Exponent®
Engineering & Scientific Consulting

Jason Gray, Ph.D.
Scientist | Mechanical Engineering
Chicago
+1-312-999-4256 | jgray@exponent.com

Professional Profile

Dr. Gray is a physicist with expertise in computational modeling, having applied his skills and experience in this area to a variety of topics ranging from the study of materials used in semiconductor manufacturing, to the stochastic evolution of cancer cells. At Exponent Dr. Gray uses his multidisciplinary skills in theoretical physics, experimental physics, and material science to assist clients with a variety of engineering challenges including intellectual property litigation, failure analysis of mechanical components, and the investigation of industrial accidents.

Academic Credentials & Professional Honors

Ph.D., Physics, Case Western Reserve University, 2026

M.Sc., Physics, Rensselaer Polytechnic Institute, 2021

B.Sc., Physics, Virginia Polytechnic Institute and State Univ, 2017

Prior Experience

Joint Graduate Researcher and Teaching Assistant Department of Physics, College of Arts and Sciences, Case Western Reserve University and at the Cleveland Clinic Department of Translational Hematology and Oncology Research, Lerner Research Institute, 2021 – 2025

Graduate Researcher and Teaching Assistant Department of Physics, Applied Physics, and Astronomy, School of Science, Rensselaer Polytechnic Institute, 2017 – 2021

Cleveland Clinic Research Intern Department of Translational Hematology and Oncology Research, Lerner Research Institute, Cleveland Clinic, Summer 2017

Undergraduate Researcher Department of Physics, College of Science, Virginia Polytechnic Institute and State University, 2014–2017

Lawrence Livermore National Laboratory Intern Equation of State (EOS) and Materials Theory Group, Lawrence Livermore National Laboratory, Summer 2016

Concrete Laboratory Technician, Geosci, Summer 2013

Publications

Card KJ, Crozier D, Durmaz A, Gray JM, Creary J, Stocks A, Maltas J, Bonomo RA, Burke ZDC, Scott JG. Evolution under vancomycin selection drives divergent collateral sensitivity patterns in staphylococcus aureus. Proceedings of the National Academy of Sciences 2025; 122(39):e2507962122.

Barker-Clarke RJ, Gray JM, Strobl MAR, Tadele DS, Maltas J, Hinczewski MX, Scott JG. The balance between intrinsic and ecological fitness defines new regimes in eco-evolutionary population dynamics. BioRxiv 2024; In Press.

Gray JM, Barker-Clarke RJ, Scott JG, Hinczewski MX. Asymmetric interactions shape survival during population range expansions. BioRxiv 2024; In Press.

Sheremetyeva N, Tristant D, Yoshimura A, Gray JM, Liang L, Meunier V. First-principles study of the thermodynamic and vibrational properties of ReS2 under pressure. Physical Review B 2019.

Presentations

Gray JM, Barker-Clarke RJ, Scott JG, Hinczewski MX. How games shape surfing probabilities of range expansions. Invited speaker, KSMB-SMB SEOUL 2024, Society for Mathematical Biology Annual Meeting, Seoul, South Korea, 2024.

Gray JM, Barker-Clark RJ, Hinczewski MX, Scott JG. Simulating cancer initiation, evolution, and immune evasion in a spatial four phenotype model. Invited speaker, International Symposium in Mathematical and Computational Oncology (ISMCO), Virtual, 2021.

Gray JM, Pleimling M. Structural pattern formation in cyclically interacting populations. Poster presentation, Virginia Tech Annual Undergraduate Research Poster Symposium, 2017.

Gray JM, Scott JG. Machine learning for the prediction of evolutionary success from spatial structure. Poster presentation, Cleveland Clinic Annual Undergraduate Research Poster Symposium, 2017.

Project Experience

Performed Density Functional Theory investigations of the semiconductor Rhenium Disulfide under pressure. Analyzed phase transitions between direct and indirect bandgap phases of this material. Helped to develop quantum and thermodynamic theory to describe the stable phases of this material as they change with pressure and temperature.

Developed software for stochastic computational simulations of cancer cells and their interactions. Developed a mathematical model to determine the probability of a cancer mutation taking over a population of healthy cells as a function of interactions and spatial location.

Peer Reviews

Physica A: Statistical Mechanics and its Applications

Journal of the Royal Society Interface

The Swiss National Science Foundation