The Robust Incentives Group is an Ethereum Foundation research team dedicated to the study of protocol mechanisms with the lens of game theory, mechanism design, crypto-economics, formal methods and data science.

Looking to expand your credentials and participate in Ethereum research?

Check out our current RIG Open Problems (ROPs)!

Watch all Columbia Cryptoeconomics workshop (CCE) 2023 videos, for the latest academic and industry research on cryptoeconomics.

Watch all ETHconomics 2videos, a research gathering at Devconnect for all things Ethereum cryptoeconomics! Subscribe to our Robust communications, and receive a ~monthly summary of what we've been up to! **Posts** All posts By tag Filter Sort Title **Authors** Tags Date published Link Electra: Issuance Curve Adjustment Proposal Caspar Schwarz-Schilling **Ansgar Dietrichs Protocol Development** Game Theory / Econ February 22, 2024 ethereum-magicians.org/t/e.../18825 **Endgame Staking Economics: A Case for Targeting** Caspar Schwarz-Schilling **Ansgar Dietrichs** Protocol Development Game Theory / Econ February 22, 2024 ethresear.ch/t/e.../18751

Semantics of Staking 3: Advanced constructions

Barnabé Monnot

Game Theory / Econ

Protocol Development

February 22, 2024

mirror.xyz/bar...Wv8VQo

| Unbundling staking: Towards rainbow staking   |
|---|
| Barnabé Monnot  |
| Consensus   |
| Protocol Development  |
| February 15, 2024   |
| ethresear.ch/t/uarnabe  |
| The price is right: Realigning builder-proposer incentives with predictive MEV-burn |
| Thomas Thiery   |
| MEV   |
| Proposer-Builder Separation   |
| February 12, 2024   |
| ethresear.ch/t/t/18656  |
| Properties of issuance level (part 1)   |
| A   |
| Anders  |
| Game Theory / Econ  |
| Protocol Development  |
| January 9, 2024   |
| notes.ethereum.org/@anlqjo 6  |
| Semantics of Staking 2: Re-staking  |
| Barnabé Monnot  |
| Game Theory / Econ  |
| Protocol Development  |
| January 4, 2024   |
| mirror.xyz/barb40o50  |
| Timing Games: Implications and Possible Mitigations                                 |
| Caspar Schwarz-Schilling  |
| Michael Neuder  |
| Consensus   |
| MEV   |
| December 5, 2023  |
| ethresear.ch/t/t/17612  |
| Semantics of Staking 1: Liquefaction  |
| Barnabé Monnot  |
| Game Theory / Econ  |
| Protocol Development  |
| November 28, 2023   |

mirror.xyz/bar...VAzAL4 MEV burn: Incentivizing earlier bidding in "a simple design" Α Anders Proposer-Builder Separation MEV November 11, 2023 ethresear.ch/t/m.../17389 The Costs of Censorship: A Modeling and Simulation Approach to Inclusion Lists **Thomas Thiery Protocol Development** Game Theory / Econ Simulations November 10, 2023 ethresear.ch/t/t.../17382 Minimum Viable Issuance Α **Anders** Game Theory / Econ **Protocol Development** October 7, 2023 notes.ethereum.org/@an...suance Fun and games with inclusion lists Barnabé Monnot Game Theory / Econ Proposer-Builder Separation September 6, 2023 ethresear.ch/t/f...arnabe Rollups are Real — Rollup Economics 2.0 D **Davide Crapis** Scaling / Rollups Game Theory / Econ August 13, 2023 davidecrapis.notion.site/Rol...a5a3de Empirical analysis of Builders' Behavioral Profiles (BBPs)

**Thomas Thiery** 

| MEV   |
|---|
| Data  |
| Proposer-Builder Separation                       |
| August 10, 2023                                   |
| ethresear.ch/t/e/16327                            |
| PEPC FAQ  |
| Barnabé Monnot                                    |
| MEV   |
| Protocol Development                              |
| Proposer-Builder Separation                       |
| August 3, 2023                                    |
| efdn.notion.site/PEP?pvs=4                        |
| Game-theoretic Model for MEV-Boost Auctions (MMA) |
| Thomas Thiery                                     |
| MEV   |
| Game Theory / Econ                                |
| Simulations                                       |
| July 27, 2023                                     |
| ethresear.ch/t/g/16206                            |
| Latency in Blockchains and Ethereum L2 Migration  |
| D   |
| Davide Crapis                                     |
| Game Theory / Econ                                |
| Resource Pricing                                  |
| Scaling / Rollups                                 |
| July 21, 2023                                     |
| davidecrapis.notion.site/Latb14ed3                |
| Cascading Network Effects on Ethereum's Finality  |
| Thomas Thiery                                     |
| Consensus   |
| Data  |
| June 13, 2023                                     |
| ethresear.ch/t/c/15871                            |
| Bid cancellations considered harmful              |
| Thomas Thiery                                     |
| Proposer-Builder Separation                       |
| MEV   |

