

Distributed organisations for Collaborative Research

To build a new home for science.

MCAA, Vienna, February 2019

Martin Etzrodt @AkashaProject

www.akasha.org

Challenges from the beginnings...

Being the first to discover



*smaismrmilmepoet
aleumibunenugttau
iras
=
Altissimum
planetam
tergeminum
observavi.
(I have observed the
highest of the
planets [Saturn]
three-formed")*

Galileo's anagram

https://en.wikipedia.org/wiki/Galileo_Galilei#/media/File:Justus_Sustermans_-_Portrait_of_Galileo_Galilei,_1636.jpg

Reproducibility



Rita Greer

Robert Hooke & Robert Boyle:
Experiments under witnesses

https://commons.wikimedia.org/wiki/Category:Paintings_by_Rita_Greer#/media/File:4_The_Scientists.JPG

How we work

- *Wissenschaftliche Arbeit ist Kollektivarbeit.*
- *Eine wissenschaftliche Erkenntnis und erfordert die Existenz von "Denkkollektiven".*

Ludwig Fleck, *Die Entstehung einer wissenschaftlichen Tatsache*, 1935

- *Activities of scientist are co-ordinated and rely on constant communication.*
- *Adjustment [...] occurs in response of the results obtained by others.*

The Republic of Science, Michael Polanyi 1962

How we communicate

Scientific journals...

- Collect and redistribute scientific literature
- Act as a notary permitting the attribution of a scientist's work
- Filter mechanisms: editor & peer-reviews (a "curated list")
- Artificially restrict the number of permitted articles per issue/unit of time despite no actual restrictions (print) exist anymore.
- Turn an *anti-rival good* into a *rival good* (both for OA & CA, just differently)

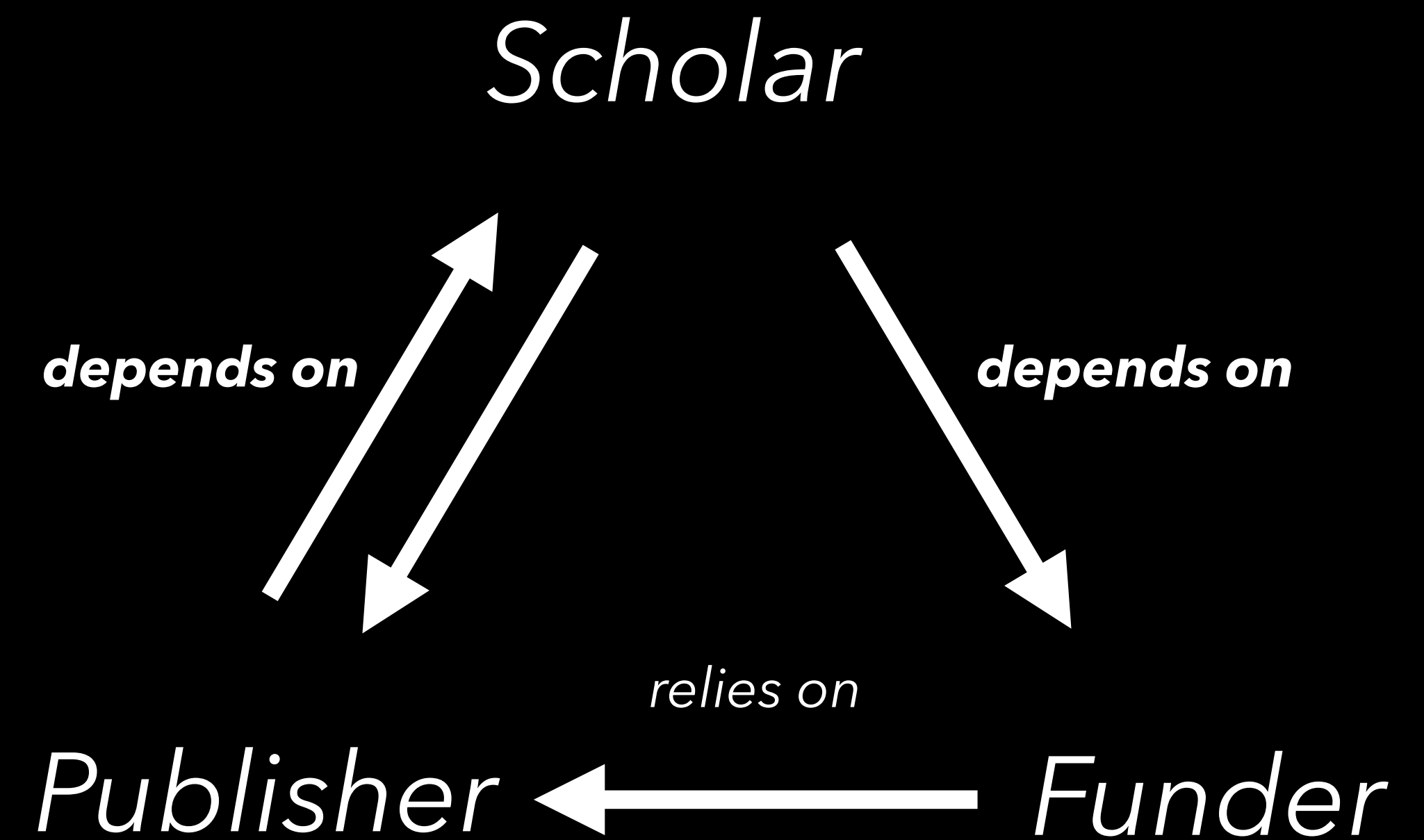
Data & knowledge are "anti-rival" goods:
Free dissemination of data and knowledge
increases their value and exceeds the profit
gained by few through copyright or IP.

