



Education

- 2011 *Ph.D.* in Applied Physics.
[California Institute of Technology](#).
 Ph.D. thesis advisors: [Erik Winfree](#), co-advised by [Bernard Yurke](#).
- 2003 *B.S.* in Physics
B.S. in Biochemistry.
[Washington State University](#).
 Undergraduate thesis advisor: [J. Thomas Dickinson](#).

Academic and professional experience

- 2024– Associate Professor
2016–2024 Assistant Professor
Department of Physics and the Biodesign Institute
[Arizona State University](#)
Other ASU affiliations:
 (i) Biodesign Center for Molecular Design and Biomimetics (ii) Center for Biological Physics
 **Graduate faculty:** (iii) School of Molecular Sciences (iv) School of Biological and Health Systems Engineering. **Affiliate faculty:** (v) Biodesign Center for Molecular Evolution, (vi) The Biomimicry Center, (vii) Global Security Initiative, (viii) Grand Challenges Scholars Program
- 2015–2016 Wyss Institute Postdoctoral Fellow (PI: [Peng Yin](#))
Wyss Institute for Biologically-Inspired Engineering
[Harvard University](#)
- 2011–2015 Postdoctoral Research Fellow (PI: [Sivaraj Sivaramakrishnan](#))
Department of Cell and Developmental Biology
[University of Michigan](#)

Awards

At ASU

3 research awards, 1 teaching award.

- 2024 NSF CAREER.
2021 Outstanding Teaching Award, Department of Physics, Arizona State University.
2018 NIH Director's New Innovator Award (*with a perfect Impact Score of 10*).
2018 Arizona Biomedical Research Commission New Investigator Award.

Before ASU

- 2002 *Top 3, LeRoy Apker Award*, American Physics Society.
The highest award offered in the US for an undergraduate thesis in physics.
- 2002 *Honorable mentions*, 2002 All-American College Academic Team, [USA Today](#).

Publications

At ASU

ASU mentees: [undergraduate](#), [postdoc/postbac/graduate student](#) mentored by Hariadi

- [Under revision](#) I. F. Tegganu, S. Dey, D. Kishnan, and **R. F. Hariadi**, “A simple surface modification to generate atomically-flat and hydrophobic substrates for evaluating the activity of protein motors”. [\[ChemRxiv\]](#)
- [Under revision](#) G. B. M. Wisna, [D. Sukhareva](#), [J. Zhao](#), D. Satyabola, Michael Matthies, Subhajit Roy, Petr Šulc, Yan, **Rizal F. Hariadi**, “DNA origami cryptography in 2-D and 3-D space with improved detection and fast readout enabled by high-speed DNA-PAINT and unsupervised clustering”. [\[bioRxiv\]](#)
- [Under revision](#) P. Xia, D. Satyabola, Md A. R. Laskar, X. Zhou, [G. B. M. Wisna](#), Y. Zhang, A. Ikbal, [A. Kemeklis](#), [A. E. Krylova](#), **R. F. Hariadi**, H. Yan, and C. Wang, “High-frequency readout of DNA helix bundle-encoded multi-bit information by sapphire-supported nanopores”.
- [In preparation](#) F. Djutanta, [R. Kha](#), B. Yurke, and **R. F. Hariadi**, “Hydrodynamically-active oily ocean surface as a cradle for the emergence of life”.
- [In preparation](#) N. Acharya, R. Sasmal, [G. B. M. Wisna](#), S. Dey, Y. Liu, H. Yan, **Rizal F. Hariadi**, “Non-destructive, exogenous stain for membrane-enclosed oligonucleotides composed of cholesterol modified DNA nanostructure”.
- 2023 [S. Pradhan](#), [C. Swanson](#), [C. Leff](#), [I. Tegganu](#), Melissa H. Bergeman, Ian B. Hogue, and **R. F. Hariadi**, “Viral attachment blocking chimera composed of DNA origami and nanobody inhibits Pseudorabies virus infection *in vitro*”. *ACS Nano* 17(23):23317-23330. [\[Paper\]](#)
- 2023 [J. Sentosa](#), [F. Djutanta](#), [B. Horne](#), [D. Showkeir](#), [R. Rezvani](#), and **R. F. Hariadi**, “Gradient-mixing LEGO robots for purifying DNA origami nanostructures of multiple components by rate-zonal centrifugation”. *PLOS ONE*, 18(7): e0283134. [\[Paper\]](#)
- 2023 [F. Djutanta](#)^o, [P. Brown](#)^o, [B. Nainggolan](#), Alexis Coullomb, [S. Radhakrishnan](#), [J. Sentosa](#), B. Yurke, and **R. F. Hariadi**^{*}, and D. Shepherd^{*}, “Decoding the hydrodynamic properties of microscale helical propellers from Brownian fluctuations”, *PNAS* 120 (22) e2220033120. [\[Paper\]](#)
^o *Authors contributed equally.*
^{*} *Authors supervised equally.*
- 2022 X. Zhou, H. Liu, [F. Djutanta](#), S. Jiang, X. Qi, L. Yu, D. Satyabola, S. Lin, **R. F. Hariadi**, Y. Liu, N. Woodbury, and H. Yan, “DNA-templated programmable excitonic wires for micron-scale exciton transport”, *Chem*, 8(9), 2442-59. [\[Paper\]](#)
- 2022 [Perspective](#) [D. Gandavadi](#) and **R. F. Hariadi**, “The right shoe for the job”, *Science*, 375, 1089–1090. [\[Paper\]](#)

