Title: A Madman Dreams of Turing Machines: Limits of Truth and Mind

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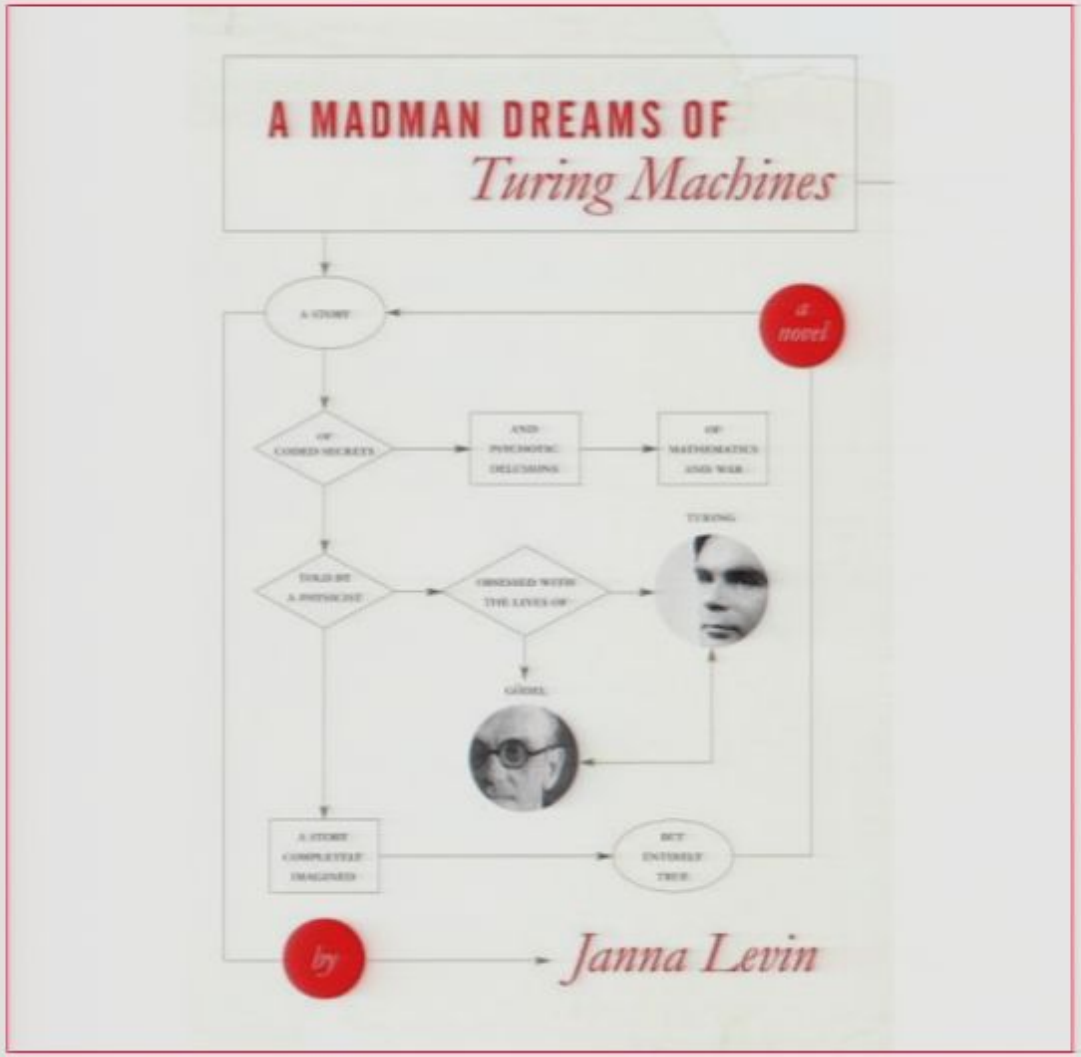
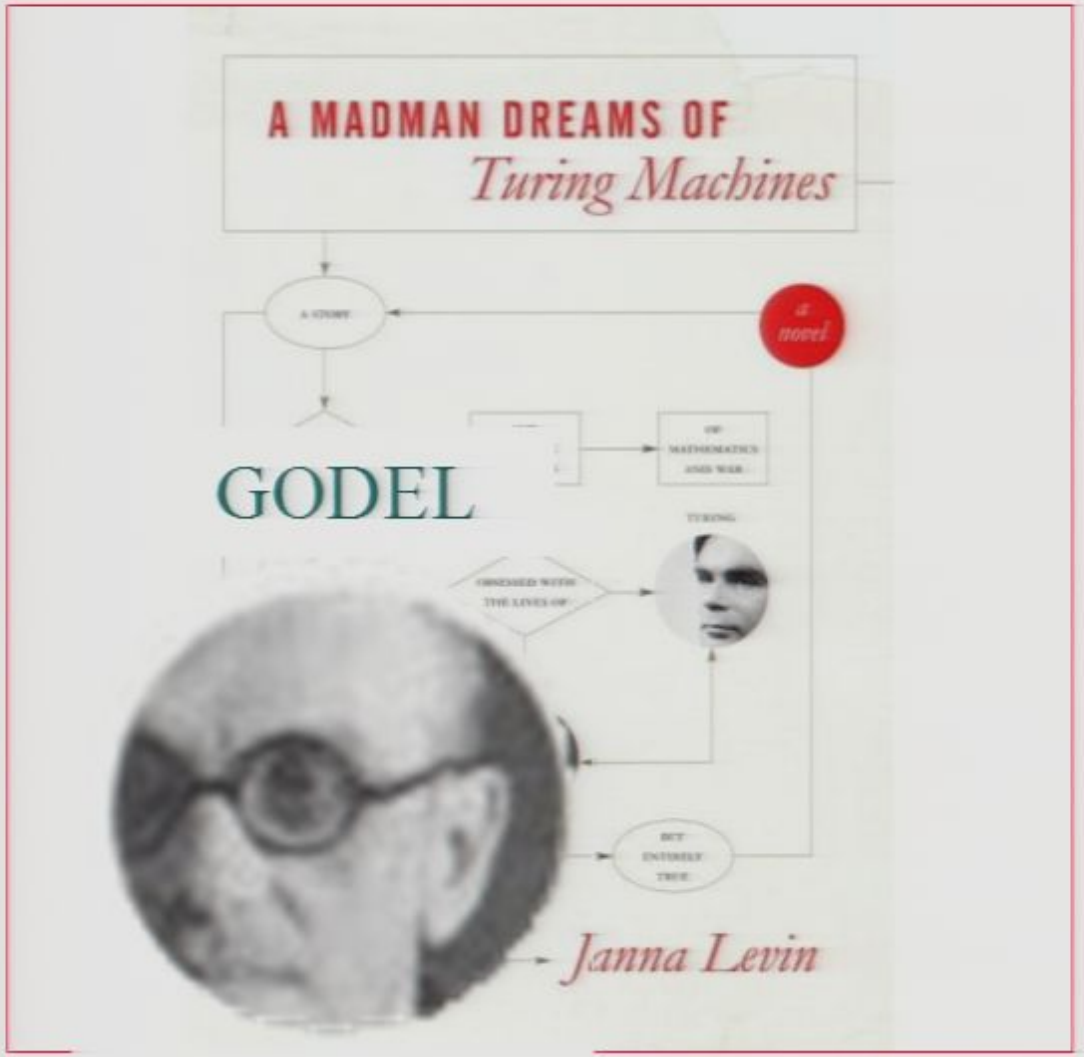
Abstract: From LevinÂ’s recent book comes a strange if true story of coded secrets, psychotic delusions, mathematics, and war. This story of greatness and weakness, of genius and delusion, circulates around the parallel lives of Kurt GÃ¶del, the greatest logician of many centuries, and Alan Turing, the extraordinary code breaker during World War II. Taken together their work proved that there are limits to knowledge, that machines could be taught to compute, that one day there could be artificial intelligence. Yet GÃ¶del believed in transmigration of the soul and Turing concluded that we were soulless biological machines. And their suicides were complementary. GÃ¶del, delusional and paranoid, starved himself to death fearing his food was poisoned. Turing ate a poison apple, driven to suicide after being arrested and convicted of homosexual activities. These two men were devoted to truth of the highest abstract nature, yet were unable to grasp the mundane truths of their own lives. Through it all, you will explore, along with these two odd heroes, if any of us can ever really grasp the truth. <kw>Madman Dreams, Turing Machines, Turing, Truth, Godel, Mathematical Theory of Everything, Liar\'s Paradox, Turing machine, limits, mathematical truth </kw>