Lawrence Lessing

2004

*“Non solus”:
The relationship between the scholar
and publisher is interdependent.*

“The triangle of money.”



https://en.wikipedia.org/wiki/Isaac_Elzevir#/media/File:Elsevier.svg

Elsevier Logo

Since 1620

Something went wrong...



*Digitisation of back issues
of academic journals &
books.*

*Introduction of a licensing
model for financing
instead of a publicly
funded effort.*

1995

Fight for open access



https://en.wikipedia.org/wiki/Aaron_Schwartz#/media/File:Aaron_Schwartz_and_Lawrence_Lessig.jpg

Aaron Schwartz †2013 Lawrence Lessig

We need to take information, wherever it is stored, make our copies and share them with the world. [...]

We need to download scientific journals and upload them to file sharing networks. We need to fight for Guerrilla Open Access.

https://archive.org/stream/GuerillaOpenAccessManifesto/Goamjuly2008_djvu.txt

Aaron Schwartz 2008

2008

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<https://pixabay.com/en/fist-fight-red-communism-159019/>



From: [REDACTED] </O=ITHAKA/OU=FIRST ADMINISTRATIVE GROUP/CN=RECIPIENTS/CN=[REDACTED]>
Sent: Friday, January 28, 2011 3:00 PM
To: 'Heymann, Stephen (USAMA)' <Stephen.Heymann@usdoj.gov>
Subject: FW: MIT Update: It's worse than we know

... and this.

From: [REDACTED]
Sent: Friday, January 28, 2011 2:58 PM
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: MIT Update: It's worse than we know

An additional point to note.

As you look at [REDACTED] first chart. Note that only the December 26th incident hit our radar. With [REDACTED] rough estimate of 2.8 million + the 500K taken in the 9/25 incident, I am extrapolating that we may well see similar spikes on those months that went unrecognized, as we do in December.

Known incidents (9/25 + 10/9 + [REDACTED] Nov/Dec analysis) = 3.5 million to date

Unknown incidents (spikes we may see for October and September + activity since January) = ???????

Finally, there has been no assertion that this activity "started" on 9/25 so there may be more unrecognized activity prior to 9/25.

With roughly 4-5 million "real" articles (not front matter/back matter/indexes)

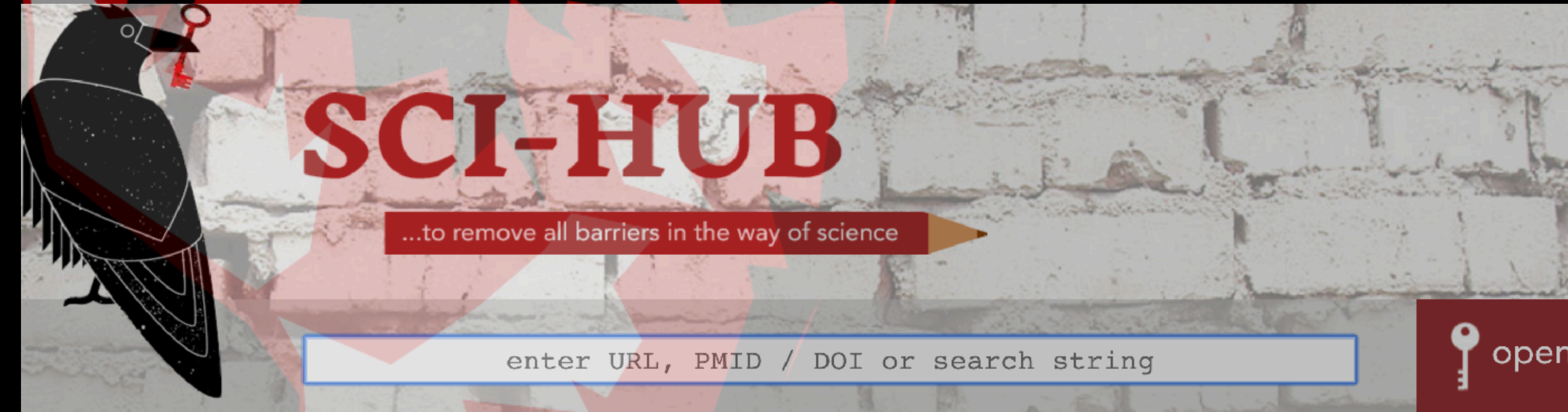
I think nearly all or all of the corpus is a small intellectual leap.

All of that said, it might help us to know more about the hard drive(s) they claim to have recovered and what was on

With roughly 4-5 million "real" articles (not front matter/back matter/indexes)

I think nearly all or all of the corpus is a small intellectual leap.

Today: Total open access is a reality



<http://sci-hub.tw/>

Our mission is to remove any barrier impeding the widest possible distribution of knowledge in human society!



<https://www.flickr.com/photos/ajolly/4696604402/>

Alexandra Elbakyan

2011

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Some still pay too much...Germany's 'new deal' with Wiley

- Publish and read agreement running 2019-22.
- Access to 1,708 Wiley journals*
- The PAR (publish and read) fee is €2,750 per estimated article.
- Estimated annual publishing volume being 10,000 articles & for Gold open access 20% discount total cost: **€27,500,000**

"OPEN ACCESS TODAY IS ROOTED IN AN EXPENSIVE PAY TO PUBLISH IDEA"

