George N. Wong: Curriculum Vitae

Department of Physics
241 Loomis Lab, 1110 West Green Street
Urbana, IL 61801, USA

email: gnwong2@illinois.edu
web: gnwong.com

Education

University of Illinois Urbana–Champaign

Ph.D. in Physics under the supervision of Charles F. Gammie	in progress
M.S. in Physics	August 2019

New York University

B.A.s in Physics with honors, Mathematics and Computer Science	May 2015

Research Overview

I am an astrophysicist with broad interests that are often related in some way to black holes and plasma physics. I have studied models of accretion onto supermassive black holes and the connection between black holes and relativistic jets, especially in the context of observation. I employ both computational simulation and analytic calculation in my work.

Academic Appointments

University of Illinois at Urbana-Champaign

Graduate Research Assistant (Astrophysics)	May 2017 – present
Teaching Assistant (Graduate Computational Physics)	January 2020 – May 2020
Teaching Assistant (Undergraduate Physics)	August 2016 – May 2017

Los Alamos National Laboratory

Graduate Research Fellow (CCS-2)	September 2019 – December 2019

New York University

Adjunct Instructor (Undergraduate Physics & CS)	September 2015 – May 2016
Undergraduate Research Assistant (EE → Astrophysics)	October 2014 – May 2016
Teaching Assistant (General Physics)	Summer 2014

Research History

Computational and theoretical astrophysics

Center for Theoretical Astrophysics (Illinois) 2016 – present

Numerical and analytic models of black hole accretion, relativistic polarized radiative transfer, pair production physics, jet population mechanisms.

CCS-2 (Los Alamos National Lab) 2019

Development and testing of Monte Carlo radiation codes, numerical simulation of radiatively inefficient accretion flows.

Center for Cosmology and Particle Physics (NYU) 2014 – 2016

Extending models of relativistic jets into the analytic regime, radiative transfer afterglow calculation, statistical (Bayesian) analysis of Swift afterglow mission observations.

Computational epidemiology

University of Illinois 2020 – present

Modeling COVID-19 for the Illinois governor's office using heterogeneous, non-Markovian age-of-infection models, analysis of contact tracing using agent-based models.

5G wireless technologies

NYU WIRELESS 2012 – 2015

Development of MIMO channel models for 5G communications, algorithm design for voltage phase triggering, channel sounder design/operation, circuit and systems design.

Nanoscale ferromagnetics

Kent Lab (NYU) 2011 – 2012

Design and photoetching of circuit boards, magnetic force microscopy, computational near-field modeling.

Selected Honors & Awards

Donald & Shirley Jones Fellowship	2020
Illinois Physics Department Excellence Award	2020
Breakthrough Prize in Fundamental Physics, Albert Einstein Medal, Bruno Rossi Prize, Nelson P. Jackson Aerospace Award (as a member of the EHT)	2020
Illinois University Fellowship	2019
Samuel F. B. Morse Medal for Excellence in Physics	2015
George Granger Brown Scholarship in Physics	2015
IEEE Donald G. Fink Award	2015
NYU College of Arts and Science Tuition Scholarship	2011 – 2015
NYU Presidential Honors Scholar	2011 – 2015
Louis Baron Scholarship in Mathematics	2013 – 2015
Julius Silver Scholarship	2011

Publications

⋆ *denotes significant contribution*

1.⋆ A. V. Tkachenko, S. Maslov, A. Elbanna, **G. N. Wong**, et al. "Persistent Heterogeneity Not Short-Term Overdispersion Determines Herd Immunity to COVID-19," *submitted to* PNAS

2.⋆ **G. N. Wong**, Z. J. Weiner, A. V. Tkachenko, A. Elbanna, et al. "Modeling COVID-19 dynamics in Illinois under non-pharmaceutical interventions," *submitted to* PRX

3. D. Psaltis, L. Medeiros, P. Christian, F. Özel, et al. "A Gravitational Test at the Second Post-Newtonian Order with the Shadow of the M87 Black Hole," *submitted to* PRL

4.⋆ A. Ricarte, B. S. Prather, **G. N. Wong**, R. Narayan, et al. "Decomposing the Internal Faraday Rotation of Black Hole Accretion Flows," *accepted to* MNRAS

