

AI and Human Understanding

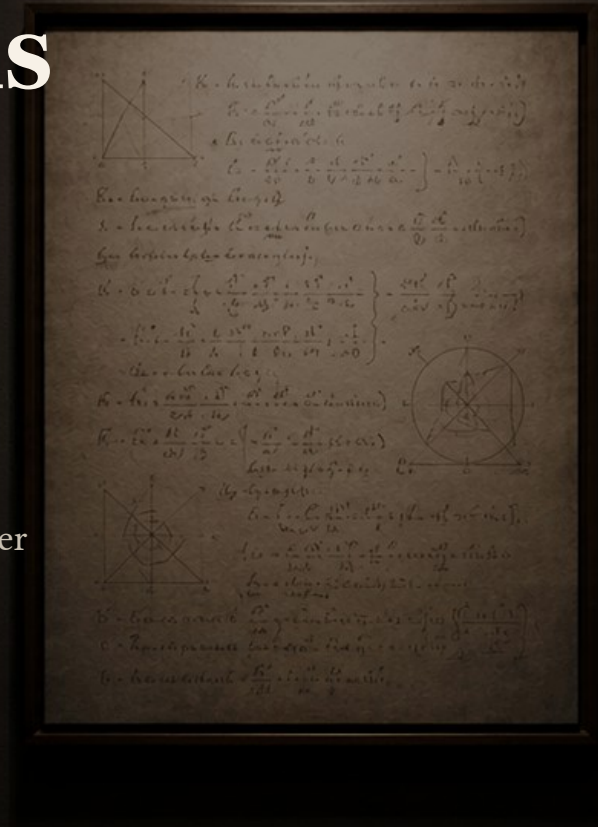
When Mathematicians Become Curators

REMIX Summit Sydney 2026 · Liming Zhu



“Mathematicians are becoming curators.”

A provocative claim from the AI-mathematics frontier



Correctness is the entry ticket.

At the frontier, STEM still asks human questions.