Preprint server: example ArXiv.org

arXiv CY17 FINAL BUDGET				
REVENUE			Projected	Final
Member contributions			\$400,000	\$449,560
Simons Foundation Annual Commitment			\$100,000	\$100,000
Simons Foundation Matching Fund			\$300,000	\$300,000
Cornell University Library (Direct)			\$75,000	\$75,000
Gifts			\$50,000	\$91,865
TOTAL REVENUE			\$925,000	\$1,016,425
EXPENSES				
Personnel (including benefits) ¹				
	Program Director ² , Membership, Finance, Policy	<i>approx. 1 FTE</i>		<i>Considered Indirect</i>
	Scientific Director	<i>0.5FTE</i>		
	Operations Manager, User Support & Moderation	<i>3.5 FTE + 0.6 FTE student + Contract</i>		
	CTO, IT Lead, Programming, Systems, UX	<i>1.8 FTE + 1 FTE + Contract</i>		
		Subtotal Personnel³	\$834,831	\$622,620
Non-Personnel				
	Servers (physical & virtual), hardware maintenance, storage and backup		\$44,000	\$56,356
	Staff computers, software, supplies, network, and misc. expenses		\$5,500	\$5,140
	Meetings, workshops, training, consultancy		\$40,000	\$60,165
		Subtotal Non-Personnel	\$89,500	\$121,661
TOTAL DIRECT EXPENSES			\$924,331	\$744,281
Indirect and Volunteer Costs				
	College and department administration, staff support (26% of direct costs) ⁴			
	Facilities (11% of direct costs) ⁵			
		Subtotal Indirect Costs	\$42,002	\$275,384
TOTAL EXPENSES (direct + indirect)			\$966,333	\$1,019,665
ANNUAL OPERATING RESERVES⁶				
Operating Reserves				
Development Reserves			\$684,754	\$906,898

<https://arxiv.org/>

Hint to publishers: "Firms need only to exist when market transactions are costlier than the firm's internal coordination...."

Next: Reclaim control of the distribution of knowledge

- The distributed web
- Self-sovereign publishing
- “Knowledge as transactions”
- Distributed (Autonomous) Research Organisations

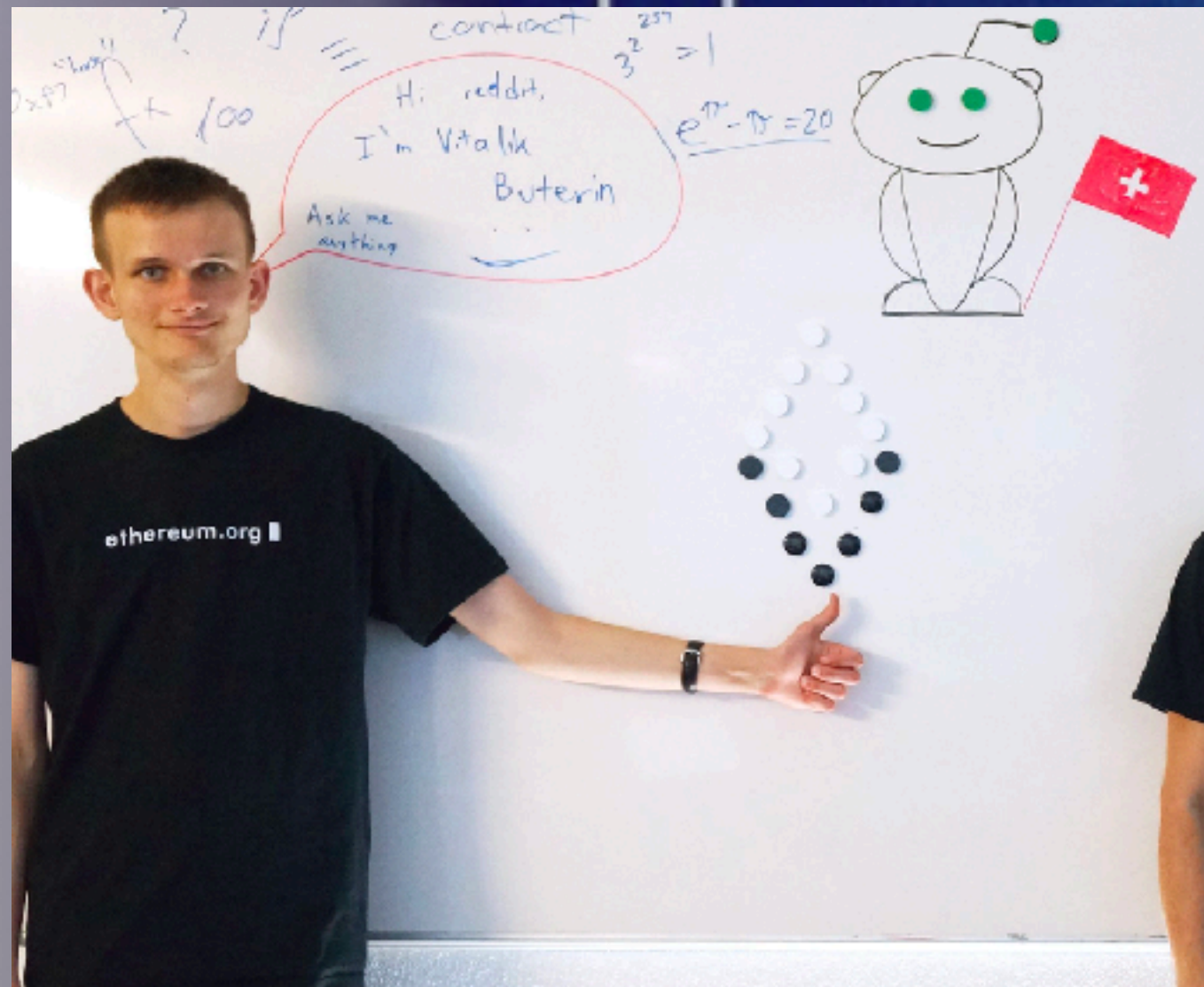
The distributed web



ipfs



Juan Bennet, IPFS



Vitalik Buterin

Ethereum
@ethereumproject

28/11/14 - #DEVCON 0 concludes - Thank you to all the attendees and everyone who made this unique event possible!