- 2022 Review S. Pradhan, A. Varsani, C. Leff, C. Swanson, and **R. F. Hariadi**, “Viral aggregation: The knowns and unknowns”. **Viruses** 14(2), 438. [\[Paper\]](#)
- 2021 R. M. Shetty, S. Brady, P. W. K. Rothmund, **R. F. Hariadi***, and A. Gopinath*, “Bench-top fabrication of single-molecule nanoarrays by DNA origami Placement”. **ACS Nano** 15(7) 11441–11450. [\[Paper\]](#)
* *authors supervised equally.*
- 2019 L. Green, H. K. K. Subramanian, V. Mardanlou, J. Kim, **R. F. Hariadi**, and E. Franco, “Autonomous dynamic control of DNA nanostructure self-assembly”, **Nature Chemistry**, 11, 510–520. [\[Paper\]](#)
- 2019 I. Sgouralis, S. Madaan, F. Djutanta, R. Kha, **R. F. Hariadi**, and S. Pressé, “A Bayesian nonparametric approach to single-molecule FRET”, **J. Phys Chem B.**, 123(3), 675–688. [\[Paper\]](#)
- 2016 V. Mardanlou, L.N. Green, Hari K. K. Subramanian, **R. F. Hariadi**, J. Kim, and E. Franco, “A coarse-grained model of DNA nanotube population growth”, **International Conference on DNA-Based Computers**, 135–147. [\[Paper\]](#)
- 2016 **R. F. Hariadi***, A. Appukutty*, and S. Sivaramakrishnan, “Engineering circular gliding of actin filaments along myosin-patterned DNA nanotube rings to study long-term actin-myosin behaviors”. **ACS Nano**, 10(9), 8281–8288. [\[Paper\]](#)
* *authors contributed equally.*
- 2016 R. F. Sommesse, **R. F. Hariadi**, K. Kim, M. Liu, M. J. Tyska, M. A. Titus, S. Sivaramakrishnan, “Patterning protein complexes on DNA nanostructures using a GFP nanobody”. **Protein Science**, 25(11), 2089–2094. [\[Paper\]](#)

📌 Before ASU

- 2015 **R. F. Hariadi**, E. Winfree, and B. Yurke, “Determining hydrodynamic forces in bursting bubbles using DNA nanotube mechanics”, **PNAS**, 2015, 112, E6086–E6095. [\[Paper\]](#)
- 2015 V. Verma, L. Mallik, **R. F. Hariadi**, S. Sivaramakrishnan, G. Skiniotis, A. P. Joglekar, “Using Protein Dimers to Maximize the Protein Hybridization Efficiency with Multisite DNA Origami Scaffolds”, **PLoS One**, 2015 10(9): e0137125. [\[Paper\]](#)
- 2015 **R. F. Hariadi***, R. F. Sommesse*, A. Adhikari, R. Taylor, S. Sutton, J. Spudich, and S. Sivaramakrishnan, “Mechanical coordination in motor ensembles revealed using engineered artificial myosin filaments”, **Nature Nanotechnology**, 2015, 10, 696–700. [\[Paper\]](#)
* *authors contributed equally.*
- 2015 **R. F. Hariadi**, R. F. Sommesse, and S. Sivaramakrishnan, “Tuning myosin-driven transport on cellular actin networks”, **eLIFE**, 2015, 4, e05472. [\[Paper\]](#)
- 2015 Y. H. Tee, T. Shemesh, V. Thiagarajan, **R. F. Hariadi**, K. L. Anderson, C. Page, N. Volkman, D. Hanein, S. Sivaramakrishnan, M. Kozlov, and A. Bershadsky, “Cellular chirality arising from the self-organization of the actin cytoskeleton”, **Nature Cell Biology**, 2015, 4(17), 445–457. [\[Paper\]](#)
- 2015 **R. F. Hariadi**, B. Yurke, and E. Winfree, “Thermodynamics and kinetics of DNA nanotube polymerization from single-filament measurements”. **Chemical Science**, 2015, 6, 2252–2267. [\[Paper\]](#)
- 2014 **R. F. Hariadi**, M. Cale, and S. Sivaramakrishnan, “Myosin lever arm directs the emergence of collective movement patterns”, **PNAS**, 2014, 111, 4091–4096. [\[Paper\]](#)
- 2013 D. Y. Zhang*, **R. F. Hariadi***, H. M. T. Choi, and E. Winfree. “Integrating DNA strand displacement circuitry with DNA tile self-assembly”, **Nature Communications**, 2013, 4, 1965.
* *authors contributed equally.* [\[Paper\]](#)

