

# Wern Juin Gabriel Ong

wgabrielong@uni-bonn.de

## EDUCATION

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- **Rheinische Friedrich-Wilhelms-Universität Bonn** Bonn, Germany  
*M.S. Mathematics* October 2024 - Exp. August 2026
- **Bowdoin College** Brunswick, ME  
*B.A. Mathematics & Minor in Classical Greek (Leave 2020-21)* August 2019 - 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

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- **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

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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, G. Muratore, **W. Ong**. “Quadratic Counts of Lines Highly Tangent to Hypersurfaces” *In Preparation*.

## RESEARCH IN COMPUTATIONAL BIOLOGY

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Authors are ordered by contribution. <sup>†</sup> 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**<sup>†</sup>, P. Kirubakaran<sup>†</sup>, 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

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A full list of presentations is available at [wgabrielong.github.io/talks](https://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 Circles 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

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- **E. S. Hammond Mathematics Prize (2024):** Completion of the mathematics major with distinction.
- **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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A full list of presentations is available at [wgabrielong.github.io/talks](https://wgabrielong.github.io/talks).

- “ $A^1$ -Brouwer Degrees in Macaulay2.” at Effective Methods in Algebraic Geometry, Leipzig, Germany, July 2024.
- “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 Circles Tangent to Three Conics.” Algebraic Geometry Northeastern Series, UMass Amherst, November 2022.
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## SERVICE TO THE PROFESSION

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- **Summer of Math Exposition 2023:** Peer judge for the Summer of Math Exposition, hosted by Grant Sanderson (aka 3Blue1Brown).
- **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 & Spring 2024):** Assisted in small-group student interviews for the tenure-track faculty search in Spring 2020.
- **Mathematics Department Visiting Faculty Search (Summer 2020 & Spring 2023):** Assisted in small-group student interviews for the visiting assistant professor search in Summer 2020.

## SKILLS

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- **Programming:** Python (TensorFlow, SKLearn, Pandas, NumPy); Julia; Wolfram Mathematica; Lean
- **Computational Skills:** Google Suite, Microsoft Office, L<sup>A</sup>T<sub>E</sub>X
- **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