| Data   |
|--|
| May 5, 2023  |
| ethresear.ch/t/b/15500                                       |
| Seeing Like a Protocol                                       |
| Barnabé Monnot   |
| Protocol Development   |
| MEV  |
| April 10, 2023   |
| barnabe.substack.com/p/sotocol                               |
| Estimating inclusion delays for censored transactions        |
| Thomas Thiery  |
| Proposer-Builder Separation                                  |
| Data   |
| March 22, 2023   |
| ethresear.ch/t/e/15115                                       |
| MEV Resilient Ethereum                                       |
| D  |
| Davide Crapis  |
| MEV  |
| Protocol Development   |
| Proposer-Builder Separation                                  |
| Data   |
| March 20, 2023   |
| notes.ethereum.org/@RMcq8Co                                  |
| EIP-4844 Fee Market Analysis                                 |
| D  |
| Davide Crapis  |
| Resource Pricing   |
| March 16, 2023   |
| ethresear.ch/t/e/15078                                       |
| Latency arms race concerns in blockspace markets             |
| D  |
| Davide Crapis  |
| MEV  |
| March 3, 2023  |
| ethresear.ch/t/I/14957                                       |
| Approximating User Welfare and Surplus with Transaction Data |

| D   |
|---|
| Davide Crapis   |
| Game Theory / Econ  |
| Resource Pricing  |
| Data  |
| February 6, 2023  |
| ethresear.ch/t/a/14766  |
| Guide to Ethereum Economics: Introduction                       |
| D   |
| Davide Crapis   |
| Game Theory / Econ  |
| Protocol Development  |
| January 12, 2023  |
| medium.com/@dc873d09  |
| Block vs. Slot Auction PBS                                      |
| J   |
| Julian  |
| Proposer-Builder Separation                                     |
| December 14, 2022   |
| mirror.xyz/0x09GXBrQ  |
| Notes on Proposer-Builder Separation                            |
| Barnabé Monnot  |
| Proposer-Builder Separation                                     |
| MEV   |
| Protocol Development  |
| November 8, 2022  |
| barnabe.substack.com/p/pbs                                      |
| Structuring Blockspace Derivatives                              |
| J   |
| Julian  |
| Resource Pricing  |
| Game Theory / Econ  |
| October 21, 2022  |
| mirror.xyz/0x0dHNKs   |
| Next-Block Base Fee Options: Towards a Practical Implementation |
| J   |
| Julian  |

| Resource Pricing  |
|---|
| Game Theory / Econ  |
| October 21, 2022  |
| mirror.xyz/0x0Q89aFc  |
| Timing games in Proof-of-Stake  |
| Barnabé Monnot  |
| Consensus   |
| Game Theory / Econ  |
| October 20, 2022  |
| ethresear.ch/t/t/13980  |
| Unbundling PBS: Towards protocol-enforced proposer commitments (PEPC) |
| Barnabé Monnot  |
| Proposer-Builder Separation   |
| MEV   |
| October 8, 2022   |
| ethresear.ch/t/uarnabe  |
| Visualising the 7-block reorg on the Ethereum beacon chain            |
| Barnabé Monnot  |
| Consensus   |
| Data  |
| May 29, 2022  |
| barnabe.substack.com/p/preorg   |
| Understanding rollup economics from first principles                  |
| Barnabé Monnot  |
| Resource Pricing  |
| Scaling / Rollups   |
| February 24, 2022   |
| barnabe.substack.com/p/us-from  |
| Change fork choice rule to mitigate balancing and reorging attacks    |
| Caspar Schwarz-Schilling  |
| Francesco D'Amato   |
| С   |
| Carl Beekhuizen   |
| Consensus   |
| October 28, 2021  |
| ethresear.ch/t/c/11127  |
| beaconrunner: Agent-based simulations of Proof-of-Stake Ethereum      |

