

# lean Ethereum



perfectly balanced



perfectly balanced



**SCALE L1**  
**SCALE L2**  
**IMPROVE UX**

**LEAN CL**  
**LEAN DL**  
**LEAN EL**

max security  
max simplicity  
max longevity

part 1—tracks

part 2—principles

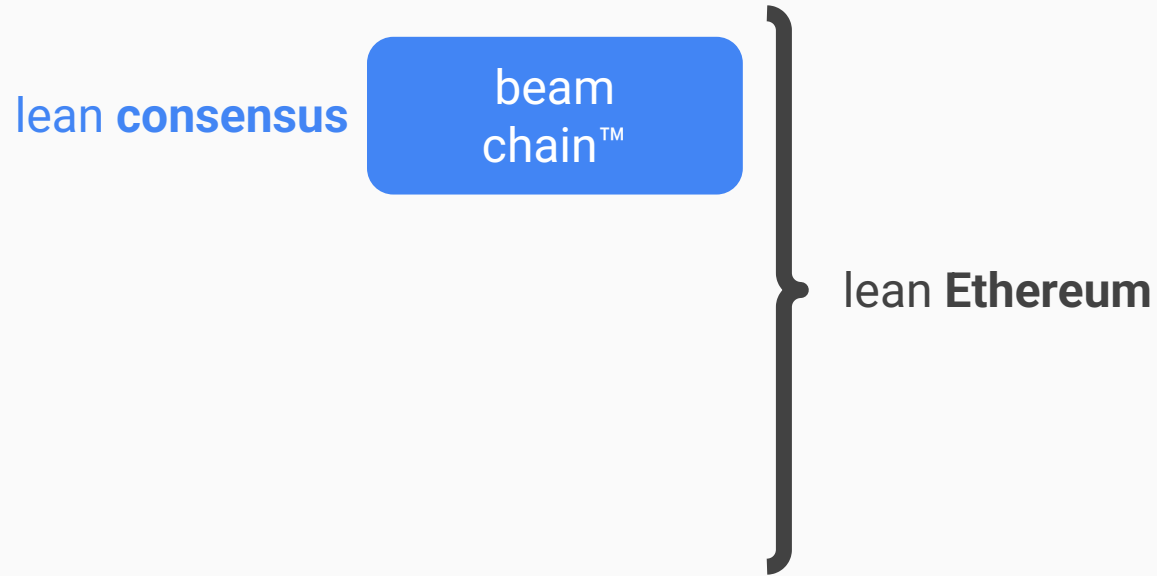
part 3—synergies

part 1—tracks

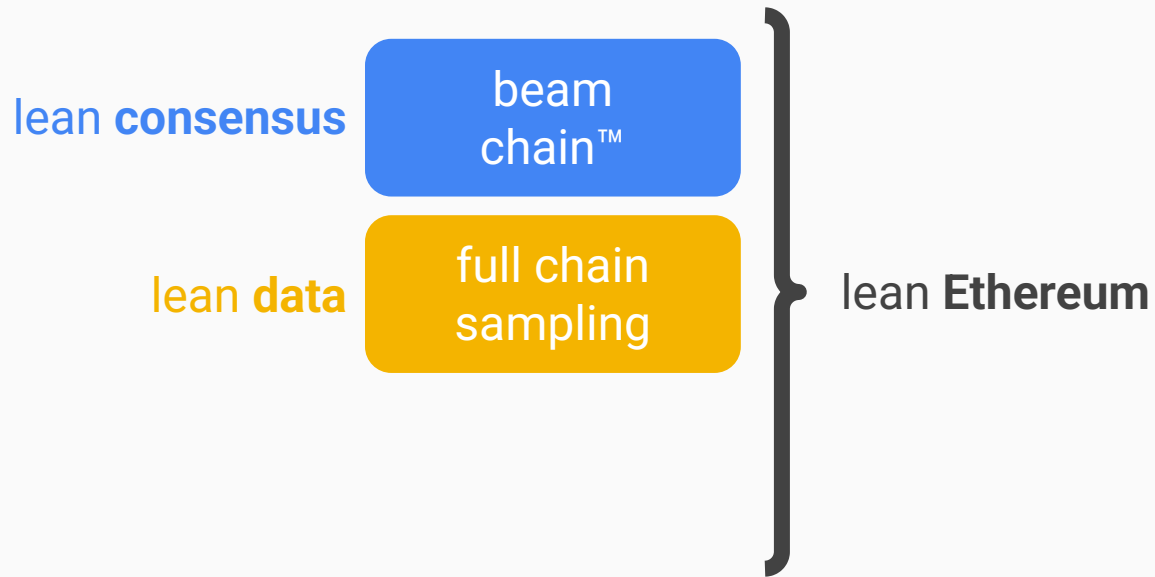
part 2—principles

part 3—synergies

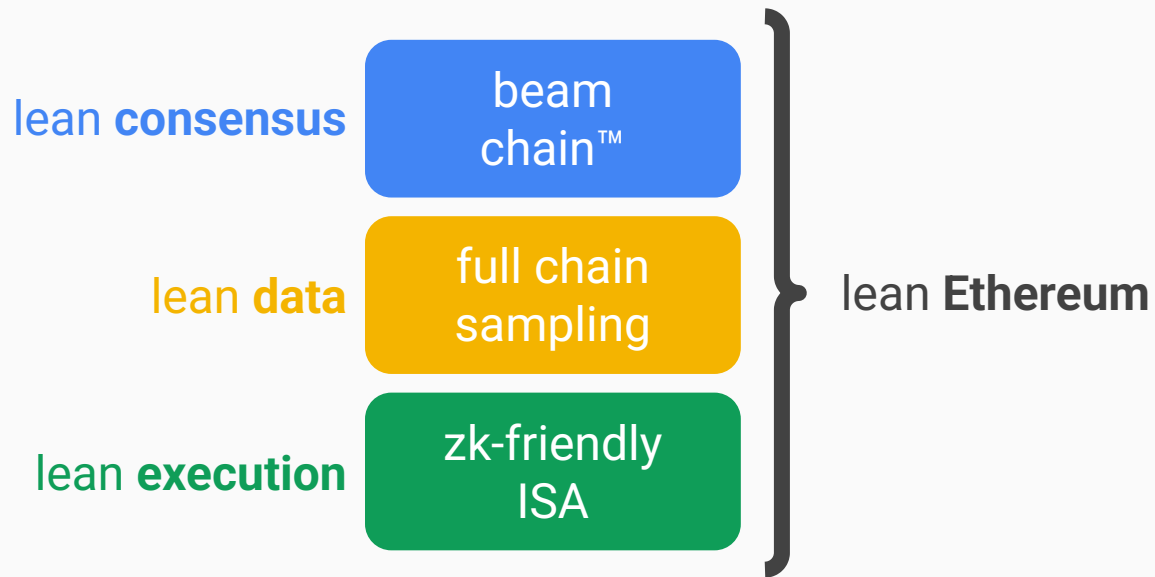