- 2012 C. G. Evans, **R. F. Hariadi**, and E. Winfree, “Direct atomic force microscopy observation of DNA tile crystal growth at the single-molecule level”, **JACS**, 2012, 134, 10485–10492. [\[Paper\]](#)
- 2010 **R. F. Hariadi** and B. Yurke, “Elongational-flow-induced scission of DNA nanotubes in laminar flow”, **Physical Review E**, 2010, 82, 046307. [\[Paper\]](#)
- 2008 P. Yin, **R. F. Hariadi**, S. Sahu, H. M. T. Choi, S. H. Park, T. H. LaBean, and J. H. Reif, “Programming DNA tube circumference”, **Science**, 2008, 321, 824–826. [\[Paper\]](#)
- 2007 K. Fujibayashi, **R. F. Hariadi**, S. H. Park, E. Winfree, and S. Murata, “Toward reliable algorithmic self-assembly of DNA tiles: a fixed-width cellular automaton pattern”, **Nano Letters**, 2008, 8, 1791–1797. [\[Paper\]](#)
- 2002 **R. F. Hariadi**, S. C. Langford, and J.T. Dickinson, “Controlling nanometer-scale crystal growth on a model biomaterial with a scanning force microscope”, **Langmuir**, 2002, 18, Issue 21, 7773–7776. [\[Paper\]](#)
- 2000 J. T. Dickinson, **R. F. Hariadi**, and S. C. Langford, “Mechanical detachment of nanometer particles strongly adhering to a substrate: an application of corrosive tribology”, **Journal of Adhesion**, 74, 373–390.
- 1999 J. T. Dickinson, **R. F. Hariadi**, and S. C. Langford, “Nanometer scale investigations of chemical mechanical polishing mechanisms using scanning force microscopy,” **Ceramics Transactions**, 102, 213–232.
- 1999 J.T. Dickinson, **R. F. Hariadi**, L. Scudiero, and S. C. Langford, “A scanning force microscope study of detachment of nanometer-sized particles from glass surfaces”, **Tribology Letters**, 7, 113–119.
- 1999 **R. F. Hariadi**, S. C. Langford, and J.T. Dickinson, “Scanning force microscope observations of particle detachment from substrates: The role of water vapor in tribological debonding”, **Journal of Applied Physics**, 1999, 86, 4885–489. [\[Paper\]](#)

Intellectual property

At ASU

Total: 4 patent applications filed, 9 provisional applications filed, 2 invention disclosures filed.

- 2024 “Compositions and methods related to imaging cancer cells”
Co-inventors: Ranjan Sasmal.
Application No. 63/697,328, *filed on September-23-2024.*
- 2024 “Compositions and methods related to nucleic acid nanopores”
Co-inventors: Ranjan Sasmal.
Application No. 63/663,231, *filed on September-23-2024.*
- 2024 “Compositions and methods related to removal of cholesterol-modified transmembrane sensors”
Co-inventors: Ranjan Sasmal, Youssef Hassan.
Application No. 63/663,231, *filed on 24-June-2024.*
- 2024 “DNA origami nanoarrays”
Co-inventor: Prathamesh Chopade.
Application No. 63/638,158, *filed on 24-Apr-2024.*
- 2023 “Enhanced transmembrane sensors and molecular amplifiers for lysis-free detection of intracellular targets”
Co-inventors: Nirbhik Acharya, Carter Swanson.
SkySong invention ID: D23-228

- 2023 “Compositions and methods related to nucleic acid sensors”
Co-inventor: Gde Bimananda Mahardika Wisna and Ranjan Sasmal.
 Application PCT/US23/63860, *filed on 03/07/2023.*
- 2023 “Flip-flop membrane spanning sensors and application thereof”
Co-inventor: Nirbhik Acharya.
 SkySong Invention ID: D23-191, *filed on 03-06-2023.*
- 2023 “Applications for transmembrane DNA hairpin and duplex sensors – Localized Immune Response”
Co-inventor: Carter Swanson.
 SkySong Invention ID: D23-148, *filed on 01-12-2023.*
- 2023 “Applications for transmembrane DNA hairpin and duplex sensors – Bioimaging Invention”
Co-inventor: Carter Swanson.
 Application 63/580,879, *filed on 09-07-2023.*
- 2023 “Applications for transmembrane DNA hairpin and duplex sensors”
Co-inventor: Carter Swanson.
 SkySong Invention ID: D23-144, *filed on 01-04-2023.*
- 2023 “Delivery of a chemical entity, termed payload, across lipid membranes into cells or lipid compartments using a cholesterol-modified transmembrane DNA structure”
Co-inventor: Carter Swanson.
 SkySong Invention ID: D23-143, *filed on 01-02-2023.*
- 2022 “Compositions and methods related to multivalent binders for antiviral therapeutics”
Co-inventor: Carter Swanson, Swechchha Pradhan.
 U.S. provisional patent application No. 63/368,313, *filed on 07/13/2022.*
- 2020 “Transmembrane nanosensors and molecular amplifiers for lysis-free detection of intracellular targets.”
Co-inventors: Hao Yan, Swarup Dey, and Carter Swanson.
 U.S. provisional patent application No. 63/091,113, *filed on 10/13/2020.*
- 2020 “Transmembrane nanosensor arrays for rapid, ultra-sensitive and specific digital quantification of internal microRNA content of intact exosomes.”
Co-inventors: Hao Yan, Swarup Dey (Arizona State University).
 Application PCT/US2021/018371
- 2017 “[Materials and methods relating to single molecule arrays.](#)”
Co-inventors: Rishabh Shetty (ASU), Ashwin Gopinath (MIT), Paul Rothmund (California Institute of Technology).
 Application WO-2019108954-A1

📌 Before ASU

- 2015 “Treatments using aggregation of target particles”
Co-inventor: Carter Swanson.
 AzTE Invention ID: D17-130, AzTE Technology ID: M17-161L.
- 2008 “DNA structures self-assembled from single-stranded DNA tiles: Chains, ribbons, and tubes”,
Co-inventors: Peng Yin, Rizal F. Hariadi (California Institute of Technology),
 Sudheer Sahu, Thomas H. LaBean, and John H. Reif (Duke University).
 U.S. Provisional patent, *filed on March 24th, 2008.*

Talks

At ASU

Outside ASU

13 invited seminars/talks, e.g., MIT, Yale, Notre Dame, North Carolina State University, University of Michigan, Nature Conference, Foundation Nanotechnology Conference, and others.

