

Daniel Ariad

BIOINFORMATICS DATA SCIENTIST · PHYSICIST

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Summary

As a bioinformatics data scientist at PrognomiQ Inc, I focus on researching and devising innovative solutions to tackle the analytical complexities associated with analyzing molecular entities in biological fluids. I'm a physicist by training, with research experience in condensed matter and astrophysics. I'm interested in adapting theory and analytical approaches from these fields to the develop genetic tests for early detection of diseases and disorders. I received my Ph.D. from Ben-Gurion University of the Negev and subsequently worked as postdoctoral fellow at Indiana University Bloomington and Johns Hopkins University.

Professional Experience

- Oct 2022 - Present **Bioinformatics Data Scientist**, PrognomiQ Inc, Ca, USA
Developed a fragmentomics-based methodology to estimate the proportion of cell-free tumor DNA in liquid biopsies, enhancing early cancer detection capabilities. Moreover, I spearheaded a comprehensive analysis of the company's genomics dataset, assessing the reproducibility of measurements and the detection boundaries of tumor signals through the implementation of diverse features and techniques.
- Mar 2020 - Oct 2022 **Postdoctoral Researcher**, Johns Hopkins University, MD, USA
Developed computational tools to study the origin and etiology of human chromosome abnormalities. The research aim is to uncover basic mechanisms responsible for chromosomal abnormalities and the development of diagnostic tests to detect them.
- Mar 2019 - Mar 2020 **Postdoctoral Researcher**, Indiana University Bloomington, IN, USA
Classified phases of matter and phase transitions in disordered Graphene, using high performance clusters.
- Apr 2018 - Mar 2019 **Postdoctoral Fellow**, Ben-Gurion University of the Negev, Israel
Studied edge modes in topological insulators.
- 2009 - 2018 **Teaching Assistant**, Ben-Gurion University of the Negev, Israel
Labs instructor and teaching assistant in undergraduate physics courses

Military Service

- Jul 2003 - Jul 2006 **Sergeant First Class**, Combat Corps, IDF, Israel
Electro-optic technician. Tested, evaluated, and analyzed EO/IR devices. Performed test planning, day-to-day operation, data analysis, and the preparation of reports.

Education

- Ben-Gurion University of the Negev** *Israel*
PHD IN THEORETICAL CONDENSED MATTER PHYSICS *2013 - 2019*
• Advisor: Dr. Eytan Grosfeld
• Thesis: "Studied the geometric phases in topological superconductors."
- Ben-Gurion University of the Negev** *Israel*
MSc IN ASTROPHYSICS *2009 - 2013*
• Advisor: Dr. Michael Gedalin
• Thesis: "The role pickup ions play in the termination shock."
- Ben-Gurion University of the Negev** *Israel*
BSc IN PHYSICS *2006 - 2009*

Publications, Preprints and Patents

Sara A. Carioscia, Kathryn J. Weaver, Andrew N. Bortvin, **Daniel Ariad**, Avery Davis Bell, Rajiv C. McCoy. “Strict adherence to Mendel’s First Law across a large sample of human sperm genomes”
bioRxiv 2021.11.19.469261

Daniel Ariad, Stephanie M. Yan, Andrea R. Victor, Frank L. Barnes, Christo G. Zouves, Manuel Viotti, Rajiv C. McCoy. “Haplotype-aware inference of human chromosome abnormalities”.
PNAS November 16, 2021 118 (46) (2021) bioRxiv:10.1101/2021.05.18.444721

Daniel Ariad, Rajiv C. McCoy, Manuel Viotti. Patent: “Methods and related aspects for analyzing chromosome number status”. Patent status: pending, PCT/US2021/058219

Daniel Ariad, Yshai Avishai and Eytan Grosfeld. “How vortex bound states affect the Hall conductivity of a chiral $p \pm ip$ superconductor”. Phys. Rev. B 98, 104511 (2018), arXiv:1603.00840. Appeared on PRB Kaleidoscope (Sep 2018)

Daniel Ariad, and Eytan Grosfeld. “Signatures of the topological spin of Josephson vortices in topological superconductors”. Phys. Rev. B 95, 161401(R) (2017), arXiv:1301.0538

Daniel Ariad, Eytan Grosfeld, and Babak Seradjeh. “On the effective theory of vortices in two-dimensional spinless chiral p-wave superfluid”. Phys. Rev. B 92, 035136 (2015), arXiv:1407.2553

Daniel Ariad, and Michael Gedalin. “The role pickup ions play in the termination shock”. Journal of Geophysical Research: Space Physics 118.6 (2013): 2854-2862.

Technical Skills

Languages **Python, Julia**, Bash, C++, SQL, HTML, CSS, PHP and Assembler.
Bioinformatics **NGS, Microarrays**, cfDNA sequencing, RNAseq, WGS, WGBS and Single-Cell (10x).
Productivity **Latex, Git**, Confluence, Slack, Zoom, JIRA

Awards, Fellowships, & Grants

- 2022 **Best Poster Award**, RECOMB 2022, the 26th edition of a series of algorithmic computational biology conferences, San-Diego, CA
- 2018 **Short-term post-doctoral fellowship**, The Kreitman School for Advanced Research Studies, Ben-Gurion University of the Negev
- 2014 **Scholarship for outstanding doctoral students**, Ilse Katz Institute for Nanoscale Science & Technology. (Declined due to a conflict with Negev-Zin policy)
- 2014 **The Negev-Zin scholarship for outstanding doctoral students**, Ben-Gurion University of the Negev

Outreach & Professional Development

SERVICE AND OUTREACH

- 2013-Present **Wikipedia Contributor**, Wikipedia — the Free Encyclopedia.
Writing new articles and expanding existing articles.
- 2009-2010 **Junior Faculty Staff Association**, Committee Member, Ben-Gurion University of the Negev, Israel
Participate in a forum that sets the Association’s policy.
- 2008-2009 **The Student Association**, Council Member, Ben-Gurion University of the Negev, Israel
The council approves the association’s budget and elects the chairman of the student association. In addition, council members are invited to be part of interview panels, which include the selection of personnel to staff and engagements with parties outside the association.

PEER REVIEW

- 2020-2021 **Nature**, Reviewer of Springer Nature
- 2015-2018 **Physical Review Letters, Physical Review B**, Journal Referee of the American Physical Society (APS Physics)