

MICHAEL (mike) NEUDER

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📍 brooklyn, ny

EDUCATION

Harvard University <i>Master of Science, Computational Science and Engineering</i>	2020 - 2021 Cambridge, MA
University of Colorado <i>Bachelor of Arts, Computer Science & Bachelor of Arts, Mathematics</i>	2015 - 2020 Boulder, CO
University of Oxford <i>Visiting Student</i>	2018 Oxford, UK

ACADEMIC EXPERIENCE

EconCS Group, Harvard University <i>Research Assistant supervised by Dr. David C. Parkes</i>	August 2019 - August 2021 Cambridge, MA
Santa Fe Institute <i>Undergraduate Research Fellow: Summer 2018 REU</i>	June 2018 - August 2018 Santa Fe, NM
Bradley Lab, University of Colorado <i>Research Assistant supervised by Dr. Elizabeth Bradley</i>	April 2017 - August 2021 Boulder, CO
Mozer Lab, University of Colorado <i>Research Assistant supervised by Dr. Michael Mozer</i>	March 2017 - May 2019 Boulder, CO

INDUSTRY EXPERIENCE

The Ethereum Foundation <i>Researcher – Applied Research Group (ARG)</i>	March 2023 - Present New York, NY
Google <i>Software Engineer (L3 → L4) – Cloud Storage</i>	August 2020 - March 2021 (Cambridge, MA)
<i>Software Engineering Intern – Network Infrastructure</i>	Summer 2020 (remote)
<i>Software Engineering Intern – Flights</i>	Summer 2019 (Cambridge, MA)
<i>Software Engineering Intern – Mobile Device Management</i>	Fall 2018 (Sunnyvale, CA)
Lockheed Martin & LASP¹ <i>Software Engineering Intern</i>	Feb 2017 - Oct 2017 Boulder, CO

PUBLICATIONS & CORRESPONDING TALKS (REVERSE CHRONOLOGICAL)

- (1) Zhou Fan, Francisco Marmolejo-Cossio, Daniel Moroz, **Michael Neuder**, Rithvik Rao, and David C. Parkes, “Strategic Liquidity Provision in Uniswap v3,” *ACM Conference on Advances in Financial Technologies (AFT) 2023*. <https://doi.org/10.4230/LIPIcs.AFT.2023.25>.
- (2) **M. Neuder**, E. Bradley, E. Dlugokencky, J. W. C. White, J. Garland, “Detection of Local Mixing in Time Series using Permutation Entropy,” *Physical Review E* 103, 2021. <https://doi.org/10.1103/PhysRevE.103.022217>.
– [Poster Presentation](#). 2021 European Geosciences Union General Assembly. *April 13, 2021*.
- (3) **M. Neuder**, D. J. Moroz, R. Rao, D. C. Parkes, “Low-cost attacks on Ethereum 2.0 by sub-1/3 stakeholders,” *Workshop on Game Theory in Blockchain, Conference on Web and Internet Economics (WINE) 2020*. https://econcs.pku.edu.cn/wine2020/wine2020/Workshop/GTiB20_paper_8.pdf.

¹Laboratory of Atmospheric and Space Physics: <https://lasp.colorado.edu/home/>.

- [Conference talk](#). December 8, 2020.
- (4) **M. Neuder**, D. J. Moroz, R. Rao, D. C. Parkes, “Defending Against Malicious Reorgs in Tezos Proof-of-Stake,” *ACM Conference on Advances in Financial Technologies (AFT) 2020*. <https://doi.org/10.1145/3419614.3423265>.
- [Conference talk](#). October 21, 2020.
- (5) **M. Neuder**, D. J. Moroz, R. Rao, D. C. Parkes, “Selfish Behavior in the Tezos Proof-of-Stake Protocol,” *Cryptoeconomic Systems (CES) Conference 2020*. <https://arxiv.org/pdf/1912.02954.pdf>.
- [Conference talk](#). March 7, 2020.
- (6) J. Garland, T. Jones, **M. Neuder**, J. W. C. White, E. Bradley, “An information-theoretic approach to extracting climate signals from deep polar ice cores,” *Chaos: An Interdisciplinary Journal of Nonlinear Science* 29:101105 (2019). <https://doi.org/10.1063/1.5127211>.
- (7) J. Garland, T. Jones, **M. Neuder**, V. Morris, J. W. C. White, E. Bradley, “Anomaly Detection in Paleoclimate Records using Information Theory,” *Entropy* 20(12):931 (2018). <https://doi.org/10.3390/e20120931>.

