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EMPLOYMENT AND APPOINTMENTS

- 09/04 – present *Assistant Professor*, Department of Physics,
Queens College of the City University of New York (CUNY)
Graduate Center of the City University of New York (CUNY)
Member, CUNY Photonics Initiative
- 09/04 – 11/06 *Visiting Researcher*, Department of Electrical Engineering,
Princeton University, Princeton, NJ 08544
- 12/03 -08/04 *Research Staff Member*, Department of Electrical Engineering,
Princeton University, Princeton, NJ 08544
- 05/01-12/03 *Post Doctoral Fellow*, Center for Photonics and Optoelectronic Materials,
Princeton University, Princeton, NJ 08544
- 09/98-05/01 *Research Assistant*, Photonics Center and Department of Physics,
University of Massachusetts, Lowell, MA 01854.

PROFESSIONAL PREPARATION

- 05/01-05/02 LUCENT-BELL LABS POSTDOCTORAL FELLOWSHIP IN PHOTONICS, **Princeton University**.
Area of Research: Nonlinear optical phenomena in semiconductor heterostructures, photonic
integrated circuits, organic/inorganic microcavity devices, and molecular beam epitaxy of quantum
heterostructures and novel material systems.
- 09/96 -05/01 PH.D. PHYSICS, **University of Massachusetts**, Lowell, MA.
Thesis Title: “Design, Fabrication and Characterization of Quantum Cascade Terahertz Emitters”
- 08/93-05/95 M. SC. PHYSICS, **University of Hyderabad**, India.
Specialization: Laser Physics and Quantum Optics
- 07/90-05/93 B. SC. PHYSICS, **P.S.G College of Arts and Science**, Coimbatore, India.

RESEARCH EXPERIENCE

- 09/04 - Present *Assistant Professor- Physics Department, Queens College and Graduate Center of CUNY*
Laboratory for Nano and Micro Photonics (LaNMP)
- Cavity quantum electrodynamics using nano/micro –cavities.
 - Flexible photonics.
 - Nonlinear optics at low photon levels in photonic crystals.
 - Organic – Inorganic hybrid systems.
 - Nanoscale metallic photonic structures for plasmonics.
 - Photonic circuits using colloidal quantum dot composites.
- 12/03- 08/04 *Research Staff Member* [Center for Photonics and Optoelectronic Materials (POEM),
05/01-12/03 *Research Associate* [and Dept. of Electrical Engineering, Princeton University.
- Organic-Inorganic hybrid microcavity polaritons.
 - Design and fabrication of micro-ring/disk resonators in organic and inorganic medium.
 - Designed and fabricated photonic integrated circuits for ultrafast signal processing.
 - Developed high-speed monolithically integrated wavelength converter.

Significant accomplishments:

- Demonstration of strong coupling and exciton hybridization in an organic-inorganic optical microcavity.
- Experimental demonstration of control of cavity Q-factor and critical coupling in microring resonators with integrated gain elements.
- Experimental observation of non-reciprocity of counter propagating signals in integrated Sagnac interferometer.
- Demonstration of monolithically integrated wavelength converter operating at 10 Gbps.
- Demonstration of monolithically integrated arrayed waveguide gratings with high-speed photodiodes for chip-scale wavelength division multiplexing applications.

09/98-05/01 *Research Assistant*, Photonics Center, University of Massachusetts, Lowell.

- Designed quantum cascade multiple quantum well structure for terahertz emission.
- Designed novel waveguide schemes for terahertz intersubband lasers.
- Molecular beam epitaxial growth of quantum cascade terahertz emitters.
- Low temperature optical and electrical characterization of terahertz emitters.
- Self-consistent modeling of Pseudomorphic High Electron Mobility Transistors (p-HEMTs).

Significant accomplishments:

- Conceived the idea of *phonon wavefunction engineering* for enhancing device performance.
- First demonstration of phonon engineered quantum cascade emitter using *interface phonons*.
- First demonstration of dual wavelength terahertz emission from quantum cascade structures.

12/95-05/96 *Research Fellow*, Inter-University Center for Astronomy & Astrophysics, Pune, India.

- Design of multi stack thin film optical filters for optical astronomy.

