

Jacob Trevino, PhD

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PROFESSIONAL EXPERIENCE

Columbia University, New York, NY

Senior Director, CNI Shared Labs

July 2025 – Present

- Provide strategic leadership and operational oversight for Columbia's shared cleanroom, imaging, and materials characterization laboratories under the Columbia Nano Initiative.
- Manage interdisciplinary research infrastructure supporting faculty, students, and external collaborators across engineering, physical sciences, and biomedical fields.
- Coordinate compliance, safety, and training programs in alignment with university policies and federal regulations governing shared research facilities.

Chemeleon (Drinksavvy Inc.), New York, NY

Chief Innovation Officer

June 2024 – Present

- Lead the development and implementation of innovative strategies to drive the company's growth and competitive edge.
- Oversee research and development initiatives to identify new opportunities and technologies.
- Manage the innovation pipeline from idea generation through to commercialization.
- Develop and manage partnerships with academic institutions, industry leaders, and research organizations.
- Monitor market trends and competitor activities to inform strategic planning.
- Spearhead the development of proposals for grants and funding opportunities (NSF, NIH, DOD) for new product development.

Chief Executive Officer

May 2022 – June 2024

- Directed the company's overall operations, strategies, and procedures to ensure efficient and effective business performance.
- Oversaw all aspects of business development, including market research, finance, operations, and marketing.
- Built and maintained professional relationships with potential investors, partners, and stakeholders.
- Developed a strategic roadmap for scaling prototype devices to foundry-level manufacturing.
- Successfully raised funding through investor relations, venture capital, and grant proposals to support company growth and product development initiatives.

Principal Scientist

March 2018 – May 2022

- Designed, simulated, fabricated, and tested next-generation colorimetric chemical sensors.
- Combined nanotechnology, photonics, and molecular recognition to create novel devices for the commercial, medical, environmental, and food industries.
- Developed and wrote SBIR proposals (NSF, NIH, DOD) for new product development.

Nanotech NYC, New York, NY

Founder and President

Feb. 2018 – Present

- Founded and established a thriving community for nanotechnology professionals in the Greater New York City area.
- Organized and facilitated regular events to foster networking and collaboration among researchers, entrepreneurs, and industry leaders.

Columbia University, New York, NY

Adjunct Associate Professor

Aug. 2015 – Dec. 2024

- Teaching Principles of Device Microfabrication in the School of Engineering, covering the science and technology of conventional and advanced micro- and nano-fabrication techniques for electronic integrated and discrete components.

University of Pennsylvania, Philadelphia, PA

Nanofabrication Facility Director

January 2022 – May 2022

- Directed the operation and growth of the Quattrone Nanofabrication Facility's capabilities.
- Led efforts to develop operating procedures and policies, external user programs, digital lab, and management protocols.
- Identified and pursued equipment and research funding opportunities to enhance the facility and services provided.
- Developed strategies to provide tools and processes to meet user needs effectively.
- Supervised and directed activities of staff (process engineers, scientists, and technicians), optimizing productivity and minimizing tool downtime.

New York University, New York, NY

Nanofabrication Cleanroom Facility Director

Dec. 2020 – Dec. 2021

- Directed the operation and growth of the Tandon cleanroom and shared instrumentation facilities.
- Developed and implemented recruitment strategies for new cleanroom users from internal and external academic institutions, as well as start-ups and large companies.
- Led efforts in the selection, acquisition, and installation of additional cleanroom equipment (approximately 10 systems, \$2 million).
- Developed operational policies and standard operating procedures for the facility and communicate them to staff and users.

City University of New York, Advanced Science Research Center, New York, NY

Nanofabrication Facility Director

Aug. 2013 – Feb. 2018

- Supervised cleanroom final design and build, in collaboration with contractors, architects, and consultants (\$17.5 million).
- Led efforts in selection, acquisition, and installation of all cleanroom equipment (\$8 million).
- Developed operating procedures, policies, external user programs, digital lab management protocols, billing, and user fee structure.
- Led the hiring of technical and administrative staff, and developed outreach efforts for industrial, government, and academic collaborations.
- Successfully recruited over 500 users for the cleanroom since its opening in 2015.

