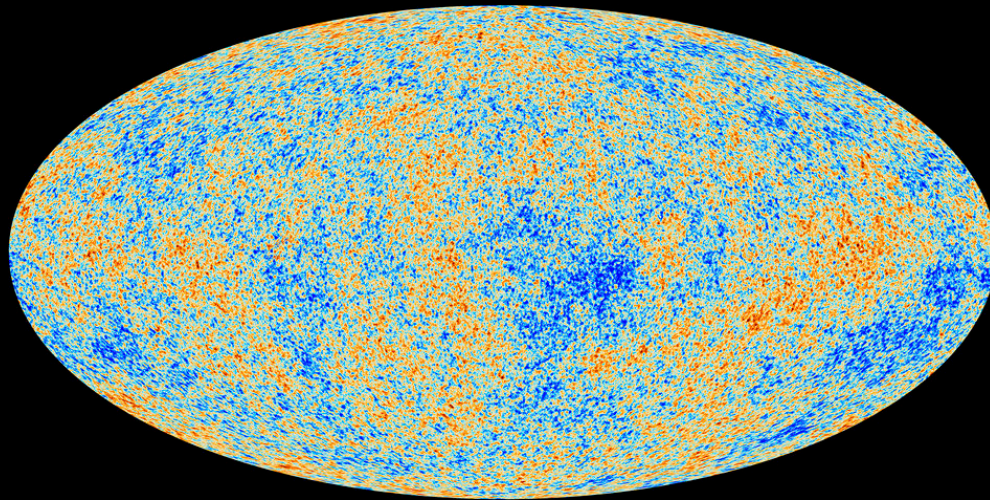


(Strange) Summary of the 6th KIAS workshop on
Cosmology and Structure Formation:
From After Dark to Beyond Dark