HONORS

- Feliks Gross Endowment Award for Outstanding Scholarly Work by an Assistant Professor at CUNY 2008.
- President's Award for Innovative Teaching Project, Queens College – CUNY, 2006.
- Inducted to Sigma Xi and Golden Key Honor Societies, 2006.
- Lucent-Bell Labs Post Doctoral Fellowship in Photonics at Princeton University, 2001.
- Outstanding Graduate Student Award for the academic year 2000-2001 from the Department of Physics at University of Massachusetts Lowell, 2001.
- Summer Research Fellowship from the Center for Cellular and Molecular Biology, Hyderabad, India, 1994.

PUBLICATIONS

- "Lasing from quantum dots in a spin-coated flexible microcavity," V. M. Menon, M. Luberto, N. Valappil, S. Chatterjee, *Submitted*
- "Time resolved and steady state luminescence properties of InGaP colloidal quantum dots," S. Chatterjee, N. Valappil, and V. M. Menon *Submitted*
- "Luminescence from a Fibonacci photonic crystal," V. Passias, Z Shi, N. Valappil, L. Deych, A. Lisyansky, and V. M. Menon, *In Preparation*
- "Solution processed microcavity structures with embedded quantum dots," N. Valappil, M. Luberto, I. Zeylikovich, T. K. Gayen, J. Franco, B. B. Das, R. R. Alfano and V. M. Menon, *Photonics and Nanostructures: Fundamentals and Applications* **5**, 184 (2007)
- "Control of spontaneous emission from colloidal quantum dots in a polymer microcavity," V. M. Menon, N. Valappil, I. Zeylikovich, B. Das, T. Gayen and R. R. Alfano, *Mater. Res. Soc. Symp. Proc.* **959**, M10-01 (2007).
- "Strong coupling and hybridization of Frenkel and Wannier-Mott excitons in an organic-inorganic optical microcavity," R. J. Holmes, S. Kena-Cohen, V. M. Menon, and S. R. Forrest, *Phys. Rev. B* **74**, 235211 (2006).
- "Light induced symmetry breaking and related giant enhancement of nonlinear properties in CdZnTe:V crystals," S. Shwartz, R. Weil, M. Segev, E. Lakin, E. Zolotoyabko, V. M. Menon, S. R. Forrest, and U. El-Hanany, *Opt. Express* **14**, 9385 (2006).

