KIRILL GRIGOREV, Ph.D.

kirillgrigorev.com
scholar.google.com/citations?user=Mn83Ny0AAAAJ

DATA SCIENCE, GENOMICS DATABASES, SPACE GENOMICS AND PHYSIOLOGY, COMPUTATIONAL GENETICS, GENOMICS ALGORITHMS, TELOMERES, GENOME ASSEMBLY

STAFF SCIENTIST

NASA Open Science Data Repository (NASA OSDR) | osdr.nasa.gov
NASA Ames Research Center (NASA ARC)
RadLab Working Group Steering Committee (RLWG-SC)

Blue Marble Space Institute of Science (BMSIS) | bmsis.org

Ph.D. in Physiology, Biophysics, and Systems Biology, Weill Cornell Medicine
M.S. in Biology, University of Puerto Rico
B.S. in Biotechnology, Saint Petersburg Chemical and Pharmaceutical Academy

PRINCIPAL AREAS OF ACADEMIC INTEREST

Genomics and physiology of spaceflight
Biological and radiological database and API development
Translational and personalized genomics
Genomics algorithms

PRINCIPAL SKILLSET

Genomic data analysis
Advanced Python (inc. SciPy stack, Cython)
Lua/LuaJIT, JavaScript, R, C
Graph and numerical algorithms

RESEARCH AND WORK SUMMARY

2023 – … **NASA Ames Research Center** (through **Blue Marble Space Institute of Science**)
Development of **NASA Open Science Data Repository** databases and analysis platforms for space biology and telemetry data to further space exploration.
Fostering collaborations with national and international institutions and data providers.
Enabling technologies for open science data integration and analysis [1, 7—11].

Principal developer of **RadLab** and **GeneLab Open API**.
Member of the **RadLab Working Group Steering Committee**.

RadLab: visualization.osdr.nasa.gov/radlab
Environmental Data Application: visualization.osdr.nasa.gov/eda
GeneLab Open API: visualization.genelab.nasa.gov/GLOpenAPI

2018 – 2023 **GeneLab Visualization Working Group**
Development of an analysis platform for space genomics data [14, 17, 18].

2018 **New York Genome Center**
Epigenetic evolution of cancers, phylogenetics algorithms [20].

2017 – 2023 **Weill Cornell Medicine, Institute for Computational Biomedicine, Mason Lab**
Quantification of effects of spaceflight on human biology [2—5, 12, 15, 16].
Sequence analysis in theoretical and translational applications [6, 19, 21].
Novel discoveries in telomere biology and bioinformatics [12, 13].

2015 – 2017 **University of Puerto Rico, Caribbean Genome Center**
Methods of genome assembly, evolutionary genetics and conservation strategies of endangered Caribbean species [22, 23, 25].

2014 – 2015 **Dobzhansky Center for Genome Bioinformatics**
Human epigenetics [24]; methods of genome assembly, GWAS visualization.

OTHER PROFESSIONAL APPOINTMENTS

2024 **Invited expert** at **Heliolab Research Horizons** (Frontier Development Lab, a NASA and Trillium Technologies initiative in partnership with Google Cloud and NVidia). Current and future research applications of state-of-the-art artificial intelligence for space science.

2024 **External expert advisor** at **FDL-X Heliolab** (Frontier Development Lab). Applied artificial intelligence for climate adaptation, energy futures, and space exploration. Project "Forecasting Radiation Exposure for Human Space Flight."

2024 **Mentor** for the **Young Scientist Program** (Blue Marble Space Institute of Science). Project "Amplicon Sequencing Data Visualization."