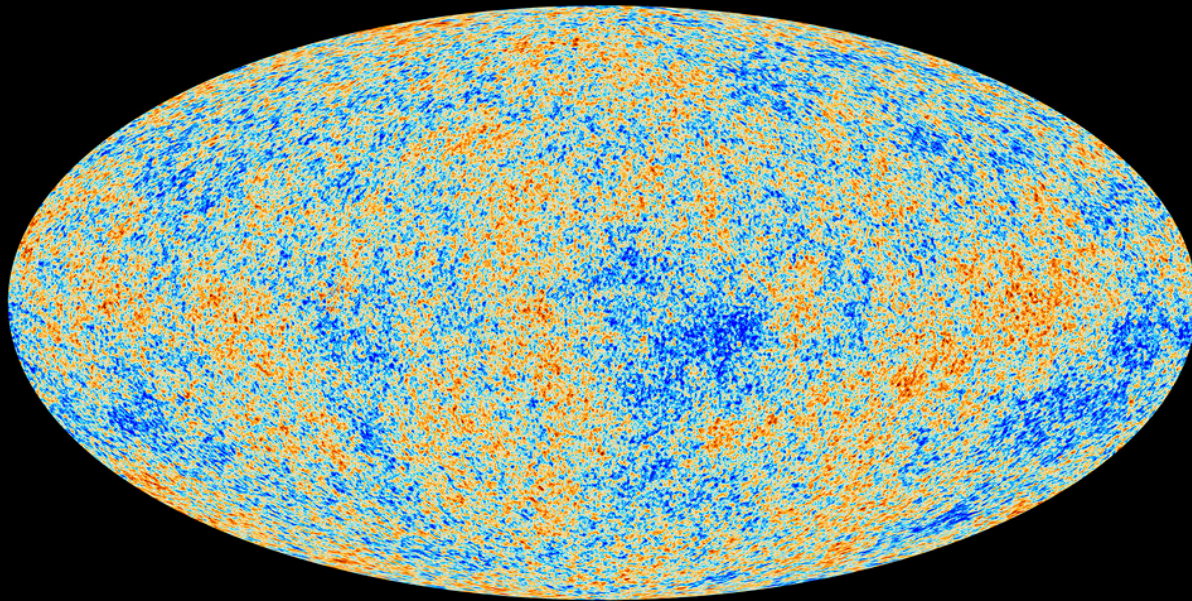


Yasushi Suto

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November 6, 2014

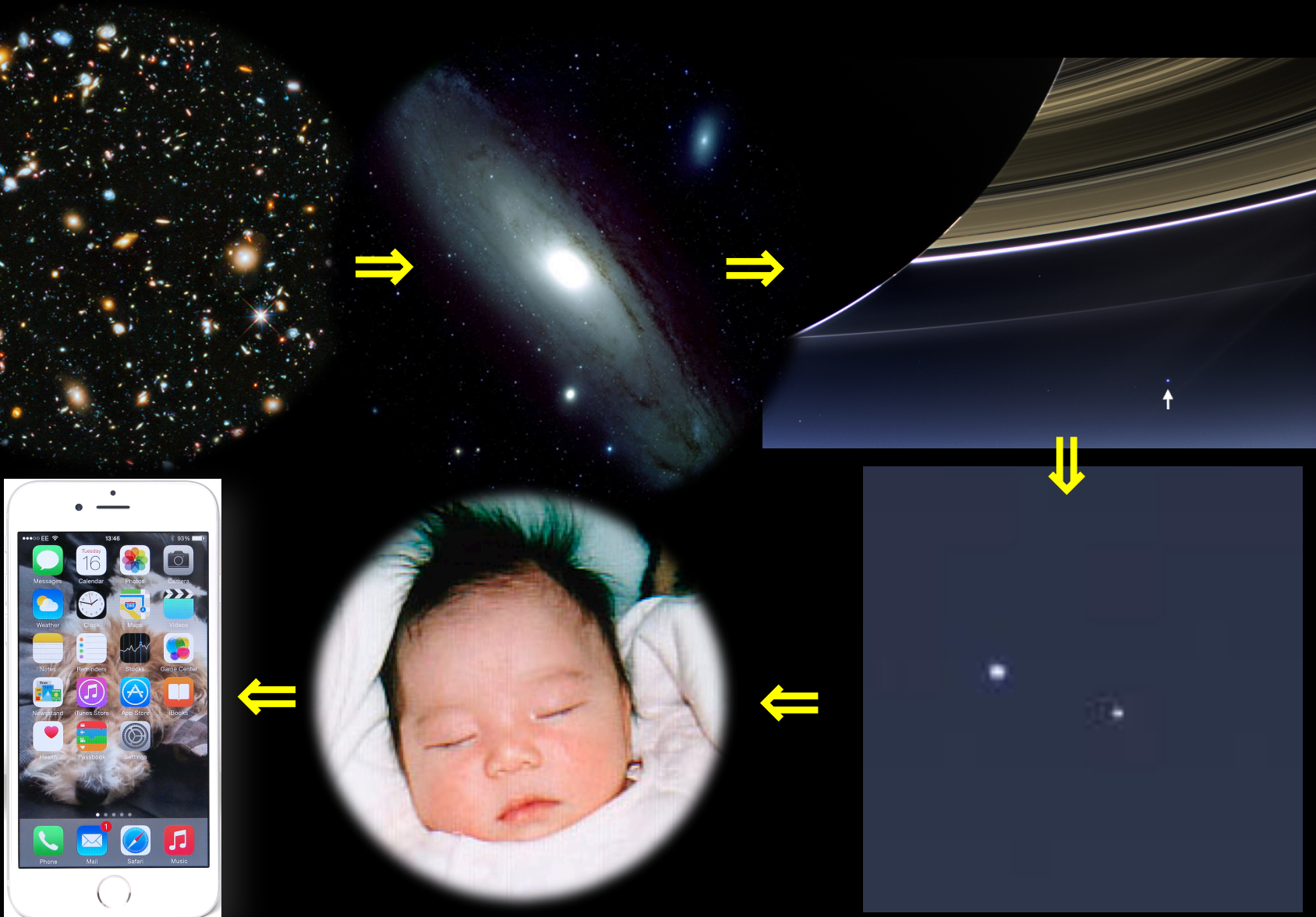
**Even though quite surprising,
everything of our current universe
is imprinted here**



■ **Central dogma of cosmology**

Initial condition + (known) laws of physics
= current universe

Even beyond mere cosmic structures



Goal of cosmology \neq parameter estimate

\Rightarrow ***from known unknowns
to unknown unknowns***

- Universe = 宇宙 = Space + Time
- World = 世界 = Time + Space
- *Universe > World* or *World > Universe* ?

***from
a known universe
to
the yet unknown world***

a famous American philosopher and poet: D.H.Rumsfeld



The Unknown

As we know,
There are known knowns.
There are things we know we
know.
We also know
There are known unknowns.
That is to say
We know there are some things
We do not know.
But there are also unknown un-
knowns,
The ones we don't know
We don't know.

*—Feb. 12, 2002, Department of
Defense news briefing*

Haruki Murakami "After Dark"
(English translation by Jay Rubin)

- Three brothers went out fishing and got caught in a storm. They drifted on the ocean for a long time until they washed up on the shore of an uninhabited island. It was a beautiful island with coconuts growing there and tons of fruit on the trees, and a big, high mountain in the middle.

The night they got there, a god appeared in their dreams and said

- A little farther down the shore, you will find three big, round boulders. I want each of you to push his boulder as far as he likes. The place you stop pushing your boulder is where you will live. The higher you go, the more of the **world** you will be able to see. It's entirely up to you how far you want to push your boulder.

The youngest brother quit first.

- Brothers, this place is good enough for me. It's close to the shore, and I can catch fish. It has everything I need to go on living. I don't mind if I can't see that much of the **world** from here.

His two elder brothers pressed on, but when they were midway up the mountain, the second brother quit.

- Brother, this place is good enough for me. There is plenty of fruit here. It has everything I need to go on living. I don't mind if I can't see that much of the **world** from here.

