Aaron Fenyes

as of December 2023

Web site https://ooo.fareycircles.ooo

Education

Ph.D. Mathematics. University of Texas at Austin, 2016.

M.S. Theoretical Physics. Perimeter Scholars International, 2010.

B.S. Mathematical Sciences and Honors Physics. University of Michigan (Ann Arbor), 2009.

Employment

Instructor at Phillips Exeter Academy, 2022–2023.

Instructor at MathILy-Er, summer 2022.

Postdoc at the Institut des Hautes Études Scientifiques, 2019 – 2022.

Postdoctoral fellow at the University of Toronto, 2016 – 2019.

Saturday Morning Math Group coordinator at UT Austin, 2014.

Mentor at Canada/USA Mathcamp, summer 2013 – 2014.

Instructor at Duke TIP (Trinity University site), summer 2012.

Papers and preprints

Preprints are marked with .

- A. Fenyes, A. Maret. "The geometry of Deroin-Tholozan representations." 2023.
  arXiv:2312.09199
- V. Fantini, A. Fenyes. "Regular singular Volterra equations on complex domains." 2023.
  arXiv:2309.00603

A. Fenyes. "Quasiperiodic prints from triply periodic blocks." In M. Damrau and M. Skrodzki (eds.), "Wooden Mathematics – Making abstraction tangible." w/k (2022).
https://between-science-and-art.com/wooden-mathematics-making-abstraction-tangible/

- A. Fenyes. "The complex geometry of the free particle, and its perturbations." 2020.
  arXiv:2008.03836
- A. Fenyes. "A dynamical perspective on shear-bend coordinates." 2018.
  arXiv:1510.05757

A. Fenyes. "Warping geometric structures and abelianizing $\mathrm{SL}_2\,\mathbb{R}$ local systems." Ph.D. thesis, 2016.
https://repositories.lib.utexas.edu/handle/2152/41629

A. Fenyes. "Limitations on cloning in classical mechanics." J. Math. Phys. 53, 012902 (2012).
doi:10.1063/1.3676295

Selected visualizations

"Who wants to be a Belyionaire?"
Work in progress with Michael Musty and Sam Schiavone
https://www.belyionaire.net/

"Quasiperiodic prints from triply periodic blocks"
German Mathematical Society Annual Conference (Mathematics and Arts minisymposium), 2021
Interactive slides at https://ooo.fareycircles.ooo/seeing/slices
Also listed under teaching talks and activities.

"Typomatic"
Used in all "(Th)ink Machine" activities and courses.
https://ooo.fareycircles.ooo/typomatic

"Visualizing neutral theory"
Harvard CMSA Interdisciplinary Science Seminar, 2021
Interactive slides at https://ooo.fareycircles.ooo/seeing/thicket
Also listed under teaching talks and activities.

"Block prints of Novikov slices"
Illustrating Mathematics, D. Davis, ed. (2020), p. 145

"Whorled"
Bridges 2018 general exhibition
http://gallery.bridgesmathart.org/exhibitions/2018-bridges-conference/vectornaut

"Pinwheel"
2015 Visualizing Science finalist, 3rd place. UT Austin College of Natural Sciences
https://cns.utexas.edu/news/visualizing-science-2015

"The Geometry of The Night Sky (or, An Ape Pointing at The Stars)"
Joint Mathematics Meetings, 2015
Notes and slides at https://ooo.fareycircles.ooo/writing.html#celestial
Also listed under teaching talks and activities.

Research talks and posters

Posters are marked with ✧. Many talk slides and all posters can be found on my web site, at

https://ooo.fareycircles.ooo/writing.html.

"Geodesic Music"
German Mathematical Society Annual Conference (Mathematics and Arts minisymposium), 2023
Slides at https://ooo.fareycircles.ooo/writing.html#geodesic-music

"New perspectives on Borel summation" (with Veronica Fantini)
IHÉS, 2023
Video at https://www.youtube.com/playlist?list=PLx5f8IelFRgGWmqB8o95POx8wUFR7-6sS

✧ "Operator ordering for quantum curves"
TR Salento, 2021
Poster at https://ooo.fareycircles.ooo/writing.html#operator-ordering

"Hyperbolic surfaces as singular flat surfaces"
IHÉS: geometric group theory seminar, 2021
Bristol Geometry & Topology seminar, 2020
University of Maryland: geometry-topology seminar, 2018
Slides at https://ooo.fareycircles.ooo/writing.html#hyp-as-flat-2021

"Pleated hyperbolic surfaces in condensed matter physics"
Heidelberg Geometry Seminar, 2021
Purdue: mathematical physics seminar, 2019
Slides at https://ooo.fareycircles.ooo/writing.html#hops

"The geometry of quantum energy levels"
ReNewQuantum internal seminar, 2020
Slides at https://ooo.fareycircles.ooo/writing.html#energy-levels

"A bumpy ride through the space of holomorphic quadratic differentials"
Simons Center: Holomorphic Differentials in Mathematics and Physics, 2019
Slides at https://ooo.fareycircles.ooo/writing.html#bumpy-ride

"Dynamical descriptions of surface group representations"
MIT: Lie theory and mathematical physics, 2017

"A reason for representation theorists to play billiards"
Perimeter Institute: math physics seminar, 2017
USC: Geometry & Topology Seminar, 2015

"Spectral networks craft hour"
JMM special session on group actions and geometric structures, 2017
Slides at https://ooo.fareycircles.ooo/writing.html#craft-hour