RETWEETS 15 FAVORITES 19

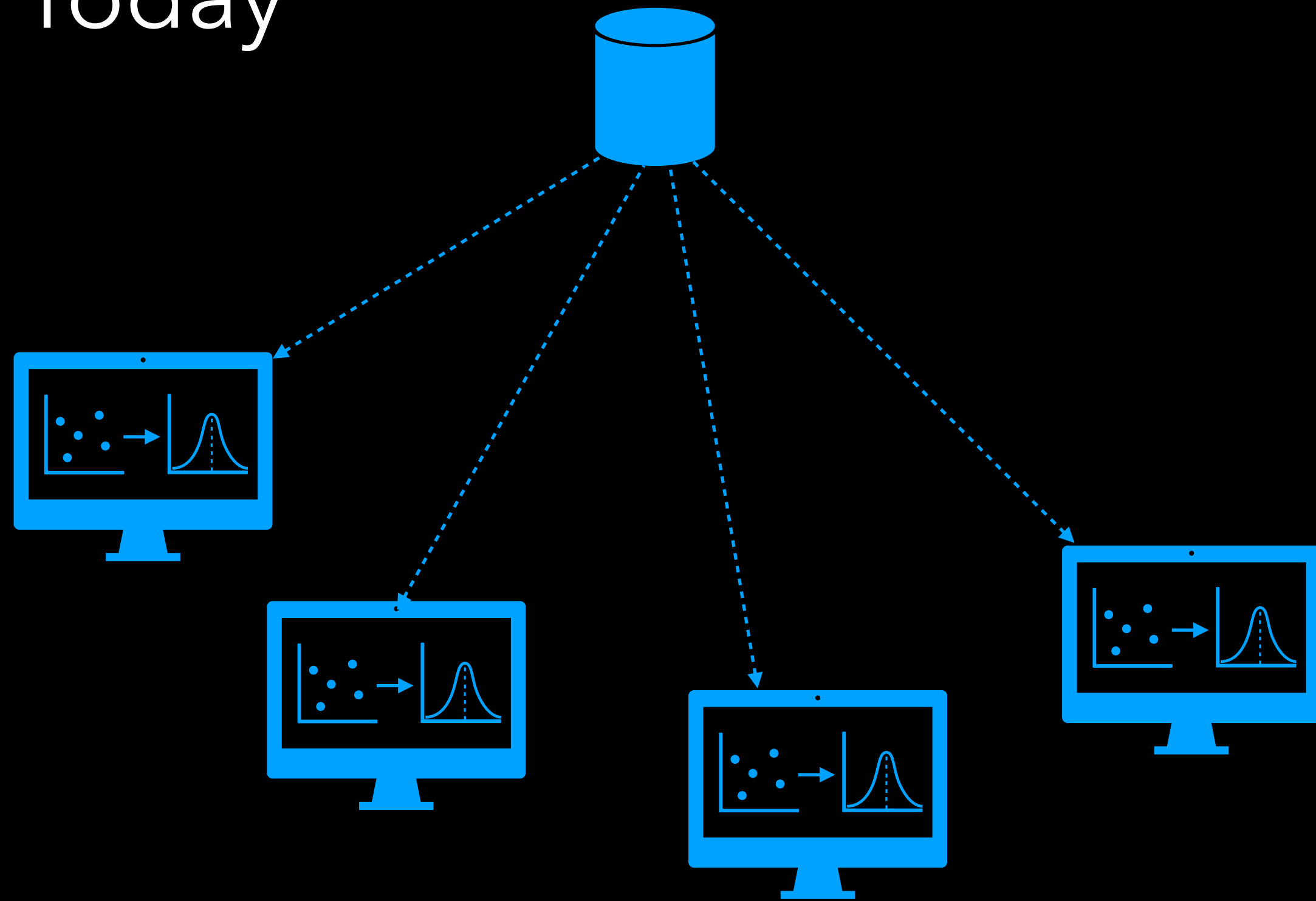
5:31 PM - 28 Nov 2014

Mihai's blog: <https://blog.ethereum.org/2015/03/14/ethereum-the-first-year/>

2014

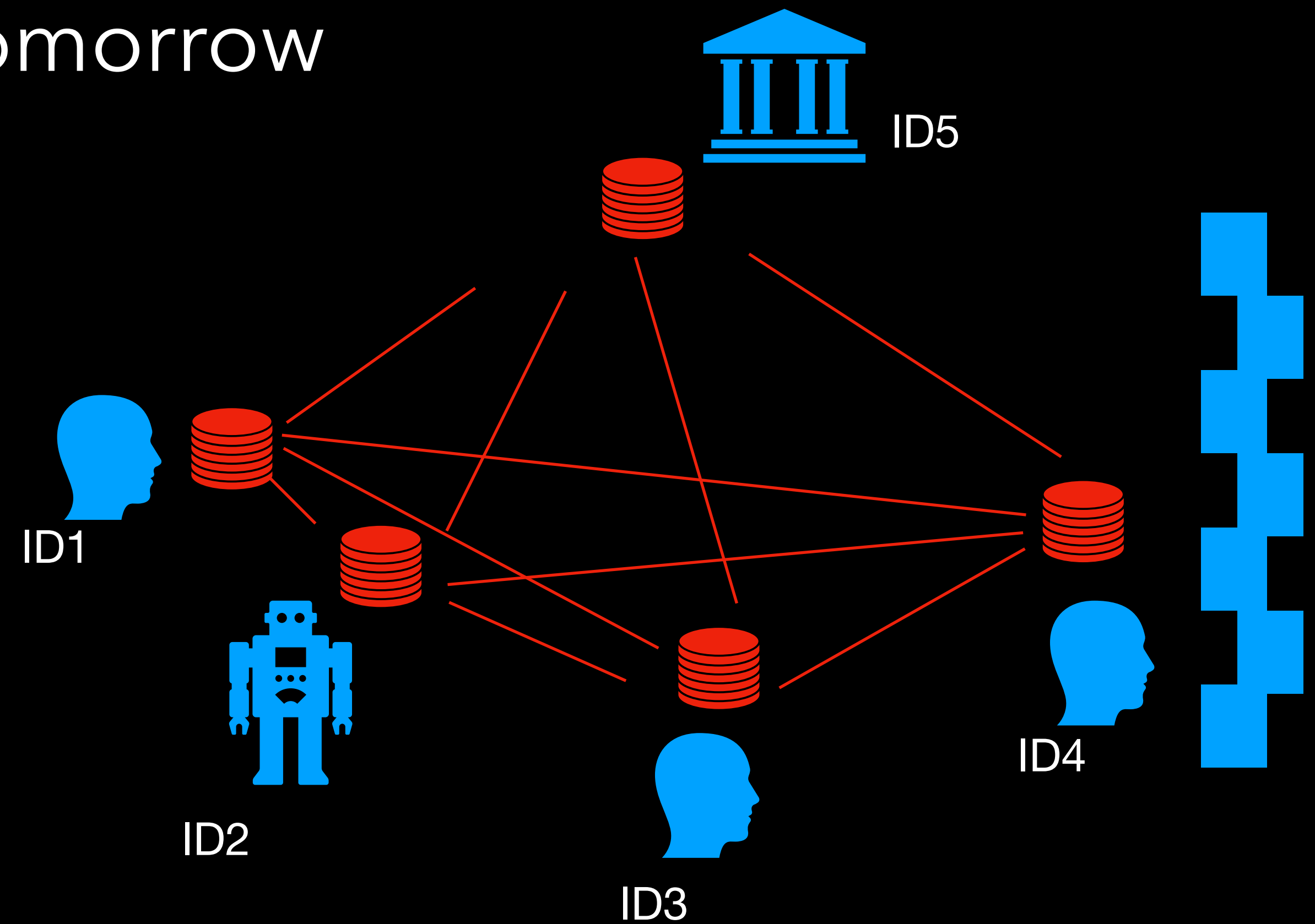
The distributed web

Today



Federated ID, no control over data, attribution, censorable

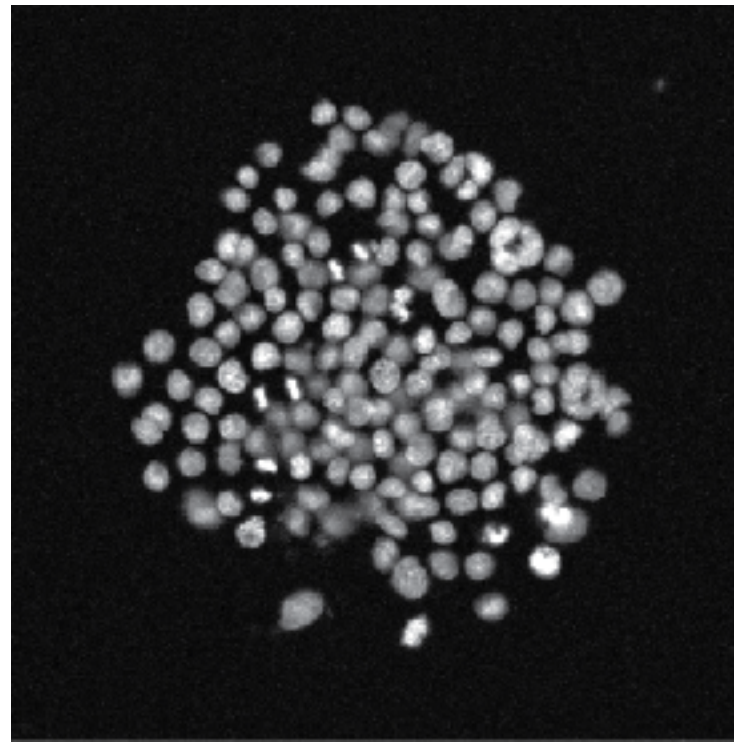
Tomorrow



Self-sovereign ID, control of storage & censorship resistance

Data & knowledge become transactions

1. Acquisition



Storage



Notarization



2. Analysis

```
//run("Brightness/Contrast...");
setMinAndMax(59, 186);
run("Smooth");
run("Apply LUT");
//run("Threshold...");
setThreshold(0, 120);
setOption("BlackBackground", false);
run("Convert to Mask");
run("Analyze Particles...", " show=Outlines
display clear include summarize record add");
```

Permanent content-addressed storage (IPFS)



