

# CLASS NOTES EXTENDED: A JOURNEY THROUGH Neurophysics and Mindfulness



Peter Barth '81 celebrating a birthday with his family at California's famed French Laundry restaurant in March 2024

**Peter Barth G'81** sent us a class note in June 2024 that was so rich in detail and included such wonderful photos that we had to make it a "Class Notes Extended" feature.

We'll start when Peter arrived to UVM in 1979.

Between 1979 and 1981, in fulfillment of his master's degree in physics, Peter conducted theoretical research in Neurophysics under Professor John E. Krizan, a well-known theorist active on the forefront of statistical mechanics at the time.

This area of physics looks at how large groups of things, like atoms or brain cells, behave when they are all interacting with each other.

Barth's big accomplishment was solving a problem related to something called the "Ising model." The Ising model is a mathematical way to represent how parts of a system, like brain cells, interact with each other. He applied this model to a specific type of network, called a "Cayley tree." Imagine a tree with branches that split off in all directions, but eventually, they loop back and connect to each other again.

Peter thought this kind of structure might help explain how brain cells communicate.

After Peter finished his thesis, he and another scientist, M.L. Glasser, showed that their model could describe a new type of phase transition. A phase transition is like when water changes from liquid to ice—it's when a system changes in a big way. In their model, these changes happened depending on where the parts (like brain cells) were located within the tree structure.

They shared their findings at important conferences, including one at Rutgers University in 1983. Their work suggested that the Ising model could be useful for understanding how large groups of brain cells interact, especially in complex parts of the brain that deal with advanced thinking and behavior.

Later on, other scientists also found Barth's work useful. For example, in 2014, a team of researchers found that the Ising model might help explain how different parts of the brain work together as a whole. This model, and the work Peter did on it, continues to be important for studying the brain and how its many, many cells work together to help us think and function.

For Peter, these levels of curiosity, intuition and commitment to learning led to a successful career in various engineering disciplines between 1977 and 2015, when he retired. He also used his experience and background to teach others. Peter served as an adjunct professor in Information Systems Management at the University of San Francisco from 1997 to 2008.

## A TRIP TO THE HIMALAYAS IN 1974



Chagdud Tulku Rinpoche (1930-2002) and his family in northern India in 1974. Chagdud Tulku went on to ensure the preservation of the leading mind teaching text of the Nyingma lineage and its translation into English (*The Precious Treasury of the Basic Space of Phenomena*, 2001.) Photo by Peter Barth.



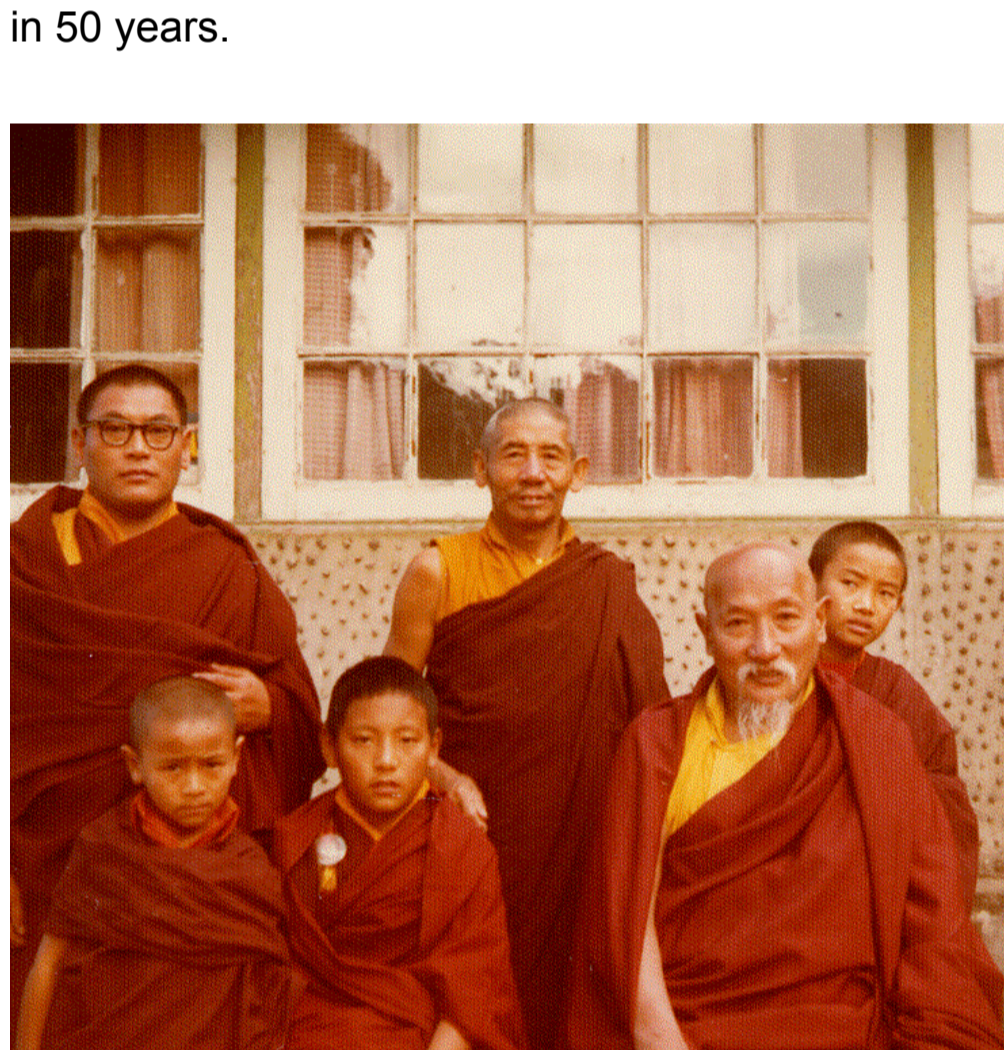
With refugee monks in northern India in 1974. Photo by Peter Barth (right).

