Wern Juin Gabriel Ong

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Education

- **Bowdoin College** — Brunswick, ME
  B.A. Mathematics & Minor in Classical Greek (Leave 2020-21) — *August 2019 - Exp. May 2024*
- **Harvard University** — Cambridge, MA
  Visiting Student — *September 2023 – December 2023*
- **Columbia University in the City of New York** — New York City, NY
  Visiting Student, Dept. of Mathematics — *August 2020 - June 2021*
- **Mont' Kiara International School** — Kuala Lumpur, Malaysia
  High School Diploma & IB Diploma — *August 2017 - May 2019*

Experience

- **Nonlinear Algebra – Max Planck Institute for Mathematics in the Sciences** — Leipzig, Germany
  Visiting Researcher (Mentor: P. Breiding) — *May 2022 - August 2022*
  - Proved several results relating to the intersection theory of plane conics.
  - Developed computational methods for investigating the real geometry of enumerative problems.
- **The Xena Project – Imperial College London** — London, United Kingdom
  Independent Contributor — *June 2021 - August 2021*
  - Formalized Chapter 1 of Hardy and Wright's *An Introduction to the Theory of Numbers* in the `Lean` Automated Theorem Prover.
- **Karanicolas Lab – Fox Chase Cancer Center & Temple Medical School** — Philadelphia, PA
  Researcher (Mentor: J. Karanicolas) — *May 2020 - June 2021*
  - Developed deep learning models to process large-scale biological data for the identification of lead compounds with a view to kinase inhibitors.
  - Assisted principal investigator in preparing grants for the National Institutes of Health and National Science Foundation.
  - Presented research at several academic conferences.

Research in Mathematics

Authors are ordered alphabetically by last name.

- P. Breiding, J. Lindberg, **W. Ong**, L. Sommer. "Real Circles Tangent to 3 Conics." *Le Matematiche, Vol. 78, No. 1.* [`arXiv`][Journal]
- N. Borisov, T. Brazelton, F. Espino, T. Hagedorn, Z. Han, J. Lopez Garcia, J. Louwsma, **W. Ong**, A. Tawfeek. "$\mathbb{A}^1$-Brouwer Degrees in `Macaulay2`." [`arXiv`]
- **W. Ong**, A. Seigal. "Neural Networks and Discriminant Loci of Parametrized Polynomial Systems: First Examples" *In Preparation.*
- S. McKean, **W. Ong**. "Quadratic Counts of Lines Highly Tangent to Hypersurfaces" *In Preparation.*

Research in Computational Biology

Authors are ordered by contribution. † Indicates equal contribution.

- G. Andrianov, **W. Ong**, I. Serebriiskii, and J. Karanicolas. "Efficient Hit-to-Lead Searching of Kinase Inhibitor Chemical Space via Computational Fragment Merging." *J. Chemical Information and Modeling, Vol. 61, No. 12.* `doi.org/10.1021/acs.jcim.1c00630`
- **W. Ong**†, P. Kirubakaran†, J. Karanicolas. "How Current Neural Network Models for Kinase-Inhibitor Affinity Predictions Generalize Poorly." In submission at *J. Chem. Inf. Modeling*, online ahead of print `doi.org/10.1101/2023.09.04.556234`

Selected Presentations

A full list of presentations is available at `wgabrielong.github.io/talks`.

- "Neural Networks and Discriminant Loci of Parametrized Polynomial Systems: First Examples." SIAM Applied Algebraic Geometry, Eindhoven, The Netherlands, July 2023.
- "Enumerative Geometry: Past, Present, and Future." Undergraduate Seminar, University of Toronto – Scarborough, June 2023.
- "Real Circes Tangent to Three Conics." Algebraic Geometry Northeastern Series, UMass Amherst, November 2022.
- "Group Equivariant Neural Networks in Computer Vision." Presented to the Algebraic Vision Network at Czech Technical University – Prague, May 2022.
- "Sentences and Strings: An Introduction to Model Theory." Presented to the Undergraduate Mathematics Society at Columbia University as part of the Summer Learning Seminar 2021.

Awards and Honors

- **Sarah and James Bowdoin Scholar (2022):** (Dean's List) For exceptional academic performance.
- **Smyth Mathematics Prize (2022):** For most exceptional performance in mathematics coursework.
- **$100\pi - \varepsilon$ Prize (2020):** For extraordinary inspiration and joy for the pursuit of mathematics.

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Service to the Profession

- **Summer of Math Exposition 2023:** Peer judge for the Summer of Math Exposition, hosted by Grant Sanderson (aka 3Blue1Brown).
- **Mathematics Department Visiting Faculty Search (Spring 2023):** Assisted in small-group student interviews for the visiting assistant professor search in Spring 2023.
- **Bowdoin Science Experience (Fall 2021 & 2022):** Organized an orientation trip introducing students historically underrepresented in the sciences to the Bowdoin science departments and other academic support services.
- **Mathematics Department Tenure-Track Faculty Search (Spring 2020):** Assisted in small-group student interviews for the tenure-track faculty search in Spring 2020.
- **Mathematics Department Visiting Faculty Search (Summer 2020):** Assisted in small-group student interviews for the visiting assistant professor search in Summer 2020.

Skills

- **Programming:** Python (TensorFlow, SKLearn, Pandas, NumPy); Julia; Wolfram Mathematica; Lean
- **Computational Skills:** Google Suite, Microsoft Office, LaTeX
- **Languages:** English (Native), Classical Greek (Scholarly), Spanish (Working), Mandarin (Spoken), Malay (Spoken)
- **Certificates and Training:** WMA Wilderness First Responder (exp. 2023), PADI Master SCUBA Diver