Rizal F. HARIADI

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1 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.

2 Academic and professional experience

2016– 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 & 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

3 Awards

Since employment at ASU

2 research awards, 1 teaching award.

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 employment at ASU

2002 *Top 3*, LeRoy Apker Award, American Physics Society.
The highest award offered in the U.S. for an undergraduate thesis in physics

2002 Honorable mentions, 2002 All-American College Academic Team, USA Today.

4 Publications

Total: >1800 citations; h-index=15

Since employment at ASU

9 publications since employment at ASU in addition to 2 accepted, 2 in revision, and 3 in preparation.
ASU mentees: undergraduate , postdoc/postbac/graduate student mentored by Hariadi

Acccepted PLoS One — 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".
bioRχiv pre-print: https://doi.org/10.1101/2021.07.02.450731

In revision Langmuir — I. F. Tengganu, 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 pre-print: 10.26434/chemrxiv-2021-d62p2-v3

In revision ACS Nano — S. Pradhan, C. Swanson, C. Leff, I. Tengganu, 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".
bioRχiv pre-print: https://www.biorxiv.org/content/10.1101/2023.02.13.528373v1

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 — ulG. B. M. Wisna, D. Sukhareva, J. Zhao, D. Satyabola, H. 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".

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 — F. Djutanta°, P. Brown°, 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.
°*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.

2022 Perspective — D. Gandavadi and **R. F. Hariadi**, "The right shoe for the job", **Science**, 375, 1089–1090

2022 Review — S. Pradhan, A. Varsani, C. Leff, C. Swanson, and **R. F. Hariadi**, "Viral aggregation: The knowns and unknowns". **Viruses** 14(2), 438

2021 — R. M. Shetty, S. Brady, P. W. K. Rothemund, **R. F. Hariadi***, and A. Gopinath*, "Bench-top fabrication of single-molecule nanoarrays by DNA origami Placement". **ACS Nano** 15(7) 11441–11450
**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

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.

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.

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.
**authors contributed equally.*

2016 R. F. Sommese, **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.

Before employment at 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.

2015 V. Verma, L. Mallik, **R. F. Hariadi**, S. Sivaramakrishnan, G. Skiniotis, A. P. Joglekar, "Maximizing protein hybridization efficiency on multisite DNA origami scaffolds using protein dimerization", **PLoS One**, 2015 10(9): e0137125.

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. **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.

2015 Y. H. Tee, T. Shemesh, V. Thiagarajan, **R. F. Hariadi**, K. L. Anderson, C. Page, N. Volkmann, 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.

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.

2014 **R. F. Hariadi**, M. Cale, and S. Sivaramakrishnan, "Myosin lever arm directs the emergence of collective movement patterns", **PNAS**, 2014, 1111, 4091–4096.

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.*

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.

2010 **R. F. Hariadi** and B. Yurke, "Extensional-flow-induced scission of DNA nanotubes in laminar flow", **Physical Review E**, 2010, 82, 046307.

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.

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.

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.

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.

5 Intellectual property

Since employment at ASU

Total: 4 patent applications filed, 5 provisional applications filed, 3 invention disclosures filed

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.
SkySong Invention ID: D23-146, *filed on 01-12-2023*.

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, trans-membrane 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 (Arizona State University).
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 micro-RNA 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 Rothemund (California Institute of Technology).
Application WO-2019108954-A1

Before employment at 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*.

6 Talks

Since employment at ASU

Outside ASU

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

07/05/2023	Upcoming Institut Teknologi Bandung. Invited
06/05/2023	Upcoming Build a Cell webinar
05/22–24/2023	SynCell 2023: International Conference on Engineering Synthetic Cells and Organelles
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: 28th International Conference on DNA Computing and Molecular Programming.
07/16/2022	American Society of Virology (AVS) 42nd Annual meeting
04/11/2022	FNANO 2022
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: 26th 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 employment at 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, 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.