Notarization (who and when) on blockchain



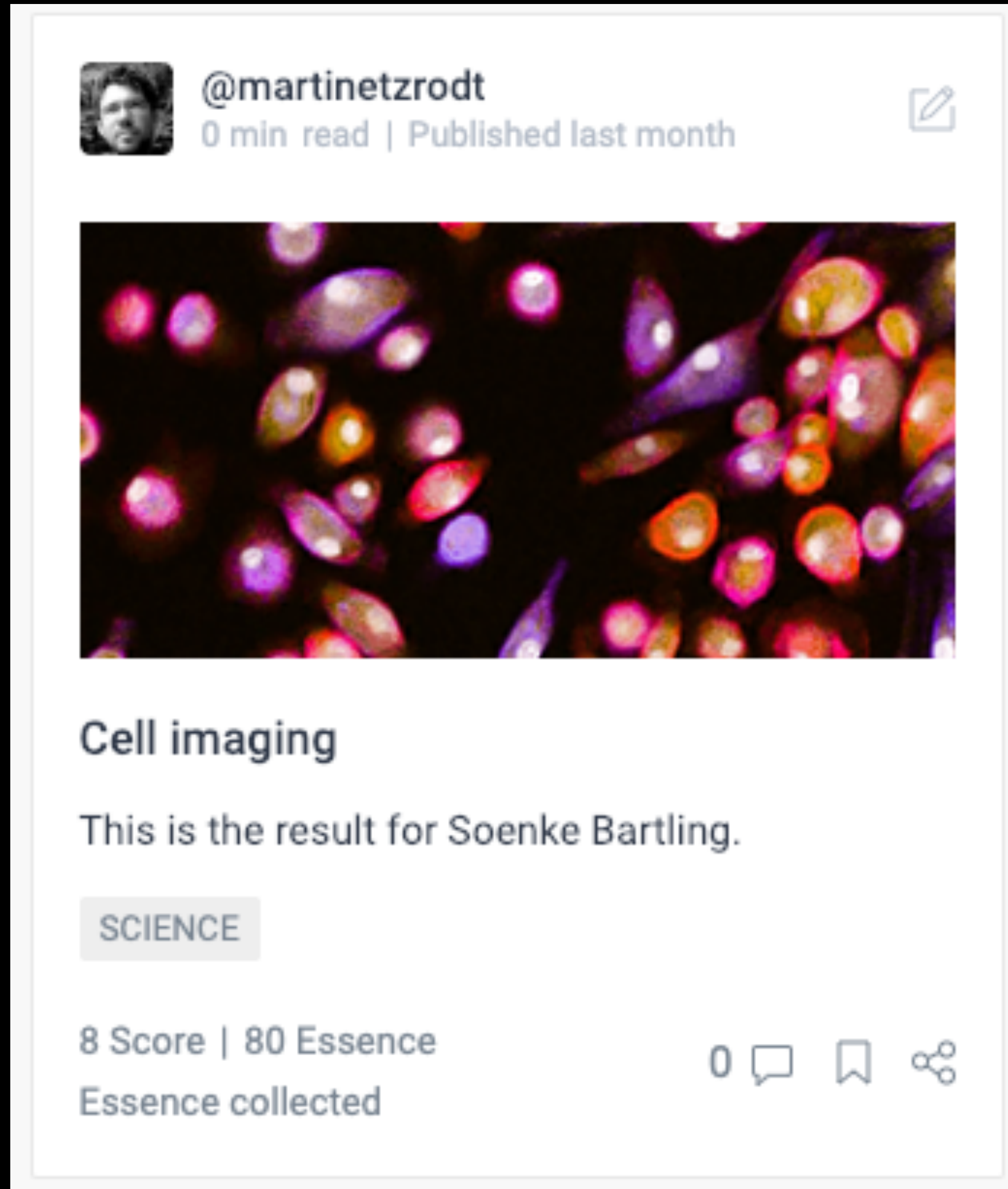
3. Interpretation



Transaction Information	
Timestamp:	Jul-05-2017 11:43:07 PM
Operator:	0x74abbd4c4e5d62210194f503a871a6bf68744b1a1
Analyst:	0x74abbd4c4e5d62210194f503a871a6bf68744b1a1
Timestamp:	Jul-05-2017 11:36:07 PM
From:	0x74abbd4c4e5d62210194f503a871a6bf68744b1a1
To:	Contract
Analyst:	0x8d6e62a50c59db437e4615913d7142f543f2302d
Value:	0 Ether (\$0.00)
Timestamp:	Jul-05-2017 11:43:07 PM
Publisher:	0x74abbd4c4e5d62210194f503a871a6bf68744b1a1

2017

<https://beta.akasha.world> : Self-sovereign publishing



-Permanent publication

-Attribution of contributions

-Interoperability & trigger processes via
smart contracts: IP sharing, grants &
funding, ...

Blockchain 1.0 → #BeYourOwnBank (Bitcoin)

Blockchain 2.0 → #BeYourOwnJournal (now)

2018

Beyond the "paper"

VALUATION

*Non fungible tokens for IP
(ERC721)*



<https://www.cryptokitties.co/kitty/1>

*Your unique scientific finding
received a 'virtual counterpart on the
blockchain.*

