

JOSEPH E. HIBDON, JR, PH.D.

Curriculum Vitae

Department of Mathematics
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RESEARCH INTERESTS

Theoretical and Computational Fluid Dynamics; Biological Modeling; Combustion Modeling; Dynamics and Stability of Diffusion Flames; Student Engagement in STEM; Mathematics Education; Asymptotic and Perturbation Methods; Stochastic Differential Equations; Dynamical Systems.

EDUCATION

Northwestern University Evanston, IL.
Ph.D. in Applied Mathematics April 2011
Dissertation: *Effects of Variable Transport and Diffusive-Thermal Instabilities on Diffusion Flames*
Advisor: Moshe Matalon Ph.D.

Northwestern University Evanston, IL.
M.S. in Applied Mathematics December 2005

College of the Holy Cross Worcester, MA.
B.A. in Mathematics May 2004
Minor in Chemistry

APPOINTMENTS

Northeastern Illinois University Chicago, IL.
Assistant Professor – Mathematics Department September 2013-Current

Introduction to Advanced Mathematics WIP Course

Mathematical Modeling in the Natural Sciences (Created Course)

Mathematical and Statistical Modeling (Created Course)

Business Calculus

Calculus II (Modified Course through NSF Grant)

Applied and Computational Statistics (Modified Course through NSF Grant)

Ordinary Differential Equations I

Ordinary Differential Equations II

Partial Differential Equations

Introduction to Stochastic Modeling

Special Topic in Chaos Theory and Dynamical Systems (Created Course)

Introduction to Math Physics (Physics Department)

Research Skills I and II (Biology Department)

- Graduate Advisor for MS in Applied Mathematics, Minor Advisor, SACNAS Chapter Advisor
- Co-Founder of the Mathematics Community Center and Summer EMERGE Program (Supporting student success in mathematics at NEIU)

- Master in Public Health – Helped with curriculum development.

Northeastern Illinois University Chicago, IL.
Interim Coordinator, Program Advisor-Student Center for Science Engagement February 2011-August 2013

- Supervised and coordinated the activities of the department
- Worked with diverse group of undergraduates to provide resources for improving recruitment, retention, graduation, and communication with faculty; increase diversity in STEM
- Helped develop a website and programs to provide students with career development, research programs, and scholarship searches

Northeastern Illinois University Chicago, IL.
Adjunct Professor June 2012-Current

Introduction to Mathematical Physics (Spring 2013)

Mathematical Modeling (Fall 2012)

Ordinary Differential Equations (Summer 2012)

GRE Prep Course - Lecturer

September 2011-Current

- Organized and taught material necessary for the GRE Exam
- Initiated the course

Northwestern University Evanston, IL.
Teaching Assistant

Multivariable Calculus and Vector Calculus September 2009-December 2009

- Taught recitation sections and lectured during professor absences
- Prepared and graded quizzes
- Maintained grades for the multi-section class

Engineering Analysis IV (Ordinary Differential Equations) September 2005-December 2005

- Taught during professor absences
- Coordinated TA activities for a multi-section class
- Headed computing lab sections

ACADEMIC RESEARCH EXPERIENCE

Northwestern University
 Evanston, IL.

Graduate Research Assistant March 2005-June 2011

- Conducted analytical and numerical studies of diffusion flames
- Used asymptotic techniques to determine conditions leading to flame extinction in terms of the supplied fuel and oxidizer concentrations and the state of the fresh reactants
- Modified current models to obtain better quantitative approximation to experimental data
- Predicted conditions under which a diffusion flame will become unstable using linear stability analysis

VOLUNTEER EXPERIENCE

McGaw YMCA
Project SOAR

Evanston, IL.
 August 2005-July 2008

- Mentored a disadvantaged youth one-on-one, established a strong relationship and provided a consistent role model
- Conducted and led volunteer work throughout the community of Evanston and Chicago area