## three tracks



## three tracks



## three tracks





# headliners

PQ

snarkification

3SF

APS

PQ

snarkification

3SF

APS



hash-based  
DAS

full chain  
sampling

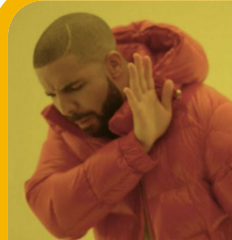
# headliners

PQ

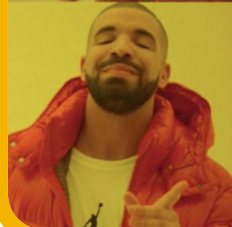
snarkification

3SF

APS



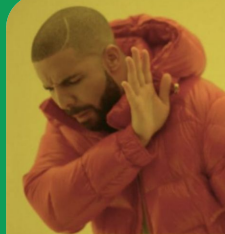
**BLOBS**



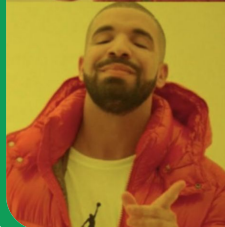
**CALLDATA**

hash-based  
DAS

full chain  
sampling



**EVM**



**LEAN  
zkEVM**

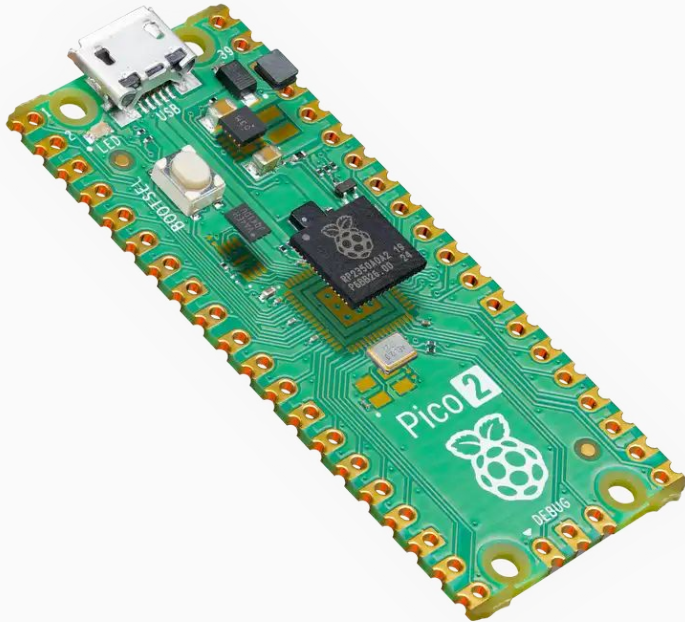
simple  
zkVM

enshrined  
zkVM

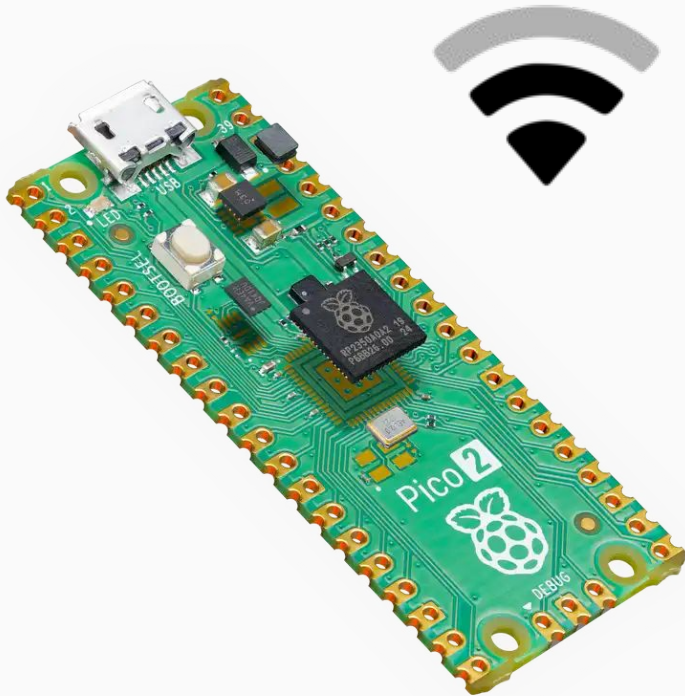
part 1—tracks

part 2—principles

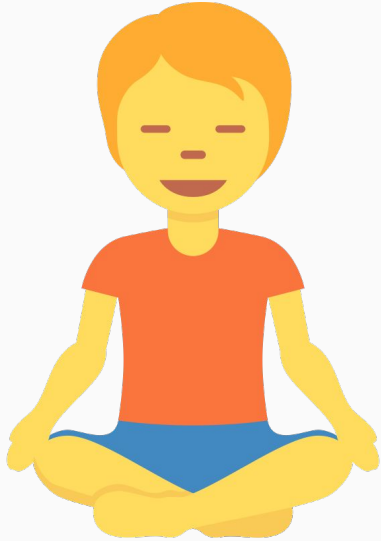
part 3—synergies



validators, wallets, includers

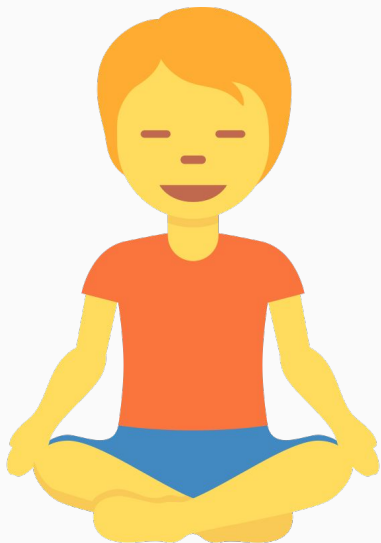


validators, wallets, includers



attester-proposer  
separation

- 
- 
- 
-

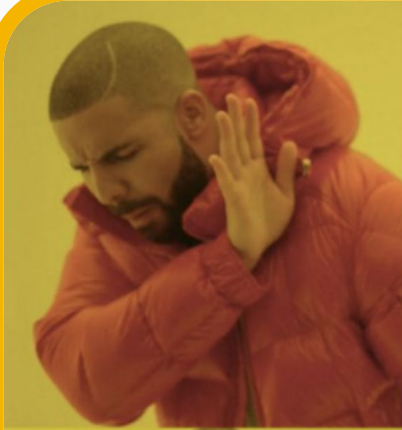