7 Posters

Since employment at ASU

06/08–09/2023	Upcoming NIH High-Risk, High-Reward Research (HRHR) Symposium.
04/2023	Upcoming 2023 Foundation of Nanoscience (FNANO), Snowbird, Utah.
08/08/2022	DNA28: 28th International Conference on DNA Computing and Molecular Programming.
03/2022	Biophysical Society meeting.
09/2020	DNA26: 26th International Conference on DNA Computing and Molecular Programming. Virtual conference due to COVID–19 outbreak
04/2020	2020 Foundations Of Nanoscience: Self-assembled Architectures And Devices (FNANO), Utah. Virtual conference due to COVID–19 outbreak
02/26/2020	5th Annual ABRC-Flinn Research Conference, Phoenix AZ.
02/13–16/2020	AAAS Annual Meeting, Seattle WA.
01/19–24/2020	GRC: Origins of Life, Galveston, TX.
03/30/2019	Biophest, Arizona State University.
03/22/2019	FUSION 2019, Biodesign Retreat, Arizona State University.
10/08/2018	Statistical Physics in Biology: A workshop in honor of Ken Dill, Arizona State University.
05/05/2018	Biophest, University of Arizona.
04/13/2018	FUSION 2018, Biodesign Retreat, Arizona State University.
09/25/2017	DNA23–23rd International Conference on DNA Computing and Molecular Programming, University of Texas, Austin, TX.
04/22/2017	Biophest, Department of Physics, Arizona State University.
04/07/2017	FUSION 2017, Biodesign Retreat, Arizona State University.
03/03/2017	2017 Arizona Imaging and Microanalysis Society Conference, Arizona State University.
02/11–15/2017	61st Annual Meeting, Biophysical Society.

8 Active collaborators (*alphabetical order*)

Krishna Chinthalapudi	Ohio State University.
Po-Lin Chiu	Arizona State University.
Heather Clark	Arizona State University.
Ian Hogue	Arizona State University.
Ke Hu	Arizona State University.
Douglas Shepherd	Arizona State University
Petr Šulc	Arizona State University.
Abhishek Singharoy	Arizona State University.
Nicholas Stephanopoulos	Arizona State University.
Chao Wang	Arizona State University.
Xu Wang	Arizona State University.
Hao Yan	Arizona State University.
Sui Yang	Arizona State University.
Bernard Yurke	Boise State University.

9 Mentorship (>1 semester)

Since employment at ASU

Postdoctoral researchers: 7 advised; 2 secured faculty positions.

Postdocs	Prathamesh Chopade	01/2023–**present**
	Amarnath Singam	12/2022–**present**
	Ranjan Sasmal	02/2022–**present**
	Tarushyam Mukherjee	01/2022–09/2022
	Nirbhik Acharya	04/2021–**present**
	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: 7 advised; 4 graduated (2 moved to postdocs at Harvard, MIT/Caltech, 1 moved to industry, 1 is running a spin-off startup from the laboratory.)

Graduate students (*chronological order*)	Rishabh Manoj Shetty SBHSE Merit Award – Next stop: postdoc at MIT and Caltech.	01/2017–07/2019
	Swarup Dey (co-advised with Hao Yan) – Next stop: postdoc at Harvard.	Summer 2017–Spring 2021
	Franky Djutanta – Next stop: Oxford NanoImaging.	02/2017–05/2022
	Swechchha Pradhan SBHSE Merit Award – Next stop: Exodigm Biosciences, Inc.	Spring 2020–08/2022
	Gde Bimananda Mahardika Wisna AHA predoctoral fellow	Fall 2020–**present**
	Karen Baker (co-advised with Nicholas Stephanopoulos)	Spring 2023–**present**