10/22/2024	Upcoming Institute for Quantitative and Computational Biosciences, UCLA. Invited
10/04/2024	Biomimicry in Medicine, ASU. Invited
09/29/2024	Nanobiology Institute, Yale. Invited
09/20/2024	DNA30, Johns Hopkins University. Invited
01/17–18/2024	Phase A closeout and Phase B kickoff, IARPA, Washington DC.
08/31/2023	Department of Physics colloquium, Arizona State University.
07/10/2023	Universitas Indonesia. Invited
07/07/2023	Institut Teknologi Bandung. Invited
07/06/2023	Universitas Gajah Mada. Invited
06/05/2023	Build a Cell webinar.
05/22–24/2023	SynCell 2023: International Conference on Engineering Synthetic Cells and Organelles.
05/2023	Phase A kickoff, IARPA, Washington DC.
04/2023	2023 Foundation of Nanoscience (FNANO), Snowbird, Utah. Invited
03/2/2023	Biophysics Program, Ohio State University. Invited
01/13/2023	Biophysics Program, University of Michigan. Invited
08/08/2022	DNA28: 28 th International Conference on DNA Computing and Molecular Programming.
07/16/2022	American Society of Virology (AVS) 42 nd Annual meeting
04/11/2022	2022 Foundation of Nanoscience (FNANO), Snowbird, Utah.
03/18/2022	American Physics Society March Meeting 2022
01/08/2022	Universitas Brawidjaya, Department of Physics. Invited
12/10/2021	University of Michigan–Dearborn, Department of Physics. Invited
12/2/2021	Missouri State University, Department of Physics, Astronomy, and Materials Science. Invited
9/20–21/2021	Research Institute of Nanoscience and Nanotechnology, Institut Teknologi Bandung, Indonesia. Invited
8/3/2021	Universitas Pertahanan RI. Invited
09/2020	Astrobiology Australasia Meeting. Virtual conference due to COVID–19 outbreak
09/2020	DNA26: 26 th International Conference on DNA Computing and Molecular Programming. Virtual conference due to COVID–19 outbreak
04/2020	Foundation of Nanoscience 2020 (FNANO 2020), Snowbird, Utah. Virtual conference due to COVID–19 outbreak
01/19–24/2020	GRC: Origins of Life, Galveston, TX.
05/22/2019	North Carolina State University, Department of Physics. Invited
05/19–22/2019	Nature Conference on Engineering Biology for Medicine. Invited
09/11/2018	University of Notre Dame, Department of Aerospace and Mechanical Engineering. Invited
05/05/2018	2018 BioPhest, the University of Arizona
12/05/2017	Massachusetts Institute of Technology, Modern Optics, and Spectroscopy seminar. Invited
04/10/2017	2017 Foundation of Nanoscience (FNANO), Snowbird, Utah. Invited

📌 At ASU

- 01/26–27/2023 UBonn and ASU virtual symposium for Transdisciplinary Research Area Life and Health.
- 11/15/2022 Chalk talk at Center for Biological Physics.
- 01/18/2019 2019 Regional Academic Collaboration Conference (ReACT) on Bio Security
- 11/06/2018 Chalk talk at Center for Biological Physics.
- 02/05/2018 Chalk talk at Biodesign Institute.
- 03/31/2017 School of Biological and Health Systems Engineering.
- 02/02/2017 Department of Physics.

📌 Before ASU

- 02/25/2016 Department of Mechanical Engineering, Johns Hopkins University.
- 01/21/2016 Department of Physics, Washington University.
- 01/14/2016 Department of Physiology and Biophysics, University of Washington.
- 12/16/2015 Department of Physics, Arizona State University.
- 12/13/2015 2015 American Society for Cell Biology (ASCB) Annual Meeting, San Diego.
- 12/03/2015 Department of Physics and Brandeis Materials Research Science and Engineering Center, Brandeis.
- 08/18/2015 21st International Conference on DNA Computing and Molecular Programming, Cambridge, MA.
- 12/10/2014 2014 ASCB Annual Meeting, Philadelphia.
- 04/17/2014 2014 Foundation of Nanoscience (FNANO), Snowbird, Utah.
- 08/07/2013 Mechanobiology Institute, National University of Singapore.
- 08/05/2013 Munich DNA Node, München, Germany.
- 08/05/2013 Department of Physics, Ludwig-Maximilians-Universität, München, Germany.

Active collaborators (*alphabetical order*)

Po-Lin Chiu	Arizona State University.
Sivaraj Sivaramakrishnan	University of Minnesota.
Petr Šulc	Arizona State University.
Xu Wang	Arizona State University.
Hao Yan	Arizona State University.
Sui Yang	Arizona State University.
Bernard Yurke	Boise State University.

Mentorship (>1 semester)

📌 At ASU

Postdoctoral researchers: 7 advised; 2 secured faculty positions.

Postdocs	Deepak Karna	09/2024–present
	Prathamesh Chopade	01/2023–present
	Ranjan Sasmal	02/2022–present

Nirbhik Acharya	04/2021–07/2023
Amarnath Singam	12/2022–06/2023
Tarushyam Mukherjee	01/2022–09/2022
Daisuke Inoue (Next stop: Assistant Professor, Kyushu University)	10/2018–04/2019
Tunjung Mahatmanto (Next stop: Lecturer at Universitas Brawijaya)	11/2016–6/2018

Visiting postdoc Adi Wibowo Summer–Fall 2017

Ph.D. Students: 5 advised; 4 graduated (2 moved to postdocs at Harvard, MIT/Caltech, 1 moved to industry, 1 is running a spin-off startup based on the science developed in the laboratory.)

