

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 2](#) videos, 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!

ALT

Posts

All posts

By tag

Filter

Sort

Title

Authors

Tags

Date published

Link

[Initial Analysis of Stake Distribution](#)

J

Julian

Game Theory / Econ

Consensus

March 15, 2024

[ethresear.ch/t/i.../19014](#)

[The Internet of Agents](#)

D

Davide Crapis

Crypto x AI

March 11, 2024

[davidecrapis.notion.site/The...cfd6af](#)

[Economic Analysis of Execution Tickets](#)

D

Davide Crapis

Proposer-Builder Separation

Protocol Development

Game Theory / Econ

March 7, 2024

[ethresear.ch/t/e.../18894](https://ethresear.ch/t/e.../18894)

[Reconsidering the market structure of PBS](#)

Barnabé Monnot

Proposer-Builder Separation

March 1, 2024

[mirror.xyz/bar...3mnCOg](https://mirror.xyz/bar...3mnCOg)

[The more, the less censored: Introducing committee-enforced inclusion sets \(COMIS\) on Ethereum](#)

Thomas Thiery

Barnabé Monnot

Francesco D'Amato

Consensus

Protocol Development

February 29, 2024

[ethresear.ch/t/t.../18835](https://ethresear.ch/t/t.../18835)

[Electra: Issuance Curve Adjustment Proposal](#)

Caspar Schwarz-Schilling

Ansgar Dietrichs

Protocol Development

Game Theory / Econ

February 22, 2024

[ethereum-magicians.org/t/e.../18825](https://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](https://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](https://mirror.xyz/bar...Wv8VQo)

[Unbundling staking: Towards rainbow staking](#)

Barnabé Monnot

Consensus

Protocol Development

February 15, 2024

[ethresear.ch/t/u...arnabe](https://ethresear.ch/t/u...arnabe)

[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](https://ethresear.ch/t/t.../18656)

[Properties of issuance level \(part 1\)](#)

A

Anders

Game Theory / Econ

Protocol Development

January 9, 2024

[notes.ethereum.org/@an...lqjo\\_6](https://notes.ethereum.org/@an...lqjo_6)

[Semantics of Staking 2: Re-staking](#)

Barnabé Monnot

Game Theory / Econ

Protocol Development

January 4, 2024

[mirror.xyz/bar...b40o50](https://mirror.xyz/bar...b40o50)

[Timing Games: Implications and Possible Mitigations](#)

Caspar Schwarz-Schilling

Michael Neuder

Consensus

MEV

December 5, 2023

[ethresear.ch/t/t.../17612](https://ethresear.ch/t/t.../17612)

[Semantics of Staking 1: Liquefaction](#)

Barnabé Monnot

Game Theory / Econ

Protocol Development

November 28, 2023

[mirror.xyz/bar...VAzAL4](https://mirror.xyz/bar...VAzAL4)

[MEV burn: Incentivizing earlier bidding in “a simple design”](#)

A

Anders

Proposer-Builder Separation

MEV

November 11, 2023

[ethresear.ch/t/m.../17389](https://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](https://ethresear.ch/t/t.../17382)

[Minimum Viable Issuance](#)

A

Anders

Game Theory / Econ

Protocol Development

October 7, 2023

[notes.ethereum.org/@an...suance](https://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](https://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](https://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](https://ethresear.ch/t/e.../16327)

[PEPC FAQ](#)

Barnabé Monnot

MEV

Protocol Development

Proposer-Builder Separation

August 3, 2023

[efdn.notion.site/PEP...?pvs=4](https://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](https://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/Lat...b14ed3](https://davidecrapis.notion.site/Lat...b14ed3)

[Cascading Network Effects on Ethereum's Finality](#)

Thomas Thiery

Consensus

Data

June 13, 2023

[ethresear.ch/t/c.../15871](https://ethresear.ch/t/c.../15871)

[Bid cancellations considered harmful](#)

Thomas Thiery

Proposer-Builder Separation

MEV

Data

May 5, 2023

[ethresear.ch/t/b.../15500](https://ethresear.ch/t/b.../15500)

[Seeing Like a Protocol](#)

Barnabé Monnot

Protocol Development

MEV

April 10, 2023

[barnabe.substack.com/p/s...otocol](https://barnabe.substack.com/p/s...otocol)

[Estimating inclusion delays for censored transactions](#)

Thomas Thiery

Proposer-Builder Separation

Data

March 22, 2023

[ethresear.ch/t/e.../15115](https://ethresear.ch/t/e.../15115)