attester-proposer  
separation

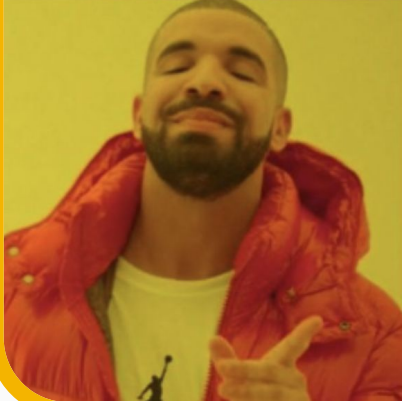
- no relays
- no timing games
- no MEV spikes
- no preconf



## lean assumptions

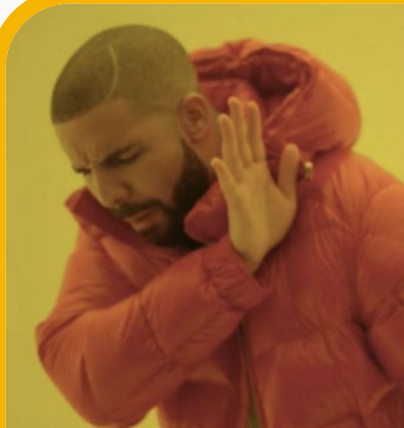


**BLS  
KZG**

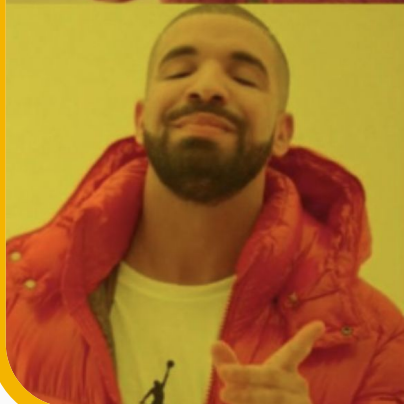


**PQ**

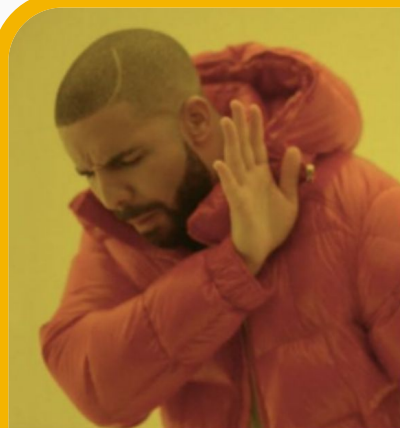
## lean assumptions



**BLS  
KZG**



**PQ**



**LATTICES  
ISOGENIES**

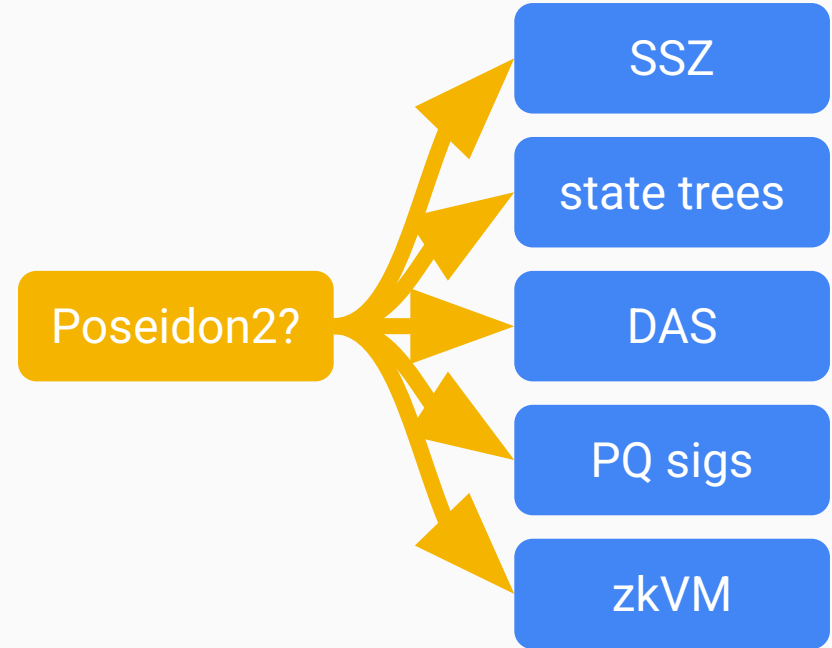


**HASHES**



Poseidon2?