Graduate students (<i>chronological order</i>)	Rishabh Manoj Shetty	01/2017–07/2019
	– Next stop: postdoc at MIT and Caltech.	
	Swarup Dey (co-advised with Hao Yan)	Summer 2017–Spring 2021
	– Next stop: postdoc at Harvard.	
	Franky Djutanta	02/2017–05/2022
	– Next stop: Oxford NanoImaging.	
	Swechcha Pradhan	Spring 2020–08/2022
	– Next stop: Exodigm Biosciences, Inc.	
	Gde Bimananda Mahardika Wisna	Fall 2020–present. Expected graduation date: Summer 2024

Undergraduate Students: >30 advised, 3 Goldwater scholars, >10 moved on to graduate schools

Under-graduate students (<i>alphabetical order</i>) & ≤ 1 semester)	Michelle Anthony (<i>Next stop: M.D. student at U of Arizona</i>)	Spring 2018
	Indrajit Badvaram (<i>Next stop: Ph.D. student at Johns Hopkins</i>)	Summer 2017–Summer 2018
	Alonzo Beatty	Summer–Fall, 2019
	Sarah Brady	–Summer 2019
	Alexander DaSilva	Barrett fellow at CLAS Summer 2018
	Dustin Foote	Summer 2018–Spring 2019
	Chase Hanson (<i>Next stop: Ph.D. student at UC Davis</i>)	Spring–Summer 2018
	Youssef Hassan	Summer 2022–present
	Gabrielle Hirneise	Summer 2018–Spring 2019
	Jun Skyler Hong (<i>Next stop: dental student at the University of New England</i>)	Spring–Fall 2019
	Jae Woo Jeong	Spring 2024–present
	Neil Karerakattil	Spring 2021–Summer 2022
	Rachael Kha (<i>Current position: Ph.D. student at MIT</i>)	–Summer 2019
	Maeve Kennedy (<i>Current position: M.D./Ph.D. student at Baylor/Rice</i>)	Summer 2018–Summer 2019
	Joyce Kuang	Summer–Fall 2018
	Malikakhon Kuchkarova	Spring 2024–present
	Eric Le	Spring 2017–Spring 2020
	Chloe Leff	Summer 2021
	Aidan McGirr (<i>Current position: Law student at NYU</i>)	Fall 2018–Spring 2019
	Kenna McRae	Spring 2018
	Sritharini Radhakrishnan	Fall 2019–Summer 2022
	Christopher Ramirez (<i>Next stop: Ph.D. student at UC Davis</i>)	Summer 2018–Spring 2019

Sri Ujjwal Reddy	Fall 2022–present
Robert Rezvani (<i>Next stop: M.D. student at U of Arizona</i>)	Summer 2018–Spring 2019
Rayhan Rizqi	Spring 2023–present
Shuchi Sharma (<i>Next stop: M.D. student at Ohio State</i>)	Summer 2018
Tal Sneh	Summer 2018–Spring 2021
Sabrina Suhartono (<i>Next stop: programmer at Revature</i>)	Fall 2017–Spring 2019
Daria Sukhareva	Fall 2020–Spring 2023
Tohma Taniguchi	Spring 2022–Spring 2023
Bryan Ugaz (<i>Next stop: Ph.D. student at Stanford, then at ASU</i>)	May 2018–Spring 2019
Ritvik Warriar	Fall 2021–Fall 2022
Justin Wilson	Fall 2019–Spring 2020
Sarah Xi	Spring 2020–Fall 2020
Irene Zhang (<i>Next stop: Ph.D. student at U of Michigan</i>)	Fall 2018–Spring 2019
Jonathan Zhao	Spring 2022–present

High-school students: 6 advised

High school students	Pranati Chintada	Summer 2024–
	Anshuman Patel	Summer 2024–
	<i>Through ASU SCENE (Science and Engineering Experience) program</i>	
	Adrian Kwiatkowski (<i>Next stop: University of Chicago</i>)	Fall 2018–Spring 2019
	Aliyapadi Biruni Hariadi (<i>Next stop: Yale University</i>)	Fall 2022–Spring 2023
	Leann Landkoff (<i>Next stop: Duke University</i>)	Fall 2022–Spring 2023
	Kavi Ullal (<i>Next stop: Case Western University</i>)	Fall 2022–Fall 2023

Visiting student researchers: 8 advised.