| Barnabé Monnot                                  |
|---|
| Consensus                                       |
| Simulations                                     |
| June 1, 2021                                    |
| ethereum.github.io/beaunner/                    |
| abm1559: Agent-based simulations of EIP 1559    |
| Barnabé Monnot                                  |
| Resource Pricing                                |
| Simulations                                     |
| Game Theory / Econ                              |
| June 1, 2021                                    |
| ethereum.github.io/abm1559/                     |
| A data-driven view of the beacon chain incident |
| Barnabé Monnot                                  |
| Consensus                                       |
| Data  |
| April 30, 2021                                  |
| barnabe.substack.com/p/abeacon                  |
| The road to Ethereum                            |
| Barnabé Monnot                                  |
| Consensus                                       |
| Scaling / Rollups                               |
| April 20, 2021                                  |
| barnabe.substack.com/p/eth2                     |
| Better bidding with eip1559                     |
| Barnabé Monnot                                  |
| Resource Pricing                                |
| March 5, 2021                                   |
| barnabe.substack.com/p/bip1559                  |
| Understanding fees in eip1559                   |
| Barnabé Monnot                                  |
| Resource Pricing                                |
| February 26, 2021                               |
| barnabe.substack.com/p/uip1559                  |
| Congestion control and eip1559                  |
| Barnabé Monnot                                  |
| Resource Pricing                                |

| February 17, 2021   |
|---|
| barnabe.substack.com/p/cip1559  |
| EIP 1559 simulations  |
| Barnabé Monnot  |
| Resource Pricing  |
| April 15, 2020  |
| ethresear.ch/t/es/7280  |
| Papers  |
| Open item for links to papers.  |
| Gallery   |
| Filter  |
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| Drag image to repositionRepositionStrategic Bidding Wars in On-chain AuctionsFei Wu,@Thomas Thiery, Stefanos Leonardos, Carmine VentreMEVGame TheoryDataSimulations2023   |
| Drag image to repositionRepositionCooperative AI via Decentralized Commitment DevicesXinyuan Sun,@Davide Crapis, Matt Stephenson,@Barnabé Monnot,@Thomas Thiery, Jonathan Passerat-PalmbachGame TheoryAIMEV2023MASEC workshop@ NeurIPS 2023                               |
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| Drag image to repositionRepositionOptimal Dynamic Fees for Blockchain Resources@Davide Crapis, Ciamac C. Moallemi, Shouqiao WangResource PricingSimulationsData2023   |
| Drag image to repositionAgent-Based Modelling of Ethereum ConsensusBenjamin Kraner, Nicolò Vallarano, Claudio J. Tessone,@Caspar Schwarz-SchillingConsensusSimulations2023IEEE ICBC 2023  |
| Drag image to repositionRepositionTime is Money: Strategic Timing Games in Proof-of-Stake Protocols@Caspar Schwarz-Schilling, Fahad Saleh,@Thomas Thiery, Jennifer Pan, Nihar Shah,@Barnabé MonnotConsensusGame TheoryMEVData2023AFT 2023                                 |
| Drag image to repositionRepositionOptimality Despite Chaos in Fee MarketsStefanos Leonardos, Daniël Reijsbergen,@Barnabé Monnot, Georgios PiliourasResource Pricing2022FC 2023  |
| Drag image to repositionRepositionThree Attacks on Proof-of-Stake Ethereum@Caspar Schwarz-Schilling, Joachim Neu,@Barnabé Monnot, Aditya Asgaonkar, Ertem Nusret Tas, David TseConsensusMEV2021FC 2022  |
| Drag image to repositionRepositionTransaction Fees on a Honeymoon: Ethereum's EIP-1559 One Month LaterDaniël Reijsbergen, Shyam Sridhar,@Barnabé Monnot, Stefanos Leonardos, Stratis Skoulakis, Georgios PiliourasResource PricingSimulationsData2021IEEE Blockchain 2021 |
| Drag image to repositionRepositionDynamical Analysis of the EIP-1559 Ethereum Fee MarketStefanos Leonardos,@Barnabé Monnot, Daniël Reijsbergen, Stratis Skoulakis, Georgios PiliourasResource PricingSimulations2021AFT 2021  |
| Talks   |
| Open item for videos and slides.  |
| Table   |
| Filter  |
| Sort  |
| Name  |
| Speaker   |

Location

## Date **ASSA Annual Meeting 2024** Caspar Schwarz-Schilling San Antonio, Texas, USA January 5, 2024 Columbia Cryptoeconomics workshop (CCE) 2023 Caspar Schwarz-Schilling **Davide Crapis Thomas Thiery** Columbia University, New York, US December 6, 2023 → December 8, 2023 **Devconnect Istanbul** D **Davide Crapis** Barnabé Monnot Istanbul November 13, 2023 → November 18, 2023 Scaling Ethereum: Rollup Economics Barnabé Monnot **CBER Forum Webinar** November 2, 2023 PBS ME(V)etup J Julian Amsterdam, the Netherlands October 25, 2023 AFT '24: Time is Money: Strategic Timing Games in PoS Protocols Caspar Schwarz-Schilling Princeton University, Princeton, USA October 23, 2023 The Blockspace Expo Barnabé Monnot