Boston University, Boston, MA

Materials Science & Engineering Research Assistant

Aug. 2009 – Aug. 2013

- Designed and fabricated novel metal-dielectric nanostructures to enhance light-matter interaction.
- Developed processes for the top-down fabrication of complex nanostructures.

- Conducted research on enhancing and controlling radiative optical processes in semiconductors and generating optical sources for quantum encryption applications.

Analog Devices Inc., Cambridge, MA

Senior Process Engineer

Apr. 2007 – Aug. 2009

- Optimized MEMS wafer-level device packaging process in a high-volume manufacturing environment.
- Collaborated with foundry partners in Asia and Europe to establish new MEMS production lines.
- Managed process and manufacturing technicians to achieve project goals.

Integrated Sensing Systems Inc., Ypsilanti, MI

Microelectromechanical Systems Engineer

Oct. 2004 – Apr. 2007

- Developed MEMS products for medical devices, including a wireless, batteryless pressure sensor and a micro-Coriolis mass flow sensor.
- Carried out process development and fabrication of MEMS devices for various customers via MEMS Foundry Services.

EDUCATION

Doctor of Philosophy, Materials Science and Engineering

Boston University, Boston, MA

Aug. 2013

Thesis: Engineering aperiodic spiral order for photonic-plasmonic device applications

Sponsor: Dr. Luca Dal Negro

Master of Science, Electrical Engineering

Case Western Reserve University, Cleveland, OH

May 2006

Thesis: Development of low-stress, heavily doped, poly-SiC films for MEMS applications

Sponsor: Dr. Christian Zorman

Bachelor of Science, Physics & Bachelor of Arts, Mathematics

Susquehanna University, Selinsgrove, PA

May 2002

EXTERNAL FUNDING AWARDED

Development of a Colorimetric Sensor for Detection of Cerebrospinal Fluid Leaks

Agency: NIH, NINDS Phase II SBIR

Budget period: 01/01/2023 - 12/31/2024

Role: Investigator/senior personal

Total Award: \$1,680,880

\$420,220 allocated to the candidate

Development of a Colorimetric Sensor for Detection of Cerebrospinal Fluid Leaks

Agency: NIH, NINDS Phase I SBIR

Budget period: 06/01/2019 - 05/31/2020

Role: Investigator/senior personal

Total Award: \$225,000

\$56,250 allocated to the candidate

CREST Center for Interface Design and Engineered Assembly of low-dimensional systems

Agency: NSF

Budget period: 04/01/2016 - 03/31/2021

Role: Investigator/senior personal

Total Award: \$1,000,000

\$50,000 Allocated to candidate

Collaborative Research: REU Site: Nano-NY

Agency: NSF

Budget period: 03/01/2017 - 02/29/2020

Role: Investigator

Total Award: \$75,948
0% allocated to the candidate

NYC Futureworks Nanofabrication Service Center

Agency: New York City Economic Development Corp.

Role: Principal Investigator

Budget period: 11/01/2016 - 04/30/2018

Total Award: \$208,264
\$208,264 allocated to the candidate

MRI: Development of a scanning-probe-assisted confocal microscope for the investigation of optical and magnetic phenomena in arbitrary material systems and devices