A MADMAN DREAMS OF
Turing Machines
a novel
by
Janna Levin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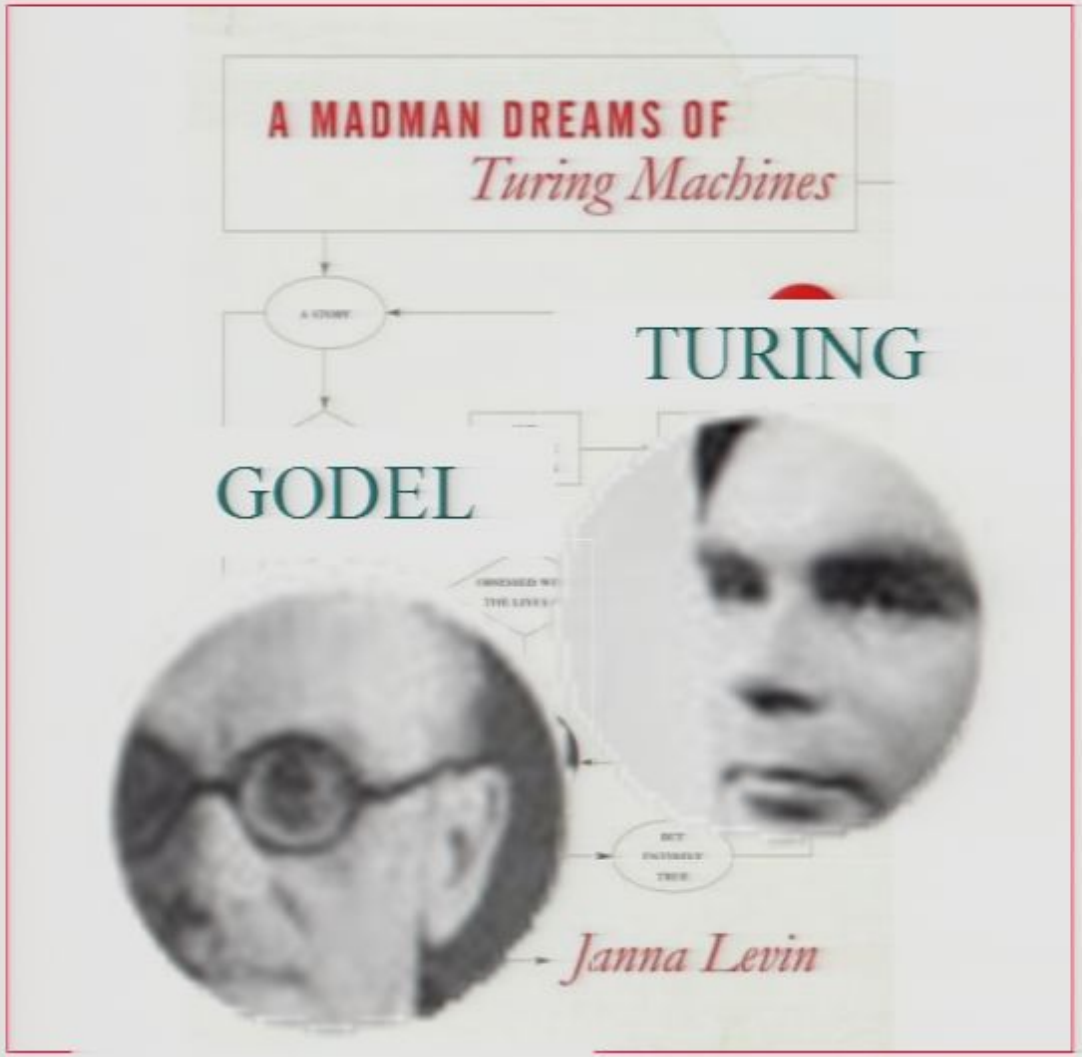
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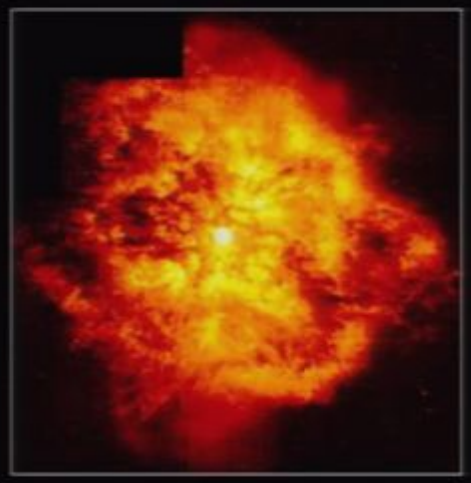
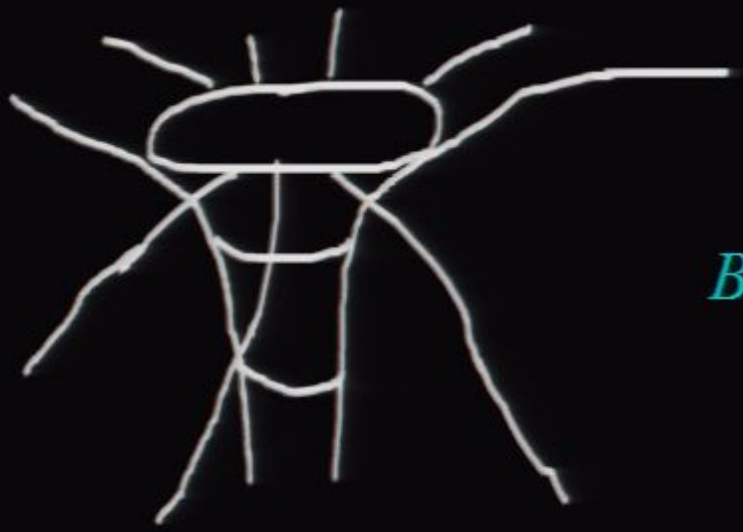
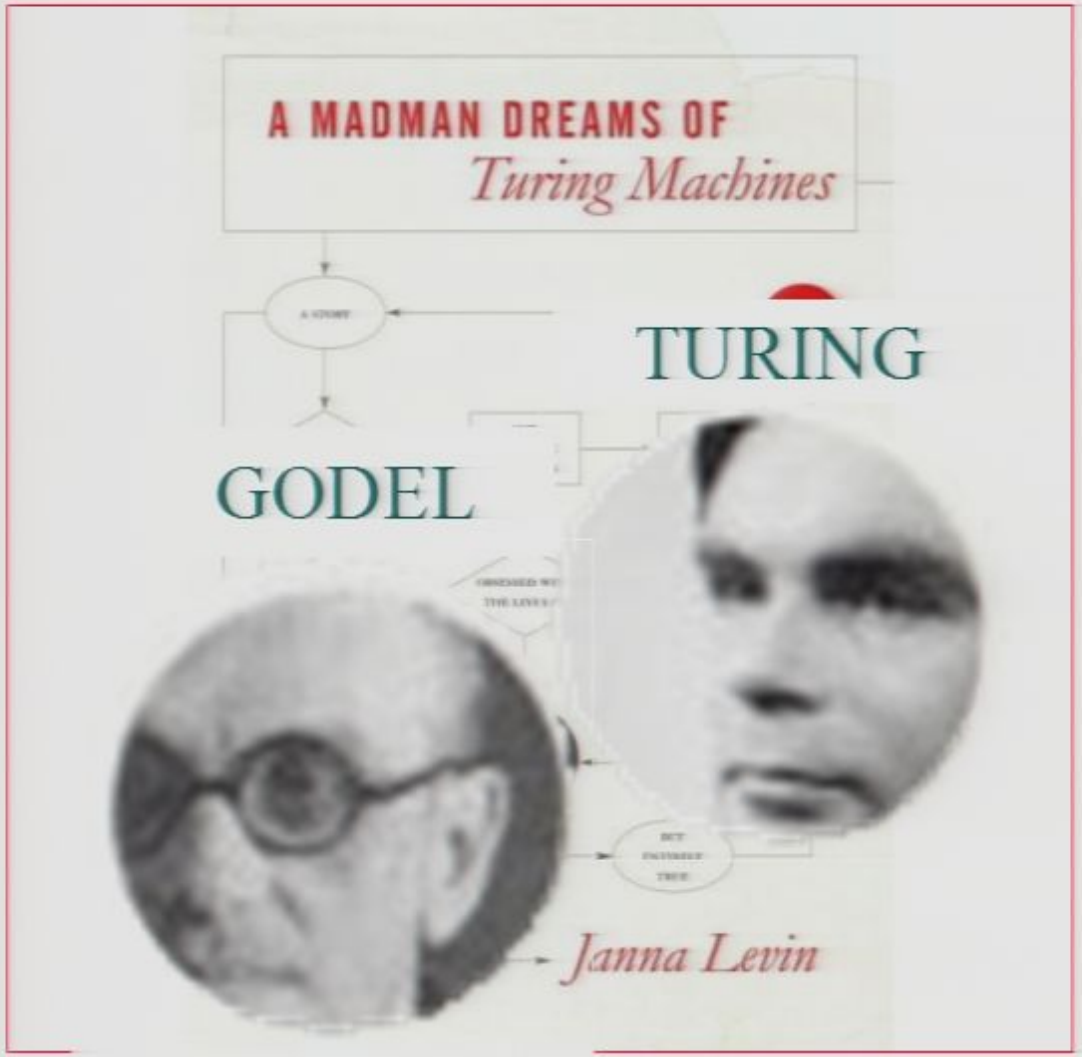
Infinity



