

NSF BIOGRAPHICAL SKETCH

NAME: Maslov, Sergei

ORCID: 0000-0002-3701-492X

POSITION TITLE & INSTITUTION: Professor of Bioengineering and Physics, Bliss Faculty Scholar, University of Illinois Urbana-Champaign

(a) PROFESSIONAL PREPARATION

INSTITUTION	LOCATION	MAJOR / AREA OF STUDY	DEGREE (if applicable)	YEAR YYYY
Moscow Institute for Physics and Technology	Moscow	Theoretical physics and applied mathematics	Master of Science	1992
Stony Brook University	Stony Brook, NY	Theoretical statistical physics	Doctor of Philosophy	1996
Brookhaven National Laboratory	Upton, NY	Theoretical physics	Postdoctoral Fellow	1996 - 1998

(b) APPOINTMENTS

- 2015 - present Professor of Bioengineering and Physics, Bliss Faculty Scholar, University of Illinois Urbana-Champaign, Urbana, IL
- 2016 - present Scientist (summer appointment), Argonne National Laboratory, Lemont, IL
- 2011 - 2016 Tenured biophysicist, Computational Biology Group Leader, Brookhaven National Laboratory, Dept. of Biological Environmental and Climate Sciences, Upton, NY
- 2002 - 2011 Physicist (with tenure since 2004), Department of Condensed Matter Physics and Material Sciences, Brookhaven National Laboratory, Upton, NY
- 1998 - 2002 Staff scientist, Department of Condensed Matter Physics and Material Sciences, Brookhaven National Laboratory, Upton, NY

(c) PRODUCTS

Products Most Closely Related to the Proposed Project

1. Wang Z, Goyal A, Dubinkina V, George A, Wang T, Fridman Y, Maslov S. Complementary resource preferences spontaneously emerge in diauxic microbial communities. *Nature Communications* 2021 12, 6661:6661-6612, <https://www.nature.com/articles/s41467-021-27023-y> DOI:10.1038/s41467-021-27023-y (2021).
2. Maslov S, Sneppen K. Regime Shifts in a Phage-Bacterium Ecosystem and Strategies for Its Control. *mSystems*. 2019 December 17; 4(6):- . Available from: <https://journals.asm.org/doi/10.1128/mSystems.00470-19> DOI: 10.1128/mSystems.00470-19
3. Dubinkina V, Fridman Y, Pandey P, Maslov S. Multistability and regime shifts in microbial communities explained by competition for essential nutrients. *eLife*. 2019 November 22, 8:e49720. Available from: <https://elifesciences.org/articles/49720> DOI: 10.7554/eLife.49720
4. Goyal A, Dubinkina V, Maslov S. Multiple stable states in microbial communities explained by the stable marriage problem. *The ISME Journal*. 2018; 12(12):2823-2834. Available from: <http://www.nature.com/articles/s41396-018-0222-x> DOI: 10.1038/s41396-018-0222-x
5. Goyal A, Maslov S. Diversity, Stability, and Reproducibility in Stochastically Assembled Microbial Ecosystems. *Phys Rev Lett*. 2018 Apr 13;120(15):158102. PubMed PMID: [29756882](https://pubmed.ncbi.nlm.nih.gov/29756882/)

Other Significant Products, Whether or Not Related to the Proposed Project

1. Goyal A, Wang T, Dubinkina V, Maslov S. Ecology-guided prediction of cross-feeding interactions in the human gut microbiome. *Nature Communications*. 2021 February 26; 12(1):- . Available from: <http://www.nature.com/articles/s41467-021-21586-6> DOI: 10.1038/s41467-021-21586-6
2. Pilosof S, Alcalá-Corona S, Wang T, Kim T, Maslov S, Whitaker R, Pascual M. The network structure and eco-evolutionary dynamics of CRISPR-induced immune diversification. *Nature Ecology & Evolution*. 2020 October 19; 4(12):1650-1660. Available from: <http://www.nature.com/articles/s41559-020-01312-z> DOI: 10.1038/s41559-020-01312-z
3. Liao C, Wang T, Maslov S, Xavier J. Modeling microbial cross-feeding at intermediate scale portrays community dynamics and species coexistence. *PLOS Computational Biology*. 2020; 16(8):e1008135-. Available from: <https://dx.plos.org/10.1371/journal.pcbi.1008135> DOI: 10.1371/journal.pcbi.1008135
4. Ping D, Wang T, Fraebel D, Maslov S, Sneppen K, Kuehn S. Hitchhiking, collapse, and contingency in phage infections of migrating bacterial populations. *The ISME Journal*. 2020 May 01; 14(8):2007-2018. Available from: <http://www.nature.com/articles/s41396-020-0664-9> DOI: 10.1038/s41396-020-0664-9
5. Wang T, Goyal A, Dubinkina V, Maslov S. Evidence for a multi-level trophic organization of the human gut microbiome. *PLoS Comput Biol*. 2019 Dec;15(12):e1007524. Available from: <https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1007524> PubMed Central PMCID: [PMC6922320](https://pubmed.ncbi.nlm.nih.gov/PMC6922320/).

(d) SYNERGISTIC ACTIVITIES

1. Associate editor at PLoS Computational Biology (2019-current)
2. Member of the editorial board at *Biology Direct* journal (2005-current)
3. Dr. Maslov is one of two founding members of the COVID-19 modeling team for the office of the Governor of Illinois. Between April 2020 and July 2021, the UIUC modeling team, which Dr. Maslov co-lead provided weekly modeling predictions such as the likelihood to exceed hospital capacity in each of the 11 regions of the state. The team also advised the Governor's office on various questions related to COVID-19 epidemiology. The UIUC modeling team that Dr. Maslov co-lead also developed an agent-based model of COVID-19 epidemics on the UIUC campus. The model was used to advise the university leadership on testing frequency, scheduling, and mitigation measures such as, e.g., a temporary ban on student parties. For this work Dr. Maslov was awarded a Presidential Award and Medallion of the University of Illinois.
4. Between 2011 and 2016 Dr. Maslov was one of four co-PIs and the Associate Chief Science Officer of the DOE Systems Biology Knowledgebase (KBase) – a large computational infrastructure project funded by the US Department of Energy and focused on computational systems biology. In KBase he managed a team of scientists from Brookhaven National Laboratory, Cold Spring Harbor Laboratory and Yale University working on networks and -omics analysis in plants, microbes, and communities.