CURATION

Markets & Curated registries

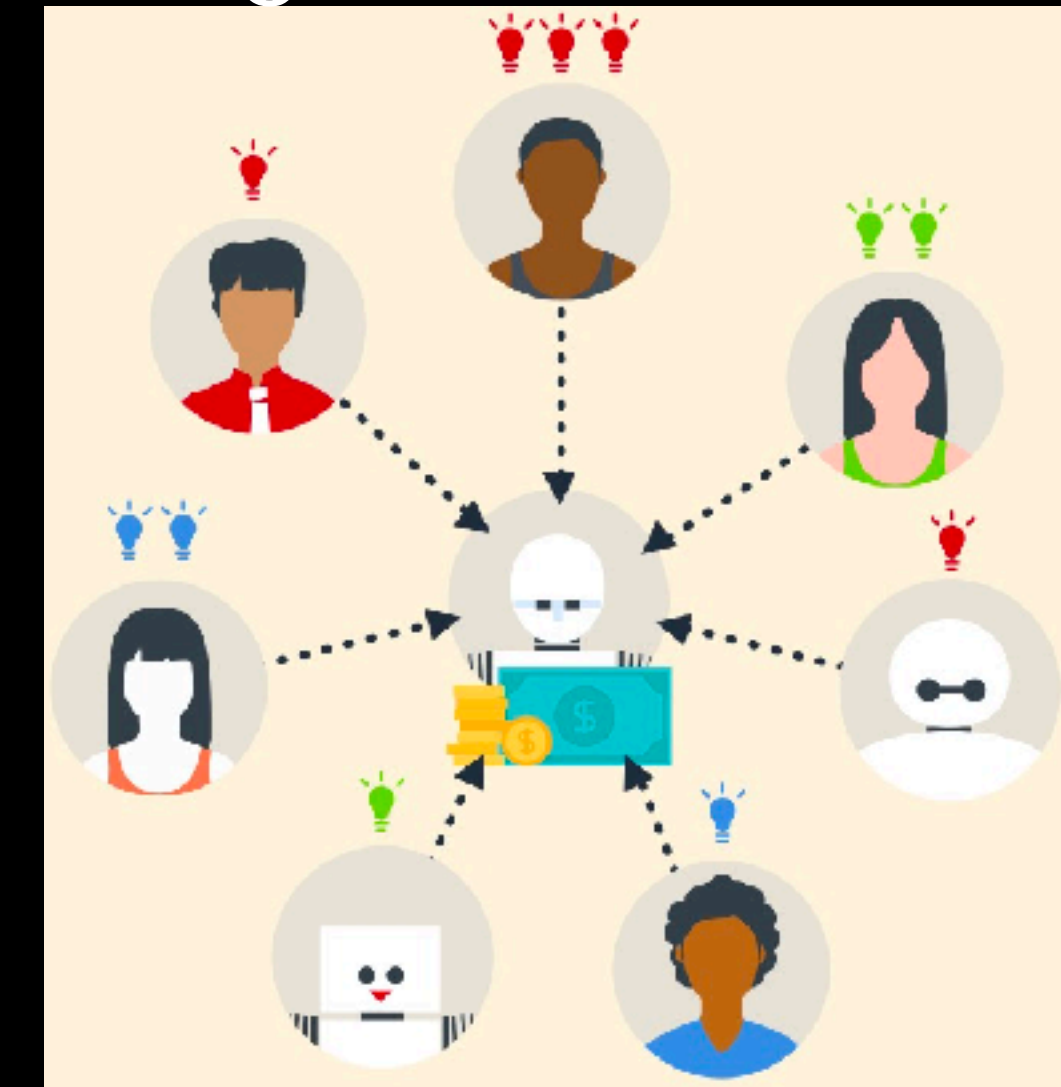


<https://hackernoon.com/token-curated-registry-tcr-design-patterns-4de6d18efa15>

*Someone that believes in your work. If it
attains value both will directly benefit.
Replace peer review by content
curation, and curation games*

