

**AI to Assist Mathematical Reasoning:  
A Workshop**

June 12-14, 2023

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**JUNE 12, 2023 (all times EDT)**

10:00 am **Welcome**

**Petros Koumoutsakos**, Harvard University

**Motivation from the National Science Foundation**

**David Manderscheid**, Director of the Division of Mathematical Sciences

**Dilma Da Silva**, Director of the Division on Computing and  
Communication Foundations

**SESSION I**

**STATE OF THE ART OF USING AI TO ASSIST MATHEMATICAL  
REASONING**

10:20 a.m. **Overview and Grand Vision**

**Moshe Vardi**, Rice University

**Geordie Williamson**, University of Sydney

Moderated by **Brendan Hassett**, Brown University

11:30 a.m. **Case Studies: AI to Assist Mathematical Reasoning**

**François Charton**, Facebook AI Research

**Adam Wagner**, Worcester Polytechnic Institute

Moderated by **Yann LeCun**, Meta

12:45 p.m. Break

1:00 p.m. **Case Studies: Proof Verification and Checking**

**Thierry Coquand**, University of Gothenburg

**Johan Commelin**, University of Freiburg

**Greg Morrisett**, Cornell University

Moderated by **Talia Ringer**, University of Illinois Urbana-Champaign

SESSION II  
CURRENT CHALLENGES AND BARRIERS TO THE USE OF AI FOR  
MATHEMATICAL REASONING

- 2:20 p.m.    **Development of Datasets Specific to the Mathematical Sciences**  
                  **Sean Welleck**, University of Washington  
                  Moderated by **Kavitha Srinivas**, IBM Research
- 2:55 p.m.    **Wrap Up**  
                  **Petros Koumoutsakos**, Harvard University
- 3:00 p.m.    **Adjourn Day 1**
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JUNE 13, 2023 (all times EDT)

- 10:00 a.m.    **Welcome**  
                  **Petros Koumoutsakos**, Harvard University
- 10:10 a.m.    **Building an Interdisciplinary Community**  
                  **Jeremy Avigad**, Carnegie Mellon University  
                  **Alhussein Fawzi**, Google DeepMind  
                  Moderated by **Heather Macbeth**, Fordham University
- 11:10 a.m.    **The Role of Intuition and Mathematical Practice**  
                  **Ursula Martin**, University of Oxford  
                  **Stanislas Dehaene**, Collège de France  
                  Moderated by **Petros Koumoutsakos**, Harvard University
- 12:10 p.m.    Break
- 12:30 p.m.    **Concentration of Machine Learning Capabilities and Open  
Source Options**  
                  **Stella Biderman**, Booz Allen Hamilton and EleutherAI  
                  Moderated by **Terry Tao**, University of California, Los Angeles

- 1:00 p.m. **Mathematical Foundations of Machine Learning**  
**Morgane Austern**, Harvard University  
**Rebecca Willett**, the University of Chicago  
Moderated by **Terry Tao**, University of California, Los Angeles
- 2:00 p.m. **Challenges and Barriers Panel**  
**Carlo Angiuli**, Carnegie Mellon University  
**Jeremy Avigad**, Carnegie Mellon University  
**Stella Biderman**, Booz Allen Hamilton and EleutherAI  
**Ursula Martin**, University of Oxford  
Moderated by **Terry Tao**, University of California, Los Angeles
- 2:55 p.m. **Wrap Up**  
**Petros Koumoutsakos**, Harvard University
- 3:00 p.m. **Adjourn Day 2**
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**JUNE 14, 2023 (all times EDT)**

- 10:00 a.m. **Welcome**  
**Petros Koumoutsakos**, Harvard University

**SESSION III**

**TECHNICAL ADVANCES REQUIRED to expand this initiative**

- 10:10 a.m. **Research Advances in Computer Science**  
**Brigitte Pientka**, McGill University  
**Aleksandar Nanevski**, IMDEA Software Institute  
**Avraham Shinnar**, IBM Research  
Moderated by **Talia Ringer**, University of Illinois Urbana-Champaign

11:40 a.m.    **Research Advances in the Mathematical Sciences**  
**Javier Gomez-Serrano**, Brown University  
**Alex Kontorovich**, Rutgers University  
**Adam Topaz**, University of Alberta  
Moderated by **Brendan Hassett**, Brown University

1:10 p.m.    Break

**SESSION IV**  
**ROLES FOR STAKEHOLDERS IN ADVANCING**  
**AI FOR MATHEMATICAL REASONING**

1:30 p.m.    **Perspectives of Mathematical Organizations**  
**Gunnar Carlsson**, American Mathematical Society  
**Brendan Hassett**, Institute for Computational and Experimental  
Research in Mathematics  
**Dima Shlyakhtenko**, Institute for Pure and Applied Mathematics  
**Suzanne Weekes**, Society for Industrial and Applied Mathematics  
Moderated by **Heather Macbeth**, Fordham University

2:30 p.m.    **Concluding Remarks**  
**Jordan Ellenberg**, University of Wisconsin-Madison

2:50 p.m.    **Wrap Up**  
**Petros Koumoutsakos**, Harvard University

3:00 p.m.    **Adjourn Workshop**