

## DANA MATTHIESSEN

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Minnesota Center for Philosophy of Science  
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### ACADEMIC APPOINTMENTS

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2023-present      **Minnesota Center for Philosophy of Science**, Postdoctoral Associate  
2022-23            **University of Pittsburgh**, Visiting Lecturer, History and Philosophy of Science  
2021-22            **Pittsburgh Center for Philosophy of Science**, Program Assistant

### EDUCATION

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2022                **University of Pittsburgh**, PhD in History and Philosophy of Science  
                          Chair: Sandra Mitchell  
2015                **Georgetown University**, M. A. in Philosophy  
2009                **Wesleyan University**, B. A. in Philosophy

### PUBLICATIONS

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#### Invited

Forthcoming      **Understanding Phenomena Through Opaque Models: Machine Learning and Integrative Practices in Structural Biology**, in D. Rowbottom, A. Curtis-Trudel, and D. Barack (eds), *The Role of AI in Science: Epistemological and Methodological Studies*, Routledge.  
Forthcoming      **Representational Content in Minds and Models: Latent Influences and Explanatory Challenges**, in Z. Kondor & I. Danka (eds), *Representation in Ab/Use*.

Peer Reviewed

- Forthcoming      **Crystallizing Techniques: Sample Preparations, Technical Knowledge, and the Characterization of Blood Crystals, 1840-1909**, *History and Philosophy of the Life Sciences*
- 2023                **Observations, Experiments, and Arguments for Epistemic Superiority in Scientific Methodology** (w/ Nora Boyd), *Philosophy of Science* 91: 111-131
- 2022                **Empirical Techniques and the Accuracy of Scientific Representations**, *Studies in the History and Philosophy of Science, Part A*, 94: 143-157
- 2019                **The Rise of Cryptographic Metaphors in Boyle and Their Use for the Mechanical Philosophy**, *Studies in the History and Philosophy of Science, Part A*, 73: 8-21
- 2017                **Mechanistic Explanation in Systems Biology: Cellular Networks**, *British Journal for the Philosophy of Science*, 68(1): 1-25
- 2017                **Causal Concepts Guiding Model Specification in Systems Biology**, *Disputatio, Special Issue on Causality and Modeling in the Sciences*, 9(47): 499-527

Currently Under Review

**What's in a Model? Empirical Practice and the Informativeness of Scientific Representations**

Review Articles

- 2024                **History and Philosophy of Structural Biology Symposium Summary**, *Proceedings of the Seventeenth International Congress on Logic, Methodology and Philosophy of Science and Technology* (co-authors: Agnes Bolinska and Jacob Neal)
- 2016                **Review of P. Huneman (ed.), *Functions: Selection and Mechanisms***, in *History and Philosophy of the Life Sciences* 38(1): 161-164

In Preparation

“High-Throughput Biology and the Epistemology of Measurement”

“Fine-Graining Accounts of Exploratory Experimentation: Data-Intensive Methods in Particle Physics and Molecular Biology”

“Scaffolding and Entrenchment in the Historical Development of Empirical Practices”

## CONFERENCES AND TALKS

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### Conferences/Symposia Organized

- 2025 Co-Organizer, **Pragmatism and Measurement: New Directions**, University of Pittsburgh Center for Philosophy of Science
- 2024 Co-Organizer, **Measurement Across the Life Sciences: Conceptual Issues**, Philosophy of Science Association 2024 Conference
- Co-Organizer, **Measurement Across the Life Sciences: Conceptual Issues**, Society for the Philosophy of Science in Practice 2024 Conference
- 2022 Committee Member, **Institutions and the Scientific Research Agenda**, University of Pittsburgh Center for Philosophy of Science

### Invited Talks

- 2024 Panelist, **Explanation and Gravitation: Boyle, Newton, and Early Modern Science in Dialogue**, Traveling Early Modern Philosophy Organization
- 2023 **What Makes Scientific Models Informative?**, UMN History of Science, Technology, and Medicine Colloquium Series
- 2023 **Reciprocal Influence of Modeling and Experiment in the Large-Scale History of Protein Structure**, International Union of History and Philosophy of Science and Technology Symposium Series, 17<sup>th</sup> International Congress on Logic, Methodology and Philosophy of Science and Technology (CLMPST)