Big Bang



Black holes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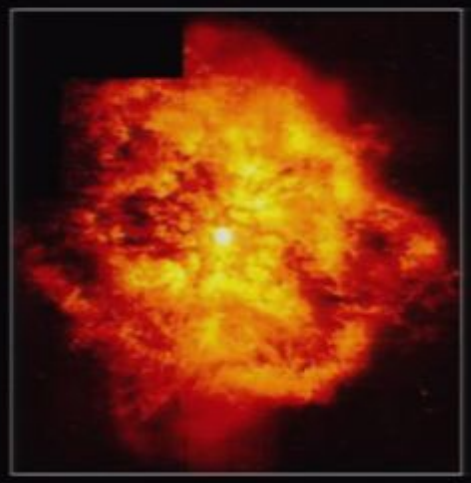

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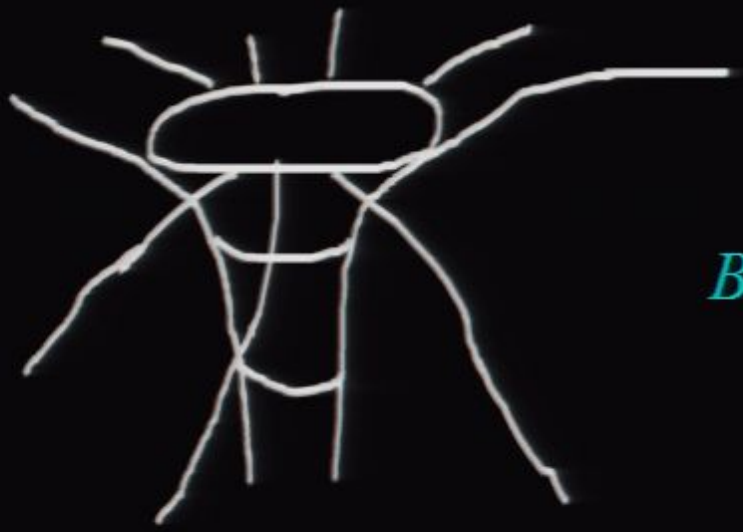

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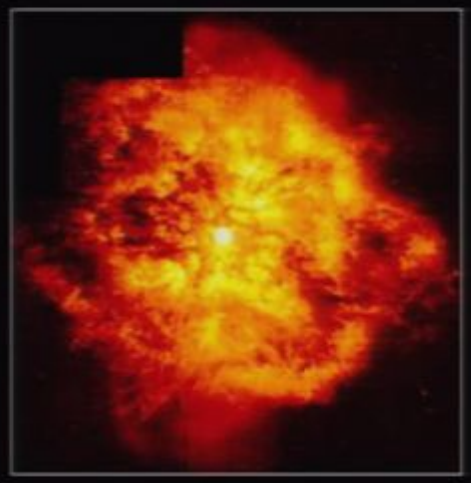
Infinity



