE Photonics Society Student Chapter and SPIE Student Chapter, Webinar (2021)

University of Southern California, Photonics Seminar (2021)

Ball Aerospace, Seminar (2020)

NIST Applied Physics Division Seminar, Boulder (Fall 2019)

DMMI Workshop on Domestic Manufacturing Capabilities for Critical DoD Applications: Emerging Needs in Quantum Enabled Systems, Invited Panelist (Spring 2019)

Enabling Quantum Materials Workshop, Louisiana State University, Invited Speaker (Spring 2019)

Kansas State University, OSA Traveling Lecturer (Spring 2019)

University of Denver, Physics Colloquium (Spring 2019)

University of Texas at Austin (Fall 2018)

Donostia International Physics Center, Seminar (Spring 2018)

University of Colorado Boulder, Physics Colloquium (Fall 2017)

Miami University, Physics Colloquium (Spring 2017)

University of Minnesota, Electrical Engineering Colloquium (Fall 2016)

Harvard University, CEAS Seminar (2016)

IEEE Boston Photonics Society, Seminar (2016)

Ball Aerospace, Research Seminar (2015)

NIST Boulder, Research Seminar (2015)

Cornell University, Electrical Engineering Seminar (2015)

University of California San Diego, Electrical Engineering Seminar (2015)

University of Colorado-Boulder, IONS Conference Seminar, Boulder CO (2015)

University of Colorado-Boulder, Research Seminar Series on Optical, Electronic and Quantum Systems (2014)

Colorado School of Mines, Research Seminar (2013)

University of Colorado-Boulder, Physics Department Condensed Matter Seminar (2010)

China Lake Naval Air Warfare Center, Seminar Speaker (2010)

University of Colorado-Boulder, Electrical and Computer Engineering Department Seminar (2008) and (2014)

Colorado State University, Electrical and Computer Engineering Department Seminar (2007)