### Refereed Presentations

- 2024 **High-Throughput Biology and the Epistemology of Measurement**, Philosophy of Science Association
- Measurement in High-Throughput Biology: Beyond the “Objective” and “Data-Driven” Ideals**, Society for the Philosophy of Science in Practice (SPSP)
- Understanding Through Coordinated Practices: Uses of Deep Learning Algorithms in Structural Biology**, Machine Learning, Explain Yourself! Conference

- Uses of Deep Learning in Structural Biology**, Sixth Annual Scientific Understanding and Representation Conference
- 2023      **Observations, Experiments, and Arguments for Epistemic Superiority in Scientific Methodology**, Philosophy of Experiment Workshop at Stockholm University
- Pragmatic Representational Content**, Fifth Annual Scientific Understanding and Representation Conference
- 2022      **Technical Understanding and Representational Content: How Experimentation Informs the Interpretation of Models**, Fourth Annual Scientific Understanding and Representation Conference
- Empirical Techniques and the Accuracy of Scientific Representations**, American Philosophical Association Pacific Division
- 2021      **Dynamics of Modeling and Empirical Techniques in Protein Crystallography**, International Society for the History, Philosophy, and Social Studies of Biology (ISHPSSB)
- 2018      **Decoding the Secrets of Nature: Robert Boyle and Cryptographic Metaphors in Seventeenth Century Science**, History of Science Society
- Two Dogmas of Representationalism**, Society for Philosophy of Science in Practice (SPSP)
- Shaping Patterns into Structures: Protein Science and the Mobility of Data**, American Philosophical Association Pacific Division
- 2016      **Cartesian Cryptography and Norms of Scientific Explanation**, History of Philosophy of Science Conference
- Einstein and the Foundations of Geometry: A Deflationary Approach**, Irvine-Pittsburgh-Princeton Conference on the Conceptual and Mathematical Foundations of Physics
- 2015      **Mechanistic Explanation in Systems Biology: Cellular Networks**, International Society for the History, Philosophy, and Social Studies of Biology (IHPSSB)
- Causality and Underdetermination in Models of Biological Networks**, Causality and Modeling in the Sciences Conference
- Predictive Brains and Mental State Representations**, Social Minds Graduate Conference

**Analogy, Abstraction, and Symbolism in Early Rationalist Epistemology,**  
British Society for the History of Philosophy Conference

**Poster Sessions**

- 2021            **Choosing Empirical Methods: Challenging the Superiority of Manipulation-Based Inquiry** (w/ Nora Boyd), Philosophy of Science Association
- 2016            **Reconsidering Scientific Representation**, Philosophy of Science Association

**Invited Discussant**

- 2021            **Perspectivism in the Philosophy of Science**, Campus BioMedico, Rome IT
- 2015            **New Directions in Foundations of Physics**, Washington DC
- 2014            **New Directions in Foundations of Physics**, Washington DC

**ACADEMIC TEACHING**

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**Independent Instructor**

*University of Pittsburgh*

Morality and Medicine (6 sections, 2019, 2020, 2021, 2023)  
Mind and Medicine: Understanding New Technologies (3 sections, 2022)  
Race—History, Biology, Psychology, Philosophy (1 section, 2021)  
Magic, Medicine, and Science (1 section, 2018)

*Georgetown University*

Philosophy of Music (1 section, co-taught, 2015)

**Guest Speaker**

Philosophy of the Natural Sciences (University of Wisconsin-Madison, 2024)

**Teaching Assistant and Discussion Leader**

*University of Pittsburgh*

Mind and Medicine (TA/DL, 2017)  
Nature of Emotions (TA/DL, 2016)

*Georgetown University*

Intro to Logic (TA, 2014)