Visiting student researchers (<i>alphabetical order</i>)	Gaby Almira (<i>then at Osaka University</i>)	Summer 2017
	Isyatul Azizah (<i>then at Universitas Brawijaya</i>)	Summer–Fall 2017
	Emilio Bachtiar (<i>then at Johns Hopkins University</i>)	Summer 2017
	Anshuman Bakshi (<i>then at UC Berkeley</i>)	Summer 2017
	Fania Feby Ramadhani (<i>then at Institut Teknologi Bandung</i>)	Summer 2017
	Jason Sentosa (<i>then at Georgia Institute of Technology</i>)	Summer 2019 & Summer 2020
	Isadonna Fortune Tenganu (<i>then at Surya University</i>)	Summer 2019
	– Next stop: graduate student at ASU SoLS (Advisor: Ke Hu)	
Gde Bimananda Mahardika Wisna (<i>then at Institut Teknologi Bandung</i>)	Summer 2017	
– Next stop: graduate student in Hariadi lab at ASU Physics		

Before ASU

2012–2017	Leopold Green	University of California, Riverside.
2015–2016	Alexander Auer	Wyss Institute at Harvard.
2013–2016	Abhinav Appukutty	University of Michigan.
2014–2016	Neerja Garikipati	Huron High School, Ann Arbor.
2012–2014	Mario Cale	University of Michigan.
Fall 2013	James Song	University of Michigan.
2011–2012	Terrence Tigney	University of Michigan.
Summer 2007	Yudhistira Virgus	Institut Teknologi Bandung, Indonesia.

Mentored Trainee's Honors and Awards

At ASU

3 Goldwater scholars: M. Kennedy (2019), T. Sneh (2020), C. Leff (2023)
Graduate student fellowship: G. Wisna (2023; American Heart Association)
1 Gates Scholar, 1 U.S. Presidential Scholar: A. Kwiatkoswskii (2019)

International- & National-level

Spring 2023	Chloe Leff	Goldwater Scholar .
Spring 2023	Gde Bimananda Mahardika Wisna	American Heart Association predoctoral fellowship.
Spring 2020	Tal Sneh	Goldwater Scholar .
Spring 2020	Tal Sneh	2020 AAAS Best Student e-Poster Competition.
Spring 2019	Aidan McGirr	<i>National finalist</i> , Truman Scholar.
Spring 2019	Daisuke Inoue	Kazato Research Encouragement Prize.
Spring 2019	Maeve Kennedy	Goldwater Scholar .
Spring 2019	Adrian Kwiatkowski	U.S. Presidential Scholar in Career and Technical Education Program.
Spring 2019	Adrian Kwiatkowski	Gates Scholar.

State-level

Spring 2023	A. Biruni Hariadi	Flinn Scholar semifinalist. US Presidential Scholar finalist.
Spring 2019	Adrian Kwiatkowski	1 st place Arizona Science and Engineering Fair (AzSEF) (Biochemistry category).

University-level

2024–2025	Sri Ujwall	Grand Challenge Scholars Research Stipend.
Spring 2021	Tal Sneh	2021 Chair's Distinguished Senior Awards
Spring 2020	Swarup Dey	ASU SMS Innovation award.
Spring 2020	Tal Sneh	Physics scholarship.
Spring 2019	Swarup Dey	The College Graduate Excellence Award.
Spring 2019	Chase Hanson	Wally Stoelzel scholarship.
Spring 2019	Chase Hanson	Department of Physics scholarship.
Spring 2019	Dustin Foote	Fulton Grand Challenge Scholars Program.
Spring 2019	Tal Sneh	2019 Fusion Best Poster Award.
Spring 2018	Rishabh Shetty	ASU SBHSE Merit Award.

Travel grants

10 travel grants.

Spring 2024	Gde Bimananda Mahardika Wisna	Biophysical Society meeting.
Spring 2024	Gde Bimananda Mahardika Wisna	Biodesign Travel Grant.
Summer 2022	Swechchha Pradhan	American Society of Virology 2022 Travel Award.

Spring 2022	Swechchha Pradhan	Biodesign Travel Grant.
Fall 2021	Franky Djutanta	Light-sheet microscope conference.
Spring 2020	Franky Djutanta	International Conference on Engineering Synthetic Cells and Organelles.
Spring 2020	Franky Djutanta	<i>Travel award</i> , Gordon Research Seminar: Origins of Life Registration Grant.
Spring 2020	Tal Sneh	AAAS <i>Travel Grant</i> .
Fall 2019	Tal Sneh	<i>Travel grant</i> , NSF Center for Engineering MechanoBiology.
Fall 2018	Swarup Dey	<i>Travel award</i> , Mechbio Conference 2018.

▮ Before ASU

Summer 2015	Abhinav Appukutty	<i>Best poster</i> , 21 st International Conference on DNA Computing and Molecular Programming, Harvard University, MA.
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Teaching

▮ At ASU

Courses: Undergraduate and graduate courses relating to thermodynamics, electromagnetism, optics, biophysics, soft matter, and laboratory work.

Ratings: as high as a perfect rating of 5/5 (PHY 472, Fall 2022) and evaluations stating “*Professor Hariadi is by far one of the best professors I’ve had at ASU. He is very organized and responds very quickly*” (PHY 112 student, Spring 2021).

Teaching award: 1 Outstanding Teaching Award, Department of Physics, ASU.

Fall {2017–2022}	PHY 472: “Advanced Biophysics Laboratory” – <i>New course developed at ASU.</i>
Spring {2021,2022,2023}	PHY 112: Physics II.
Spring {2018, 2019, 2020}	PHY 252: “Physics III” Wave physics, oscillations, harmonic systems, physical optics, thermodynamics, kinetic theory.
Fall 2016	PHY 598: “Biomolecular and Cellular Mechanics” – <i>New course developed at ASU.</i>

▮ Before ASU

Winter 2006	BE/APh161, “Physical Biology of the Cell” California Institute of Technology. <i>Teaching assistant</i> , Course Instructor: Rob Phillips.
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Teaching workshop

▮ At ASU

8/1/2022	<i>Webinar speaker</i> , Examining graduate programs in Physics.
6/28–7/1/2021	New Faculty Workshop. Organized by the American Association of Physics Teachers (AAPT), the American Physical Society (APS), and the American Astronomical Society (AAS), College Park, MD.