A diagram consisting of a yellow rectangular box with rounded corners on the left, containing the text "Poseidon2?". From the right side of this box, five yellow arrows of varying lengths and angles point outwards towards the right edge of the slide.



lean **finality**

*112 LoC*

[ethereum/research/3sf-mini](#)

lean **snarks**

*445 LoC*

[TomWambsgans/simple-snark-spec](#)

lean **ISA**

*51 LoC*

[ChatGPT: "minimal Python RISC-V"](#)

lean **signatures**

*57 LoC*

[ChatGPT: "minimal WOTS XMSS"](#)

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lean **ISA**

*51 LoC*

[ChatGPT: "minimal Python RISC-V"](#)

lean **signatures**

*57 LoC*

[ChatGPT: "minimal WOTS XMSS"](#)

encapsulated  
complexity

aesthetics

# lean tech debt

- sync committees
- slot committees
- deposit contract
- withdrawal credentials
- effective balance
- max effective balance
- swap-or-not
- BLS



# lean tech debt

- sync committees
- slot committees
- deposit contract
- withdrawal credentials
- effective balance
- max effective balance
- swap-or-not
- BLS

CL

- blobs

DL





# lean tech debt

- sync committees
- slot committees
- deposit contract
- withdrawal credentials
- effective balance
- max effective balance
- swap-or-not
- BLS

CL

• blobs ← DL

• EVM ← EL



improve status quo  
vs  
reach endgame

improve status quo  
vs  
reach endgame

optimality

3SF

Hypercube

minslack

improve status quo  
vs  
reach endgame

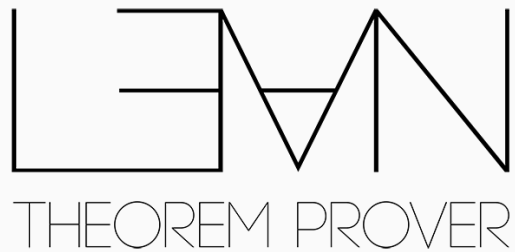
optimality

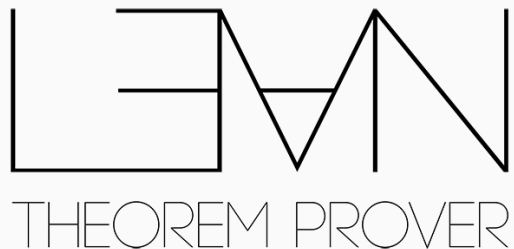
3SF

Hypercube

minslack







[verified-zkevm.org](https://verified-zkevm.org)