Intro to Ethics (TA/DL, 2014)  
Intro to Philosophy (TA/DL, 2013)  
Intro to Philosophy (TA, 2013)  
Intro to Ethics (TA, 2012)

### **Mentorship**

#### *University of Minnesota*

Academic Mentor for philosophy graduate students working in philosophy of science (2023–25)

#### *University of Pittsburgh*

Teaching Mentor for history and philosophy of science graduate students (2020–21)

#### *Georgetown University*

Logic Tutor for philosophy graduate students (2014)

### **COMPETITIVE GRANTS AND AWARDS**

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2024	Grant to Organize Workshop on Pragmatism and Measurement (\$10,000) Center for Philosophy of Science, University of Pittsburgh
2022	Wesley C. Salmon Graduate Research Award (\$500)
2021	University of Pittsburgh International Studies Fund (\$1,000)
2021	Wesley C. Salmon Graduate Research Award (\$1,000)
2018	Wesley C. Salmon Graduate Research Award (\$1,000)
2015	Georgetown Graduate School Travel Grant (\$500)

### **SERVICE/PROFESSIONAL CONTRIBUTIONS**

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#### **Reviewing and referee work**

Ongoing	Reviewer for • <i>Philosophy of Science</i> , • <i>British Journal for Philosophy of Science</i> , • <i>Studies in History and Philosophy of Science</i> , • <i>Synthese</i> , • <i>History and Philosophy of the Life Sciences</i> , • <i>Theoria</i> , • <i>European Journal for Philosophy of Science</i> , • <i>Journal for General Philosophy of Science</i>
2024	External referee for Philosophy of Race undergraduate textbook proposal
2023	Teaching peer reviewer for Prof. Mark Borrello, University of Minnesota

2014 External referee for P.-A. Braillard and C. Malaterre (eds.), *Explanation in Biology* (Springer, 2015)

### Committee and organizational work

2024 Search Committee Member, Minnesota Center for Philosophy of Science  
2024 postdoctoral appointment

2022 Co-Organizer, Pittsburgh Summer Program (PSP6) for underrepresented students in philosophy of science

2020 Volunteer, Pittsburgh Summer Program (PSP4) for underrepresented students in philosophy of science

2018-2019 Co-Organizer, Pop-up Idea Kitchen, event series aimed at fostering conversations between graduate students in sciences and humanities

2015-2022 Member, University of Pittsburgh Graduate MAP Chapter

2014-2015 Member, Georgetown University Graduate MAP Chapter

### SUMMER SCHOOLS AND WORKSHOP PARTICIPATION

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2024 Epistemological Issues of Machine Learning in Science, Dortmund University

2021 Data Science Workshop, Center for Research Computing, University of Pittsburgh (nine 3-hour sessions)

2017 American Association of Philosophy Teachers Inclusive Pedagogy Workshop, University of Pittsburgh

Georgetown Summer School on the Philosophy and Science of Active Materials, Georgetown University

2014 North American Summer School in Language, Logic, and Information, University of Maryland

### PROFESSIONAL ORGANIZATION MEMBERSHIPS

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American Philosophical Association

Philosophy of Science Association

Society for the Philosophy of Science in Practice

International Society for the History, Philosophy, and Social Studies of Biology  
Society for the History of Philosophy of Science

## **RELEVANT NON-ACADEMIC EXPERIENCE**

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- 2015-2024      Event Organizer, Pittsburgh, PA: Contact presenters, coordinate staffing, maintain organizing schedule, manage finances, promote, and run events.
- 2007-2012      Private Tutoring, Middletown, CT and New York City, NY. Tutor for high-school students in Math, Physics, Test Prep.
- 2009-2012      Central Park Tutors, Empire Edge Academic Advising, and Mosaic Tutoring, New York City and Long Island, NY. Tutor in Math, Physics, Test Prep.

## **REFERENCES**

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**Please note:** all confidential letters can be requested through the Pitt HPS department assistant  
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**Teaching: Jonathan Fuller**

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