- “Photonic integration using asymmetric twin waveguide (ATG) technology – II. Devices,” V. M. Menon, F. Xia, and S. R. Forrest, *IEEE Journal of Selected Topics in Quantum Electronics* **11**, 30-42 (2005).
- “Photonic integration using asymmetric twin waveguide (ATG) technology – I. Concepts and Theory,” F. Xia, V. M. Menon, and S. R. Forrest, *IEEE Journal of Selected Topics in Quantum Electronics* **11**, 17-29 (2005).
- “Reduction of absorption loss in asymmetric twin waveguide laser tapers using argon plasma-enhanced quantum-well intermixing,” Y. Huang, F. Xia, V. M. Menon, S. R. Forrest and M. Gokhale, *IEEE Photonics Technology Letters*, **16**, 2221-2223 (2004).
- “Control of Q-factor and critical coupling in microring resonators through integration of semiconductor optical amplifier,” V.M. Menon, W. Tong, and S. R. Forrest, *IEEE Photonics Technology Letters*, **16**, 1343-1345 (2004).
- “An asymmetric twin waveguide, 8-channel polarization independent arrayed waveguide grating with an integrated photodiode array,” W. Tong, V. M. Menon, F. Xia, and S. R. Forrest, *IEEE Photonics Technology Letters*, **16**, 1170-1172 (2004).
- “Non-reciprocity of counter propagating signals in a monolithically integrated Sagnac interferometer,” V. M. Menon, W. Tong, F. Xia, C. Li, and S. R. Forrest, *Optics Letters*, **29**, 513-515 (2004).
- “Characterization of GaAs grown by molecular beam epitaxy on vicinal Ge(100) substrates,” A. Wan, V. M. Menon, S. R. Forrest, D. Wasserman, S. Lyon, and A. Kahn, *J. Vac. Sci Technol. B* **22**, 1893-1898 (2004).
- “Terahertz magneto-photoconductive characterization of hydrogenic barrier donors in GaAs/AlGaAs epitaxial thin films,” A. Naweed, W. Goodhue, W. Gorveatt, R. Giles, J. Waldman, and V. M. Menon *J. Vac. Sci. Technol. B* **22**, 1580-1583 (2004).
- “Monolithic integration of a semiconductor optical amplifier and a high bandwidth p-i-n photodiode using asymmetric twin-waveguide technology,” F. Xia, J. Wei, V. M. Menon, and S. R. Forrest, *IEEE Photonics Technology Letters*, **15**, 452-454 (2003).
- “All optical wavelength conversion using a regrowth free monolithically integrated Sagnac Interferometer,” V. M. Menon, W. Tong, C Li, F. Xia, I Glesk, P. R. Prucnal, and S. R. Forrest, *IEEE Photonics Technology Letters*, **15**, 254-256 (2003).
- “Phonon engineered quantum cascade terahertz emission,” V. M. Menon, L. R. Ram-Mohan, W. D. Goodhue, A. S. Karakashian, A. Naweed, A. Gatesman, and J. Waldman, *Physica E*, **15**, 197-201 (2002).
- “Dual frequency quantum cascade terahertz emitter,” V. M. Menon, W. D. Goodhue, A. S. Karakashian, A. Naweed, J. Plant, L. R. Ram-Mohan, A. Gatesman, V. Badami, and J. Waldman, *Applied Physics Letters*, **80**, 2454-2456 (2002). (Also published in the Virtual Journal of Nanoscale Science and Technology, **5**, #15, 2002.)
- “Role of interface phonons in quantum cascade terahertz emitters,” V. M. Menon, L. R. Ram-Mohan, W. D. Goodhue, A. J. Gatesman, and A. S. Karakashian, *Physica B*, **316-317**, 212-215 (2002).
- “Phonon mediated lifetimes in intersubband terahertz lasers,” V. M. Menon, W. D. Goodhue, A. S. Karakashian, and L. R. Ram-Mohan, *Journal of Applied Physics*, **88**, 5262-5267 (2000).
- “Waveguide design optimization for a quantum cascade laser emitting at 77 μm ,” V. M. Menon, W. D. Goodhue, A. S. Karakashian, and L. R. Ram-Mohan, *Physica E*, **7**, 52-57 (2000).
- “TE- and TM- polarized optoelectronic properties of HgCdTE quantum wells,” V. M. Menon, L. R. Ram-Mohan, I. Vurgaftman, and J. R. Meyer, *Journal of Electronic Materials*, **29**, 865-868 (2000).

INVITED PRESENTATIONS

- “Organic-inorganic hybrid photonic emitters and circuits using colloidal quantum dots,” V. M. Menon, American Chemical Society Annual Meeting, Philadelphia, PA, August 17-21, 2008.
- “Photonic Emitters and Circuits based on colloidal quantum dot composites,” V. M. Menon, Quantum Dots 2007, Ft. Lauderdale, FL, Dec 3-4, 2007.
- “Organic – Inorganic Hybrid Photonic Structures,” V. M. Menon, Photonics 2006, Hyderabad, India, December 13-16, 2006.
- “Active photonic microcavities,” V. M. Menon – Polytechnic University, Brooklyn, NY, July 2006
- “Photonic building blocks for quantum informatics,” V. M. Menon, Cochin University of Science and Technology, Kochi, India, June 2005