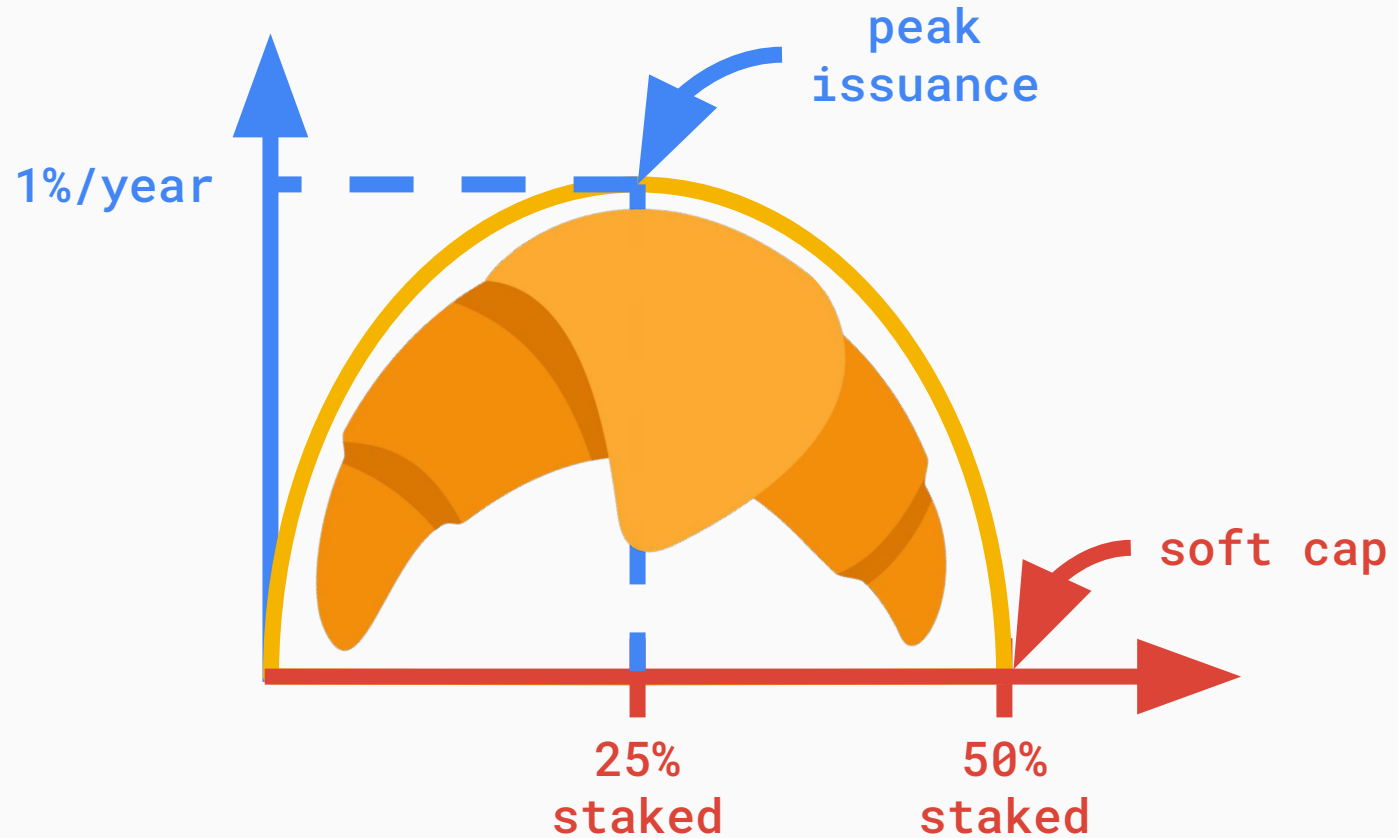
**3SF Automated Model-Checking**

[freespek/ssf-mc](https://freespek/ssf-mc)