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

Undergraduate students (*alphabetical order & >1 semester*)	Michelle Anthony (*Next stop: M.D. student at U of Arizona*)	Spring 2018
	Indrajit Badvaram (*Next stop: Ph.D. student at Johns Hopkins*)	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 (*Next stop: Ph.D. student at UC Davis*)	Spring–Summer 2018
	Youssef Hassan	Summer 2022–**present**
	Gabrielle Hirneise	Summer 2018–Spring 2019
	Jun Skyler Hong (*Next stop: dental student at the University of New England*)	Spring–Fall 2019
	Neil Karerakattil	Spring 2021–Summer 2022
	Rachael Kha (*Current position: Ph.D. student at MIT*)	–Summer 2019
	Maeve Kennedy (*Current position: M.D./Ph.D. student at Baylor/Rice*)	Summer 2018–Summer 2019

Joyce Kuang — Summer–Fall 2018
Eric Le — Spring 2017–Spring 2020
Chloe Leff — Summer 2021
Aidan McGirr (*Next stop: Ph.D. student at Stanford*) — Fall 2018–Spring 2019
Kenna McRae — Spring 2018
Sritharini Radhakrishnan — Fall 2019–Summer 2022
Christopher Ramirez (*Next stop: Ph.D. student at UC Davis*) — Summer 2018–Spring 2019
Sri Ujjwal Reddy — Fall 2022–**present**
Robert Rezvani (*Next stop: M.D. student at U of Arizona*) — Summer 2018–Spring 2019
Rayhan Rizqi — Spring 2023–**present**
Shuchi Sharma (*Next stop: M.D. student at Ohio State*) — Summer 2018
Tal Sneh — Summer 2018–Spring 2021
Sabrina Suhartono (*Next stop: programmer at Revature*) — Fall 2017–Spring 2019
Daria Sukhareva — Fall 2020–Spring 2023
Tohma Taniguchi — Spring 2022–Spring 2023
Bryan Ugaz (*Next stop: Ph.D. student at Stanford*) — May 2018–Spring 2019
Ritvik Warrier — Fall 2021–Fall 2022
Justin Wilson — Fall 2019–Spring 2020
Sarah Xi — Spring 2020–Fall 2020
Irene Zhang (*Next stop: Ph.D. student at U of Michigan*) — Fall 2018–Spring 2019
Jonathan Zhao — Spring 2022–**present**

High-school students: 3 advised

High school students — *Through ASU SCENE (Science and Engineering Experience)* program
Adrian Kwiatkowski (Next stop: University of Chicago) — Fall 2018–Spring 2019
Aliyapadi Biruni hariadi (Next stop: Yale University) — Fall 2022–Spring 2023
Leann Landkoff (Next stop: Duke University) — Fall 2022–Spring 2023

Visiting student researchers: 7 advised.

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

Before employment at 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.

10 Mentored Trainee's Honors and Awards

Since employment 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 Scholars: 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	*National finalist*, 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 nominee
Spring 2019	Adrian Kwiatkowski	1st place Arizona Science and Engineering Fair (AzSEF) (Biochemistry category).

University-level

Summer 2021	Chloe Leff	Barrett Fellow at CLAS.
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.
Summer 2017	Alexander da Silva	Barrett Fellow at CLAS.

Travel grants

8 travel grants.

Summer 2022	Swechchha Pradhan	American Society of Virology 2022 Travel Award

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

Before employment at ASU

Summer 2015	Abhinav Appukutty	*Best poster*, 21st International Conference on DNA Computing and Molecular Programming, Harvard University, MA.

11 Teaching

Since employment 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).
Award: 1 Outstanding Teaching Award, Department of Physics, ASU.

Fall {2017–2022}	PHY 472: "Advanced Biophysics Laboratory" *–New course developed at ASU.*
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" *–New course developed at ASU.*

Before employment at ASU

Winter 2006	BE/APh161, "Physical Biology of the Cell" California Institute of Technology. *Teaching assistant*, Course Instructor: Rob Phillips.

12 Teaching workshop

Since employment at ASU

08/01/2022	*Webinar speaker*, Examining graduate programs in Physics.
07/13/2020	*Webinar speaker*, Active learning in Physics on ground and online.