Beauty

Elegance

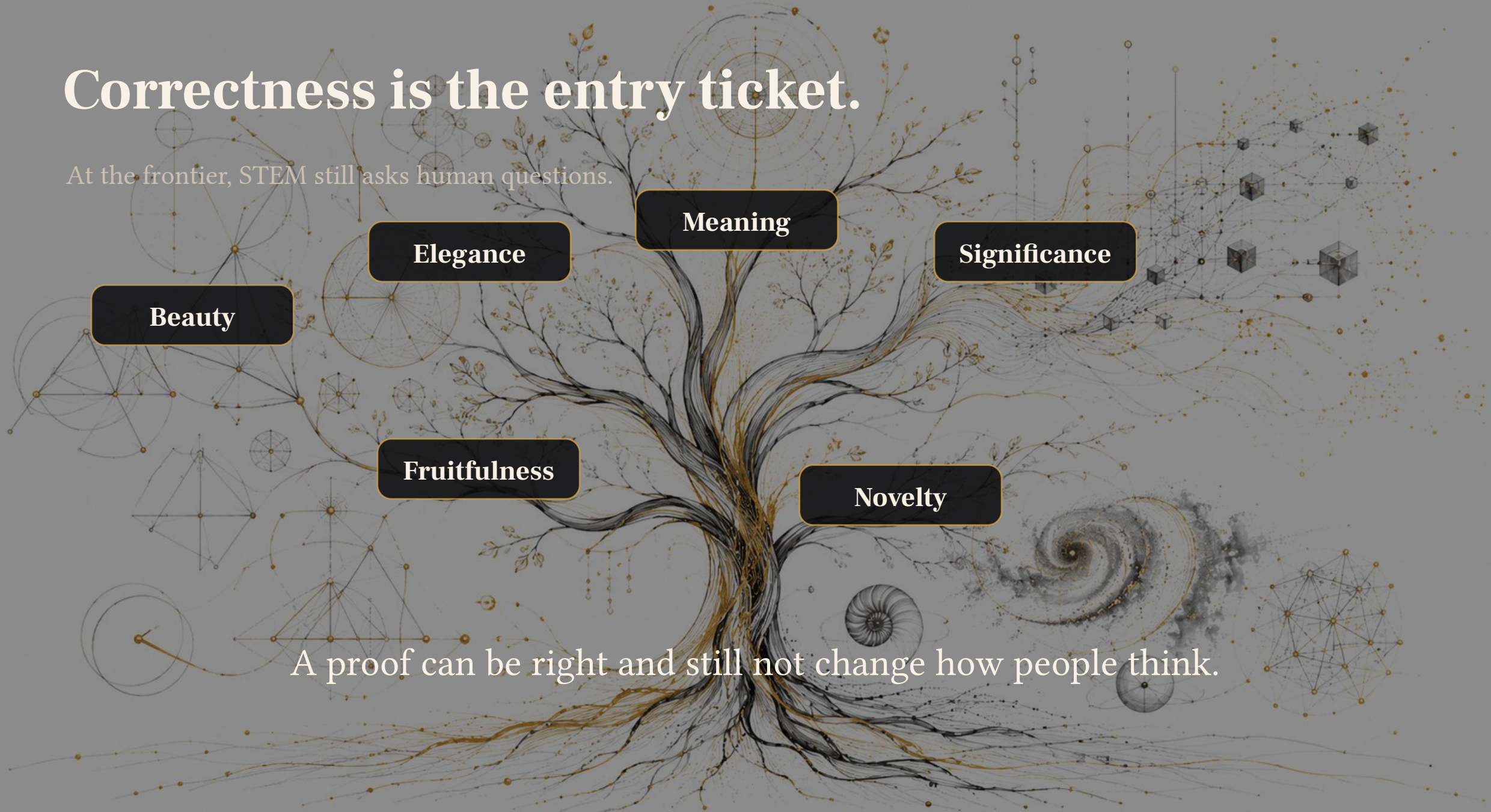
Meaning

Significance

Fruitfulness

Novelty

A proof can be right and still not change how people think.



A recent shock from mathematics

Reported OpenAI Astra results: ten advances in mathematics and theoretical computer science.

10 open problems

\$2k reported compute

machine-checked proofs

Examples reported: non-sofic groups, Connes's rigidity conjecture, high-dimensional sphere packing, coding theory, Ramsey numbers.

Difficulty framing for the 10 Astra maths results



Most of the reported results cluster around levels 7-8.5.
That is: strong research results to major field advances, with a few pushing higher.

Illustrative difficulty scale based on public commentary and expert reactions; visual summary only.

Another shock from computer science: reviewing itself

Not just AI-written papers. AI-assisted reviewing is already changing scientific judgement.



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Every single review I have handled at NeurIPS as an AC is much worse than a well executed AI review. By "much worse" I do not mean 20% or 50%. I mean a factor of about 10-100.

At least 10x more mathematical issues are caught, 10x more missing key citations are caught, 10x more novelty claims are invalidated with evidence, 10x more issues with the experiments are observed, 10x more typos and grammatical issues are fixed, 10x more inconsistencies are found, and so on.

At this point, we would be much better to just 1) give one very thorough ChatGPT review to all submitted papers automatically, and 2) keep asking for a revision or two until the number of issues decreases, 3) then a human AC can make a decision.

I can't believe I am saying this -- AI reviews were a nonsense idea even a year ago. The current AI reviews are super-human.

“AI Slop” or “Human Slop”?

Average human review is constrained by time, attention and incentives.

When “AI reviews are super-human”,

the curator role becomes sharper: what deserves attention, revision, acceptance, trust?

The bottleneck moves.