SELECTED PROFESSIONAL PRESENTATIONS

- Science Immersion: Mentoring the next generation of scientists at USDA*
Chicago, IL, HACU National Conference October 26-28, 2013
- The Effect of Gravity on Flames, and the Development of Computation Models for Extinction*
San Antonio, TX, SACNAS National Conference October 3-6, 2013
- Effect of Gravity in Diffusive Thermal Instabilities of Diffusion Flames*
Boston, MA, AMS Joint Mathematics Meetings (1077-76-1864) **Invited Talk** January 4-7, 2012
- Strategies to Help Underrepresented and First Generation Students in the STEM Fields*
Boston, MA, AMS Joint Mathematics Meetings (1077-VA-1913) January 4-7, 2012
- Mechanisms of the Instabilities of Idea Diffusion Flames*
San Francisco, CA, AMS Joint Mathematics Meetings (1056-35-1442) January 13-16, 2010
- Effects of temperature-dependent transport on the characteristics of diffusion flame*
Ann Arbor, MI, US National Combustion Meeting (13I5) May 17-20, 2009
- Diffusion Flame Characteristics*
Northwestern University, Eng. Sciences and Applied Math, Student Seminar. May 15, 2009
- Understanding of Diffusion Flames*
Northwestern University, Eng. Sciences and Applied Math, Student Seminar. January 25, 2008
- Numerical Methods for Solving Multi-Scale Large Mesh Problems*
Northwestern University, Number Crunch Lunch November 25, 2006

PUBLICATIONS

- Hibdon, J. & Matalon, M. *Effect of temperature dependence of transport properties and thermal diffusion on diffusion flame characteristics.* In Preparation
- Hibdon, J. & Matalon, M. *Diffusive-Thermal instabilities of diffusion flames with and without convection.* In Preparation
- Jennifer Slate, Rachel Adler, Scott Mayle, Sudha Srinivas, Joseph Hibdon, and Hyewon Kim, *A Multidisciplinary Approach to Incorporating Computational Thinking in STEM Courses for Preservice Teachers.* In Print - 2019
- Hibdon, J. *Temperature-dependent Transport and Thermal-diffusion Effects on Diffusion Flames.* Technical Report – Northeastern Illinois University Summer 2018
- Bird, K., Oppland-Cordell, S, and Hibdon, J., *The EMERGE Summer Program: Supporting Incoming Freshmen's Success in Mathematics Development coursework.* Learning Assistance Review (TLAR). Fall

2016, Vol. 21 Issue 2, p69-84.

Srinivas, S., Acioli, P., Voglesonger, Ken, Nicholson, K., Wrinkle N., Hibdon, J., and Rutschman, D.
Retention and Student Success in STEM through a Mentoring Scholarship Program at an Urban HSI. 8th
Annual Mentoring Conference Proceedings

Effects of Variable Transport and Diffusive-Thermal Instabilities on Diffusion Flames. Northwestern
University PhD Thesis. June 2012

GRANTS

NSF - Data Science Corps (NEIU, Northwestern University, UIC, and DePaul) Co-PI – Pending (\$2 million)
NSF - SSTEM Co-PI – Pending (\$5 million)
NIH – MARC- NU STARS Renewal Co-PI – Pending (\$3.5 million)
NSF – IUSE HSI-Conference Grant Co-PI – 2018 (\$100,000)
NIH - MARC-NU STARS Co-PI - 2014-2019 (\$1.5 million)
NSF – IUSE PEERS Co-PI – 2014-2018 (\$426,738)
NSF – STEM +C Grant Co-PI – 2016-2019 (700,608)
NSF – Research Grant Senior Personal – 2015

AWARDS

NEIU Teaching Award	2016-2017
SACNAS Summer Leadership Institute	Summer 2013
Diversifying Higher Education Faculty in Illinois (DFI)	September 2006-September 2010
Honorable Mention Ford Dissertation Fellowship	May 2009
Outstanding Volunteer Award of Evanston, IL	April 2009
Alliance for Graduate Education and the Professoriate (AGEP)	September 2006-May 2007
Minority in Engineering and Applied Sciences Fellowship	September 2004-June 2005
Patriot League All Academic League Track and Field	May 2004