- “Photonic building blocks for quantum informatics,” V. M. Menon, CUNY Photonics Symposium, New York, NY April 21, 2005
- “Photonic integrated circuits for RF, analog links, WDM, and other advanced applications based on Asymmetric twin waveguide technology,” V. M. Menon and S. R. Forrest, Integrated Photonics Research and Applications, San Diego, CA, April 11-13, 2005.
- “Photonic integrate circuits using asymmetric twin waveguide technology,” V. M. Menon, and S. R. Forrest, Frontiers in Optics, Optical Society of America Annual Meeting, Rochester, NY, October 10-14, 2004.
- “Asymmetric twin waveguide technology for monolithic photonic integration,” V.M.Menon, Workshop on Integrated Waveguide Devices, Optical Fiber Communication (OFC) Conference, Los Angeles, CA, February 22-27, 2004.
- “Monolithic integration of active and passive elements for all optical signal processing,” V. M. Menon, University of North Carolina, Charlotte, Spring Colloquium Series, January 17, 2003.
- “Photonic integration made easy using asymmetric twin waveguide technology,” V. M. Menon, F. Xia, J. Wei, W. Tong, and S. R. Forrest, Optoelectronics Industry Development Association (OIDA) Annual Forum, Washington D.C, November 20-21, 2002.
- “If you can draw it, we can build it: Photonic integration made easy using asymmetric twin waveguide technology,” V. M. Menon, F. Xia, J. We, W. Tong, S. R. Forrest, M. R. Gokhale, P. V. Studenkov, and J. Thomson, OSA Annual Meeting, Orlando, FL, September 29-Oct 2, 2002
- “Next Generation Photonic Devices,” V. M. Menon, Avinashilingam Deemed University, Coimbatore, India, September 21, 2002.
- “Self-consistent analysis of energy levels and wavefunctions for a pseudomorphic-HEMT: a route to quality assurance,” V. M. Menon, and A. S. Karakashian, Raytheon Corporation, Andover, MA, July 26, 2000.

CONTRIBUTED PRESENTATIONS

- “Flexible vertical cavity surface emitting laser using colloidal quantum dots,” M. Luberto, N. Valappil, S. Chatterjee, and V. M. Menon, Nanophotonics – OSA Topical Conference, Nanjing, China, May 26-29 2008.
- “Photoluminescence enhancement from colloidal quantum dots in a flexible microcavity,” M. Luberto, N. Valappil, S. Chatterjee, and V. M. Menon, CLEO/QELS San Jose, CA, May 5-9 2008.
- “Organic Photonic Crystal Microcavities for a Room-Temperature Single-Photon Source on Demand,” Svetlana G. Lukishova, Luke J. Bissell, Vinod Menon, Nikesh Valappil, Robert W. Boyd, Carlos R. Stroud, Jr, Photonic Metamaterials: From Random to Periodic, Jackson Hole, WY, June 4-7 2007.
- “Hybridization of Frenkel and Wannier-Mott Excitons in an Optical Microcavity,” S. K. Cohen, R. Holmes, V. M. Menon, S. R. Forrest, CLEO/QELS, Long Beach, CA, May 21-26 2006.
- “Light-Induced Ionic Displacement in CdZnTe:V Crystals Giving Rise to Crystalline Symmetry Breaking and Huge Nonlinearities,” S. Shwartz, R. Weil, M. Segev, E. Lakin, E. Zolotoyabko, V. M. Menon, S. R. Forrest, and U. El-Hanany, CLEO/QELS, Long Beach, CA, May 21-26 2006.
- “Probing impurity migration effects in Si-doped AlGaAs by terahertz spectroscopy,” A. Naweed, W. D. Goodhue, V. M. Menon, W. Gorveatt, R. Giles, and J. Waldman, CLEO/QELS, Long Beach, CA, May 21-26 2006.
- “THz Quantum Cascade Laser Design and Application to Homeland Security,” W.D. Goodhue, J. Waldman, L.R. Ram-Mohan, V. M. Menon, T.R. Nelson, G. Lamont, B. Zhu, J. Dickinson, J. van Nostrand and J. Albrecht, International Workshop on Quantum Cascade Lasers, Sevilla, Spain, January 2004.
- “Manipulation of cavity Q and critical coupling in a microring resonator through integration of a semiconductor optical amplifier,” V. M. Menon, W. Tong, and S. R. Forrest, Conference on Lasers and Electro-Optics, San Francisco, CA, May 2004.
- “Characterization of GaAs grown by MBE on vicinal Ge(100) substrates,” A. Wan, V.M. Menon, D. Wasserman, A. Kahn, S.R. Forrest, S.A. Lyon, American Vacuum Society International Symposium, Baltimore, MD, November 2-7, 2003.
- “Monolithic integration of a semiconductor optical amplifier (SOA) and a high-speed waveguide p-i-n photodiode using asymmetric twin-waveguide technology,” F. Xia, J. Wei, V.M.Menon, and S. R. Forrest, Optical Fiber Communication (OFC) Conference, Atlanta, GA, March 23-28, 2003.