Yesterday

Problems



Solutions by Human



Tomorrow

Many solutions by AI



Curated Understanding

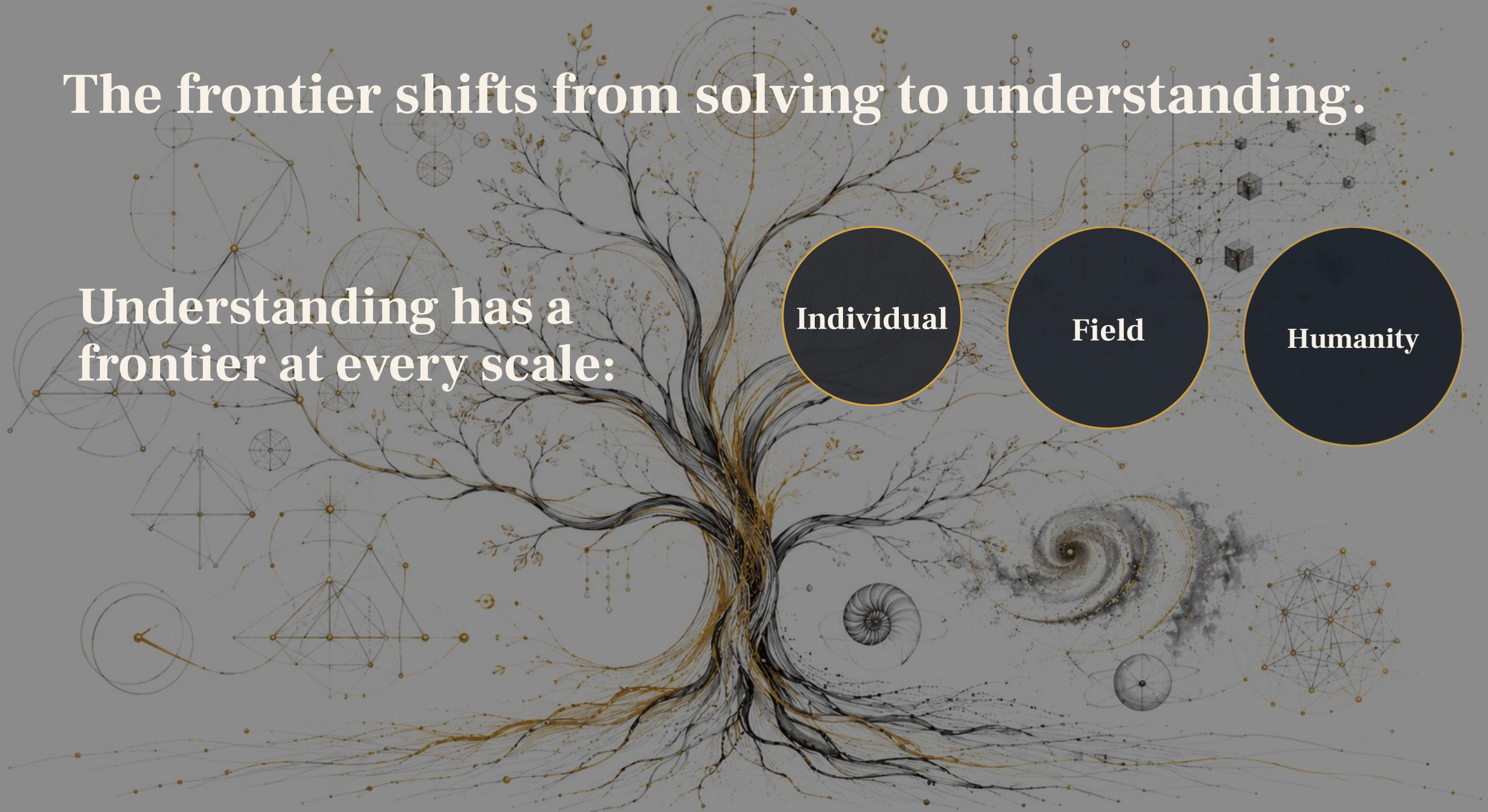
The frontier shifts from solving to understanding.

**Understanding has a
frontier at every scale:**

Individual

Field

Humanity



Risk

**When answers become
easy, understanding can
become fragile.**

A world rich in answers can still be poor in
understanding.

