The contemporary Islamic world is some 1.5 billion people. The invitation I hope to pose to you of the Islamic world, among our 7.5 billion people, is to find and lead the world “beyond modernity” to something equally vast: a new way for us all to be in the world among our 30 civilizations, carefully woven together to protect their deep, sacred, cultural roots, and to allow the flowering of new cultural forms by which we are human; in addition to help all grow past our shadow sides.

I believe the Western world is lost in Modernity, based on a science born of Newton and the Western Enlightenment. That science is powerful, but it is inadequate to a creative biosphere, econosphere, human culture and history that are literally beyond law; that is, they create their own “adjacent possibilities,” without entailing law, into which they literally become. In my long career as a biologist, studying the emergence of life and new life forms, I have noted that as anything new develops there are new adjacent possibilities. These could be possibilities for new actions, for new combinations of interactions, new places for ever new life forms. With adjacent possibilities constantly being created, life generates newness in ever new and exciting ways. Long ago Heraclitus said, “The world bubbles forth”. In ways we are just beginning to see, he was right at and beyond the watershed of life. The living world bubbles forth beyond entailing Law. (Should you wish, see “The End of a Physics Worldview: Heraclitus and the Watershed of Life”, npr.org/blogs/13.7 Aug 8, 2011). What this means is that there are no laws, such as the ‘laws’ of physics, that predetermine what creative new entities will emerge— we co-create our living world beyond entailing law.

As an American with roots in the Western tradition I cannot know, but I suspect that many of you wish to enter fully into the 21st Century, but do not wish to be “Western.” I think you wish to find your own way forward, and must do so. As you did a thousand years ago, you may invent yourselves anew.

We of the West, children of our Reformation, Newton, our Enlightenment, know the good and ill of our first world: Constitutional government—John Locke’s conception of a balance of power—and increased standards of living driven by science, on the one hand. But we also know the enormous corruption of our societies by concentration of wealth and power that greedily distorts Western societies to its interwoven ends. More, we of the first world are “reduced to price tags” as Gordon Brown, former Prime Minister of the United Kingdom, said recently. The first world economy has enormous benefits, but seeks the “highest economic value” in the name of ever GDP growth on a finite planet. We overemphasize “value in trade” and forget “value in fairness”, that is, equity. We of the West are almost unknowingly trapped in our Modernity. Our economy, with its advantages, does not serve our deepest humanity. The Islamic world is not trapped in this Western world view. Thus, you, not we, may have more freedom to explore, invent, discover and lead us all.
I need to say why Heraclitus was right, at least for the living world, if not the universe as a whole.

I start with Genesis: God created the heavens, split day from night, sea from land, created all the creatures of the world and set humanity in dominion over all of creation. We of the Abrahamic traditions were enchanted. This enchantment lasted in the West until the 15th Century with the black and white magi, the former seeking occult knowledge that would allow them to stand nature on her head and wrest their due, a twisted version of God’s promise to Adam.

Then came Newton with three laws of motion, universal gravitation, the differential and integral calculus. Newton, a single mind, invented our entire Western conceptual framework of the world.

Think of a billiard table with balls on it. How will they move? Newton taught us: i. measure the initial positions and momenta of the balls, that is the “initial conditions”; ii. measure the shape and boundaries of the table, that is the “boundary conditions”; iii use Newton’s three laws in differential equation form, given the initial and boundary conditions, and iv. integrate the equations to DEDUCE the ENTAILED future and past motions of the balls.

Laplace came in the time of Napoleon, at the end of the 18th Century. He said that a vast computing system in the sky, if supplied with the current positions and momenta of all the particles in the universe, could compute the entire future and past of the universe.

From Laplace, the West learned “reductionism.” There is, “down there,” some law that entails all that happens in the universe. The universe became an entailed, purely mechanical system incapable of novelty, incapable of bubbling forth, beyond that which was rigidly entailed.

Then came the West’s beloved Enlightenment: down with the Clerics forestalling science. Up with science for the ever greater mastery of nature, and ever betterment of humanity in indefinite progress—again God’s promise to Adam, a promise that sees humanity as forever using nature, not living with it.