07/13/2020 *Webinar speaker*, Active learning in Physics on the ground and online.
 11/17–20/2016 New Faculty Workshop. Organized by the American Association of Physics Teachers (AAPT), the American Physical Society (APS), and the American Astronomical Society (AAS), College Park, MD.

Disciplinary service

At ASU

Referee: >15 journals, e.g., Nature, Science, others.

Grant reviewer: 4 funding agencies.

Guest editor: 1 edition.

Ad hoc referees Nature, Science, Nature Communications, Science Advances, Communications Physics, Nucleic Acid Research, Angewandte Chemie, Accounts of Chemical Research, Nano Letters, Scientific Reports, Journal of the American Chemical Society, Langmuir, Trends in Analytical Chemistry, Nature Nanotechnology, International Conference on DNA Computing and Molecular Programming, Rapid Reviews: COVID-19, ACS Applied Nano Materials.

2023, 2022, 2021, 2018 *Proposal reviewer*, NSF.

2022 *Proposal reviewer*, The Wellcome Trust.

2021 *Proposal reviewer*, Department of Defense.

2019 *Proposal reviewer*, Human Frontier Science Program

2019 *Guest editor*, Journal of Visualized Experiments (JoVE) on Methods in structural and dynamic DNA nanotechnology.

2017–present *Program committee*, International Conference on DNA Computing and Molecular Programming.

2017 *Organizing committee*, Biophest at ASU.

College and department-level service

At ASU

Various committees in the Department of Physics, School of Molecular Sciences, School of Life Sciences, Biodesign Institute, and on the thesis committees for >20 students.

2024 Search committee.

2024–2025, 2020–2021 Graduate study committee, Department of Physics.

2021–2022, 2019–2020 Search committee for a faculty in the Department of Physics and Biodesign Center for Mechanisms of Evolution.
 – Search results: Failed search (2019–2020), Navish Wadhwa (2021–2022)

2018–2019 Search committee for a faculty in the Department of Physics with an emphasis in Experimental Biophysics.
 – Search outcome: Douglas Shepherd

2016–2017	Search committee for a faculty in the School of Molecular Sciences and Biodesign Center for Molecular Design and Biomimetics with an emphasis in Computational Physical Chemistry. – Search outcome: Petr Šulc
2023–2025	Colloquium committee, Department of Physics.
2023–2024	Biodesign 20 th Anniversary.
2018, 2021, 2023	Organizing committee, Biodesign Center for Molecular Design and Biomimetics symposium.
2023	Fusion poster committee, Biodesign Institute
2022–2024	Chalk talk committee, Biodesign Institute.
2022–	Advisory Board, Biodesign Center for Mechanisms of Evolution.
2021–2022	Bylaws committee, Department of Physics.
2019–2020	General studies committee, Department of Physics.
2016–2018, 2022–2023	Exam committee, Department of Physics.

Community service and outreach

At ASU

10/03/2024	Grand Challenges for Engineering, <i>Guest lecturer</i> .
11/7/2023	
09/17–18/2024	PHY 194 <i>Guest lecturer</i> .
2016–	Science-inspired cartoons with a graphic illustrator (Sapto Cahyono).
2023–	Flinn Research Council.
07/18/2024	Nizamia Andalusia High school, <i>Guest lecturer</i> .
2024–	Sun Devils Birdie, <i>Advisor</i> .
2023–	PERMIAS (Perhimpunan Mahasiswa Indonesia di Amerika Serikat), <i>Advisor</i> .
2023	BIOMOD, an annual biomolecular design competition for students, <i>Mentor and judge</i> .
2022–2023	ASU SCENE (SCience and ENgineering Experience), <i>Mentor</i> .
2022–2023	HYSA Robotics Club, <i>Treasurer</i> .
Summer 2022	BioSense Summer course, <i>Instructor</i> .
10/19/2022	Grand Challenges for Engineering, <i>Guest lecturer</i> .
06/13/2022	Migratory Student Summer Academy, hosted by the School of Transborder Studies, <i>Guest lecturer</i> .
02/23/2019	ASU Open Door 2019
01/30/2019	Biotechnology course, ASU Preparatory Academy, <i>Guest lecturer</i> .
2018–2019	ASU Scene, <i>Mentor</i> .
08/03–09/2018	2018 Asian Science Camp, Manado, Indonesia. <i>Steering committee (chair) & speaker</i> . – Attended by ~250 students from 25 countries.
08/07/2018	Science outreach at Eben Haezar Catholic High School, Manado, Indonesia. – <i>Speaker</i> , alongside Ron Vale (then at the University of California, San Francisco).
05/11/2018	Career Day, Arizona Cultural Academy, <i>Speaker</i> .
02/23/2018	ASU Open Door 2018.
10/21/2017	Future Physics Sun Devil, Department of Physics, Arizona State University.
02/24/2017	Arizona State University Night of the Open Door 2017.
2017	BIOMOD, an annual biomolecular design competition for students. <i>Judge</i> .