AWARDS

- 2020.** *Computer Science Discovery Learning Award (University of Colorado).*
- 2019-2020.** *Sieglinde Talbott Haller Scholarship in Mathematics (University of Colorado).*
- 2019.** [link](#). *Honorable Mention: Computing Research Association Outstanding Undergraduate Researcher.*
- 2017.** [link](#). *Phi Beta Kappa (University of Colorado).*
- 2015-2020.** [link](#). *President Joseph A. Sewall Esteemed Scholar Award (University of Colorado).*
- 2015-2020.** [link](#). *Dean’s List. (University of Colorado)*

PROFESSIONAL SERVICE

- | | |
|---|------------------------------|
| link . 2023 & 2024 <i>Columbia CryptoEconomics Workshop (CCE).</i> | <i>Organizing Committee.</i> |
| link . 2024 <i>Workshop on Blockchains and Decentralized Finance (EC).</i> | <i>Program Committee.</i> |
| link . 2024 <i>The Latest in DeFi Research (TLDR) Conference.</i> | <i>Program Committee.</i> |
| link . 2024 <i>Crypto Academic Summer School at Edge City.</i> | <i>Organizing Committee.</i> |
| link . 2023 <i>dYdX MEV Committee.</i> | <i>Member.</i> |

BLOCKCHAIN ARTICLES (NON-PEER REVIEWED) (BY TOPIC)

Proof-of-Stake

Ethereum Consensus

- *Issuance Issues – Subsequent Soliloquy.* [link](#).
- *Issuance Issues – Initial Issue.* [link](#).
- *Concurrent Block Proposers in Ethereum.* [link](#).
- *Rollup-Centric Roadmap (2024 version) (mike+stokes version) (From The Vault)* [link](#).
- *A set-theoretic view of Ethereum coteries.* [link](#).
- *Time, slots, and the ordering of events in Ethereum Proof-of-Stake* [link](#).

EIP-7251 ([link](#)); Increase the MAX_EFFECTIVE_BALANCE

- *Increase the MAX_EFFECTIVE_BALANCE a modest proposal.* [link](#).
- *FAQ on EIP-7251; Increasing the MAX_EFFECTIVE_BALANCE.* [link](#).
- *Slashing penalty analysis; EIP-7251.* [link](#).
- *Validator consolidation in EIP-7251.* [link](#).

EIP-7547 ([link](#)); Inclusion Lists

- *No free lunch a new inclusion list design.* [link](#).
- *Resistance is not futile; CR in mev-boost.* [link](#).
- *Unconditional inclusion lists.* [link](#).
- *Inclusion lists: execution, consensus, & engine spec overview.* [link](#).
- *Inclusion Lists PoC Specification.* [link](#).
- *The Case for ILECTRA.* [link](#).

Liquid staking & restaking

- *Musings on “two-tiered” staking, a native Liquid Staking Token design..*
- *Magnitude and direction of Lido attack vectors .*
- *The Risks of LRTs.*

[link.](#)
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Maximal Extractable Value (MEV)

Relays

- *Optimistic Relay Proposal.*
- *Towards enshrined PBS an optimistic roadmap.*
- *An optimistic weekend.*
- *Optimistic relays and where to find them.*
- *Bid cancellations considered harmful.*

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Enshrined Proposer-Builder Separation (ePBS)

- *Equivocation attacks in mev-boost and ePBS.*
- *Why enshrine Proposer-Builder Separation? A viable path to ePBS.*
- *Payload-timeliness committee (PTC) an ePBS design.*
- *ePBS the infinite buffet.*
- *Relays in a post-ePBS world.*
- *Consider the ePBS.*

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Miscellanea

- *Dr. Changestuff or: how i learned to stop worrying and love mev-burn.*
- *Timing Games: Implications and Possible Mitigations.*
- *Execution Tickets.*

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BLOCKCHAIN PRESENTATIONS, PANELS, & PODCASTS

Presentations

- *Is restaking the new staking?* – CBER Forum Annual Conference. May 2024.
- *State of the Ethereum Union (1/N perspective)* – ETHBoston. April 2024.
- *No Free Lunch* – Columbia CryptoEconomics Working Session. December 2023.
- *Enshrining PBS* – Center for Digital Finance & Technologies. December 2023.
- *Why it’s hard to enshrine PBS* – Archetype MEV Lunch. November 2023.
- *Reorgs in PoS* – MEV Roast; Reorg Edition. August 2021.