Early sociologist Max Weber said, “With Newton we LOST ENCHANTMENT AND ENTERED MODERNITY.”

The Western and First world mind largely thinks of itself as rational, scientific, modern. We have largely lost spirituality; we ARE reduced to price tags. Our world has become so mechanical that the French Existentialists desperately sought meaning in a meaningless universe by our free willed choices. The meaningless universe, including the biosphere and humanity, is itself the child of reductionism. Nothing not entailed, nothing novel, can bubble forth.

This view is deeply useful in physics, but deeply wrong in the world of the living—the biosphere, ecnosphere, culture and history. Very recent work, including my own book, Reinventing the Sacred, and that of senior mathematician Giuseppe Longo, of the Ecole Normal Superior and moving to the esteemed Ecole Polytechnique in Paris, very strongly suggests that NO LAW ENTAILS the evolutionary becoming of life bubbling forth with ever new species and
making it possible to live with one another in ever new ways that are literally untellable beforehand. Likewise there has been the bubbling forth of ever new goods—in the past 50,000 years from perhaps 1000 goods to billions in the global economy. We cannot say ahead of time what will happen in this enormous creativity of life and human life. Stunning is something we know: the invention of a new good creates the opportunity, the new “adjacent possible empty economic niche” for the invention of yet a further new good. The same occurs as evolving species make new “adjacent possible” empty niches that create the opportunity for yet further new species to “bubble forth.” No natural selection selects for the creation of these new niches as niches.

Here is an example of emergence and adjacent possibilities. The invention of the computer and its wide sale enabled a new adjacent possible economic niche, the invention and wide sale of the personal computer whose wide sale created the conditions and new empty economic niche for the invention of word processing which enabled the novelty of the world wide web, which enabled the sale of goods on the web, which enabled web search tools like Google and Facebook. There IS NO LAW that entails this creative “becoming.” The same is true of the evolution of the biosphere—its evolution is beyond entailing law. Life “bubbles forth.”

But how does life bubble forth? Kant gave us the start of an answer: “In an ‘organized being’, the parts exist for and by means of the whole, and the whole exists for and by means of the parts.” Cells and organisms exemplify this, and we KNOW they make ever novel means of living together. They create ever novel empty Adjacent Possible niches into which new life evolves. Life “bubbles forth” by the real magic of Kantian organized beings literally making ever new worlds with one another.

All this is beyond Newton, beyond Einstein, beyond Schrodinger and quantum mechanics, beyond even Darwin for no selection acts to create new empty niches AS new empty niches that are the very Adjacent Possibilities that the biosphere becomes. The biosphere, “magically” builds the very possibilities into which it creatively becomes. So too human life—both becomings are beyond law.

Then we are beyond Newton, reductionism, and entailing law, so we can possibly be Beyond Modernity and disenchantment. In the creative becoming, Heraclitus’ bubbling forth, of the biosphere and human life, beyond constraining entailing law, lies Re-Enchantment. We make the possibilities we become. Life makes the possibilities it becomes. In theological terms, if we wish to use them, God continues to create ever new entities, systems and possibilities.

William Gaddis in The Recognitions said, “There is no truth beyond magic.” He did not mean the black magic of the 15th Century. I speak here of the real magic of the creativity of the becoming of life and human life.

Is there not an inherent sense of value and meaning in this creativity? Some of it causes us harm, but much is generous in its creativity, for we can find ways to right the wrongs.
We do have a human shadow side of lethality, of overreaching greed for money and power. More, the Western and First World ARE lost in Modernity. Too much has become of us in the West in the years since Newton to easily think anew.

You of the Islamic world may be able to find new ways to embrace this beginning new view of the world, enlarge upon its beginning steps, sustain your Islamic faith, but re-enchant yourselves with the vision of Heraclitus, then teach the rest of us so that 30 civilizations around the globe can weave together and create ever new ways to find and nourish our deepest humanity.