lean issuance



# lean issuance



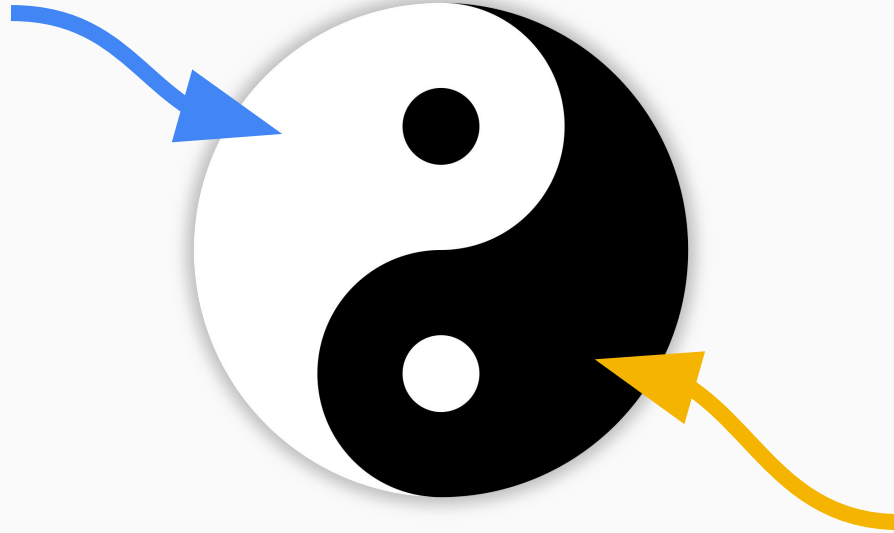


part 1—tracks

part 2—principles

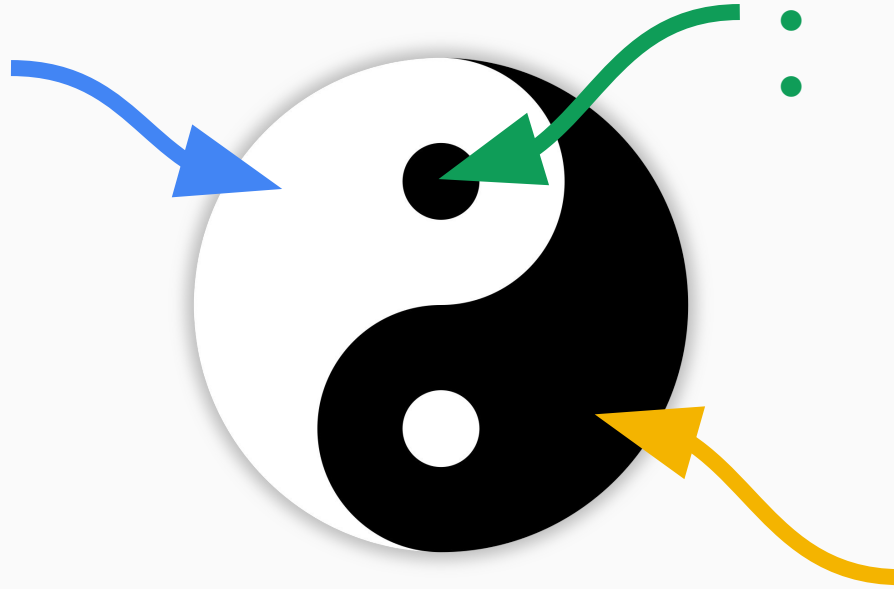
part 3—synergies

- gigagas L1
- teragas L2
- amazing UX



- \$1Q security
- optimality
- ossification

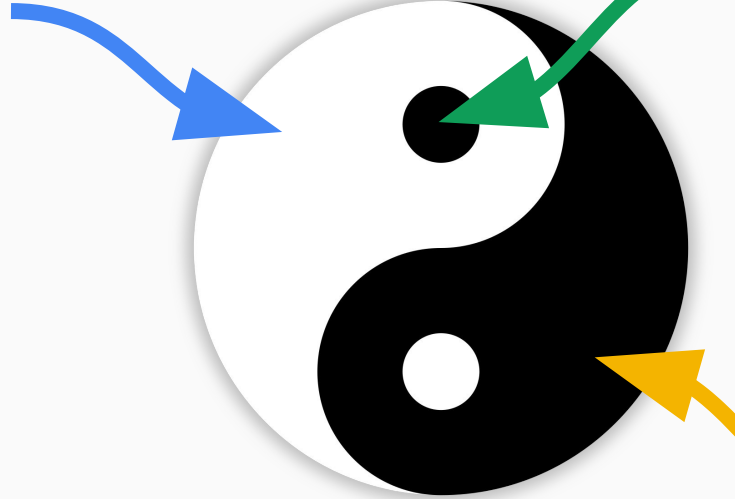
- gigagas L1
- teragas L2
- amazing UX



- FOCIL
- 
- 

- \$1Q security
- optimality
- ossification

- gigagas L1
- teragas L2
- amazing UX

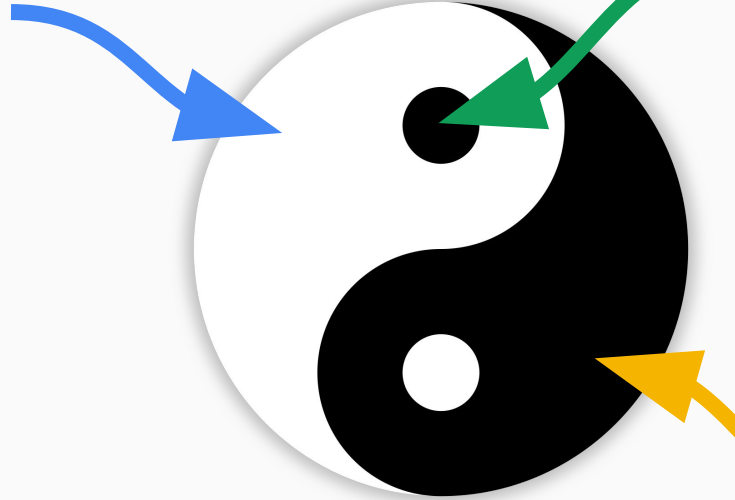


- FOCIL
- zkEVMs
- 

- \$1Q security
- optimality
- ossification

# lean synergies

- gigagas L1
- teragas L2
- amazing UX



- FOCIL
- zkEVMs
- FCS

- \$1Q security
- optimality
- ossification

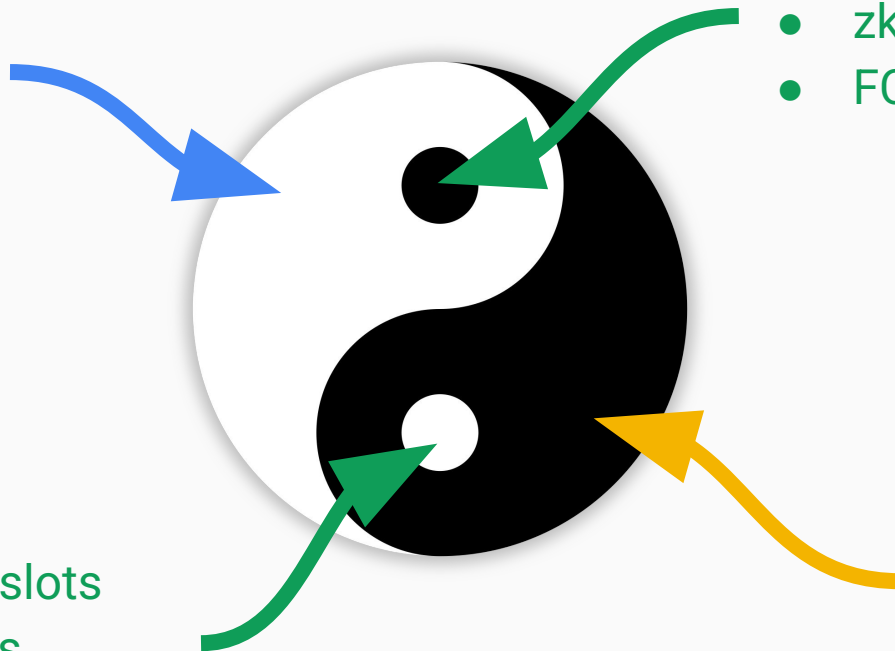
# lean synergies

- gigagas L1
- teragas L2
- amazing UX

- shorter slots
- precons
- faster finality

- FOCIL
- zkEVMs
- FCS

- \$1Q security
- optimality
- ossification



# Tomasz's secret masterplan



	win	market
5		
4		
3		
2		
1	L2 confidence	Solana

# Tomasz's secret masterplan



	win	market
5		
4		
3		
2	L2 network effects	Celestia
1	L2 confidence	Solana





	win	market
5		
4		
3	L1 unity	LayerZero
2	L2 network effects	Celestia
1	L2 confidence	Solana



	win	market
5		
4	store of value	BTC
3	L1 unity	LayerZero
2	L2 network effects	Celestia