5.⋆ M. Wielgus, K. Akiyama, L. Blackburn, C. K. Chan, et al. "Monitoring the Morphology of M87* in 2009–2017 with the Event Horizon Telescope," *accepted in* ApJ

6.⋆ J. Yao-Yu Lin, **G. N. Wong**, B. S. Prather, C. F. Gammie, et al., "Feature Extraction on Synthetic Black Hole Images," ML Interpretability for Scientific Discovery Workshop, ICML, 2020

7.⋆ R. Gold, A. Broderick, Z. Younsi, C. Fromm, et al., "Verification of Radiative Transfer Schemes for the EHT," ApJ, 897, 148G, 2020

8. A. Broderick, R. Gold, M. Karami, J. Preciado-López, et al., "THEMIS: A Parameter Estimation Framework for the Event Horizon Telescope," ApJ, 897, 139B, 2020

9.⋆ R. Yarza, **G. N. Wong**, B. R. Ryan, C. F. Gammie, "Bremsstrahlung in GRRMHD simulations of low accretion rate black holes," ApJ, 898, 50Y, 2020

10.⋆ D. C. M. Palumbo, **G. N. Wong**, B. S. Prather, "Rotational Symmetry in Simulated Horizon-Scale Polarimetric Images of Messier 87," ApJ, 894, 156P, 2020

11. F. Roelofs, M. Janssen, I. Natarajan, R. Deane, et al., "SYMBA: An end-to-end VLBI synthetic data generation pipeline. Simulating Event Horizon Telescope observations of M87," A&A, 636A, 5R, 2020

12.⋆ M. D. Johnson, A. Lupsasca, A. Strominger, **G. N. Wong**, et al., "Universal Interferometric Signatures of a Black Hole's Photon Ring," Science Advances, Vol. 6, no. 12, 2020

13.⋆ O. Porth, K. Chatterjee, R. Narayan, C. F. Gammie, et al., "The Event Horizon General Relativistic Magnetohydrodynamics Code Comparison Project," ApJS, 243, 26P, 2019

14. The Event Horizon Telescope Collaboration, et al., "First M87 Event Horizon Telescope Results. VI. The Shadow and Mass of the Central Black Hole," ApJL, 875, L6, 2019

15.⋆ The Event Horizon Telescope Collaboration, et al., "First M87 Event Horizon Telescope Results. V. Physical Origin of the Asymmetric Ring," ApJL, 875, L5, 2019

16. The Event Horizon Telescope Collaboration, et al., "First M87 Event Horizon Telescope Results. IV. Imaging the Central Supermassive Black Hole," ApJL, 875, L4, 2019

17. The Event Horizon Telescope Collaboration, et al., "First M87 Event Horizon Telescope Results. III. Data Processing and Calibration," ApJL, 875, L3, 2019

18. The Event Horizon Telescope Collaboration, et al., "First M87 Event Horizon Telescope Results. II. Array and Instrumentation," ApJL, 875, L2, 2019

19. The Event Horizon Telescope Collaboration, et al., "First M87 Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole," ApJL, 875, L1, 2019

20.⋆ T. S. Rappaport, S. Sun, R. Mayzus, H. Zhao, et al., "Millimeter Wave Mobile Communications for 5G Cellular: It Will Work!," IEEE Access, Vol. 1, pp. 335-349, 2013

21.⋆ Y. Azar, **G. N. Wong**, K. Wang, R. Mayzus, et al., "28 GHz Propagation Measurements for Outdoor Cellular Communications Using Steerable Beam Antennas in New York City," 2013 IEEE International Conference on Communications (ICC)

22.⋆ H. Zhao, R. Mayzus, S. Sun, M. Samimi, et al., "28 GHz Millimeter Wave Cellular Communication Measurements for Reflection and Penetration Loss In and Around Buildings in New York City," 2013 International Conference on Communications (ICC)

23.⋆ M. Samimi, K. Wang, Y. Azar, **G. N. Wong,**, et al., "28 GHz Angle of Arrival and Angle of Departure Analysis for Outdoor Cellular Communications Using Steerable Beam Antennas in New York City," 77th Vehicular Technology Conference (VTC Spring) 2013