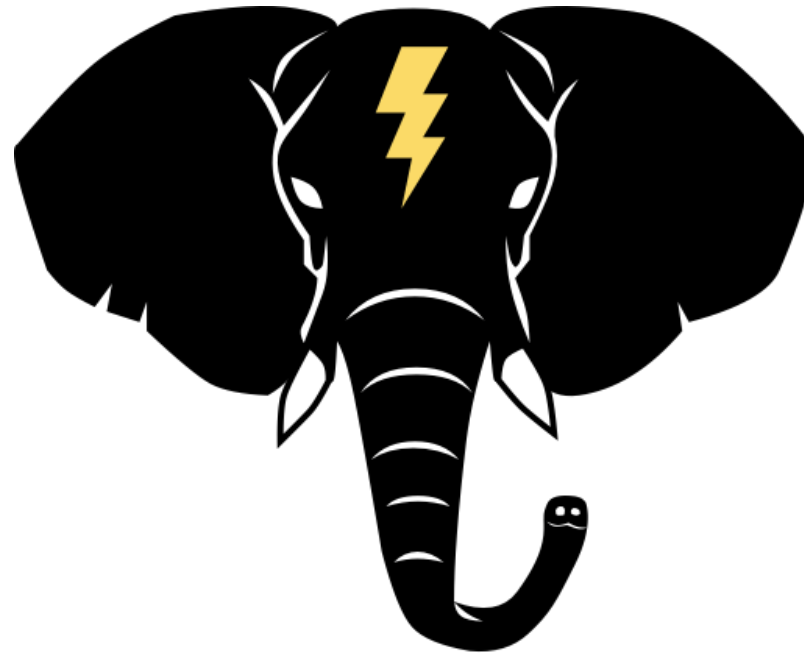**LNCM presents**

Lightning⇄RSK

Supercavitation

Easy exchange between Bitcoin and Rootstock
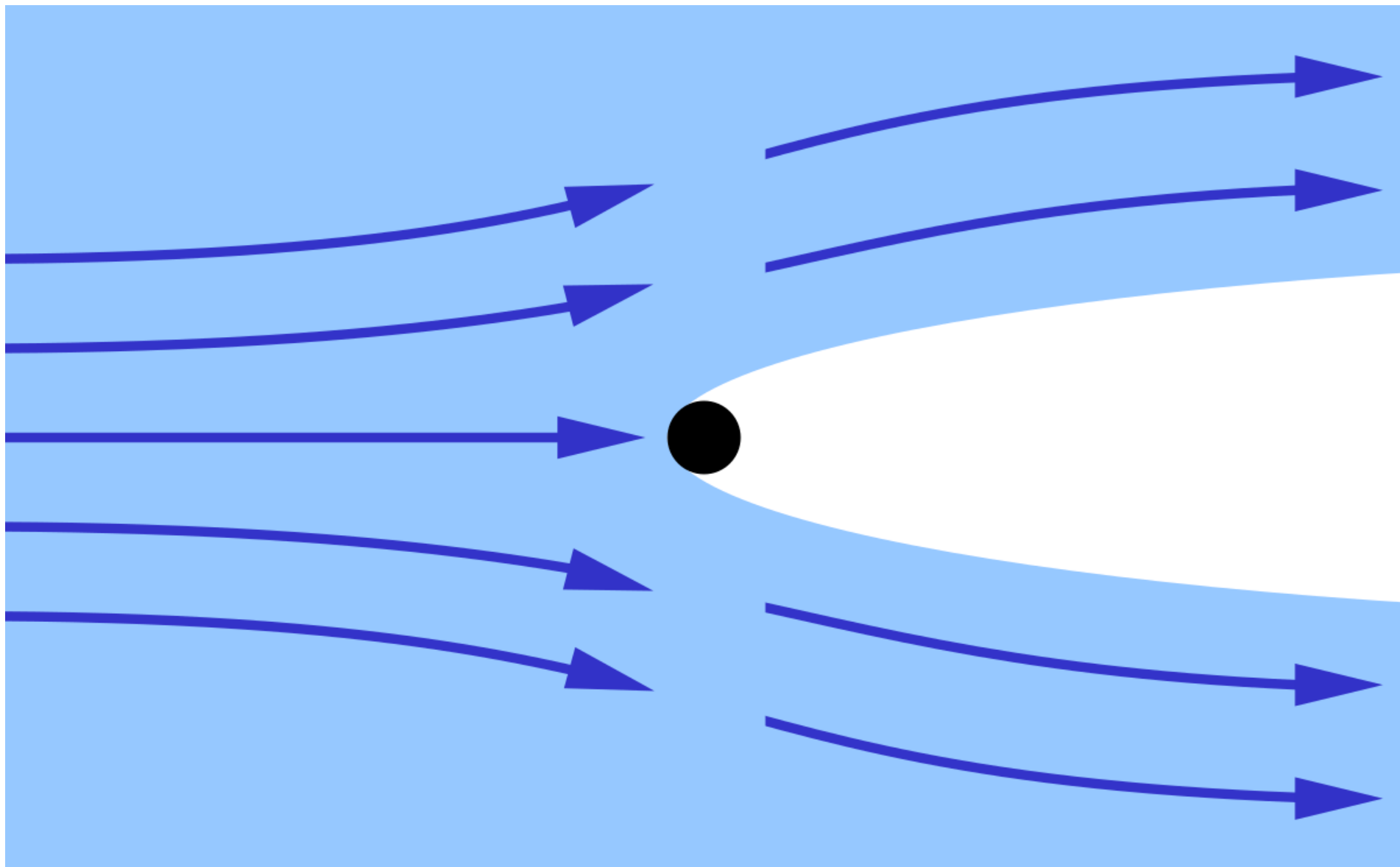
LNCM