PROFESSIONAL ACTIVITIES

Participant

SENCER, Beloit, WI	November 2012
Illinois Partners for Diversity (Invited)	October 2012
Connecting Biodiversity Research with Curriculum (Invited) – Broadening the Human Resource with Student Participation, Field Museum, Chicago, IL	September 2012
Minority Serving Institutes (Invited) – Cyberinfrastructure Empowerment Coalition, San Diego, CA	August 2012
2012 Joint Mathematics Meeting, Boston, MA.	January 2012
2010 Joint Mathematics Meeting, San Francisco, CA.	January 2010
25th Annual Mathematical Problems in Industry, Newark, DE.	June 2009
Graduate Student Mathematic Modeling Camp, Troy, NY.	June 2009
6th U.S. National Combustion Meeting, Ann Arbor, MI.	May 2009

Conference Attendee

2013 IL-LSAMP Conference, Chicago, IL (Judge & Organizer)	February 2013
2012 SACNAS National Conference, Seattle, WA (Judge)	October 2012
2012 IL-LSAMP Conference, Chicago, IL (Judge)	February 2012
2011 SACNAS National Conference, San Jose, CA (Judge)	October 2011
2011 SACNAS Regional Meeting, Chicago, IL (Organizer)	May 2011
Diversifying Higher Education Faculty in Illinois, Chicago, IL.	November 2006 & 2007
58th Meeting of the Division of Fluid Dynamics, APS, Chicago, IL.	November 2005
Midwestern University Fluid Mechanics Retreat, Rochester, IN.	April 2005

Member

American Indian Science and Engineering Society (AISES)
 Society of Industrial and Applied Mathematics (SIAM) – *Manuscript Referee*
 American Mathematical Society (AMS)
 Mathematical Association of America (MAA)
 Society for the Advancement of Chicanos and Native Americans in Science
 (SACNAS) - *Manuscript Referee*
 SACNAS –Chapter Committee Member

TECHNICAL SKILLS

Matlab, LaTeX, Mathematica, Maple, and Microsoft Office: Word, PowerPoint, Excel, Access, and Outlook
 Knowledge of C++ and FORTRAN.

RESEARCH STUDENTS

Graduate Students

Brittany Pines - Geometry, Art, and Cultural Relevance with Computational Thinking 2018-2019
 Brando Pawling – Calculus II Research Modules 2018
 Carlos Villeda – Master Thesis (Rotating Cylinder in a Viscous Fluid)
 Alejandro Sanchez – Master Thesis and Graduate Research Assistantship Award (Effect of Radiation on Stability of Diffusion Flames.)
 Colin Mitchel – Predators, Prey, and Disease: Modeling epidemiological predator-prey dynamics using NetLogo
 Amber Gehrig – Master Project (The Effect of Treatment on Metastasized Lung Cancer: Comparison of Growth Rates)
 Ramon Vela – Master Project (KAM Phenomenon in the Rocking Block Model)

Undergraduate Students

Rhys Gunther – Honors Thesis (2019) Title TBD
 Carly Hall – Honors Thesis (2016) – Modeling Schooling of Fish
 Lily Radom - Geometry, Art, and Cultural Relevance with Computational Thinking 2018-2019
 Paul Brinkmann - Geometry, Art, and Cultural Relevance with Computational Thinking 2018-2019
 Lia Yusuf - Calculus II Research Modules 2018
 Daniel Fitch – Geometry and Scratch in Education 2017
 Itzel Ruiz - Geometry and Scratch in Education 2017
 Shane Taylor – Scratchy iOS app for geometry 2017

Robert Ringstead – Crime in Metropolitan Areas, Game Theory 2016
Michael Lau – Social Interaction in NetLogo 2016