SELECTED PUBLICATIONS

1. K Grigorev *et al*. **RadLab: an open science resource for radiation studies relevant to human spaceflight**. Life Sciences in Space Research, online, in press. 10.1016/j.lssr.2024.10.001
2. K Grigorev, TM Nelson *et al*. **Direct RNA sequencing of astronaut blood reveals spaceflight-associated m6A increases and hematopoietic transcriptional responses**. Nature Communications, 15 (1), 4950. 10.1038/s41467-024-48929-3
3. EG Overbey *et al*. **The Space Omics and Medical Atlas (SOMA) and international astronaut biobank**. Nature, 632 (8027), 1145-1154. 10.1038/s41586-024-07639-y
4. CW Jones *et al*. **Molecular and physiological changes in the SpaceX Inspiration4 civilian crew**. Nature, 632 (8027), 1155-1164. 10.1038/s41586-024-07648-x
5. TM Al-Turki *et al*. **Telomeric RNA (TERRA) increases in response to spaceflight and high-altitude climbing**. Communications Biology, 7 (1), 698. 10.1038/s42003-024-06014-x
6. D Porubsky *et al*. **A familial, telomere-to-telomere reference for human de novo mutation and recombination from a four-generation pedigree**. *post peer review in Nature*. 10.1101/2024.08.05.606142
7. SV Costes *et al*. **Inspiration4 Data Access through the NASA Open Science Data Repository**. npj Microgravity, 10 (1), 56. 10.1038/s41526-024-00393-5
8. K Grigorev *et al*. **RadLab: Graphical and Programming Interfaces for Interrogation of Space Telemetry Data**. In Human Research Program-Investigators Working Group (HRP-IWG) Workshop (2024). ntrs.nasa.gov/citations/20230014315
9. AEU Acuna *et al*. **NASA GeneLab Multi-study Visualization Portal**. In Annual Meeting of the American Society for Gravitational and Space Research (2023). ntrs.nasa.gov/citations/20230009477
10. K Grigorev *et al*. **RadLab and the Environmental Data Application Dashboard: Graphical and Programming Interfaces for Interrogation of Space Telemetry Data**. In Annual Meeting of the American Society for Gravitational and Space Research (2023). ntrs.nasa.gov/citations/20230009560
11. SV Costes, K Grigorev, J Miller. **RadLab Platform: Investigating Space Radiation**. In 26th Workshop on Radiation Monitoring and Investigation in Space Science (WRMISS) (2023). ntrs.nasa.gov/citations/20230012460
12. JSG Medina *et al*. **Genome and Clonal Hematopoiesis Stability Contrasts with Immune, cfDNA, Mitochondrial, and Telomere Length Changes to Short Duration Spaceflight**. Precision Clinical Medicine 7 (1), pbae007. 10.1093/pcmedi/pbae007
13. K Grigorev, J Foox *et al*. **Haplotype diversity and sequence heterogeneity of human telomeres**. Genome Research 31 (7), 1269. 10.1101/gr.274639.120

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14. D Berrios *et al*. **NASA GeneLab: interfaces for the exploration of space omics data**. Nucleic Acids Research 49 (D1), D1515. 10.1093/nar/gkaa887
15. J Luxton *et al*. **Temporal Telomere and DNA Damage Responses in the Space Radiation Environment**. Cell Reports 33 (10), 108435. 10.1016/j.celrep.2020.108435
16. D Bezdan *et al*. **Cell-free DNA (cfDNA) and exosome profiling from a year-long human spaceflight reveals circulating biomarkers**. IScience 23 (12), 101844. 10.1016/j.isci.2020.101844
17. R Scott *et al*. **Advancing the Integration of Biosciences Data Sharing to Further Enable Space Exploration**. Cell Reports 33 (10), 108441. 10.1016/j.celrep.2020.108441
18. D Berrios *et al*. **Visualizing Omics Data from Spaceflight Samples using the NASA GeneLab Platform**. In Proceedings of the 12th International Conference on Bioinformatics and Computational Biology (Vol. 70, pp. 89-98). 10.29007/rh7n
19. C Westover *et al*. **Engineering Radioprotective Human Cells Using the Tardigrade Damage Suppressor Protein, DSUP**. bioRxiv (2020). 10.1101/2020.11.10.373571
20. F Gaiti, R Chaligne, H Gu *et al*. **Epigenetic evolution and lineage histories of chronic lymphocytic leukaemia**. Nature 569 (7757), 576. 10.1038/s41586-019-1198-z
21. ABR McIntyre *et al*. **Single-molecule sequencing detection of N6-methyladenine in microbial reference materials**. Nature Communications 10 (1), 579. 10.1038/s41467-019-08289-9
22. S Kolchanova, S Kliver *et al*. **Genomes of three closely related Caribbean amazons provide insight for species history and conservation**. Genes 10 (1), 54. 10.3390/genes10010054
23. K Grigorev, S Kliver *et al*. **Innovative assembly strategy contributes to understanding the evolution and conservation genetics of the endangered *Solenodon paradoxus* from the island of Hispaniola**. GigaScience 7 (6), giy025. 10.1093/gigascience/giy025
24. OY Naumova *et al*. **Developmental dynamics of the epigenome: a longitudinal study of three toddlers**. Neurotoxicology and teratology 66, 125-131. 10.1016/j.ntt.2017.12.006
25. AL Brandt, K Grigorev *et al*. **Mitogenomic sequences support a north–south subspecies subdivision within *Solenodon paradoxus***. Mitochondrial DNA Part A 28 (5), 662-670. 10.3109/24701394.2016.1167891