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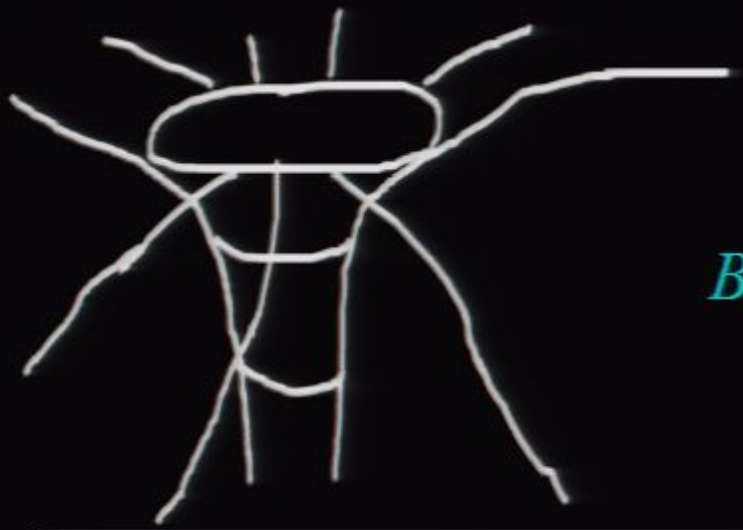

Black holes

THEORY OF EVERYTHING

Gödel and Turing
proved that there is no
Mathematical Theory of Everything

Gödel and Turing
proved that there is no
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There are some truths that
can never be proven to be true

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Mathematical Truth Can Be Elusive

Liar's Paradox

The Cretan says,

"All Cretans are liars"

"This is a Lie"

Liar's Paradox

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Can't decide if it's True or False

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If True, then it is a lie, so it's False

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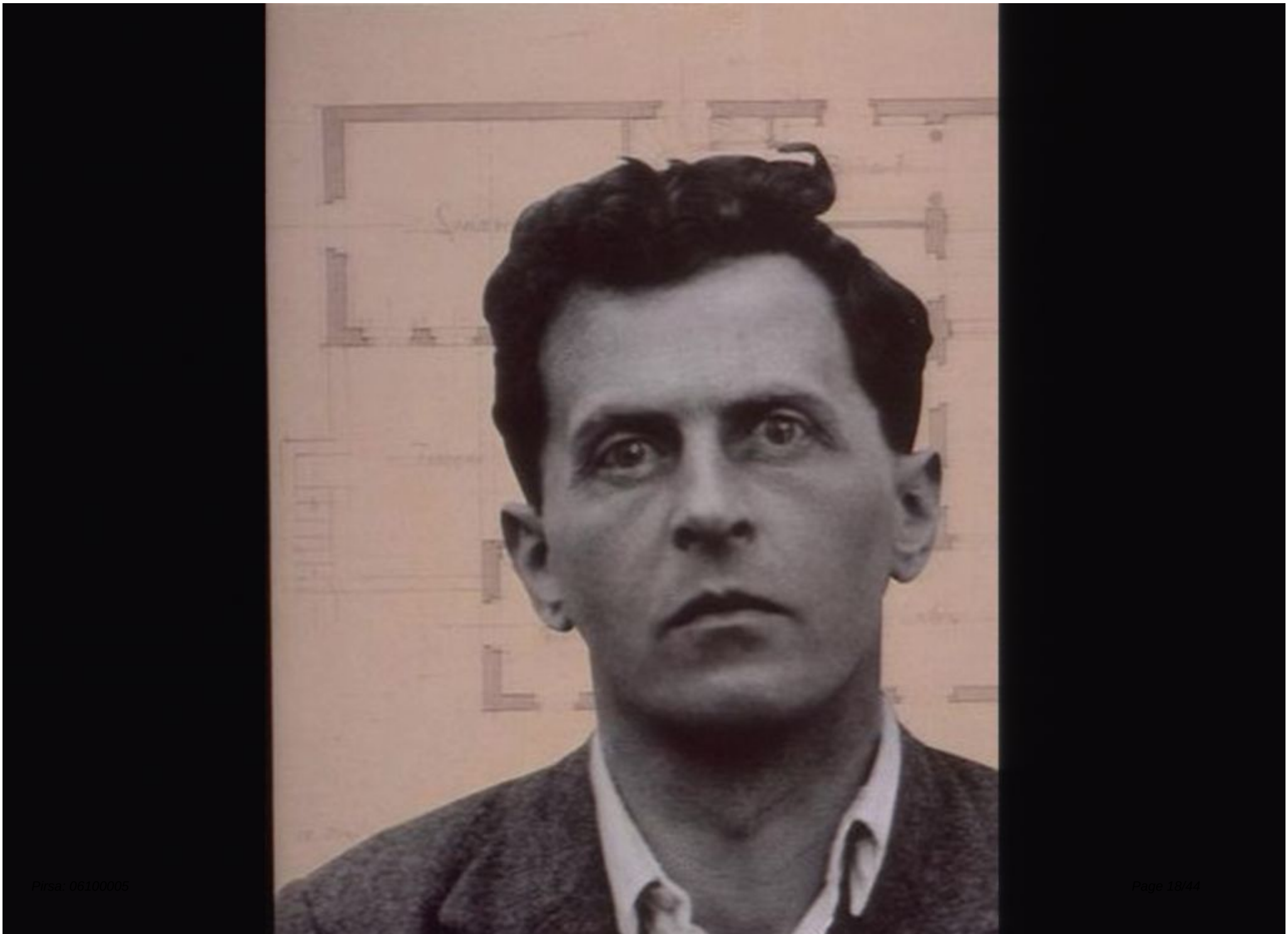
Undecidable



Mathematics must be free of undecidable tangles

Mathematics must be Complete

Mathematics must be free of undecidable tangles

Mathematics must be Complete

Right?

Wrong

Mathematics must be free of undecidable tangles

Mathematics must be Complete

Right?

Wrong

Mathematics is Incomplete

There are undecidable statements

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Mathematics must be free of undecidable tangles

Mathematics must be Complete

Right?

Wrong

Mathematics is Incomplete

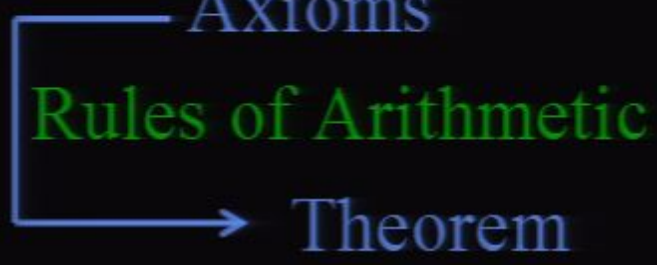
There are undecidable statements

"This is a lie" → "This is unprovable"

“This is unprovable”

"This is unprovable"

Proof:



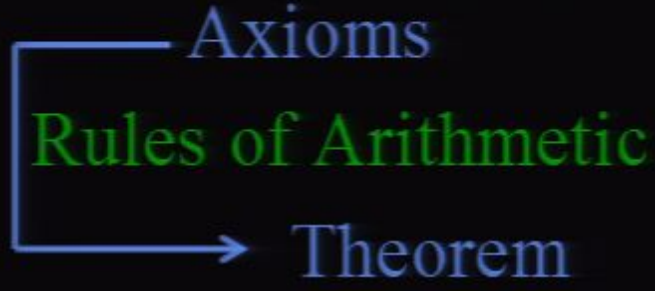
"This is unprovable"

Proof:

$$n \varepsilon K = \overline{Ber(x)\ [R(n);n]}$$

"This is unprovable"

Proof:

