

Hye Jin Park | Curriculum Vitæ

Statistical physics of ecology and evolution group,
Asia Pacific Center for Theoretical Physics, Pohang, South Korea (37673)

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Research Experience

Department of Physics, POSTECH

Adjunct Professor

Pohang, South Korea

2020.09.01–present

Asia Pacific Center for Theoretical Physics

Junior Research Group Leader

Pohang, South Korea

2020.04.01–present

Max-Planck Institute for Evolutionary Biology

PostDoc

Plön, Germany

2016.09.01–2020.03.31

Education

Sungkyunkwan University

Ph. D. in physics

Title: Statistical physics approach to social phenomena

Advisor: Beom Jun Kim

Suwon, South Korea

2011–2016

B. Sc. in Physics

2007–2011

Research Subject

- Ecological and evolutionary dynamics
- Evolutionary game dynamics
- Computational social science
- Spin system

Publications

- [18] **Park, H. J.**, B. J. Kim, H.-C. Jeong, C. Hilbe, and M. Nowak, Vacancies in a growing habitat and the evolution of cooperation, in preparation.
- [17] **Park, H. J.**, C. S. Gokhale, and Frederic Bertels, How sequence populations persist inside a genome, in bioRxiv (DOI:10.1101/2020.06.25.170514).
- [16] C. S. Gokhale and **Park, H. J.**, Eco-evolutionary spatial dynamics of non-linear social dilemmas, *Advances in Dynamic Games*, (2020), 185-198.
- [15] G. B. Ayan, **Park, H. J.**, and J. Gallie, The birth of a bacterial tRNA gene by large-scale, tandem duplication events, *eLife* 2020;9:e57947.

- [14] **Park, H. J.**, Y. Pichugin, and A. Traulsen, Why is cyclic dominance so rare?, *eLife* 2020;9:e57857.
- [13] B. Wu, **Park, H. J.**, L. Wu, D. Zhou, Evolution of cooperation driven by self-recommendation, *Phys. Rev. E* 100 (2019) 042303.
- [12] Y. Pichugin, **Park, H. J.**, and A. Traulsen, Evolution of simple multicellular life cycles in dynamic environments, *J. Royal Soc. Interface* 16 (2019) 20190054.
- [11] **Park, H. J.**, Y. Pichugin, W. Huang, and A. Traulsen, Population size changes and extinction risk of populations driven by mutant interactors, *Phys. Rev. E* 99 (2019) 022305.
- [10] **Park, H. J.** and C. S. Gokhale, Ecological feedback on diffusion dynamics, *Royal Society Open Science* 6 (2019) 181273.
- [9] **Park, H. J.**, W. S. Jo, S. H. Lee, and B. J. Kim, Generalized Gravity Model for Human Migration, *New J. Phys.* 20 (2018) 093018.
- [8] S.-G. Yang, **Park, H. J.**, and B. J. Kim, Dynamic critical behavior of the one-dimensional XY model with long-range interaction, *Phys. Rev. E* 98 (2018) 032120.
- [7] **Park, H. J.** and A. Traulsen, Extinction dynamics from meta-stable coexistences in an evolutionary game, *Phys. Rev. E* 96 (2017) 042412.
- [6] **Park, H. J.**, B. J. Kim, H.-C. Jeong, Role of generosity and forgiveness: Return to cooperative society, *Phys. Rev. E* 95 (2017) 042314.
- [5] **Park, H. J.**, S. D. Yi, D. J. Kim, B. J. Kim, Network of likes and dislikes: Conflict and membership, *Physica A* 461 (2016) 647–654.
- [4] S. K. Baek, **Park, H. J.**, B. J. Kim, Anomalous response in the vicinity of spontaneous symmetry breaking, *Eur. Phys. J. B* 88 (2015) 127.
- [3] **Park, H. J.**, S. K. Baek, B. J. Kim, Stochastic resonance in the two-dimensional q-state clock models, *Phys. Rev. E* 89 (2014) 032137.
- [2] S. K. Baek, I. G. Yi, **Park, H. J.**, B. J. Kim, Statistics of the knockout tournament, *Scientific Reports* 3 (2013) 3198.
- [1] **Park, H. J.**, H. Sim, H.-H. Jo, B. J. Kim, Analysis of one-dimensional yut-nori game: winning strategy and avalanche-size distribution, *J. Korean Phys. Soc.* 63 (2013) 1497.