Protocol Berg, Berlin

September 15, 2023

**SBC'23** 

Barnabé Monnot

| Caspar Schwarz-Schilling   |
|--|
| D  |
| Davide Crapis  |
| J  |
| Julian   |
| Stanford, Palo Alto, US  |
| August 28, 2023 → August 31, 2023  |
| EthCC[6]   |
| Barnabé Monnot   |
| Caspar Schwarz-Schilling   |
| Thomas Thiery  |
| Paris, France  |
| July 17, 2023  |
| Aligning like a protocol   |
| Barnabé Monnot   |
| <u>crediblecommitments.wtf</u>   |
| May 31, 2023   |
| 3 reasons why the 'MEV Problem' is a Protocol Designer's Dream/Nightmare   |
|  |
| J  |
| J<br>Julian  |
|  |
| Julian   |
| Julian ETHDam BloXroute event  |
| Julian ETHDam BloXroute event May 20, 2023   |
| Julian ETHDam BloXroute event May 20, 2023 MEV 2.0 - Order Flow Auctions & Privacy   |
| Julian ETHDam BloXroute event May 20, 2023  MEV 2.0 - Order Flow Auctions & Privacy Barnabé Monnot   |
| Julian ETHDam BloXroute event May 20, 2023 MEV 2.0 - Order Flow Auctions & Privacy Barnabé Monnot Bell Curve Podcast   |
| Julian ETHDam BloXroute event May 20, 2023  MEV 2.0 - Order Flow Auctions & Privacy Barnabé Monnot Bell Curve Podcast May 16, 2023   |
| Julian ETHDam BloXroute event May 20, 2023 MEV 2.0 - Order Flow Auctions & Privacy Barnabé Monnot Bell Curve Podcast May 16, 2023 Ethereum: Designing the Infinite Economic Machine  |
| Julian ETHDam BloXroute event May 20, 2023 MEV 2.0 - Order Flow Auctions & Privacy Barnabé Monnot Bell Curve Podcast May 16, 2023 Ethereum: Designing the Infinite Economic Machine Barnabé Monnot   |
| Julian ETHDam BloXroute event May 20, 2023 MEV 2.0 - Order Flow Auctions & Privacy Barnabé Monnot Bell Curve Podcast May 16, 2023 Ethereum: Designing the Infinite Economic Machine Barnabé Monnot NYU Stern   |
| Julian ETHDam BloXroute event May 20, 2023 MEV 2.0 - Order Flow Auctions & Privacy Barnabé Monnot Bell Curve Podcast May 16, 2023 Ethereum: Designing the Infinite Economic Machine Barnabé Monnot NYU Stern April 21, 2023  |
| Julian ETHDam BloXroute event May 20, 2023 MEV 2.0 - Order Flow Auctions & Privacy Barnabé Monnot Bell Curve Podcast May 16, 2023 Ethereum: Designing the Infinite Economic Machine Barnabé Monnot NYU Stern April 21, 2023 Blockchain Mechanism Design                            |
| Julian  ETHDam BloXroute event  May 20, 2023  MEV 2.0 - Order Flow Auctions & Privacy  Barnabé Monnot  Bell Curve Podcast  May 16, 2023  Ethereum: Designing the Infinite Economic Machine  Barnabé Monnot  NYU Stern  April 21, 2023  Blockchain Mechanism Design  Barnabé Monnot |
| Julian ETHDam BloXroute event May 20, 2023 MEV 2.0 - Order Flow Auctions & Privacy Barnabé Monnot Bell Curve Podcast May 16, 2023 Ethereum: Designing the Infinite Economic Machine Barnabé Monnot NYU Stern April 21, 2023 Blockchain Mechanism Design Barnabé Monnot D           |