The eldest brother continued walking up the mountain. There he stopped and surveyed the world.

- This was the place he would live — where no grass grew, where no birds flew. For water, he could only lick the ice and frost. For food, he could only gnaw on moss. But he had no regrets, because now he could look out over the whole **world.**

Mari offers her opinion:

"To me, the lives chosen by the two younger brothers make the most sense."

- "True," Takahashi concedes. "Nobody wants to go all the way to Hawaii to stay alive licking frost and eating moss. That's for sure. But the eldest brother was curious to see as much of the world as possible, and he couldn't suppress that curiosity, no matter how big the price was he had to pay"
- ***"Intellectual curiosity."***
- "Exactly." *(Haruki Murakami "After Dark")*

Intellectual curiosity

- “True,” Takahashi concedes. “***Nobody wants to go all the way to Hawaii to stay alive licking frost and eating moss.*** That’s for sure. But the eldest brother was curious to see as much of the world as possible, and he couldn’t suppress that curiosity, no matter how big the price was he had to pay”

***Nobody wants to go all
the way to Hawaii to
stay alive licking frost
and eating moss.***

Nobody

Indeed, we are *the Nobody* !



Youngest brother @sea shore, Hilo, Hawaii



Second Brother @2800m above sea level



Eldest brother @4200m above sea level



But, he saw more of the world



Nightfall: We didn't know anything

Very famous
short novel
by Isaac Asimov

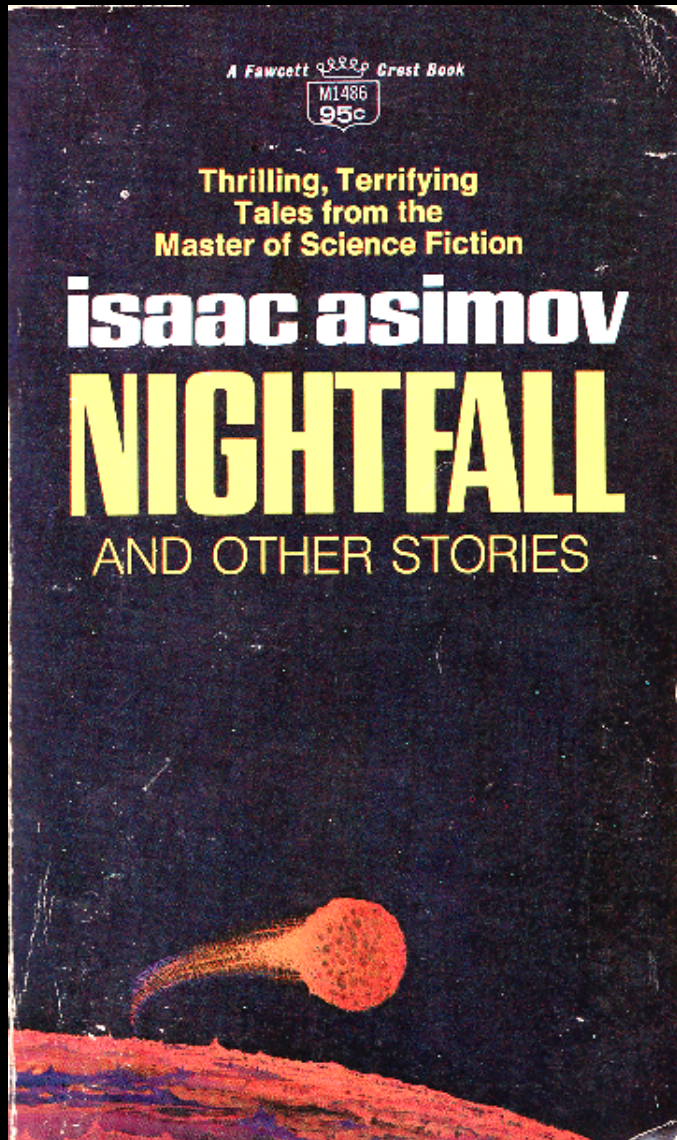


(Alisa Haba)

- No "night" except the total eclipse due to another planet every 2049 years on the planet "Lagash"
- People realized the true world for the first time through the darkness full of stars

Nightfall by Isaac Asimov:

unknown unknowns beyond dark



- “Light !” he screamed. Aton, somewhere, was crying, whimpering horribly like a terribly frightened child.
- *“Stars -- all the Stars -- we didn't know at all. We didn't know anything.”*

Towards the 7th KIAS workshop:

From a known universe to the yet unknown world

- Goal of science \neq to publish well-cited papers
 - To answer the (known) fundamental questions ?
 - It is equally, or even more, important *to discover unknown fundamental questions, or to recognize that **we didn't know anything** (Asimov 1941)*
- 学問 (~ Research ? Academia ? Learning ?)
 - 学 (Gaku) is to learn, and 問 (Mon) is to ask
 - You can ask questions only after you learn something seriously. Learning without asking later does not bring any future progress.