1	L2 confidence	Solana



	win	market
5	global finance	???
4	store of value	BTC
3	L1 unity	LayerZero
2	L2 network effects	Celestia
1	L2 confidence	Solana

# Tomasz's secret masterplan



	win	market	
5	global finance	???	} "lean"
4	store of value	BTC	
3	L1 unity	LayerZero	
2	L2 network effects	Celestia	} "mean"
1	L2 confidence	Solana	



social layer—believe in something™



# social layer—believe in something™



	language dev count	coordinator location	website Github org
<b>Zeam</b>	<b>Zig</b> 2 devs	<b>Gajinder</b> India	<b>zeam.in</b> blockblaz
<b>Ream</b>	<b>Rust</b> 9 devs	<b>Unnawut</b> Thailand	<b>reamlabs.com</b> ReamLabs
<b>[Quadrivium]</b>	<b>C++</b> 5 devs	<b>Kamil</b> Kazakhstan	<b>qdrvm.io</b> qdrvm
<b>[Nethermind]</b>	<b>C#</b> 2 devs	<b>Jorge</b> Spain	<b>nethermind.io</b> NethermindEth
<b>[Kakarot]</b>	<b>Cairo</b> 2 devs	<b>Elias</b> France	<b>kakarot.org</b> kkrt-labs
<b>Lantern</b>	<b>C</b> 5+ devs	<b>Mihir</b> Australia	<b>piertwo.com</b> Pier-Two
<b>[LambdaClass]</b>	<b>Elixir or Rust</b> 5 devs	<b>Federico</b> Argentina	<b>lambdaclass.com</b> lambdaclass
<b>Colibri</b>	<b>C, C++ or Rust</b> 2 devs	<b>Jork</b> Germany	<b>corpus.io</b> corpus-io
<b>Afream</b>	<b>Rust</b> 6 devs	<b>Ayodeji</b> Nigeria	<b>afream.io</b> Blocuseducare

thank you :)