📌 Before ASU

- 2014 College 101, University of Michigan, Instructor.
- 09/22/2013 Webinar: How to apply to graduate schools in the US, *Speaker*
- 03/16–17/2012 Bridging International Cooperation between Indonesia and America, Washington, DC,
Conference Chair.
- 07/16/2011 National Seminar of Science and Technology, Aceh, Indonesia, *Invited speaker*.
- 2011 Science outreach at Universitas Negeri Medan, Indonesia, *Speaker*.
- 2009 Science outreach at Satya Wacana Christian University, *Speaker*.
- 2009 Science outreach at Paramadina University, *Speaker*
- 2008 2008 Asian Science Camp, Bali, Indonesia, *Invited speaker*.
- 2008 Science outreach at Tugasku elementary school, Jakarta, Indonesia, *Speaker*.

Entrepreneurship

📌 After employment at ASU

1 ASU startup.

- 2020– [Exodigm Bioscience Inc.](#)
Co-founder alongside Hao Yan and General Inception.
– Finalist, Skysong Innovations startup challenge
– Secured funding from [IARPA \(Intelligence Advanced Research Projects Activity\)](#).

📌 Before ASU

- 2014–2015 ImmunoRodeo.
Co-founder, alongside Carter Swanson.
– *Semi finalist (1 of ~70 semi finalists, out of >600 proposals)* in OneStart Competition.

Support

📌 Internal funding

- 2019 Global Security Initiative (GSI), Arizona State University
\$50,000
PI: Rizal F. Hariadi
(i) *Purchase of an FPLC* and (ii) *2-month support for a visiting scholar*.

📌 Trainee funding (>\$5K)

1 postdoc fellowship; 1 graduate student fellowship; 3 REU supplements.

2023–2025	American Heart Association (AHA) Predoctoral Fellowship \$ 65,106 PI: Gde Bimananda Mahardika Wisna (GRA Year 3) <i>Investigations of single-molecule integrin under tension using DNA origami multi-axial tension device</i>
2024	National Science Foundation REU supplement \$20,000 for 2 REU students (Aaron Sakai and Kavi Ullal).
2023	National Science Foundation REU supplement \$16,000 for 2 REU students (Rayhan Rizqi and Youssef Hassan).
2022	National Science Foundation REU supplement. \$8,000 for 1 REU student (Ritvik Warriar).
2018–2020	Kazato Research Foundation. ¥ 2,000,000 (equivalent to ~\$ 15,000 in 2018) PI: Daisuke Inoue (Postdoc Year 1) <i>Design of microtubule structure by DNA origami.</i>

External funding

Total: 9 grants (2 NIH, 3 NSF, 1 ABRC, 1 Flinn Foundation, 1 DoD, and 1 IARPA).
\$11,196,156 in total funding
\$7,458,322 to Hariadi = \$5,146,862 administered by ASU + \$2,311,460 from a grant administered by Exodigm Biosciences.

04/01/2018–03/31/2021 Completed	ADHS17-00007401 Arizona Biomedical Research Commission (ABRC) New Investigator Award \$225,000 PI: Rizal F. Hariadi 100% = \$225,000 <i>An ultra-sensitive and low-cost diagnostic for valley fever.</i>
09/30/2018–08/30/2023 Completed	1DP2AI144247-01 National Institutes of Health Director's New Innovator Award \$2,353,661 PI: Rizal F. Hariadi 100% = \$2,353,661 <i>Nanoscale reconstruction of mechanical systems involved in disease pathogenesis.</i>
10/01/2020–09/30/2023 Completed	2027215 National Science Foundation \$1,500,000 PI: Hao Yan, Co-PIs: (i) Rizal F. Hariadi 33% = \$500,000 and (ii) Chao Wang <i>SemiSynBio II: DNA-based memory for high-density information storage and molecular cryptography with fast readout methods.</i>

- 09/01/2021–8/31/2024 Completed HQ00342110007
 Department of Defense
 \$1,399,584
 PI: Abhishek Singharoy, Co-Is: Rizal F. Hariadi 10% ~ \$140,000 + 7 other Co-Is.
National Defense Education Program: A zero-cost online biotechnology program for middle and high schools.
- 11/01/2022–10/31/2025 2227650
 National Science Foundation
 \$1,500,000
 PI: Hao Yan, Co-PIs: (i) Rizal F. Hariadi 25% = \$375,000 (ii) Petr Sůlc and (iii) Sui Yang
SemiSynBio-III: DNA templated chiral metamaterials for information storage.
- 05/01/2023–04/30/2026 1R61CA278558-01
 National Institutes of Health, National Cancer Institute (NCI) Innovative Molecular Analysis Technologies (IMAT)
 \$706,500
 PI: Hao Yan, Co-PI: Rizal F. Hariadi 50% = \$353,250
High-throughput, purification-free, and ultrasensitive transmembrane nanosensor arrays for digital counting of microRNA biomarkers of intact exosomes.
- 02/01/2024–01/31/2029 2341002
 National Science Foundation
 \$1,099,951
 PI: Rizal F. Hariadi 100% = \$1,099,951
CAREER: High-throughput multi-axial tension-inducing DNA origami device for investigating mechanosensitive signaling pathways and protein structures under defined tension.
- 02/01/2025–07/31/2026 24-17692
 Flinn foundation
 \$100,000
 PI: Rizal F. Hariadi 100% = \$100,000
Live-cell RNA detection probes for cell sorting and therapeutic applications

 **Funding administered by Exodigm Biosciences, Inc.**

- 06/2023–06/2025 N6600123C4504
 Intelligence Advanced Research Projects Activity (IARPA)
 \$2,311,460
 PI: Rizal F. Hariadi 100% = \$2,311,460
Transmembrane nanosensors for live cell genotyping and enrichment.