[MEV Resilient Ethereum](#)

D

Davide Crapis

MEV

Protocol Development

Proposer-Builder Separation

Data

March 20, 2023

[notes.ethereum.org/@RM...\\_cq8Co](https://notes.ethereum.org/@RM..._cq8Co)

[EIP-4844 Fee Market Analysis](#)

D

Davide Crapis

Resource Pricing

March 16, 2023

[ethresear.ch/t/e.../15078](https://ethresear.ch/t/e.../15078)

[Latency arms race concerns in blockspace markets](#)

D

Davide Crapis

MEV

March 3, 2023

[ethresear.ch/t/l.../14957](https://ethresear.ch/t/l.../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](https://ethresear.ch/t/a.../14766)

[Guide to Ethereum Economics: Introduction](#)

D

Davide Crapis

Game Theory / Econ

Protocol Development

January 12, 2023

[medium.com/@dc...873d09](https://medium.com/@dc...873d09)

[Block vs. Slot Auction PBS](#)

J

Julian

Proposer-Builder Separation

December 14, 2022

[mirror.xyz/0x0...9GXBrQ](https://mirror.xyz/0x0...9GXBrQ)

[Notes on Proposer-Builder Separation](#)

Barnabé Monnot

Proposer-Builder Separation

MEV

Protocol Development

November 8, 2022

[barnabe.substack.com/p/pbs](https://barnabe.substack.com/p/pbs)

[Structuring Blockspace Derivatives](#)

J

Julian

Resource Pricing

Game Theory / Econ

October 21, 2022

[mirror.xyz/0x0...-dHNKs](https://mirror.xyz/0x0...-dHNKs)

[Next-Block Base Fee Options: Towards a Practical Implementation](#)

J

Julian

Resource Pricing

Game Theory / Econ

October 21, 2022

[mirror.xyz/0x0...Q89aFc](https://mirror.xyz/0x0...Q89aFc)

[Timing games in Proof-of-Stake](#)

Barnabé Monnot

Consensus

Game Theory / Econ

October 20, 2022

[ethresear.ch/t/t.../13980](https://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/u...arnabe](https://ethresear.ch/t/u...arnabe)

[Visualising the 7-block reorg on the Ethereum beacon chain](#)

Barnabé Monnot

Consensus

Data

May 29, 2022

[barnabe.substack.com/p/p...-reorg](https://barnabe.substack.com/p/p...-reorg)

[Understanding rollup economics from first principles](#)

Barnabé Monnot

Resource Pricing

Scaling / Rollups

February 24, 2022

[barnabe.substack.com/p/u...s-from](https://barnabe.substack.com/p/u...s-from)

[Change fork choice rule to mitigate balancing and reorging attacks](#)

Caspar Schwarz-Schilling

Francesco D'Amato

C

Carl Beekhuizen

Consensus

October 28, 2021

[ethresear.ch/t/c.../11127](https://ethresear.ch/t/c.../11127)

[beaconrunner: Agent-based simulations of Proof-of-Stake Ethereum](#)

Barnabé Monnot

Consensus



Simulations

June 1, 2021

[ethereum.github.io/bea...unner/](https://ethereum.github.io/beacon-unner/)

[abm1559: Agent-based simulations of EIP 1559](#)

Barnabé Monnot

Resource Pricing

Simulations

Game Theory / Econ

June 1, 2021

[ethereum.github.io/abm1559/](https://ethereum.github.io/abm1559/)

[A data-driven view of the beacon chain incident](#)

Barnabé Monnot

Consensus

Data

April 30, 2021

[barnabe.substack.com/p/a...beacon](https://barnabe.substack.com/p/a...beacon)

[The road to Ethereum](#)

Barnabé Monnot

Consensus

Scaling / Rollups

April 20, 2021

[barnabe.substack.com/p/eth2](https://barnabe.substack.com/p/eth2)

[Better bidding with eip1559](#)

Barnabé Monnot

Resource Pricing

March 5, 2021

[barnabe.substack.com/p/b...ip1559](https://barnabe.substack.com/p/b...ip1559)

[Understanding fees in eip1559](#)

Barnabé Monnot

Resource Pricing

February 26, 2021

[barnabe.substack.com/p/u...ip1559](https://barnabe.substack.com/p/u...ip1559)

[Congestion control and eip1559](#)

Barnabé Monnot

Resource Pricing

February 17, 2021

[barnabe.substack.com/p/c...ip1559](https://barnabe.substack.com/p/c...ip1559)

## [EIP 1559 simulations](#)

Barnabé Monnot

Resource Pricing

April 15, 2020

[ethresear.ch/t/e...s/7280](https://ethresear.ch/t/e...s/7280)

Papers

Open item for links to papers.