COORDINATION

OrgTech: *Distributed autonomous
research organisations*



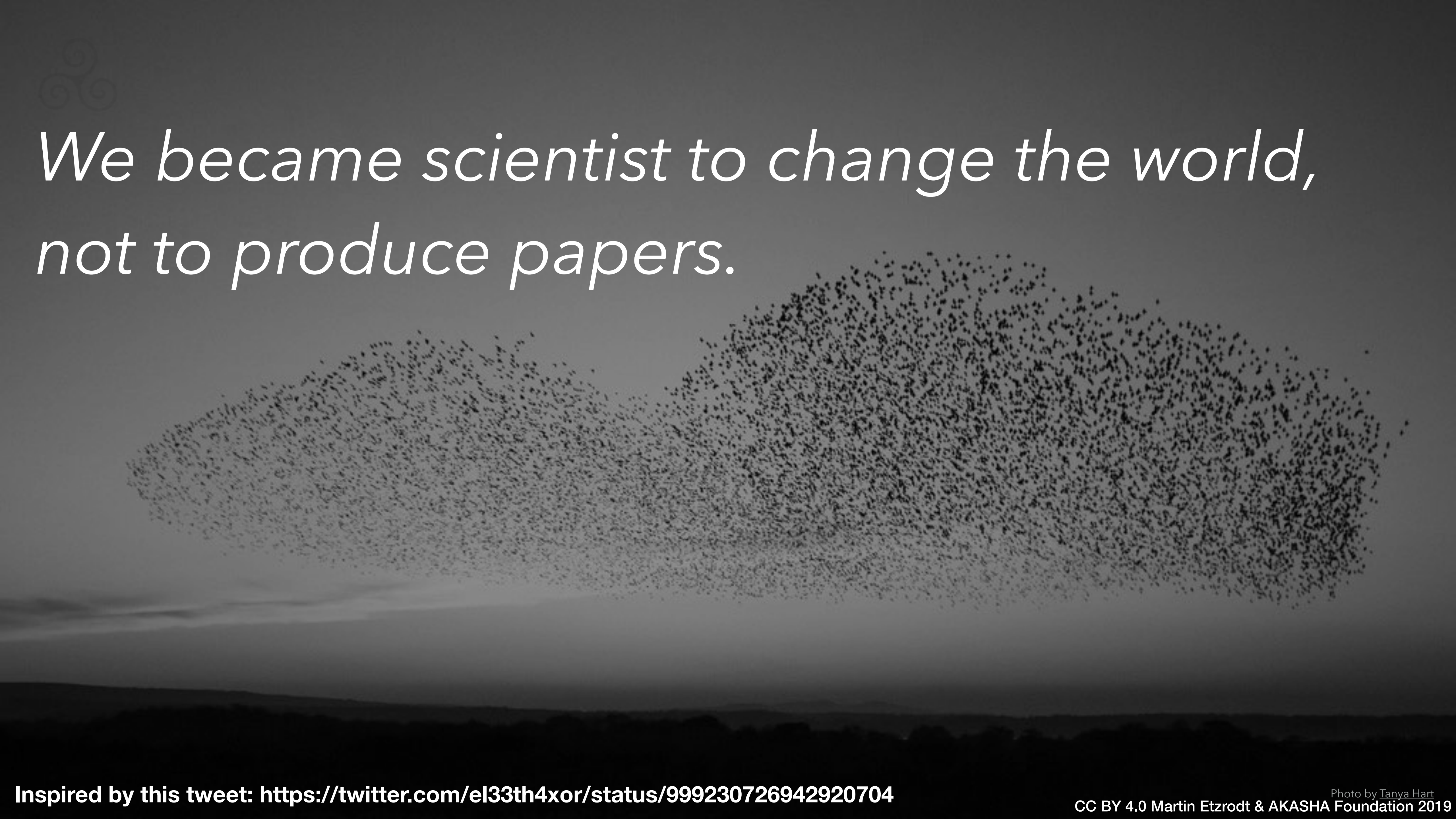
www.ethereum.org

*Massive means of autonomous
coordination among scholars & public.
Scale globally, beyond the control of
"national" governments*



*The pursuit of science by **independent, self-coordinated initiatives** assures the most efficient possible organisation of scientific progress.*

The Republic of Science, Michael Polanyi 1962

A large flock of birds is captured in flight, forming a distinct V-shape against a dark, overcast sky. The birds are small and numerous, creating a dense, textured pattern. The background shows a dark horizon line, suggesting a sunset or sunrise. In the top left corner, there is a faint, light-colored logo consisting of several overlapping circles.

*We became scientist to change the world,
not to produce papers.*

AKASHA Foundation



Software

Architecture, protocols, models, and applications.



Hardware

Bits dancing with atoms at the edge.

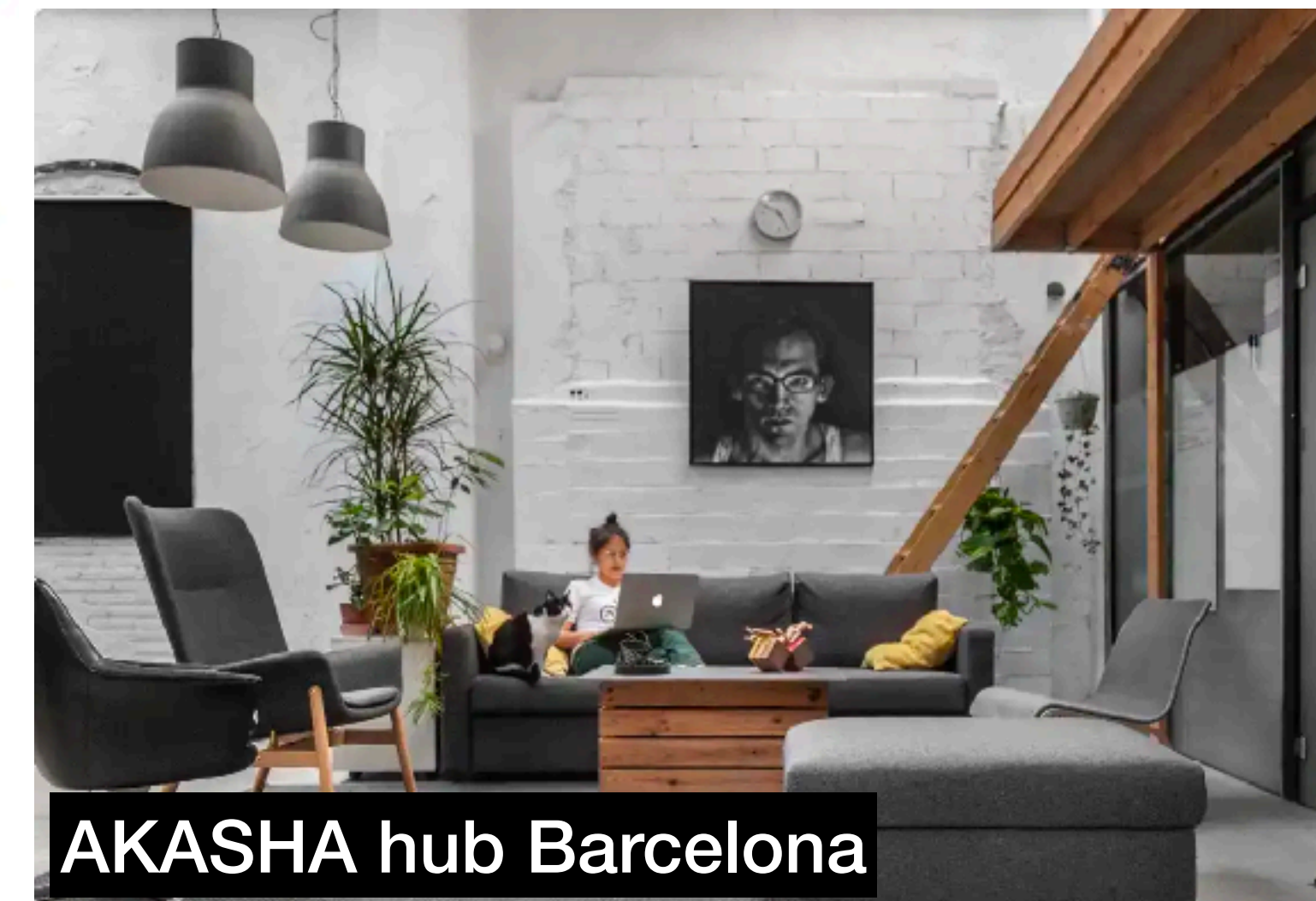


Research

Exploring new frontiers through playful experimentation.



AKASHA Team Switzerland/ World



AKASHA hub Barcelona

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