As a young man, the first American-born child of two Italians of German heritage, Peter says he was first influenced by his father – one of NYU's oldest students to obtain a graduate degree in electrical engineering. Later, he found inspiration from writers such as Isaac Asimov, who wrote non-fiction science books as well as those of fiction.

It was only in 1970, upon encountering a book edited by the modern Chinese philosopher-scholar, Lin Yutang, (*The Wisdom of China and India*, 1942) that he was exposed to, and then pursued, more Eastern approaches to self-understanding and exploration through meditation.

By the time Peter reached the age of 18, his interests in these areas evolved to the extent that in 1974 he found himself in the Himalayas. For three months, he studied and practiced with various Tibetan Buddhist yogis who were trained in the mind teachings of their individual lineages.

During that trip, Peter took the photos you see in this article - some of which are being shown for the first time in 50 years.



Tibetan refugee monks in Northern India in 1974. Photo by Peter Barth.



Drukpa Thuksey Rinpoche (1916-1983) in northern India in 1974. Thuksey Rinpoche ensured the preservation of the most important mind teaching text of the Kagyu lineage and its translation into English (*Mahamudra: The Moonlight - Quintessence of Mind and Meditation*, 1986.) Photo by Peter Barth.

## 50 YEARS OF TIBETAN BUDDHIST PRACTICE

In 1993, nearly twenty years later, he authored the first of what were to be three books on Tibetan Buddhist experiential approaches to understanding the nature of mind.

In "Piercing the Autumn Sky", Peter writes, "...within the traditions of the people of Tibet and the Himalayas exists a body of knowledge referred to as the 'mind teachings.' It is here that we find a quite extensive and 'alive' tradition which deals with direct investigations of the nature of mind."

Harkening back to his undergraduate years at UVM working on the Ising model, Peter wrote, "Regardless of how wonderful a model or theory of mind and its nature might be, we cannot even be sure that the assumptions upon which that model is based are correct. Ultimately, if we apply only this 'analytical approach' we will leave this life feeling hollow and dry, having made little genuine progress in understanding mind, and who and what we are. An alternate approach which we may choose to explore, and is found in varying degrees across a wide array of social cultures and religions, is called 'the experiential approach'."

It is in documenting and making accessible these experiential approaches, as maintained and refined for over a millennium by Tibetan Buddhists, that Peter continued his work over the next three decades.

From 1990 to 2015, he served as the founding director of a non-profit corporation and group called Mahamudra Meditation Center, established to preserve and make accessible the mind teachings of Tibet in a humanist educational manner.

In early 2023, Barth was invited by a senior editor at Wikipedia to provide input based on his expertise and experience in the Tibetan Buddhist mind teachings.

In September of last year, he successfully launched the Wikipedia page entitled, "Mind teachings of Tibet", chronicling the efforts of several Tibetan Buddhist teachers (including Chagdud Tulku Rinpoche and Drukpa Thuksey Rinpoche) to preserve and make accessible their written and oral teachings during the last 50 years (from 1975 to 2024), as the full scope of the destruction to Tibet's religious and cultural heritage became increasingly apparent in the devastating wake of the Tibetan diaspora of 1959.

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