- Lightning Network Chiang Mai

- Open source developers focused on lightning

- https://lncm.io

Submarine swaps?

- Submarine swaps between layers

- Lightning network is a second layer to Bitcoin

- Lightning tx happen directly between two parties (except opening/closing channels)

- "Submarine swaps" since they are partially hidden from on-chain view

Supercavitation?

- Creating bubbles of gas in front of a submarine to reduce friction and achieve very high speeds.

Why?

- Native swaps take many hours (require 100 confirmations) and need address whitelisting

- Restricted market participation

- Counter-party risk with custodians (exchanges / federation)

- Bitcoin confirmations are slow (~10 min)

Solution

- Lightning transactions are nearly instant

- Moves bottleneck to RSK block confirmation time (~30s)

- Trustless

- Atomic (either succeeds or gets rolled back)

Alice and Bob

- Alice has BTC in a lightning wallet

- Bob owns RBTC on rootstock

- Alice wants to sell BTC for RBTC
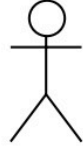
- Bob wants to sell RBTC for BTC

Innovations

- Incentivise Bob and other participants to settle payments quickly

- Subsidise Alice to be able to transact on RSK without having RBTC beforehand

- Self-hosted open platform without barriers to entry

- Alice is able to broadcast her RSK redemption transaction if Bob disappears
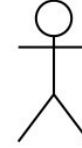
- Alice only requires a mobile phone

How?