"Abelianizing geometric structures and other local systems"
UT Austin: thesis defense, 2016

"Not-quite-Anosov representations"
Caltech: Workshop on Surface Group Representations, 2016

"Deflating hyperbolic surfaces"
Joint Mathematics Meetings, 2016

"Wall-crossing your way around Teichmüller space"
Fields Institute: Geometric Structures Lab seminar, 2015

✧ "Potentially cluster-like coordinates from dense spectral networks"
CRM: Positive Grassmannians, 2015
Poster at https://ooo.fareycircles.ooo/writing.html#cluster-like-coordinates

"Warping structures, warping sheaves"
UT Austin candidacy talk, 2014

Teaching talks and activities

"Quasiperiodic prints from triply periodic blocks"
German Mathematical Society Annual Conference (Mathematics and Arts minisymposium), 2021
Interactive slides at https://ooo.fareycircles.ooo/seeing/slices

"(Th)ink Machine"
MathILy-Er daily gather, 2021
UT Austin Saturday Morning Math Group, 2014

"Visualizing neutral theory"
Harvard CMSA Interdisciplinary Science Seminar, 2021
Interactive slides at https://ooo.fareycircles.ooo/seeing/thicket

"The basics of homology"
Harvard CMSA Young Data Scientist Seminar, 2020
Slides at https://ooo.fareycircles.ooo/writing.html#homology-basics

"Mystery crystals"
MathILy-Er daily gather, 2020

"Almost right"
MathILy-Er daily gather, 2019

"A friendlier introduction to Feynman diagrams"
University of Toronto postdoc seminar, 2017

"An illustrated proof of the Perron-Frobenius theorem"
University of Toronto postdoc seminar, 2017
Slides at https://ooo.fareycircles.ooo/writing.html#perron-frobenius

"The Geometry of The Night Sky (or, An Ape Pointing at The Stars)"
Joint Mathematics Meetings, 2015

"A tour of singular integrable systems"
Student Geometry Seminar, 2014

"Braided Feynman diagrams for braided spaces"
Geometry & String Theory seminar, 2014

"Soundscape"
UT Austin Undergraduate Math Club, 2014

"Pseudoholomorphic curves are unexpectedly friendly"
Gromov-Witten Theory working group, 2014

"An informal introduction to two-dimensional extended TFTs"
Student seminar on Chern-Simons theory, 2014

"Farey Lace"
UT Austin Undergraduate Math Club, 2013
Notes and slides at https://ooo.fareycircles.ooo/writing.html#farey

"My Pet Field Theory"
UT Austin Undergraduate Math Club, 2012

"Start Digging! (A mathematical comedy in two acts.)"
UT Austin Saturday Morning Math Group, 2012

Notes

These unpublished expository notes can be found on my web site, at

`https://ooo.fareycircles.ooo/writing.html`.

"The Geometry of The Night Sky (or, An Ape Pointing at The Stars)"
A prose version of the talk.

"Matrix Algebras and Error-Correcting Codes"
Written as enrichment for computer science students learning linear algebra.
Has been used as a reference for a linear algebra course project.

"Classification of two-dimensional Frobenius and H^*-algebras"

"Where do alternating multilinear maps come from?"

"Relativity and Quantization"

"Farey Sets in $\mathbb{R}^n$"

Courses taught

Term		Role	Course		Program
Spring	2023	Instructor	Advanced Integrated Math	Math 310	Phillips Exeter Academy
		Instructor	Enriched Introductory Calculus	Math 411	
		Instructor	Linear Algebra	Math 640	
Winter	2023	Instructor	Advanced Integrated Math	Math 320	Phillips Exeter Academy
		Instructor	Enriched Calculus	Math 421	
Fall	2022	Instructor	Advanced Integrated Math	Math 320	Phillips Exeter Academy
		Instructor	Enriched Calculus	Math 421	
Summer	2022	Co-instructor	`(TH)INK MACHINE`		MathILy-Er
Winter	2019	Instructor	Chaos, fractals, and dynamics	MAT 335	University of Toronto
Fall	2018	Instructor	Ordinary differential equations	MAT 244	University of Toronto
Spring	2018	Instructor	Calculus II	MAT 235	University of Toronto
Fall	2017				
Spring	2017	Instructor	Calculus II	MAT 187	University of Toronto
Fall	2016	Instructor	Calculus I	MAT 186	University of Toronto
Spring	2015	TA	IBL number theory	M 328K	UT Austin
Fall	2014	Coordinator	Saturday Morning Math Group		UT Austin
Summer	2014	Co-instructor	Facing the music		Mathcamp
		Instructor	`(TH)INK MACHINE`		
		Instructor	Quantum worlds		
		Instructor	The geometry of spacetime		
		Instructor	Irrationalia		
Spring	2014	Coordinator	Saturday Morning Math Group		UT Austin
Fall	2013	Co-coordinator	Saturday Morning Math Group		UT Austin
		TA	Matrices and matrix calculations	M 340L	
Summer	2013	Instructor	Computing with everything		Mathcamp
		Instructor	`(TH)INK MACHINE`		
		Instructor	Extreme probability!		
Fall	2012	TA	Differential calculus	M 408C	UT Austin
Summer	2012	TA	Matrices and matrix calculations	M 340L	UT Austin
Summer	2012	Instructor	Physics of propulsion		Duke TIP
Spring	2012	TA	Differential equations	M 427K	UT Austin
Spring	2011	TA	Differential calculus	M 408K	UT Austin
Fall	2010	TA	Integral calculus	M 408L	UT Austin