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 Undegraduate Research Festival November 2018
    The Ohio State University
- Publication:
  - M. Heinz and O. Costin, *The Binary Rational Expansion for Painlevé Equation PII*, in preperation

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

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, LaTeX
· 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