

Unit Name

Biological Physics Theory Unit
Adjunct Professor Greg J Stephens

Research Personnel

Kosmas Deligkaris , Research Unit Technician
Radmila Neiman , Research Unit Technician
Gautam Sridhar, Research Unit Postdoctoral Researcher
Melika Sadeghi Tabrizi, Research Unit Technician
Makoto Hiroi, Research Unit Technician (until Aug 1st, 2025)

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. M Bauer, A Goyal, S Goyal et al, Unifying Theories in High-Dimensional Biology: Approaches, Challenges and Opportunities; npj Syst Biol Appl 12, 43 (2026); <https://doi.org/10.1038/s41540-026-00680-9>; arXiv <https://arxiv.org/abs/2512.10111>
2. K Deligkaris, R Neiman, M Hiroi, T Izawa, L O'Shaughnessy, L Carretero Rodriguez, I Masai & GJ Stephens, A dataset of fine-grained zebrafish interactions in health and disease; Scientific Data, (2026); <https://doi.org/10.1038/s41597-026-06953-6>
3. F Rose, M Michaluk, T Blindauer, BM Ignatowska-Jankowska, L O'Shaughnessy, GJ Stephens, TD Pereira, MY Uusisaari, K Bozek, Deep Imputation for Skeleton data (DISK) for behavioral science, Nat Methods 23, 236–247 (2025); <https://doi.org/10.1038/s41592-025-02893-y>
4. A Kawano, I Masai & GJ Stephens, Behavioral analysis of zebrafish based on Machine learning and information theory, Jikkenigaku, Special Volume, ISBN: 978-4-7581-2287-0 (2025); (in Japanese)
5. A Kawano, L O'Shaughnessy & GJ Stephens, Decomposing information flow in social dynamics; bioRxiv <https://www.biorxiv.org/content/10.1101/2025.05.16.654393v2> (in review)
6. WC Beckerson, S Werner, M Goebbels, JJ Ramalho, AJM Swafford, I Soroka, ST Wingert, M Boxem, S Ruijtenberg, GJ Stephens, S van den Heuvel, Cde Bekker, The First of Us: Ophiocordyceps use a novel scramblase-binding peptide to manipulate zombie ants; bioRxiv <https://www.biorxiv.org/content/10.1101/2025.09.09.674826v2> (in review)

Seminars

1. Allen Institute for Neural Dynamics, Seattle US (March 2026)
2. APS Global Physics Meeting, Denver US (March 2026)
3. Tutorium: Physics of Behavior, DPG Spring Meeting of the Condensed Matter Section, Dresden DE (March, 2026)
4. Parc de Recerca Biomedica de Barcelona, Barcelona ES (Oct, 2025)
5. Advanced Tools for Data Analyses in Neuroscience, Strasbourg FR (Oct, 2025)
6. Annual Conference of the Korean Society for Brain and Neural Sciences, Incheon KR (Aug, 2025)
7. Unifying Theories in High-Dimensional Biophysics, ICTS Bangalore (July, 2026); Talk Link
8. Human Ethomics Workshop, University Bayreuth, Kulmbach DE (June, 2025)

Technology

1. A Béraud, A Kawano, I Korshok & GJ Stephens, Physics of Behavior Tutorials; GitHub <https://github.com/oist/Physics-of-Behavior-Tutorials> (2025); <https://zenodo.org/records/15099731>.

Scholarly Contributions and Creative Productions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Publisher
Makoto Hiroi	Presentation at Conference	A high-resolution camera array filming system of ants ecology		Model Systems Menagerie Workshop
Gautam Sridhar	Presentation at Conference	"Unravelling parametric variation of multiscale dynamics from data "	APS Global Physics meeting 2026	
Makoto Hiroi	Journal Article	ierarchical processing and polarization encoding in the cephalopod visual system		bioRxivorg
Makoto Hiroi	Poster Presentation at Conference	High-Resolution XY Gantry Camera System for Quantifying Chromatophore Dynamics in Freely Moving Cephalopods		
Makoto Hiroi	Poster Presentation at Conference	Quantitative Social Dynamics: From Trajectories to Interaction Motifs		Report on the 5th 'Behavior Change Biology' Area Meeting
Makoto Hiroi	Presentation at Conference	Multi-individual posture estimation and skin pattern analysis using wide-field, high-resolution imaging system		
Makoto Hiroi	Presentation at Conference	Multi-individual posture estimation and skin pattern analysis using wide-field, high-resolution imaging		Systems Ethology Seminar
Tatsuo Izawa	Presentation at Conference	Dynamics of dominance: maneuvers, contests, and assessment in the posture-scale movements of interacting zebrafish		18th International Zebrafish Conference
Akira Kuwano	Review	A.Kawano, I. Masai and G. J. Stephens, "Behavioral analysis of zebrafish based on Machine learning and information theory", Jikkenigaku, Special Volume, 978-4-7581-2287-0		
Irina Korshok	Presentation at Conference	Posture dynamics of crawling behavior in D. melanogaster larvae		APS March Meeting 2025

Honors, Awards & Fellowships

Term 1 2022 - Ongoing	Fellowship of the American Physical Society, Fellowship of the American Physical Society, 2022, American Physical Society [Fiscal Year: 2022-09-01]
Term 1 1990 - Ongoing	Phi Beta Kappa; Distinguished Graduating Senior, Physics Department, 1990, Phi Beta Kappa & Ohio University [Fiscal Year: 1990]

Other Institutional Service

Term 1 2012 - Ongoing

Institute Tea, (University) [Fiscal Year: 2012]