

## The Buddha Lectures on Cosmology

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[Insert Pic buddhalectures.jpg Here]

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*“I dedicate this story to my late aunt Joan Louise Sweany, my intellectual stimulus, mentor, spur, and marvelous friend ever since my teens. She was a longtime member of the Buddhist Temple of Chicago, and assisted Reverend Gyoko Saito in translating the works of Haya Akegarasu, a Japanese Buddhist master, into English. Her picture stands on my bookcase. I miss her, even though I feel she’s still here.”*

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I TOOK MY SEAT in the advanced physics lecture hall, trying to get the morning’s extra caffeine working. Cosmic inflation had been the subject the day before: time and space coming into existence all as one, such that time itself did not exist outside of this creation. Hard to squeeze into a human brain so early in the day.

There’s no set of tenses in human language to describe a situation where time is no more than a measure like space, and getting from the point of the singularity to the expanse of our time and times beyond is a journey in a languages of tenses other than past, present, and future. Physics alone possesses the language. So I believed, and I was struggling badly with its formidable mathematical thickets. Had I wasted all these years of study to find that I couldn’t do it?

The professor came into the hall, not carrying her usual sheaf of notes and transparencies. She looked up at the seventy-five of us and grinned.

“We have a guest lecturer today. The Buddha has decided to visit us and give today’s lecture.” She inclined her head toward the door, and reached out a hand of welcome.

There was a rustle in the seats as students shifted uneasily. I wondered what this was all about. Some guy dressed up in costume, no doubt, to jar us awake for a change. Early-September fun. Too bad there was so much material to cover—this was a detour from needed lecture time. I fiddled with the bookmarks in my copy of Dodelson.

A man quietly entered and walked to where the professor stood. He wore a pair of chinos and a tee-shirt with the equation for Stokes’s Theorem printed on it, except that the manifold designations were printed in what I took to be Chinese characters. I couldn’t decide whether he had more of a Chinese or an Indian

appearance, because his eyes were large and dark with a smooth epicanthic fold, while his nose was more prominent, and his skin tone fell between tan and olive. Had I seen him on campus the previous spring? He nodded to the professor, and she sat nearby.

He spoke. "I arrived this morning and walked on the grass still wet with dew. I found buttercups growing. See?" He held up a flower which had a single stem that branched into two smaller stems, and at the end of each smaller stem shone a small bright yellow blossom, like a bloom of sunshine.

"Like you, I study cosmology," he said. "You see, when the universe was created, time was created—there was no 'before' or 'after'." He pointed at the main stem. "So time was just a part of the universe, like this stem. Time is nothing but the path from the root to the blossoms. Time grew." Then he drew a line in the air between the upper stems. "And space is the path from stem to stem, from blossom to blossom. Space grew."

Then he held up the flower as a flower. "And this is all."

At that moment Buddha laughed and nodded his head, and a murmur spread softly in the hall. Buddha's illustration was no surprise to us—it was almost a classic contrast of timelike versus spacelike intervals in relativity. Maybe he'd done a little basic reading.

The professor stood up and thanked him, and he waved to us and walked away.

I opened my text and started tracing out one of the more difficult equations in my struggle.

"Uh ... Mr. Buddha?" It was our top teaching assistant, whom none of us liked. I looked up. This could be interesting.

Buddha stopped and turned. "Yes?"

"But where is the flower planted?" A whisper grew and then subsided to an expectant silence.

Buddha stood for a long moment in the quiet. His smile glowed. He put a finger to the side of his head. "The flower of creation is planted in the mind."

The assistant pounced. "In whose mind is it planted?"

A long silence now. The Buddha held up the little flower again. "How many plants do you see?"

An awkward pause, then a muttered, “One.”

“How many blossoms do you see?”

“Two.”

“Mind is one. Perceptions are many.”

Oh, no. Here came the anthropic principle again. I started doodling in a page margin.

The teaching assistant raised his hand, asking more politely, “Mr. Buddha, we try to understand. How many dimensions does the universe have?”

Again I looked up.

Buddha’s smile grew. He held up fingers and began counting, a deep frown on his face. He ran out of fingers and looked up, his eyebrows raised. We leaned forward.

Then he started counting his knuckles and the gaps between his fingers, faster and faster, laughing, until he raised both hands and waved them wildly in the air, the flower still between finger and thumb. Everyone started laughing along with him. At least he was a good performer.

He stopped moving, his hands still raised, and we fell silent as quickly as if sound had vanished from the world. He said, “Dimension is number. What lies between the numbers?” He pointed to the Stokes’s Theorem displayed on his chest.

Gasps from a few places in the hall. One of them was mine.

He continued, “And what lies between the blossoms?” He twirled the flower. “Excuse me now.” He left the hall.

We stayed silent for a long minute, and then everyone started talking. Stokes’s Theorem gives an intimate relationship between space and surface, manifold and boundary. What if the boundary had fractional dimension? Do the dimensions of spacetime become blurred, shaded over, and where and why and how does that happen? A light beat upon me from a deep inner place, and words and equations blurred and ran in my head.

I looked at the floor where the Buddha had stood. One small yellow petal lay there. I went down, retrieved it, and placed it between the first two pages of my book.

Centuries before, the Gautama Buddha gave daily addresses to his disciples.

One day he appeared before them, silent. In his hand he held up a small yellow flower for them to see. He said no words at all. That was his sermon.

Today he carried a different name, and we physics students weren't yet his disciples. With us, words and numbers were still necessary. But as I left, a tiny verse sprouted in my mind, and I would follow its trail for a lifetime:

*Universe—*

Yellow buttercup!

*Time and space blooming.*