fake expertise

borrowed judgement

shallow learning

poor choices

Understanding is built through practice

Mathematics

working through proofs



Understanding

not just reading final theorems

Programming

designing, debugging, refactoring



Understanding

not just copying perfect code

Science

hypothesising, failing, revising



Understanding

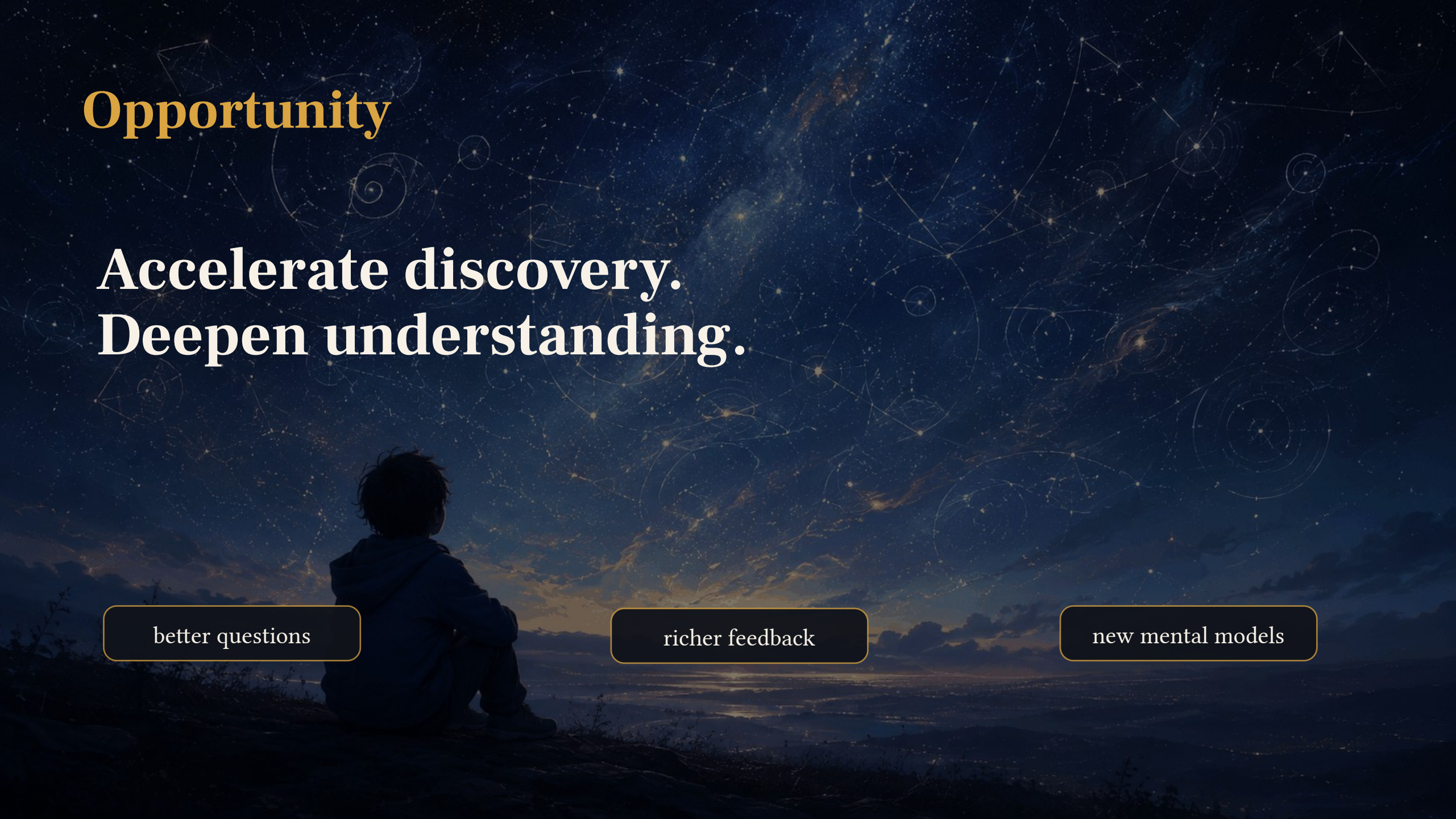
not just inspecting results

Understanding is a mental state created by the journey

Arriving is not the point.

The path changes the mind.



A child is sitting on a dark, rocky hill, looking up at a vast night sky. The sky is filled with stars and numerous constellation lines, some of which are highlighted in a golden-yellow color. The child is seen from behind, wearing a dark jacket. The overall scene is dark and atmospheric, with a hint of light on the horizon.

Opportunity

Accelerate discovery. Deepen understanding.

better questions

richer feedback

new mental models

How my own science is changing

What I increasingly do with students and collaborators

Frame

What is worth asking?
What would change how
we think?

Probe

Let AI generate paths,
objections, examples,
counterexamples.

Understand

Decide what we actually
believe, value and want
to pursue.

The scientist increasingly curates questions, evidence and meaning.

Understanding lets us choose better goals



Curiosity

what is worth exploring

Taste

what I recognise as valuable

Judgement

what I choose to trust

Agency

what I decide to pursue

You cannot know what you want without understanding the space of possibilities.

Perhaps STEM is catching up.

The creative industries have always worked with meaning, context, taste and shared understanding.

**The revenge of
the arts major.**



A child is sitting on a dark, rocky hill in the foreground, looking up at a vast night sky. The sky is filled with numerous stars and constellations, which are highlighted by thin white lines connecting the stars. The background shows a horizon with some clouds and a faint glow of light, possibly from the setting or rising sun. The overall scene is dark and atmospheric, emphasizing the vastness of the universe.

AI may extend discovery.

Humans must expand understanding.

That journey remains ours.