[slides.](#)
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ETHDenver (March 2024)

- *Execution Tickets* – Beyond the Block (Titan Builder & Hashkey Capital).
- *The Risks of LRTs* – Research Day (SevenX Ventures).

[recording.](#) [slides.](#)
[recording.](#) [slides.](#)

DevConnect (November 2023)

- *Increase the MAX_EFFECTIVE_BALANCE* – EthStaker Staking Gathering.
- *A set theoretic view of Ethereum coteries* – LidoConnect.

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EthCC (Community Conference) (July 2023)

- *Towards Enshrined Proposer-Builder Separation* – EthCC main event.
- *Ethereum PBS R&D Roadmap* – Modular Summit.
- *Increase the MAX_EFFECTIVE_BALANCE* – Kiln Rendez-vous.

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Panels

- *Decentralization Panel* – Espresson Beyond the Baselayer. March 2024.
- *Decentralize or Bust* – bloXroute & ETHStaker. March 2024.
- *Alignment Panel* – EignenLayer Restaking Summit. November 2023.
- *PBS & Beyond* – MEVDay Paris. July 2023.

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Podcasts

- *ETH Insights: Discussing MaxEB* – Coinbase Webinar. April 2024.
- *PeepAnEIP:EIP-7547* – Ethereum Cat Herders. April 2024.
- *Endgame 2.0: A Guide to Vitaliks Ethereum Roadmap* – Bankless. February 2024.
- *Were Pretty Sure Mike and Max Can Fix MEV* – The Gwart Show. February 2024.

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- *PeepAnEIP: EIP-7251* – Ethereum Cat Herders. February 2024.
- *Eigenlayer In 2024 With CEO Sreeram Kannan (co-host)* – Bankless. December 2023.
- *An Incomplete Guide to PBS* – Uncommon Core 2. September 2023.

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OPEN SOURCE CONTRIBUTIONS

EIP-7547: Inclusion Lists (python)

- [link](#). *EIP (Ethereum Improvement Proposal)*.
- [link](#). *Spec Overview (Consensus, Execution, and Engine API specifications)*.
- [link](#). *Proof-of-Concept Specification*.
- [link](#). *Compilation of Related Work*.

EIP-7251: Increase the MAX_EFFECTIVE_BALANCE (python)

- [link](#). *EIP (Ethereum Improvement Proposal)*.
- [link](#). *Minimal Spec Change (Consensus specifications)*.
- [link](#). *Compilation of Related Work*.

MEV-boost Relay: Optimistic Processing (golang)

- *Main pull requests & design documentation: [First](#), [Second](#), [Third \(final & merged\)](#).*
- [link](#). *Header-only parsing optimization*.
- [link](#). *Pull request list*.
- [link](#). *Proposal*.
- [link](#). *Builder Onboarding*.

Erigon (Ethereum Execution Layer Client) (golang)

- [link](#). *Refactored req/resp domain network encoding*.
- [link](#). *Consensus spec implementation*.
- [link](#). *Pull request list*.

Prysm (Ethereum Consensus Layer Client) (golang)

- [link](#). *Keymanager code-health refactor*.
- [link](#). *Pull request list*.

STRUMPACK (High-performance matrix math package) (C++)

- [link](#). *Mixed-precision (float64 & float32) iterative refinement*.
- [link](#). *Pull request list*.
- [link](#). *Write-up*.

OptRBC (Optimal solutions in 2D Rayleigh-Benard Convection.) (FORTAN)

- [link](#). *Multiprocessor implementation using [openmp](#)*.
- [link](#). *Write-up*.

Image quality convolutional neural networks. (python)

- [link](#). *Write-up*.
- [link](#). *Example network*.

MISCELLANEA: FUN WRITING & SOFTWARE

Writing

- [link](#). *Tattoo probabilistic analysis*.
- [link](#). *Solo-staking rig*.
- [link](#). *NBA draft probabilistic analysis*.
- [link](#). *Shakespeare Zipf-ian analysis*.

Software

- [link](#). *Monte Carlo numerical demonstrations. (python)*
- [link](#). *Connect Four PyQT application. (python)*
- [link](#). *Terminal implementation of games. (perl)*
- [link](#). *Rubik's cube solver. (C++)*