- “Monolithically integrated Sagnac Interferometer for All-Optical Wavelength Conversion,” V. M. Menon, W. Tong, C Li, F. Xia, I Glesk, P. R. Prucnal, and S. R. Forrest, IEEE LEOS Annual Meeting, Glasgow, Scotland, November 10-14, 2002.
- “Dual Frequency Quantum Cascade Terahertz Emitters,” V. M. Menon, L. R. Ram-Mohan, W.D. Goodhue, A. J. Gatesman, A. Naweed, J. Waldman, and A. S. Karakashian, Annual American Physical Society Meeting, Indianapolis, IN, March 18 - 22, 2002.
- “Exploring Terahertz Laser Design through High Performance Computing,” P Sotirelis, T. Nelson, L. R. Ram-Mohan, V. M. Menon, W. D. Goodhue, and J. Waldman, DOD HPCMO User Group Conference 2002.
- “Optical logic using asymmetric twin guide photonic integrated circuits”, V. M. Menon, F. Xia, and S. R. Forrest, Optoelectronic Industry Development Association (OIDA) Annual Forum, Washington D. C., November 28-29, 2001.
- “Design, Fabrication and Characterization of Quantum Cascade Terahertz (THz) Emitters”, V. M. Menon, L. R. Ram-Mohan, W.D. Goodhue, A. J. Gatesman, A. Naweed, J. Waldman, and A. S. Karakashian, North American Molecular Beam Epitaxy Conference, Providence, RI, Oct 1-3, 2001.
- "Interface Phonons in Quantum Cascade THz Emitters", V. M. Menon, L. R. Ram-Mohan, W. D. Goodhue, A. J. Gatesman, and A. S. Karakashian, Tenth International Conference on Phonon Scattering in Condensed Matter, Dartmouth, NH, August 12-17, 2001.
- “Theoretical gain characteristics of intersubband terahertz lasers”, V. M. Menon, W. D. Goodhue, A. S. Karakashian, and L. R. Ram-Mohan, American Physical Society Annual meeting, Seattle, WA, March 12-16, 2001.
- “TE polarized intersubband transitions in HgCdTe quantum wells,” V. M. Menon, L. R. Ram-Mohan, and J. R. Meyer, U.S. Workshop on the Physics and Chemistry of II-VI Materials, Las Vegas, NV, September 22-24, 1999.
- “Waveguide designs for quantum cascade terahertz lasers”, V. M. Menon, W. D. Goodhue, and A. S. Karakashian 5th International Conference on Intersubband Transitions in Quantum Wells, Bad Ischl, Austria, September 7-11, 1999.
- “Design of a far-infrared quantum cascade laser emitting at 77 μ m”, V. M. Menon, W. D. Goodhue, A. S. Karakashian, and L.R. Ram-Mohan, American Physical Society centennial meeting, Atlanta, GA, March 20-26, 1999.
- “A submillimeter quantum cascade laser in the GaAs/AlGaAs system”, V. M. Menon, W. D. Goodhue, and A. S. Karakashian, *Infrared Technology and Applications XXIV SPIE Proceedings* Vol. 3436, part 2, 970-974, (1998).

PATENTS

- “Spin coated polymer microcavity for light emitters and lasers,” V. M. Menon and N. Valappil, International Patent Application # PCT/US2007/021089, Published Oct 4, 2008.
- “Photonic integrated devices having reduced absorption loss,” V. M. Menon, M. R. Gokhale, S. R. Forrest, Y. Huang, F. Xia, Patent application # 20070077017, Published April 5, 2007.
- “Organic injection laser,” S. R. Forrest, V. M. Menon, Z. Soos, US Patent # 7,242,703, Issued July 10, 2007.
- “Monolithic wavelength stabilized asymmetric laser,” V. M. Menon, S. Datta, and S. R. Forrest, US Patent # 7,230,963, Issued June 12, 2007.
- “Photonic integrated circuits,” S. R. Forrest, M. R. Gokhale, F. Xia, and V. M. Menon, US Patent #6,795,622, Issued September 21, 2004.
- “Systems and methods using phonon mediated intersubband laser,” W. D. Goodhue, L. R. Ram-Mohan, A. S. Karakashian, and V. M. Menon, US Patent # 6,829,269, Issued December 7, 2004.