Gallery

Filter

Sort

[Drag image to reposition](#)[Reposition](#)[The Cost of Permissionless Liquidity Provision in Automated Market Makers](#)[@Julian@Davide Crapis](#)[MEVGame Theory2024](#)

[Drag image to reposition](#)[Reposition](#)[Strategic Bidding Wars in On-chain Auctions](#)[Fei Wu,@Thomas Thiery, Stefanos Leonardos, Carmine Ventre](#)[MEVGame TheoryDataSimulations2023](#)

[Drag image to reposition](#)[Reposition](#)[Cooperative AI via Decentralized Commitment Devices](#)[Xinyuan Sun,@Davide Crapis, Matt Stephenson,@Barnabé Monnot,@Thomas Thiery, Jonathan Passerat-Palmbach](#)[Game TheoryAIMEV2023MASEC workshop@ NeurIPS 2023](#)

[Drag image to reposition](#)[Reposition](#)[EIP-4844 Economics and Rollup Strategies](#)[@Davide Crapis, Edward W. Felten, Akaki Mamagishvili](#)[Resource PricingScaling / Rollups2023](#)

[Drag image to reposition](#)[Reposition](#)[Optimal Dynamic Fees for Blockchain Resources](#)[@Davide Crapis, Ciamac C. Moallemi, Shouqiao Wang](#)[Resource PricingSimulationsData2023](#)

[Drag image to reposition](#)[Reposition](#)[Agent-Based Modelling of Ethereum Consensus](#)[Benjamin Kraner, Nicolò Vallarano, Claudio J. Tessone,@Caspar Schwarz-Schilling](#)[ConsensusSimulations2023IEEE ICBC 2023](#)

[Drag image to reposition](#)[Reposition](#)[Time is Money: Strategic Timing Games in Proof-of-Stake Protocols](#)[@Caspar Schwarz-Schilling, Fahad Saleh,@Thomas Thiery, Jennifer Pan, Nihar Shah,@Barnabé Monnot](#)[ConsensusGame TheoryMEVData2023AFT 2023](#)

[Drag image to reposition](#)[Reposition](#)[Optimality Despite Chaos in Fee Markets](#)[Stefanos Leonardos, Daniël Reijbergen,@Barnabé Monnot, Georgios Piliouras](#)[Resource Pricing2022FC 2023](#)

[Drag image to reposition](#)[Reposition](#)[Three Attacks on Proof-of-Stake Ethereum](#)[@Caspar Schwarz-Schilling, Joachim Neu,@Barnabé Monnot, Aditya Asgaonkar, Ertem Nusret Tas, David Tse](#)[ConsensusMEV2021FC 2022](#)

[Drag image to reposition](#)[Reposition](#)[Transaction Fees on a Honeymoon: Ethereum's EIP-1559 One Month Later](#)[Daniël Reijbergen, Shyam Sridhar,@Barnabé Monnot, Stefanos Leonardos, Stratis Skoulakis, Georgios Piliouras](#)[Resource PricingSimulationsData2021IEEE Blockchain 2021](#)

[Drag image to reposition](#)[Reposition](#)[Dynamical Analysis of the EIP-1559 Ethereum Fee Market](#)[Stefanos Leonardos,@Barnabé Monnot, Daniël Reijbergen, Stratis Skoulakis, Georgios Piliouras](#)[Resource PricingSimulations2021AFT 2021](#)

Talks

Open item for videos and slides.

Table

Filter

Sort

Name

Speaker

Location

Date

[Ethereum's staking endgame](#)

Caspar Schwarz-Schilling

Uncommon Core 2.0

March 22, 2024

[ASSA Annual Meeting 2024](#)

Caspar Schwarz-Schilling

San Antonio, Texas, USA

January 5, 2024

[Columbia Cryptoeconomics workshop \(CCE\) 2023](#)

Caspar Schwarz-Schilling

D

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

[crediblecommitments.wtf](#)

May 31, 2023

[3 reasons why the 'MEV Problem' is a Protocol Designer's Dream/Nightmare](#)

J

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

Davide Crapis

Institute for Mathematical Sciences, NUS Singapore

April 14, 2023

[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

[ETHconomics](#)

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](#)

A

Anders

ETHconomics

April 21, 2022

[ETHconomics](#)

A

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

Load more