Agency: NSF

Role: Co-Principal Investigator

Budget period: 03/01/2017 - 02/29/2018

Total Award: \$572,121
0% Allocated to the candidate

PUBLICATIONS

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- R. Collison, J.B. Pérez-Sánchez, M. Du, **J. Trevino**, J. Yuen-Zhou, S. O'Brien, V. Menon, *Purcell Effect of Plasmonic Surface Lattice Resonances and Its Influence on Energy Transfer*, ACS Photonics 8, 8, 2211-2219 (2021).
 - H. Ji, **J. Trevino**, R. Tu, E. Knapp, J. McQuade, V. Yurkiv, F. Mashayek, L.T. Vuong, *Long-Range Self-Assembly via the Mutual Lorentz Force of Plasmon Radiation*, Nano Letters, 18, 4, 2564-70 (2018).
 - S. Guddala, R. Collison, M. Khatoniar, H. Bokhari, **J. Trevino**, V.M. Menon, *Strong coupling of 2D excitons to surface lattice modes of plasmonic crystals*, CLEO: Science and Innovations, SM2O-7, Optical Society of America, (2018).
 - Y. Deshko, L. Krusin-Elbaum, V. Menon, A. Khanikaev, **J. Trevino**, *Surface plasmon polaritons in topological insulator nano-films and superlattices*, Opt. Express, 7, 7398-7410 (2016).
 - C. G. Pappas, P. W. J. M. Frederix, T. Mutasa, S. Fleming, Y. M. Abul-Haija, S. M. Kelly, A. Gachagan, D. Kalafatovic, **J. Trevino**, R. V. Ulijn, S. Bai, *Alignment of nanostructured tripeptide gels by directional ultrasonication*, Chem. Commun., 51, 8465-8468 (2015).
 - **J. Trevino**, X. A. Fu, M. Mehregany, and C. A. Zorman, *Doped polycrystalline 3C-SiC films with low stress for MEMS: part II Characterization using micromachined structures*, J. of Micromech. Microeng., 24, 6, 065001 (2014).
 - Casadei, E. F. Pecora, **J. Trevino**, C. Forestiere, D. Rueffer, E. Russo-Averchi, F. Matteini, G. Tutuncuoglu, M. Heiss, A. Fontcuberta i Morral, L. Dal Negro, *Photonic-plasmonic coupling of GaAs single nanowires to optical nanoantennas*, Nano Lett., 14, 5, 2271 (2014).
 - X. A. Fu, **J. Trevino**, M. Mehregany, C. A. Zorman, *Doped polycrystalline 3C-SiC films with low stress for MEMS: part I Deposition conditions and film properties*, J. of Micromech. Microeng., 24, 3, 035013 (2014).
 - **J. Trevino**, G. F. Walsh, E. F. Pecora, S. V. Boriskina, L. Dal Negro, *Photonic-plasmonic-coupled nanoantennas for polarization-controlled multispectral nanofocusing*, Opt. Lett., 38, 22, 4861-4863 (2013).
 - F. Intonti, N. Caselli, N. Lawrence, **J. Trevino**, D. S. Wiersma, L. Dal Negro, *Near-field distribution and propagation of scattering resonances in Vogel spiral arrays of dielectric nanopillars*, New J. Phys. 15, 085023 (2013).
 - D. S. Simon, N. Lawrence, **J. Trevino**, L. Dal Negro, A. V. Sergienko, *High capacity quantum Fibonacci coding for key distribution*, Phys. Rev. A, 87, 032312 (2013).
 - S. Conesa-Boj, E. Russo-Averchi, A. Dalmau-Mallorqui, **J. Trevino**, E. F. Pecora, C. Forestiere, A. Handin, M. Ek, L. Zweifel, L. R. Wallenberg, D. Rffer, M. Heiss, D. Troadec, L. Dal Negro, P. Caroff,

