

Chase Bednarz

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Education

2015-2019 BA in Psychology, Northwestern University

Additional coursework

2017-2018 Visiting Undergraduate Student, Harvard University

- Completed Physics 267: Higher Representations in Physics and Mathematics, a graduate research seminar on representation theory in mathematical physics.

Summer 2016 Northwestern Comparative Public Health Program in Serbia and Bosnia-Herzegovina
University of Belgrade and University of Sarajevo

- Studied public health emphasizing post-conflict mental healthcare following the Yugoslav Wars.
- Observed psychosocial interventions for post-traumatic stress in site visits to the Institute of Mental Health in Belgrade and the Sarajevo Center for Addiction Disorders.

Research experience

2017-2018 Communicator and research assistant
Department of Physics, Harvard University
Advisors: Arthur Jaffe and Adrian Ocneanu (visiting professor)

- Substantively edited and wrote exposition for a forthcoming research monograph in mathematical physics with two postdoctoral fellows.
- Coordinated graduate research seminar discussions recorded in the Bok Center for Teaching and Learning.

2015-2016 Research assistant, Foley Center for the Study of Lives
Department of Psychology, Northwestern University
Advisors: Dan McAdams and Regina Logan

- Hypothesized that individuals higher in generativity and prosocial behavior more frequently exhibit growth mindsets when discussing challenging life experiences.
- Assisted in developing a codebook for identifying implicit mindsets in narrative data from the Foley Longitudinal Study of Adulthood, a nine-year study of 150 midlife adults in the Chicago area.

Selected presentations

UPCOMING

March 2019 Bednarz, Chase (March 28 2019), “Occlusion Operads for Image Segmentation”, talk at *SYCO 3: Third Symposium on Compositional Structures*. Oxford, UK.

PAST

November 2017 Bednarz, Chase & Norledge, William (November 7, 2017), “The Mathematical Picture Language Project”, poster at *Harvard Undergraduate Research Opportunities in the Sciences*. Cambridge, MA.

November 2016 Bednarz, Chase (November 2, 2016), “Causal Set Modelling for Time-Relative Personal Identity”, talk at *Personal Identity and Public Policy Workshop*. Oxford, UK.

October 2016 Bednarz, Chase (October 23, 2016), “Towards an Experimental Philosophy of Mental Illness”, talk at *First Midwest Empirical & Theoretical Association Conference*. Urbana-Champaign, IL.

Technical skills

Interviewing: Qualitative interviewing experience in research and clinical settings.

Programming: Multilevel modeling and network analysis in R. Matrix algebra in Mathematica.

Science communication: Comfortable communicating technical ideas across disciplines.

Web design: Created lab website for the Jaffe research group in mathematical physics:

<https://mathpicture.fas.harvard.edu>.

Languages: Reading proficiency in Latin. Elementary German and Serbian/Bosnian/Croatian.

Volunteering

2016-2017 Community Outreach Co-Chair, Northwestern Community Development Corps

- Cultivated relationships between Northwestern undergraduates and volunteer sites in the Chicagoland area, supporting site leaders with transportation and logistics.
- Coordinated day of service on the Northwestern campus pairing undergraduates with elementary and middle school students in Centro Romero’s after school program for immigrant youth.

2015-2017 Nationally certified emergency medical technician (EMT)

- Graduated from Georgia EMS Academy, clinical rotations with SouthStar EMS in Augusta, GA. National registry no. E3200549.

July 2016 Refugee Aid Serbia

- Conducted essential items distribution for asylum seekers in Belgrade, Serbia, midpoint of the “Balkan Route” in the European migrant crisis. Assisted IRC interpreters.

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I am in my final year of undergrad at Northwestern and this December applied to PhD programs in biostatistics. I studied representation theory for a semester as a visiting student at Harvard's physics department in the fall term of the 2017-2018 year. Since returning to Northwestern I have pursued higher math through independent study courses and the directed reading program, while my degree is in psychology and cognitive science.

Project preferences:

1. Tobias Fritz
2. Mehrnoosh Sadrzadeh
3. David Spivak
4. Miriam Backens
5. Bartosz Milewski
6. Pieter Hofstra

I will budget out a way commit to coming to Oxford if funding is not available, but it would be of great help.



Applied Category Theory <act2019school@gmail.com>

Application of Chase Bednarz

1 message

Ezra Getzler <getzler@northwestern.edu>

Tue, Jan 29, 2019 at 8:34 PM

To: "act2019school@gmail.com" <act2019school@gmail.com>

Chase Bednarz is a student in the Weinberg College of Arts and Sciences at Northwestern. He is currently a senior, graduating in June. (He has applied to PhD programs in theoretical biostatistics for next academic year.)

He has a strong interest in applications of operads and higher category theory outside mathematics. He has attended courses at Harvard of Ocneanu, and is currently studying in a Directed Reading Program in our department, working through Marcelo Aguiar's book on Hopf algebras and their applications in category theory. I think that he would be an excellent addition to your school: in fact, it sounds made for him.

Yours sincerely, Professor Ezra Getzler

Representation theory first acquainted me with monoidal categories, and from this context I am predisposed to thinking of category theory as a tool for application. As a third year undergraduate I visited Harvard's physics department for a semester, working in a research group in mathematical physics and taking courses in the department. Adrian Ocneanu lectured in the department as a visiting professor for the same semester and his seminar series on representation theory introduced me to operads via symmetric monoidal categories.

My initial fascination with operads encouraged me to keep pursuing these subjects, and working independently for a few months I drafted a paper outlining an operadic construction for image segmentation based on visual occlusion. The paper was accepted for SYCO 2 but deferred, and I am resubmitting it to SYCO 3.

This term I am participating in our mathematics department's first directed reading program at Northwestern, working through *Monoidal Functors, Species, and Hopf Algebras* by Aguiar and Mahajan. So far, my mentor and I have studied applications of monoidal functors in the construction of combinatorial species and their product structures, and we are now applying this machinery to hyperplane arrangements beginning with the braid arrangement. Participating in Adjoint School would deepen my exposure to applied category theory, a field I hope to further immerse myself in during graduate school.