{06/28–07/01/2021, 11/17–20/2016}	New Faculty Workshop. Organized by American Association of Physics Teachers (AAPT), the American Physical Society (APS), and the American Astronomical Society (AAS), College Park, MD.

13 Disciplinary service

Since employment at ASU

Referee: 16 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, and 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.

14 College and department-level service

Since employment at ASU

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

{2021–2022, 2019–2020}	Search committee for a faculty in the Department of Physics and Biodesign Center for Mechanisms of Evolution. – Search outcomes: 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	Fusion poster committee, Biodesign Institute
2022–2024	Chalk talk committee, Biodesign Institute.
2021–2022	Bylaws committee, Department of Physics.
2020–	Graduate study committee, Department of Physics.
2019–2020	General studies committee, Department of Physics.
2018 and 2021	Organizing committee, Biodesign Center for Molecular Design and Biomimetics symposium.
{2016–2018, 2022–2023}	Exam committee, Department of Physics.

15 Community service and outreach

Since employment at ASU

2016–	Science-inspired cartoon with a graphic illustrator (Sapto Cahyono)
2022–2023	HYSA Robotics Club, *Treasurer*.
Summer 2022	BioSense Summer course, *Instructor*.
10/19/2022	Grand Challenges for Engineering, *Guest lecturer*.
06/13/2022	Migratory Student Summer Academy, hosted by the School of Transborder Studies, *Guest lecturer*.
02/23/2019	ASU Open Door 2019
01/30/2019	Biotechnology course, ASU Preparatory Academy, *Guest lecturer*.
08/03–09/2018	2018 Asian Science Camp, Manado, Indonesia. *Steering committee (chair)* & *Guest speaker*. – Attended by ∼250 students from 25 countries.
08/07/2018	Science outreach at Eben Haezar Catholic high school, Manado, Indonesia. – *Speaker*, alongside Ron Vale (then at the University of California San Francisco).
05/11/2018	Career Day, Arizona Cultural Academy, *Speaker*.
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. *Judge*.

Before employment at 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*.

16 Entrepreneurship

After employment at ASU

1 ASU startup.

2020– Exodigm Bioscience Inc.
Co−founder alongside Hao Yan and General Inception Venture Studios.
− Finalist, Skysong Innovations startup challenge
− Secured a grant of $2.3 million over 2 years from IARPA (Intelligence Advanced Research Projects Activity), in addition to funding from VC.

Before employment at ASU

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

17 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 (>$10K)

1 postdoc fellowship; 1 graduate student fellowship.

2018–2020 Kazato Research Foundation
¥ 2,000,000 (equivalent to ∼ $ 15,000)
PI: Daisuke Inoue (Postdoc Y1)
Design of microtubule structure by DNA origami.

2023–2025 American Heart Association (AHA) Predoctoral Fellowship
$ 65,106
PI: Gde Bimananda Mahardika Wisna (GRA Year 2)
Investigations of single-molecule integrin under tension using DNA origami multi-axial tension device

External funding

Total: 6 grants (2 NIH, 2 NSF, 1 ABRC, 1 DoD, and 1 IARPA).
$9,996,205 in total funding
$6,258,371 to Hariadi = $3,946,911 administered by ASU + $2,311,460 from a sole PI 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
An ultra-sensitive and low-cost diagnostic for valley fever.

09/30/2018–08/30/2023

1DP2AI144247–01
National Institutes of Health Director's New Innovator Award
$2,353,661
PI: Rizal F. Hariadi **100%** = $2,353,661
Nanoscale reconstruction of mechanical systems involved in disease pathogenesis.

10/01/2020–09/30/2023

2027215
National Science Foundation
$1,500,000
PI: Hao Yan, Co-PIs: (*i*) Rizal F. Hariadi **33%** = $500,000 and (*ii*) Chao Wang
SemiSynBio II: DNA-based memory for high-density information storage and molecular cryptography with fast readout methods.

09/01/2021–8/31/2024

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 Sŭlc 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 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 .

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