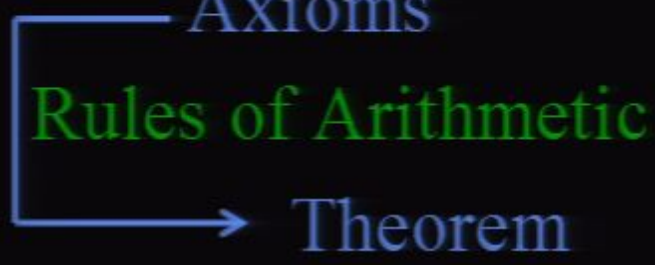


$$n \varepsilon K = \overline{Ber(x)\ [R(n);n]}$$

Gödel *proved* that there were undecidable statements

"This is unprovable"

Proof:



$$n \varepsilon K = \overline{Ber(x)}\ [R(n);n]$$

Gödel *proved* that there were undecidable statements

Can see at a glance that it's True

True but Unprovable

"This is unprovable"

Proof:

$$n \varepsilon K = \overline{Ber(x)}\ [R(n);n]$$

Gödel *proved* that there were undecidable statements

Can see at a glance that it's True

True but Unprovable

Turing Machine

0	0	1	0	1	0

Infinite list of numbers
cannot be computed by any machine

Uncomputable numbers

Mechanize Thought

Devise a machine that could Think

The Thought Experiment Behind
The Computer

Limits → Discovery

Limits → Discovery

- Limit Speed of Light → Relativity

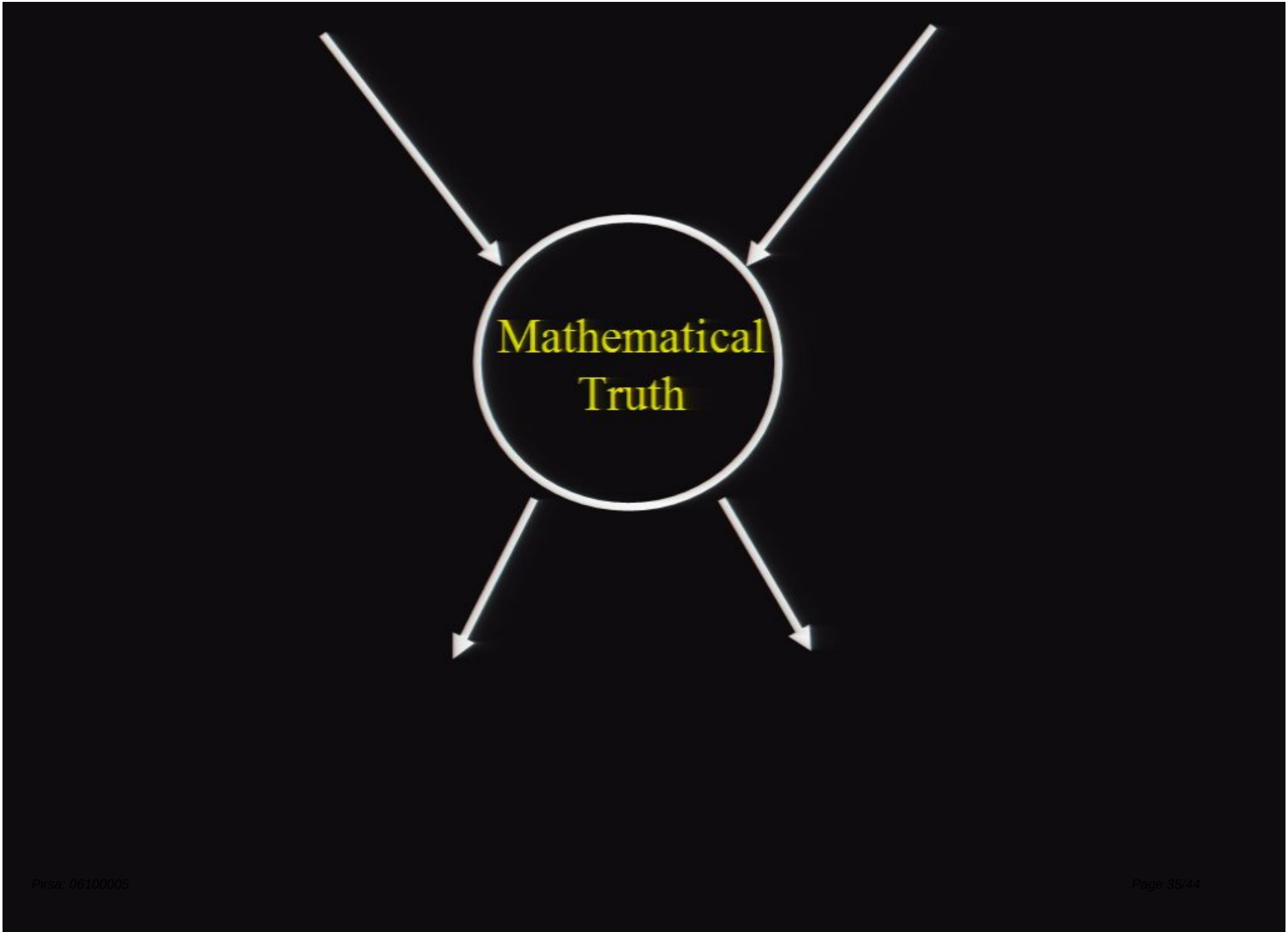
Limits → Discovery

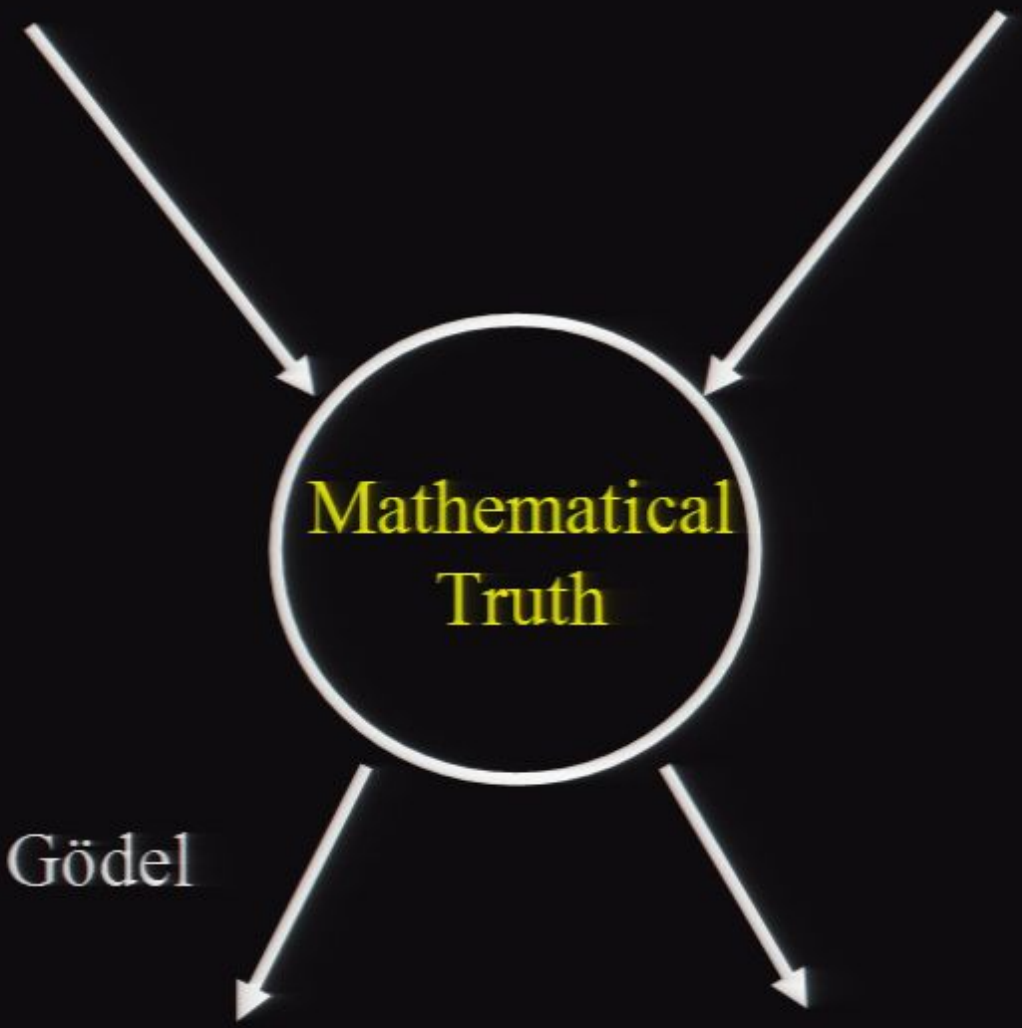
- Limit Speed of Light → Relativity

- Heisenberg Uncertainty → Quantum Reality

Limits → Discovery

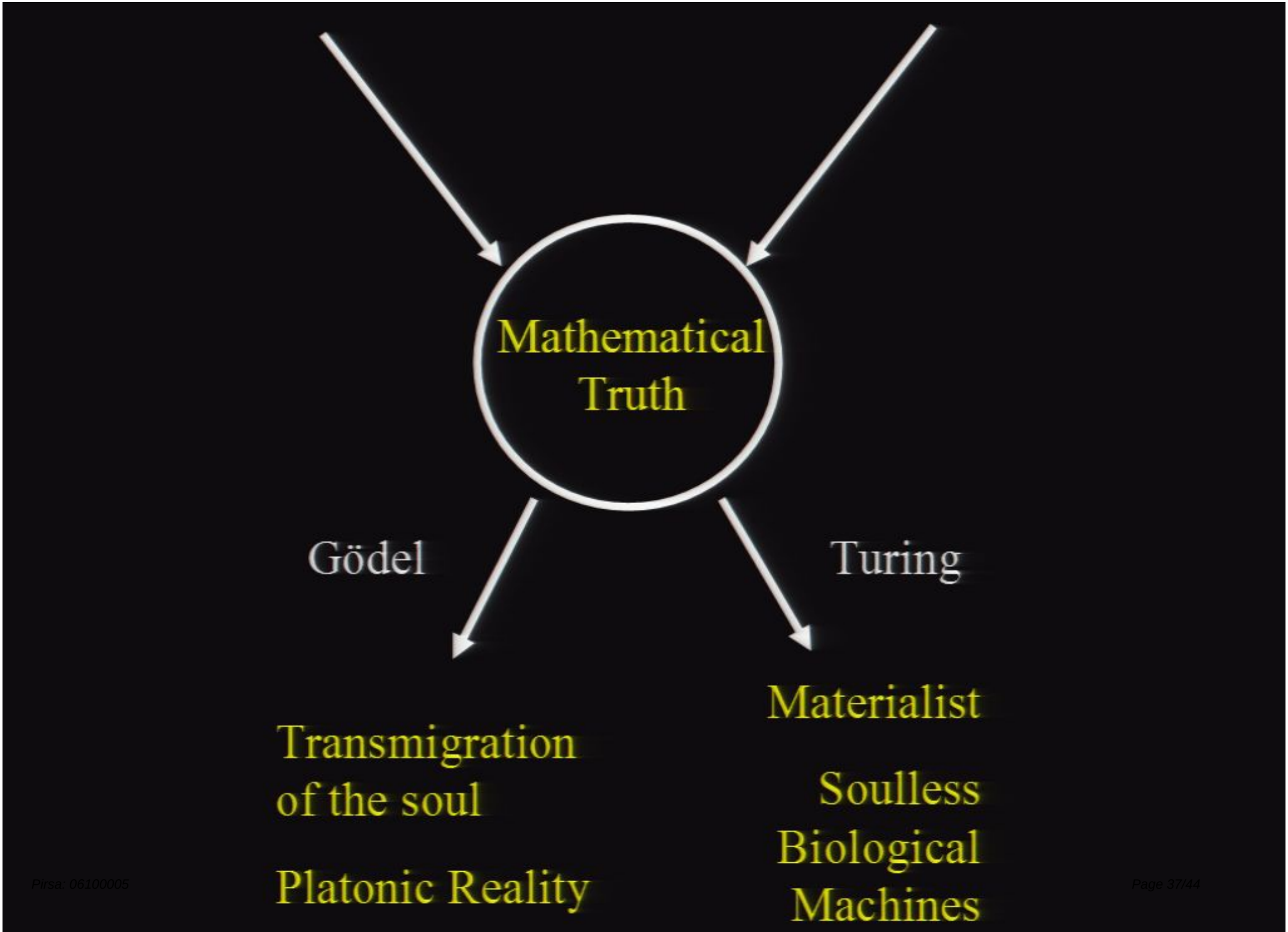
- Limit Speed of Light → Relativity
- Heisenberg Uncertainty → Quantum Reality
- Limits of Mathematics → Artificial Intelligence