ROP-5 Ethereum Supply Network Health

| Thomas Thiery                                |
|--|
| Online                                       |
| April 5, 2023                                |
| Fireside Chat: ETHconomics meets MEVconomics |
| D  |
| Davide Crapis                                |
| Barnabé Monnot                               |
| mevconomics.wtf                              |
| March 24, 2023                               |
| (Re-)Drawing Ethereum economics              |
| Barnabé Monnot                               |
| Ethereum Engineering Group                   |
| March 22, 2023                               |
| MEV Resilient Ethereum                       |
| D  |
| Davide Crapis                                |
| ETHDenver                                    |
| March 4, 2023                                |
| Time in Ethereum                             |
| Caspar Schwarz-Schilling                     |
| Berlin Ethereum Meetup                       |
| February 23, 2023                            |
| Economic Organisation of Block-Building      |
| Barnabé Monnot                               |
| Berlin Ethereum Meetup                       |
| February 23, 2023                            |
| <u>ETHconomics</u>                           |
| D  |
| Davide Crapis                                |
| Web3 London Hub                              |
| February 22, 2023                            |
| Economic Organisation of Block Building      |
| Barnabé Monnot                               |
| IC3 Winter Retreat                           |
| January 16, 2023                             |
| Proposer-Builder Separation — PeepAnEIP      |
| Barnabé Monnot                               |

| PeepAnEIP   |
|---|
| December 19, 2022   |
| Economic Organisation in the Ethereum Protocol  |
| Barnabé Monnot  |
| Columbia University   |
| December 5, 2022  |
| Columbia Cryptoeconomics workshop (CCE) 2022  |
| Barnabé Monnot  |
| J   |
| Julian  |
| Columbia University, New York, US   |
| December 1, 2022 → December 3, 2022   |
| Alt View Ep #1: Yaoqi Jia speaks to Barnabé Monnot, Ethereum Foundation on the Layer2 ecosystem |
| Barnabé Monnot  |
| AltView   |
| October 31, 2022  |
| Ethereum gas market & How gas really works  |
| J   |
| Julian  |
| ETHVietnam (Online)   |
| October 24, 2022  |
| Time in Ethereum (Devcon)   |
| Caspar Schwarz-Schilling  |
| Devcon 6  |
| October 12, 2022  |
| Updates on Proposer-Builder Separation  |
| Barnabé Monnot  |
| Devcon 6  |
| October 11, 2022  |
| ELI5 Cryptoeconomics  |
| J   |
| Julian  |
| Devcon 6  |
| October 11, 2022  |
| Making sense of rollup economics  |
| Barnabé Monnot  |
| EthCC[5]  |

July 20, 2022

Ethereum: Consensus, The Merge & Governance

Caspar Schwarz-Schilling

University of Zurich, Blockchain Summer School

July 18, 2022

Modelling blockchain protocols: Consensus and fee markets

Barnabé Monnot

**SMGT Erice** 

May 14, 2022

Let me in! Let me IIINNNN! A longitudinal study of the transaction supply chain from CryptoKitties to MEV-Boost to PBS

Barnabé Monnot

mev.day

April 22, 2022

Notes on Ethereum's circulating supply equilibrium and the prospect of perpetual deflation via minimum viable issuance under proof of stake

Α

Anders

**ETHconomics** 

April 21, 2022

**ETHconomics** 

Α

Anders

Barnabé Monnot

Caspar Schwarz-Schilling

**ETHconomics** 

April 21, 2022

Three Attacks on PoS Ethereum

Caspar Schwarz-Schilling

FC 2022

April 19, 2022

Proposer-Builder Separation (PBS)

Barnabé Monnot

Protocol R&D Workshop @ Devconnect

April 19, 2022

Robust incentives testing at the Robust Incentives Group

Barnabé Monnot

Workshop on Incentive Mechanism Validation (WIMV)@ Devconnect

April 18, 2022

## The road to Ethereum (2022 version) Barnabé Monnot SUTD Guest Lecture April 11, 2022 **Protocol Cryptoeconomics** Barnabé Monnot NTU Blockchain workshop December 20, 2021 **Economics of EIP-1559** Barnabé Monnot Berlin Ethereum Meetup November 4, 2021 The Game of Reorgs in PoS Ethereum Caspar Schwarz-Schilling LisCon 2021 October 20, 2021 Employing a reinforcement learning-based framework to analyze incentive mechanism attacks on Ethereum blockchain **EDCON 2021** August 28, 2021 Post-London EIP-1559 Assessment Barnabé Monnot EIP-1559 breakout call #12 August 13, 2021 Protocol cryptoeconomics with the RIG Barnabé Monnot EthCC[4] July 20, 2021 Ethereum: Un protocole en mutation Barnabé Monnot EthCC[4] July 20, 2021 PEEPanEIP #37: EIP-1559: Fee market change with Tim Beiko, Barnabé Monnot, Micah Zoltu Barnabé Monnot **Ethereum Cat Herders** June 21, 2021 The road to Ethereum Barnabé Monnot

## SUTD

April 9, 2021

## En route pour eip1559

Barnabé Monnot

Ethereum France, in French

November 10, 2020

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