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:
  - O. Costin and M. Heinz, *Rational Approximations for Painlevé PII Solutions* 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