PUBLIC SPEAKING, CONFERENCES, ROUND TABLES

2024 **RadLab: A Comprehensive Database and Graphical and Programming Interfaces for Space Radiation Data**. 27th Workshop on Radiation Monitoring and Investigation in Space Science (WRMISS). Boulder, CO

2024 **RadLab: Graphical and Programming Interfaces for Interrogation of Space Telemetry Data**. NASA Human Research Program Investigators' Workshop. Galveston, TX

2024 **RadLab: A Comprehensive Database and Graphical and Programming Interfaces for Space Radiation Data**. Operational and Exploration Requirements and Research Capabilities for SEP Environment Monitoring and Forecasting. Atlanta, GA. Teleconference

2024 **Application Programming Interfaces: Metadata Considerations**. NASA Science Mission Directorate Data Repositories Workshop. Pasadena, CA. Teleconference

2023 **RadLab and the Environmental Data Application Dashboard: Graphical and Programming Interfaces for Interrogation of Space Telemetry Data**. Annual Meeting of the American Society for Gravitational and Space Research. Washington, DC

2023 **RadLab Platform: Investigating Space Radiation**. 26th Workshop on Radiation Monitoring and Investigation in Space Science (WRMISS). Rome, Italy. Virtual

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2022 **Unimizers: a novel aproach to alignment of low-complexity genomic sequences**.
7th Annual MetaSUB Conference. Miami, FL

2020 **GeneLab sequencing data analysis and visualization**.
USRA / NASA Ames Research Center. Moffett Field, CA. Teleconference

2019 **Comparative circadian transcriptomics: novel and conserved features of the mammalian pineal gland**. Oakland University Genomics Symposium. Oakland University, MI

2019 **GeneLab Visualization Working Group meeting**.
Annual Meeting of the American Society for Gravitational and Space Research. Denver, CO

2019 **GeneLab visualization workshop**.
Broad Institute. Cambridge, MA

2017 **Development of robust bioinformatics pipelines**.
Fifth annual Bioinformatics Summer School. Moscow, Russia

2017 **Genomics and conservation of the Hispaniolan Solenodon**.
IX Caribbean Biodiversity Congress. Santo Domingo, Dominican Republic

2016 **Bioinformatics pipelines**.
Recent Advances in Conservation Genetics. Tihany, Hungary

NOTES

* The ”Specialist” degree from the Saint Petersburg Chemical and Pharmaceutical Academy is a five-year undergraduate degree conferred in ex-USSR countries and is equivalent to a B.S.

** ”Saint Petersburg Chemical and Pharmaceutical Academy” reflects the name of the institution at the time of graduation. Several variations of the name exist in English translations; and the institution was renamed from an Academy to a University in the years after the graduation.