

CHAOS, COMPLEXITY & CHRISTIANITY

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- Welcome to **Chaos, Complexity & Christianity**, a class about *love* and *peace* based on *modern science*.
- This class is the outgrowth of my teaching and research as a Professor of Hydrology at the University of California, Davis.
- Before briefly describing the class, I would like to say a few words about myself.
- I was born in Cartagena de Indias, in lovely Colombia, South America, and have been in the United States since 1980.
- After finishing a couple of undergraduate degrees in Mathematics and Civil Engineering at Universidad de los Andes in Bogotá, the capital of Colombia, I came to Boston to pursue my graduate work at MIT.
- There, I got a couple of Master's degrees, in Civil Engineering and Operations Research, and my Doctorate in Hydrology, the *science of water*.
- My original plan was to return to my home country, but destiny conspired against it and I have been blessed having a second home at beautiful Davis since 1986.

- I ought to say that when I came to Davis I was not much of a believer in a God.
- I was baptized by my parents as a *Catholic Christian*, but my family did not practice much of their religion.
- Although I sensed the existence of a creator God, I thought of Him as an unapproachable and remote being and, as such, I just went ahead with my life, “like everybody else.”
- As I came to Davis, the scientific field of *Chaos Theory* was in full bloom and those beautiful and simple ideas had a deep impact on my approach to hydrologic research.
- I immersed myself into the physics literature and little by little I gained understanding about the emerging field of *complexity* and about its fascinating *universality*.
- By 1989, and when I was a starting Assistant Professor, some beautiful ideas came to me and, rather quickly, such resulted in an unforeseen bridge between *disorder* and *order*.
- With my collaborators we found, and in truth not searching for it, that there was a mapping capable of transforming the ever-present spikes and violence of *turbulence* into the smooth and harmonious *bell curve*, a universal icon of freedom and independence.

- These findings, providing a *universal* antidote to disorder, inspired the question: Where can I find such transformation?
- Naturally, I searched first for a physical explanation, but there I could not find it. This was because turbulence and calmness precede one another in nature.
- Despite my inherent resistance, only a metaphysical interpretation appeared sensible, for the ideas hinted to a topic that many prefer not to talk about, and that is **Love**.
- Few weeks after and following the sound advice of a good scientist and friend, I experienced the “*flame of God*” for the first time, in a rather “*mystical night of forgiveness*” that confirmed to my core the essence of my analytical findings and that surprisingly made explicit a side of me I did not know existed.
- Soon after my unexpected and beautiful experience, I started to read the Bible that I have never read before.
- As I read and read, I wondered how could I have missed such beauty, for the “word of God” made lovely sense as it spoke directly to me, surely because of my background in complexity research.

- As time passed, and no doubt aided by the clarity brought by life's trials and tribulations, I started to notice a consistent language linking the words of the Bible with the deep metaphors and symbols of modern science.
- As I spent my first sabbatical year at the world renown Santa Fe Institute, specialized in complexity research, I just decided to study in earnest trying to write down the connections I could see before me. This is how the manuscript "**The Fig Tree & The Bell. *Chaos, Complexity, and Christianity,***" which is the basis of this class, came to be.
- This class, given since 2001, is divided into seven lessons and two discussion sessions:
 - An introduction to fractals and complexity
 - The hypotenuse: the pathway of peace
 - Turbulence and the Bible
 - Discussion
 - The essence of chaos
 - A lesson from a fig tree?
 - Discussion
 - The eloquence of transformation, and
 - The splendor of peace

- The first lesson provides an introduction to some key topics making up “**complexity**,” including themes such as *fractals*, *power-laws*, *chaos*, and *self-organized criticality*.
- The second and third lessons pertain to the dynamics of natural turbulence. First, it is explained how such happens in nature and how the same ideas provide suitable imagery to understand also our own division, including the pervasive inequalities in the world.
- Then, it is shown, consistently with the Bible, that there is indeed a single solution that, by avoiding turbulence, guarantees **peace**. Such is shown to be the love of **Jesus Christ**, who is potently symbolized by a straight hypotenuse.
- The fourth and fifth lessons are concerned with what I believe may be drawn from chaos. The explicit math of the theory and its many applications are explained first and then some unexpected and far reaching relations with the Bible, including delicate eschatological topics, are advanced, pointing us to avoid all chaos to instead **surrender to love**.
- The sixth lesson pertains to my own discoveries of a transformation capable of reversing disorder. The ideas are explained in detail first and then connections of such with the Bible’s invitation to **faith** and the **cross** are emphasized, together with other “theological vistas” that include even the **Holy Trinity**.

- The final lecture weaves yet additional symbols from power-laws and criticality that further summons us to “the ways of God” in order to find **peace**.
- The last six lessons end with a poem-song (or two) that summarize the main themes covered. I include them hoping that such would make the ideas yet more understandable.
- Finally, I like to add that I share these ideas in the spirit of *friendship* hoping that they may contribute to mend our broken world. Also, as a way of a disclaimer, I ought to say that the ideas herein do not represent the views of the University of California, Davis nor are they endorsed by any Christian church.

