

Alex Koo

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EDUCATION

2007-2015 **PhD**, Institute for the History and Philosophy of Science and Technology, University of Toronto
Thesis: **Mathematical Explanation in Science**
Supervisor: Professor James R. Brown

1999-2004 **Honours Bachelor of Science**, Mathematics and Philosophy, University of Toronto

AREAS OF SPECIALIZATION

Philosophy of Mathematics, Philosophy of Science

AREAS OF COMPETENCE

Logic; Early Modern Philosophy; Analytic Philosophy; Epistemology & Metaphysics;
History of Science; History of Mathematics; Science, Technology & Society

HONOURS

2015 University of Toronto Governor General's Gold Medals Dissertation Award
• Sole nominee from the Institute for the History and Philosophy of Science and Technology, University of Toronto

2015 Canadian Association for Graduate Studies Distinguished Dissertation Award
• Sole nominee from the Institute for the History and Philosophy of Science and Technology, University of Toronto

2014 University of Toronto Mississauga Teaching Assistant Excellence Award
• Shortlisted finalist

2011 Ontario Graduate Scholarship

2010 Teaching Assistant Training Program Teaching Excellence Award, University of Toronto
• Shortlisted finalist

2007-12 University of Toronto Fellowship

TEACHING EXPERIENCE

Lecturer:

- 2015-2016 Department of Philosophy, University of Toronto
- Develop and instruct five half-credit equivalents
 - Introduction to Philosophy (PHL100) – 350 students
 - Modern Symbolic Logic (PHL245) – two sessions of 350 students each
 - Philosophy of Natural Science (PHL355) – 40 students

Course Instructor:

- 2015 Critical Thinking II (YKC200)
School of Liberal Arts, Seneca College
- Developed and instructed a second year course in philosophy to 30 students
 - One three hour lecture and one office hour per week
- 2015 Belief, Truth and Knowledge (PHIL 3934)
Department of Philosophy, York University Glendon College
- Developed and instructed a third year course to 30 students
 - One three hour lecture and one office hour per week
- 2015 Critical Understanding of Research (INR300)
Interdisciplinary Studies, Seneca College
- Mentored 15 third year students on their bachelor's thesis
 - Instructed students on research, literature review, and critical analysis skills
 - One three hour seminar and one office hour per week
- 2015 Understanding Science and Technology (NAT108)
School of Liberal Arts, Seneca College
- Developed and instructed two sections of a humanities course on science and technology to 45 certificate program students per section
 - One three hour lecture and one office hour per week
 - Also employed for the same position in 2014
- 2014 Modern Symbolic Logic (PHL245H)
Department of Philosophy, University of Toronto
- Developed and instructed symbolic logic to a class of 100 students
 - One three hour lecture and one two hour extra help session per week
- 2014 Law, Ethics, and Social Responsibility (BTE620)
Information Technology Services, Seneca College York Campus
- Developed and instructed ethics of information technology to 43 third year students
 - Two 105 minute lectures and one office hour per week

Teaching Assistant: Tutorial Leader

- 2014-2015 Introduction to Philosophy (PHL105)
Department of Philosophy, University of Toronto Mississauga
- Held three weekly hour long tutorials with 30 students and office hours
 - Also employed for the same position in 2013 and 2014
- 2014 Modern Symbolic Logic (PHL245)
Department of Philosophy, University of Toronto and University of Toronto Mississauga
- Conducted optional weekly two hour tutorials for 20 students
 - Conducted exam review sessions for upwards of 60 students
 - Also employed for the same position in 2013, 2012, and 2011
- 2013 17th and 18th Century Philosophy (PHL210)
Department of Philosophy, University of Toronto
- Held two weekly hour long tutorials with 25 students and office hours
- 2011 Scientific Revolutions II (HPS211)
Institute for the History and Philosophy of Science and Technology, University of Toronto
- Held one weekly hour long tutorial with 95 students and office hours
- 2010 Introduction to History and Philosophy of Science (HPS100)
Institute for the History and Philosophy of Science and Technology, University of Toronto
- Held three weekly one hour long tutorials for 20 students and office hours
- 2009 Scientific Revolutions I (HPS210)
Institute for the History and Philosophy of Science and Technology, University of Toronto
- Held three weekly one hour long tutorials for 20 students and office hours

Teaching Assistant: Grader

- 2012 Topics in History of Mathematics from 1700 (HPS391)
Institute for the History and Philosophy of Science and Technology, University of Toronto
- 2008 Topics in History of Mathematics to 1700 (HPS390)
Institute for the History and Philosophy of Science and Technology, University of Toronto
- 2007 Scientific Revolutions I (HPS210)
Institute for the History and Philosophy of Science and Technology, University of Toronto

