

Michael Heinz

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EDUCATION

The Ohio State University

August 2016 - May 2020

B.S. in Mathematics and Physics with Honors (double major)

Overall GPA (4.00 scale): 4.00; Major GPA: 4.00

Hilliard Davidson High School

August 2012 - June 2016

Valedictorian of Class of 2016

RESEARCH EXPERIENCE

Resummation of Divergent Series

February 2018 - May 2019, August 2019 - Present

Undergraduate Research Asst. advised by Prof. Ovidiu Costin (Mathematical Physics) Columbus, OH

- Conducting university-funded research on advanced methods for resummation of divergent series to convergent solutions that give maximum information about the behavior of the associated function when dealing with incomplete information
- Applicable to various fields including obtaining higher precision in critical expansions at low and high temperatures in statistical mechanics
- Applying a new method of resummation developed by Prof. Costin to Painlevé Equation PII
- Conference and Forum Presentations:
 - Young Mathematicians Conference August 2019
The Ohio State University
 - Denman Undergraduate Research Forum February 2019
The Ohio State University
 - Autumn Undergraduate Research Festival November 2018
The Ohio State University
- Publication:
 - M. Heinz and O. Costin, *The Binary Rational Expansion for Painlevé Equation PII*, in preparation

Hydrodynamic Fluctuations in High-Energy Nuclear Collisions

May 2019 - July 2019

Wayne State JETSCAPE REU advised by Prof. Chun Shen (High-Energy Nuclear Theory) Detroit, MI

- Conducted theoretical research funded by JETSCAPE on the smoothed particle hydrodynamics (SPH) method to solve partial differential equations for hydrodynamic fluctuations in high-energy nuclear collisions
- Wrote an open source code package in C++ with C++ 11 standard, as well as a summarizing report
- https://bitbucket.org/wayne_state_nuclear_theory/sph_solver/src/master/

Virtual Knot Invariants

June 2017 - December 2017

Knots and Graphs Research Program advised by Prof. Sergei Chmutov Columbus, OH

- Conducted university-funded cutting-edge research on multiple knot invariants for virtual knots
- Worked to develop a novel knot invariant that would expand on current knowledge and distinguish more virtual knots
- Helped develop a program to output different knot invariants for any inputted virtual knot
- <https://people.math.osu.edu/chmutov.1/wor-gr-su17/wor-gr.htm>

Exploration in Low-Energy Nuclear Theory

June 2016 - December 2016

Undergraduate Research Asst. to Prof. Robert Perry (Low-Energy Nuclear Theory) Columbus, OH

- Independently studied various problems in quantum mechanics and discussed findings with Prof. Perry
- Attended research meetings of the Low-Energy Nuclear Theory group

WORK EXPERIENCE

The Ohio State University Dept. of Mathematics Aug. 2017 - Dec. 2017, Aug. 2018 - Present
Teaching Assistant *Columbus, OH*

- Lead two bi-weekly Precalculus recitations of 30+ students each semester
- Facilitate discussion, solve problems, and address students' questions about material
- Assist students outside of recitation through tutoring and office hours
- Administer quizzes and exams throughout the semester

Colburn Hill Group November 2018 - May 2019
Contractor *Columbus, OH*

- Created AI using UiPath to scrape relevant information from health care sites and post them to databases

Math and Stats Learning Center at The Ohio State University January 2018 - May 2018
Mathematics Tutor *Columbus, OH*

- Explained Calculus and other mathematics concepts in simplified language to increase understanding
- Helped students of various ages and levels connect concepts to continuously expand knowledge
- Identified individual learning levels of different students and broke down complex problems accordingly

ACADEMIC AWARDS

- | | |
|---|---|
| · Goldstein Math Scholarship
<i>Department of Mathematics</i> | Autumn 2019
<i>The Ohio State University</i> |
| · Smith Junior Award Winner
<i>Department of Physics</i> | April 2019
<i>The Ohio State University</i> |
| · Merit Scholarship from Gordan Memorial Fund
<i>Department of Mathematics</i> | Spring 2019
<i>The Ohio State University</i> |
| · Merit Scholarship from Gordan Memorial Fund
<i>Department of Mathematics</i> | Autumn 2018
<i>The Ohio State University</i> |
| · Smith Sophomore Award Winner
<i>Department of Physics</i> | April 2018
<i>The Ohio State University</i> |
| · Honorable Mention in the Gordon Mathematics Competition
<i>Razor-Bareis-Gordon Mathematics Competition</i> | March 2018
<i>The Ohio State University</i> |
| · Merit Scholarship from George Majda Scholarship Fund
<i>Department of Mathematics</i> | Spring 2018
<i>The Ohio State University</i> |
| · Helen Cowan Book Award Winner
<i>Department of Physics</i> | April 2017
<i>The Ohio State University</i> |
| · Merit Scholarship from George Majda Scholarship Fund
<i>Department of Mathematics</i> | Autumn 2017
<i>The Ohio State University</i> |
| · Second Place in the Gordon Mathematics Competition
<i>Razor-Bareis-Gordon Mathematics Competition</i>
– awarded Goldstein Mathematics Scholarship | March 2017
<i>The Ohio State University</i> |
| · Merit Scholarship from Morris Endowment Fund
<i>Department of Mathematics</i> | Autumn 2016
<i>The Ohio State University</i> |
| · Maximus Scholarship | Autumn 2016 - Spring 2020
<i>The Ohio State University</i> |

TALKS AND PRESENTATIONS

- “Padé Approximations and their Applications” January 2019
Given for the Low-Energy Nuclear Theory group at The Ohio State University
- “Helley’s Theorem on Convex Sets” November 2016
Given in Math 5529H, Honors Combinatorics

SKILLS AND ACTIVITIES

Skills:

- Proficient: C++, Maple, Mathematica, L^AT_EX
- Familiar: Python, UiPath

Activities:

- Member of the Radical Pi Math Club at OSU August 2016 - Present
- Bassist in The Buckeye Philharmonic Orchestra August 2016 - May 2019
- Putnam Competition participant (achieved best score of 20, rank 693.5 out of 4,638) 2016, 2017