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 solving PDE's 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 on-the-fringe 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 Assistant to Prof. Robert Perry (Low Energy Nuclear Theory) *Columbus, OH*

- Independently studied various problems in Quantum Mechanics and discussed findings with Dr. 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 — Autumn 2019
  Department of Mathematics — *The Ohio State University*
- Smith Junior Award Winner — April 2019
  Departement 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
  Departement 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
  Departement 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 August 2016 - May 2019
· Putnam Competition participant (achieved best score of 20, rank 693.5 out of 4,638) 2016, 2017