Guest Lectures:

- 2015 The Development of Western Thought IV: The Modern Age (HUM400)
School of Liberal Arts, Seneca College
- One hour lecture on developments of modern science in the 20th century
- 2015 Modern Symbolic Logic (PHL245)
Department of Philosophy, University of Toronto
- Two hour lecture to a class of 275 students
 - Also performed a guest lecture in 2014
- 2013 Intermediate Logic (PHL345)
Department of Philosophy, University of Toronto Mississauga
- Two one hour lectures on the definite descriptor to a class of 15
- 2011 Scientific Revolutions II (HPS211)
Institute for the History and Philosophy of Science and Technology, University of Toronto
- One hour lecture on modern foundations of mathematics to a class of 250

RESEARCH EXPERIENCE

- 2007-2014 **Doctoral Research**, University of Toronto
- Examined indispensability arguments for mathematical realism based on mathematical explanation in science
 - Synthesized some of the latest contributions both in support and against the existence of mathematical explanations
 - Advanced an account of genuine mathematical explanation in science
 - Introduced a novel example of a genuine mathematical explanation from quantum mechanics
 - Adopted a modern account of scientific explanation to analyze noncausal mathematical explanations
 - Assessed the use of inference to the best explanation to infer mathematical realism
- 2015 **Journal Peer Reviewer**
- Synthese
- 2013 **Journal Peer Reviewer**
- Studies in History and Philosophy of Science
- 2010 **Research Assistant**, Professor Anjan Chakravartty
Institute for the History and Philosophy of Science and Technology, University of Toronto
- Assisted in the research and editing of Professor Chakravartty's 'Scientific Realism' entry for the Stanford Encyclopedia of Philosophy

PUBLICATIONS

- Forthcoming Koo, A. (Forthcoming). Review: An Aristotelian Realist Philosophy of Mathematics by James Franklin. *The Mathematical Intelligencer*.
- 2014 Koo, A. (2014). Critical Notice: Sorin Bangu: The Applicability of Mathematics in Science: Indispensability and Ontology. *Metascience*, 23(2), 263-268.
- 2010 Koo, A. (2010). The Middle Road: A Response to Colyvan. *Proceedings of the Canadian Society for History and Philosophy of Mathematics*, 23, 183-191.
 - Non-peer reviewed

SUBMITTED PAPERS

- Genuine Mathematical Explanation and the Indexing Argument.
 - Submitted to the Australasian Journal of Philosophy

WORK IN PROGRESS

Inference to the Best Explanation and Mathematical Realism

CONFERENCE PRESENTATIONS

- 2011 Examining the Relationship Between Internal and External Mathematical Explanations
Canadian Mathematical Society Winter Meetings
Toronto, Canada
- 2011 Explanation or Representation: The Role of Mathematics in the Sciences
Causality and Explanation in the Sciences
Ghent, Belgium
- 2011 A Problem with the Inference to the Best Explanation for Mathematical Realism
Workshop: The Role of Mathematics in Science
Institute for the History and Philosophy of Science and Technology
Toronto, Canada
- 2010 A Challenge for the Indexing Argument Against Mathematical Realism
Philosophy of Logic, Mathematics, and Physics Graduate Conference Western University
of Ontario
London, Canada
- 2010 Indexing vs. Explanation: Breaking the Deadlock
Canadian Society for the History and Philosophy of Science Annual Meeting
Montreal, Canada

- 2010 The Middle Road to Nominalist: A Response to Colyvan
 Canadian Society for the History and Philosophy of Mathematics Annual Meeting
 Montreal, Canada
- 2009 Mathematical Explanation in Science: Arguments for Mathematical Realism
 Virginia Tech Graduate Philosophy Conference: Contemporary Philosophy of Science
 Blacksburg, USA

REFERENCES

Professor James R. Brown, Department of Philosophy, University of Toronto (thesis supervisor). Email: jrbrown@chass.utoronto.ca

Professor Mark Colyvan, Department of Philosophy, University of Sydney. Email: mark.colyvan@sydney.edu.au

Professor Joseph Berkovitz, Institute for the History and Philosophy of Science and Technology, University of Toronto. Email: joseph.berkovitz@utoronto.ca

Professor Bernard Katz, Department of Philosophy, University of Toronto (teaching mentor). Email: bernard.katz@utoronto.ca