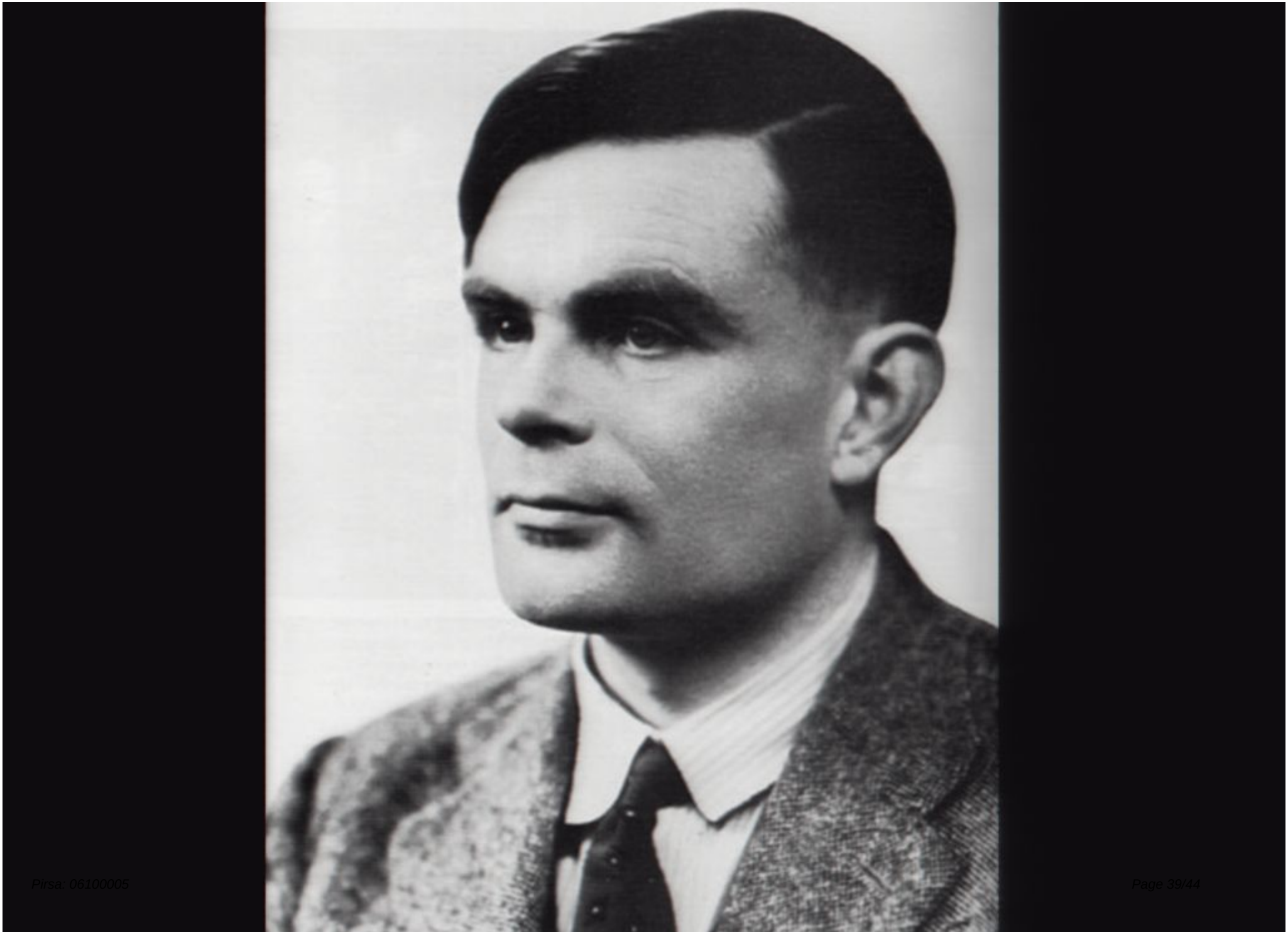

Mathematical
Truth



Transmigration
of the soul

Platonic Reality

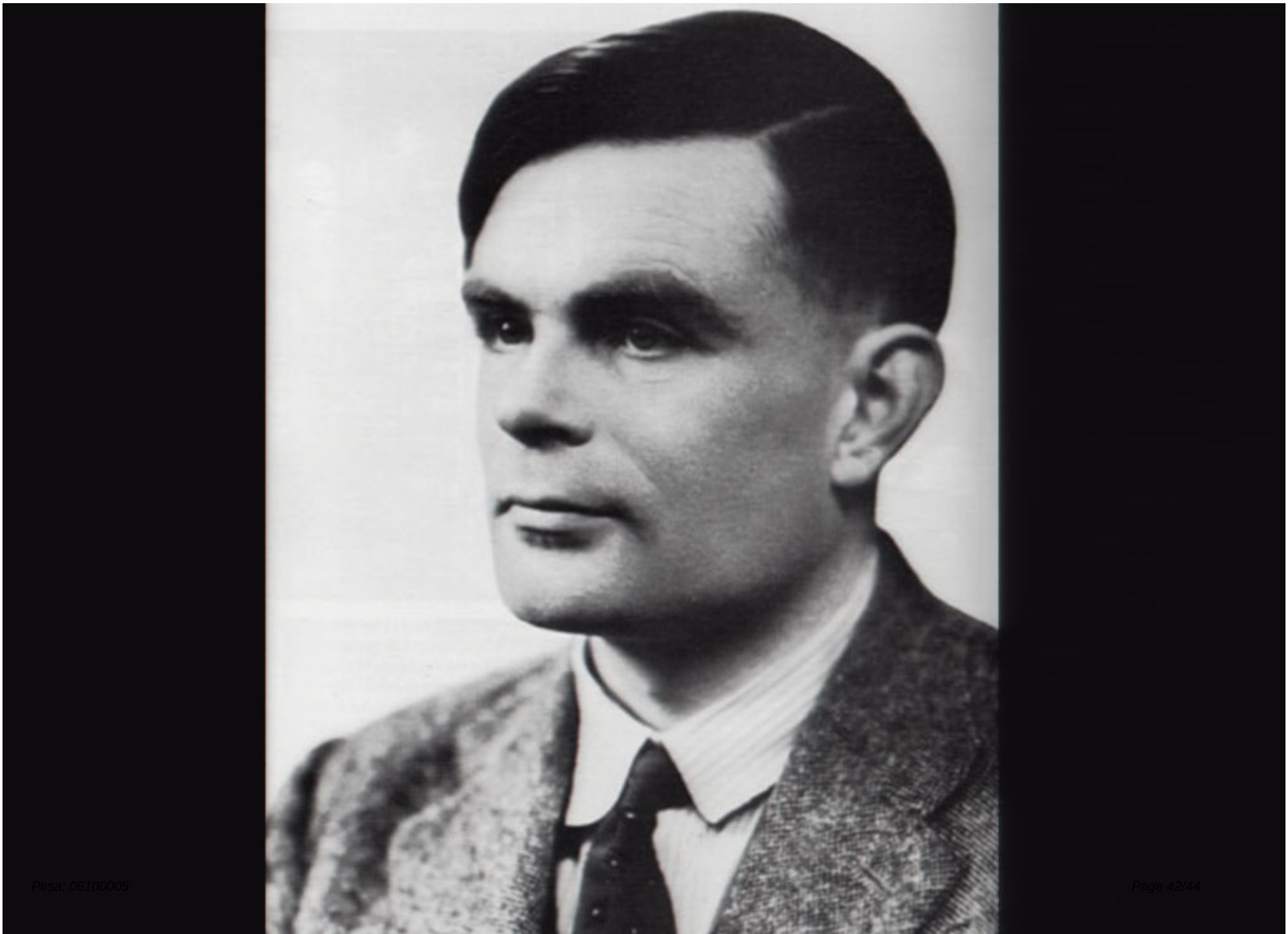

Mathematical Truth
Gödel
Turing
Transmigration of the soul
Platonic Reality
Materialist
Soulless Biological Machines