Honors

Awards: Young Statistical Physicist Award from Korea Physics Society, Daejeon, Korea, 25 April 2018

Awards: Best Poster Award from Statphys26, Lyon, France, 18-22 July 2016

Awards: Best Presentation Award from Complexity Research and Education Network, Korea, 2013

Scholarships: Lotte Scholarship (2011-2, 2012-1)

Grants

2020 September-2023 February: National Research Foundation of Korea(NRF) grant funded by the Korea government (MSIT).

Organizing

2020 August: Workshop "Modeling on Ecology and Evolution", APCTP, Pohang, Korea, August 24-26, 2020.

2020 June-Present: Seminar series "Modeling on Ecology and Evolution", APCTP, Pohang, Korea, June 2020-present.

2019 September: Workshop "Evolution of interacting populations", MPI for Evolutionary Biology, Plön, Germany, September 15-17, 2019.

2018-2020: Internal meeting "Monthly Academia", MPI for Evolutionary Biology, Plön, Germany, October 2018-March 2020.

2017-2018: Internal meeting "Statistical Physics study group", MPI for Evolutionary Biology, Plön, Germany, March 2017-February 2018.

2014 May-June: Assistant organizer of public talks "Let's play with physics", Sungkyunkwan University, Suwon, South Korea, May-June 2014.

Mentoring

2019 May-August: Supervising internship student in MPI for Evolutionary Biology, Plön, Germany

2017 July-September: Supervising internship student in MPI for Evolutionary Biology, Plön, Germany

Teaching

2013 September-December: Statistical physics practice, Sungkyunkwan University, South Korea

2013 March-June: Classical mechanics practice, Sungkyunkwan University, South Korea

2012 September-December: Thermodynamics practice, Sungkyunkwan University, South Korea

Invited Talks

2020 November: "Extinction dynamics from meta-stable coexistences in ecological systems", The 2nd workshop on stochasticity and fluctuations in small systems, Gyeongju, Korea.

2020 September: "Evolving ecological communities", StatPhys Monthly Meeting, Korea.

2020 September: "Eco-evolutionary dynamics with novel mutations", iTHEMS Biology Seminar.

2020 August: "Why cyclic dominance is so rare?", RHINO 2020 workshop, Pohang, Korea.

2019 December: "Eco-evolutionary dynamics with novel mutation", Complex Systems seminar, Queen Mary University, UK.

2019 November: "Eco-evolutionary dynamics with stochasticity and novel mutation", Frontiers of Physics Symposium, Asia Pacific Center for Theoretical Physics (APCTP), Pohang, Korea.

2019 October: "Generalized Gravity model for human migration: Marriage pattern in the past",

Seminar talk, Xiamen University, Xiamen, China.

2019 October: "Marriage pattern in the past studied by generalized gravity model", Seminar talk, Gyeongnam National University of Science and Technology, Korea.

2019 July: "Extinction risk of populations driven by mutant interactors", Mini symposium in Mathematical Models in Ecology and Evolution (MMEE), Lyon, France.

2019 June: "Role of generosity and forgiveness: Return to cooperative society", Workshop–Dynamics of Interdependent Decisions, Hanse-Wissenschaftskolleg, Germany.

2019 April: "Population size and interaction structure driven by mutant interactors", Interdisciplinary Challenges in Non-Equilibrium Physics workshop, The Higgs Centre for Theoretical Physics, University of Edinburgh, Scotland.

2018 May: "Fate of populations in a stochastic system with mutations", Perspectives in Statistical Physics on Evolutionary Game Theory, Pukyong National University (PKNU), Busan, Korea

2017 July: "Ecological feedback on evolutionary spatial dynamics with social dilemmas", Mini symposium in Mathematical Models in Ecology and Evolution (MMEE), London, United Kingdom.

2017 April: "Extinction dynamics from meta-stable coexistences", Seminar talk, Korea Institute for Advanced Study (KIAS), Seoul, Korea.

2016 May: "Vacancies in a growing habitat and the evolution of cooperation", Department of Evolutionary Theory, Max Planck Institute for Evolutionary Biology, Plön, Germany.

2015 August: "Vacancies in a growing habitat and the evolution of cooperation", Program for Evolutionary Dynamics, Harvard University, US.