- A. Fontcuberta i Morral *Vertical, III-V V-Shaped nano-membranes epitaxially grown on a patterned Si [001] substrate and their enhanced light scattering*, ACS Nano, 6, 12, 10982-10991 (2012).
- N. Lawrence, **J. Trevino**, L. Dal Negro, *Control of optical orbital angular momentum by Vogel spiral arrays of metallic nanoparticles*, Opt. Lett. 37, 24, 5076-5078 (2012).
 - D. Lin, H. Tao **J. Trevino**, J.P. Mondia, D.L. Kaplan, F.G. Omenetto, L. Dal Negro, *Direct transfer of sub-wavelength plasmonic nanostructures on bio-active silk films*, Adv. Mater., 24, 45, 6088-6093, (2012).
 - L. Dal Negro, N. Lawrence, **J. Trevino**, *Analytical light scattering and orbital angular momentum spectra of arbitrary Vogel spirals*, Opt. Express, 20, 18209 (2012).
 - Capretti, G. F. Walsh, S. Minissale, **J. Trevino**, C. Forestiere, G. Miano, L. Dal Negro, *Multipolar second harmonic generation from planar arrays of Au nanoparticles*, Opt. Express, 20, 14, 15797-15806 (2012).
 - N. Lawrence, **J. Trevino**, L. Dal Negro, *Aperiodic arrays of active nanopillars for radiation engineering*, J. Appl. Phys. 111, 113101 (2012).
 - **J. Trevino**, C. Forestiere, G. Di Martino, S. Yerci, F. Priolo, L. Dal Negro, *Plasmonic-photonic arrays with aperiodic spiral order for ultra-thin-film solar cells*, Opt. Express 20, 3, A418-A430 (2012).
 - E. F. Pecora, N. Lawrence, P. Gregg **J. Trevino**, P. Artoni, A. Irrera, F. Priolo, L. Dal Negro, *Nanopatterning of silicon nanowires for enhancing visible photoluminescence*, Nanoscale 4, 2863-2866 (2012).
 - **J. Trevino**, S. F. Liew, H. Noh, H. Cao, L. Dal Negro, *Geometrical structure, multifractal spectra and localized optical modes of aperiodic Vogel spirals*, Opt. Express 20, 3, 3015-3033 (2012).
 - S. F. Liew, H. Noh, **J. Trevino**, L. Dal Negro, H. Cao, *Localized photonic band edge modes and orbital angular momenta of light in a golden-angle spiral*, Opt. Express 19, 24, 23631-23642 (2011).
 - S. Y. Lee, C. Forestiere, A. J. Pasquale, **J. Trevino**, G. Walsh, P. Galli, M. Romagnoli, L. Dal Negro, *Plasmon-enhanced structural coloration of metal films with isotropic Pinwheel nanoparticle arrays*, Opt. Express 19, 24, 23818-23830 (2011).
 - **J. Trevino**, H. Cao, L. Dal Negro, *Circularly-symmetric light scattering from nanoplasmonic spirals*, Nano Lett. 11, 5, 2008 (2011).
 - D. Sparks, **J. Trevino**, S. Massoud-Ansari, N. Najafi, *An all-glass chip-scale MEMS package with variable cavity pressure*, J. Micromech. Microeng. 16, 2488-2491 (2006).
 - V. Hatty, H. Kahn, **J. Trevino**, M. Mehregany, C. A. Zorman, R. Ballarini, A. H. Heuer, *Fracture toughness of LPCVD polycrystalline silicon carbide thin films*, App. Phys. Lett. 99, 013517-013523 (2006).

BOOK CHAPTERS

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- L. Dal Negro, N. Lawrence, **J. Trevino**, Engineering Aperiodic Spiral Order in Nanophotonics: Fundamentals and Device Applications, *Nanodevices for Photonics and Electronics: Advances and Applications*, ed. P. Bettotti, Pan Stanford Publishing, pp. 57-126, 2016, Print
 - L. Dal Negro, **J. Trevino**, N. Lawrence, Engineering the Orbital Angular Momentum of Light with Plasmonic Vogel Spiral Arrays, *Singular and Chiral Nanoplasmonics*, ed. N. Zheludev and S. Boriskina, Pan Stanford Publishing, pp. 335-374, 2014, Print
 - L. Dal Negro, C. Forestiere, N. Lawrence, S. Lee, **J. Trevino**, G. Walsh, Aperiodic Order in Nanoplasmonics, in *Plasmonics: Theory and applications*, ed. T. V. Shahbazy and M. I. Stockman, Springer Publishing Company, pp. 330-378, 2013, Print
 - L. Dal Negro, N. Lawrence, **J. Trevino**, G. Walsh, Aperiodic Order in Nanophotonics, in *Optics of Aperiodic Structures: Fundamentals and Applications*, ed. L. Dal Negro, Pan Stanford Publishing, pp.1-56, 2013, Print

- H. Cao, L. Dal Negro, H. Noh, **J. Trevino**, Lasing in Deterministic Aperiodic Nanostructures, in *Optics of Aperiodic Structures: Fundamentals and Applications*, ed. L. Dal Negro, Pan Stanford Publishing, pp. 143-178, 2013, Print
- L. Dal Negro, N. Lawrence, **J. Trevino**, G. Walsh, Aperiodic Nanoplasmonics, in *Optics of Aperiodic Structures: Fundamentals and Applications*, ed. L. Dal Negro, Pan Stanford Publishing, pp. 239-310, 2013, Print