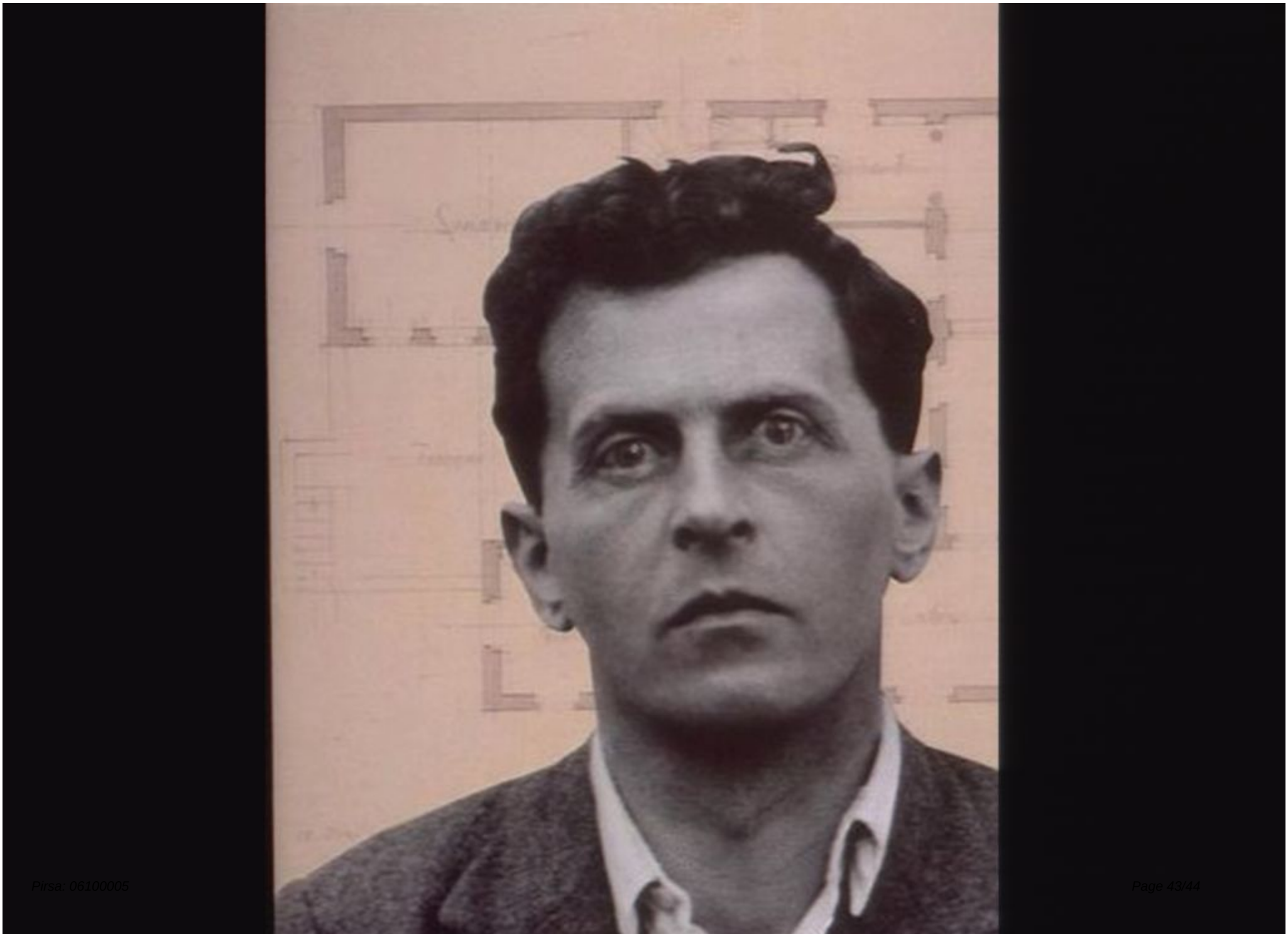


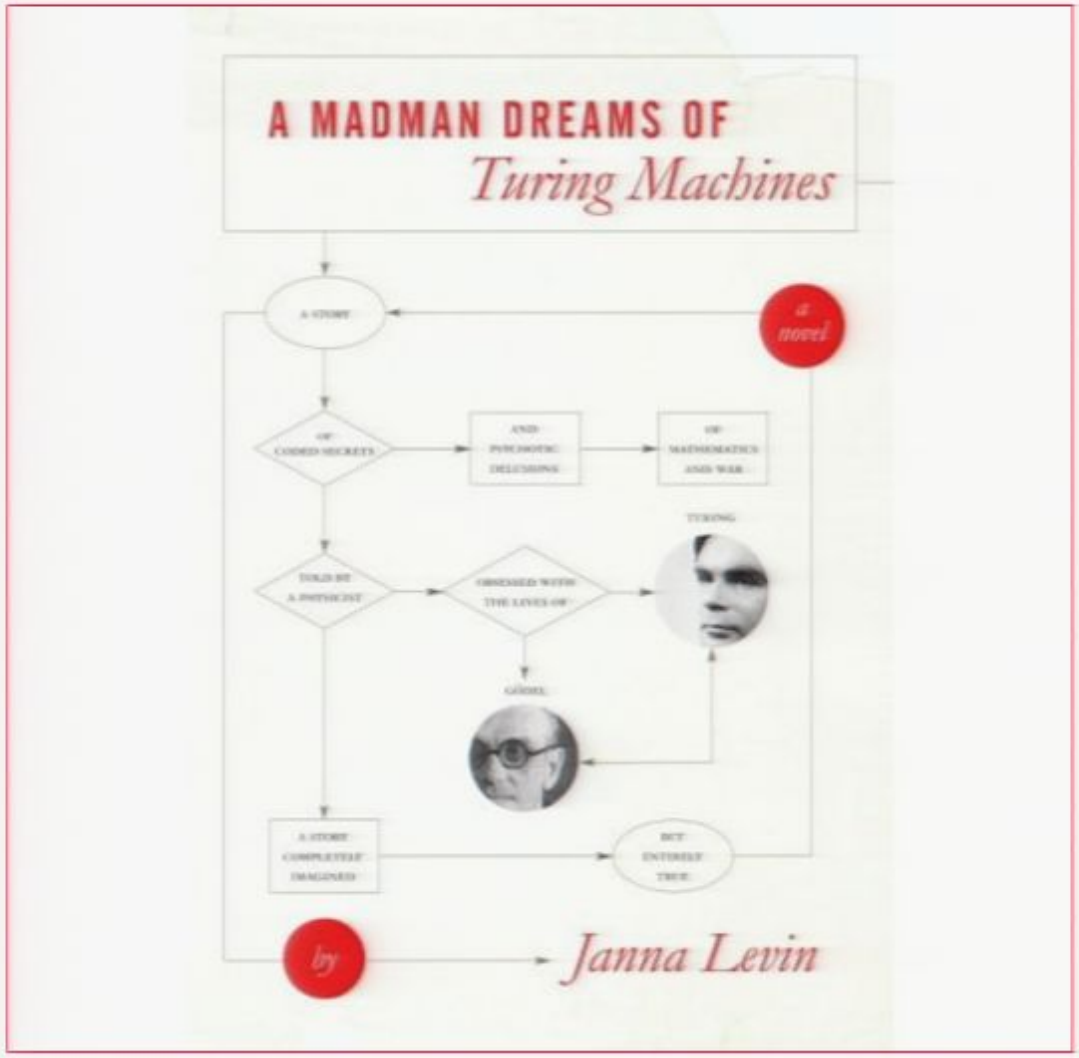
Fiction versus Nonfiction

This is a lie

but it's true



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