Gabriel Iván Vega Bellido
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Education

PhD

University of Pennsylvania
Materials Science and Engineering
Graduation Date: August 2026
GPA: 3.52

BS

University of Puerto Rico, Mayaguez Campus
Chemical Engineering Major
Graduation Date: December 2019
General GPA: 3.86, Concentration GPA: 3.76

Work Experience

Process Engineering Internship – LAM Research, Fremont, CA (Summer 2022)

- Optimized etching processes to meet customer specifications on different silicon wafer types in two projects under the supervision of a senior engineer.

Research Experience

Phase separation in Structured Fluids and Nanoparticle-Filled Polymer Blends - UPenn, Philadelphia, PA (Fall 2022-Summer 2026)

- I am using Theoretically Informed Langevin Dynamics (TILD) simulations to study the dynamics of phase separation and the structures formed in systems containing liquid crystalline phases and nanoparticle packings.

3D Organization of Chromatin– UPenn, Philadelphia, PA (Summer 2020 – Spring 2022)

- Improved an existing Molecular Dynamics model for chromatin to better identify chromosome loops and study the mechanistic relationship between the NIPBL and BRD4 transcription factors.

Self-assembly of magnetic colloids – UPRM, Mayagüez, PR (Spring 2016- Spring 2019)

- Studied the self-assembly of magnetic Janus particles caused by changes in particle dipole displacement and different magnetic interaction strengths using Brownian dynamics simulations.

Shape memory alloys – Texas A&M, College Station, TX (Summer 2019)

- Worked on development of a constitutive model for shape memory alloys that accounted for the effect of precipitates on transformation induced plasticity.

Machine learning predictions of 2D materials synthesis – UPenn, Philadelphia, PA (Summer 2018)

- Used an SVM based machine learning algorithm to predict the synthesizability of novel 3D MAX phases and their associated 2D MXenes.

Optimizing Absorbance using a Genetic Algorithm – LSU, Baton Rouge, LA (Summer 2016)

- Modeled a Bragg mirror with a Fabry-Perót cavity based on Graphene to optimize its absorbance for up to three wavelengths using a Genetic Algorithm.

Chemotactic Enzyme Based Micromotors– Penn State, State College, PA (Summer 2015)

- Studied enzyme-based micromotors to determine if they exhibited chemotactic movement in a sample system using glucose oxidase and catalase functionalized microparticles.

Mentoring Experience

Mentor – Pathways to PhD Program – UPenn, Philadelphia, PA (Fall Semester 2024)

- Helped undergraduate and master's students prepare for their PhD applications by offering suggestions and revising their application materials.

Tutor - Centro Universitario para el Acceso - UPRM, Mayagüez, PR (January 2016- December 2016)

- Tutored public school children from 7^{th} to 12^{th} grade in Math, Spanish, and English.

Volunteer Experience

Blog Writer – Penn Science Policy and Diplomacy Group (PSPDG) - UPenn, Philadelphia, PA (April 2023- June 2024)

- Wrote and edited blog posts on topics related to science, policy, and technology.

Canvasser – Eastern Service Workers Association – ESWA, Philadelphia, PA (April 2021-April 2022)

- Participated in canvassing, fundraising, and food distribution activities as part of ESWA to aid struggling workers based in Philadelphia.

Leadership Experience

Project Lead – Paragon Policy Fellowship, Remote (June 2025 – September 2025)

- Led a team of 7 fellows on a project to develop policy recommendations for implementing predictive technologies in response to flooding for the City of Charleston, South Carolina.

Science Communication Chair for Penn Science Policy and Diplomacy Group (PSPDG) – UPenn, Philadelphia, PA (June 2024 – June 2025)

- Tasked with organizing programming within Science Communication branch of PSPDG and overseeing the blog, podcast, and workshop working groups.

Materials Graduate Organization (MatGO) Co-President - UPenn, Philadelphia, PA (September 2021 – August 2022)

- Helped to organize and run activities for Materials Science and Engineering graduate students and mediated discussions between student body and faculty.

Policy Coursework

- University of Pennsylvania
  - ENMG 5020: Introduction to Energy Policy **(Grade: A-)**
  - EAS 5110: Societal Grand Challenges at the Interface of Technology and Policy **(Grade: A)**
- Online Courses on edX:
  - Policy for Science, Technology, and Innovation taught by William B. Bonvillian of MIT **(Certificate of Completion)**

Program Participation

- Science Careers & Opportunities in Policy & Education (SCOPE), Engaging with Science Policy Through Traditional and New Media Course (Summer 2025)
- Paragon Policy Fellowship, Project Lead (Summer 2025)
- Science Outside the Lab – Energy Workshop in Washington D.C. (2024)
- UPenn NSF Research Traineeship on Interdisciplinary Training in Data Driven Soft Materials Research and Science Policy Fellowship (2023-Present)
- UPenn Career Exploration Fellowship (2023)
- Center for Engineering Mechanobiology (CEMB) Summer Boot Camp (2020)
- MIT Quantitative Methods Workshop (2018)
- Minority Access to Research Careers (MARC) Trainee at UPRM (2017-2019)

Honors & Awards

- GEM Fellowship Recipient (2022)
- Xerox Technical Minority Scholarship Recipient (2016)
- Puerto Rico Louis Stokes Alliance for Minority Participation Scholarship Recipient (2016)

Skills

- Bilingual - English and Spanish
- Proficient in Microsoft Word, Excel, and Power Point; and LaTeX.
- Proficient in the coding languages MatLab, Python, Fortran, C++, and Bash.
- Experienced in Molecular Dynamics, Brownian Dynamics, and Finite Element Modeling.
- Experienced in using Machine Learning models for scientific applications.
- Experience with SEMs, spectrometers, ellipsometers, and working in a clean room or wet lab.

- Experienced in giving oral presentations and poster sessions, as well as technical and creative writing.

Publications

- [1] **Vega-Bellido, Gabriel I.,** Delacruz, R., Kretz., I. & Cordova, U. "Self-Assembly of Magnetic Colloids with Shifted Dipoles." *Soft Matter*, vol. 15, no. 20, 2019, pp. 4078–4086., doi:10.1039/c8sm02591f.
- [2] Frey, Nathan C., Wang, J., & **Vega-Bellido, G.** "Prediction of Synthesis of 2D Metal Carbides and Nitrides (MXenes) and Their Precursors with Positive and Unlabeled Machine Learning." *ACS Nano*, vol. 13, no. 3, Apr. 2019, pp. 3031–3041., doi:10.1021/acsnano.8b08014.
- [3] **Vega-Bellido, G**., & Weiss, A. "Exploring the landscape and value of citizen science: Insights from Professor Darlene Cavalier" MIT Science Policy Review, vol. 6, Aug. 2025, doi:10.38105/spr.z33kfnf5dw

Presentations

- Soundbite Talk on "*Mesoscale Modeling of Liquid-Liquid Crystalline Phase Separation"* at the Mid-Atlantic Soft Matter Workshop 2025
- Oral Presentation on "*Mesoscale Modeling of Phase Separation in Structured Fluids*" at the American Physical Society's March Meeting 2024
- Poster Presentation on "*Self-assembly of Magnetic Colloids*" at Annual Biomedical Research Conference for Minority Students 2018

Conferences

- AAAS Annual Meeting 2026
- AAAS Annual Meeting 2025
- American Physical Society's March Meeting 2024
- American Physical Society's March Meeting 2023
- SACNAS National Diversity in Stem Conference 2022
- Annual Biomedical Research Conference for Minority Students 2018