- Solidity contract deployed on RSK sidechain

- Bob (RBTC seller) runs REST backend

  - backend is connected to lightning network & RSK sidechain

- Alice (BTC seller) opens public swap website

  - has Lightning Network wallet

  - browser is connected to Bob's backend and public RSK gateway
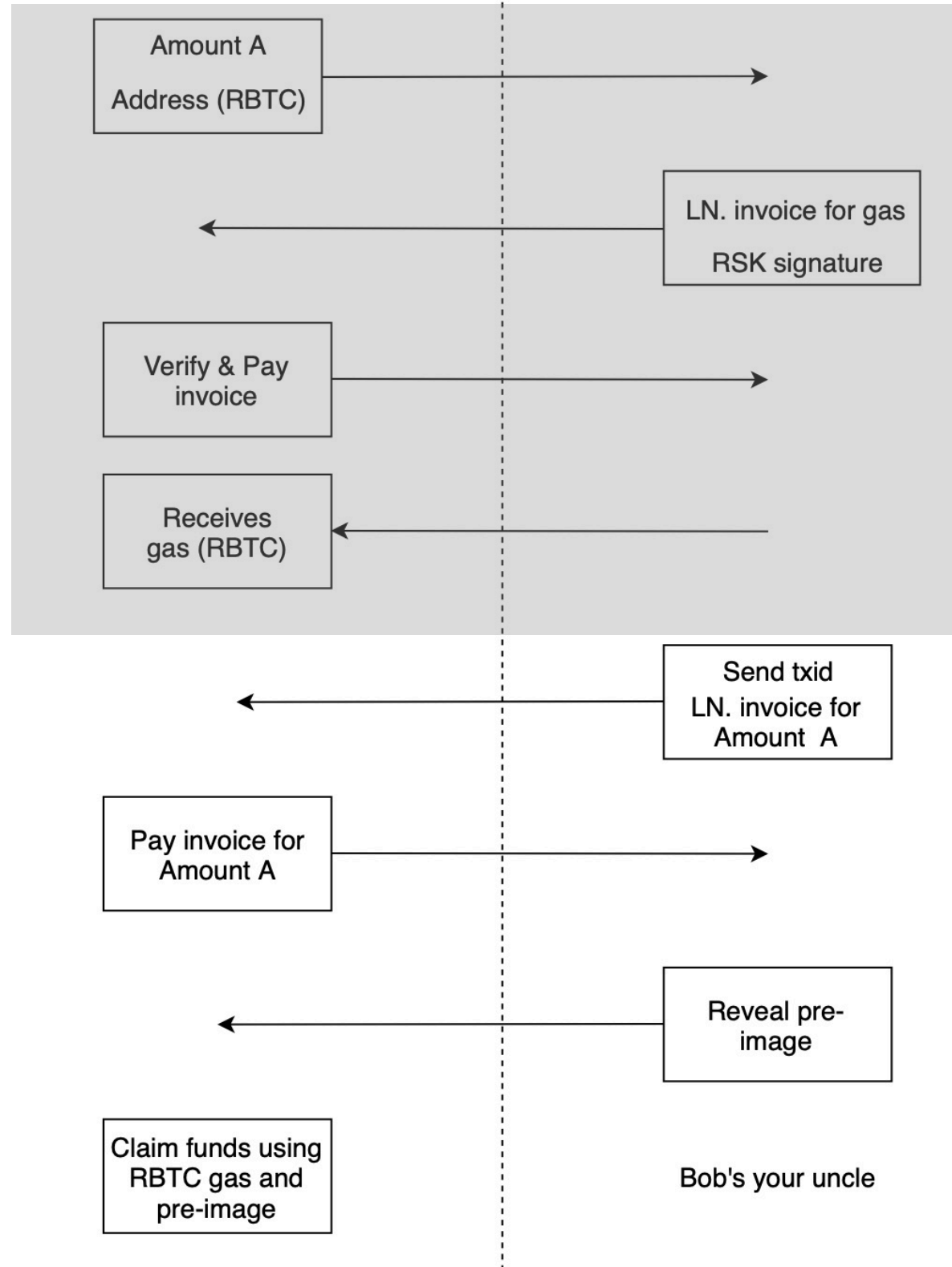
Alice has lightning wallet with BTC

Alice

Bob has RBTC

Bob

Amount A

Address (RBTC)

LN. invoice for gas

RSK signature

Verify & Pay invoice

Receives gas (RBTC)

Send txid

LN. invoice for Amount A

Pay invoice for Amount A

Reveal pre-image

Claim funds using RBTC gas and pre-image

Bob's your uncle

Result

- Bob and Alice make a mutually beneficial trade

- Alice has a more convenient way to buy RBTC

- Bob earns a fee in return for providing the service and locking some funds

- RSK on-boarding is faster and more convenient

Limitations

- Current maximum value per tx is limited on lightning network (~0.16 BTC)

- Lightning network is *still* limited by number of open channels and channel size

Future

- Supercavitation can be extended to other chains

- potentially any ERC-20 token could be swapped with BTC using lightning

- Decentralised client-side deployment on IPFS

- Reputation system

- Convenient off-ramp from Ether*i*um

- Other people are incentivised to enforce payout to Alice in case Bob doesn't